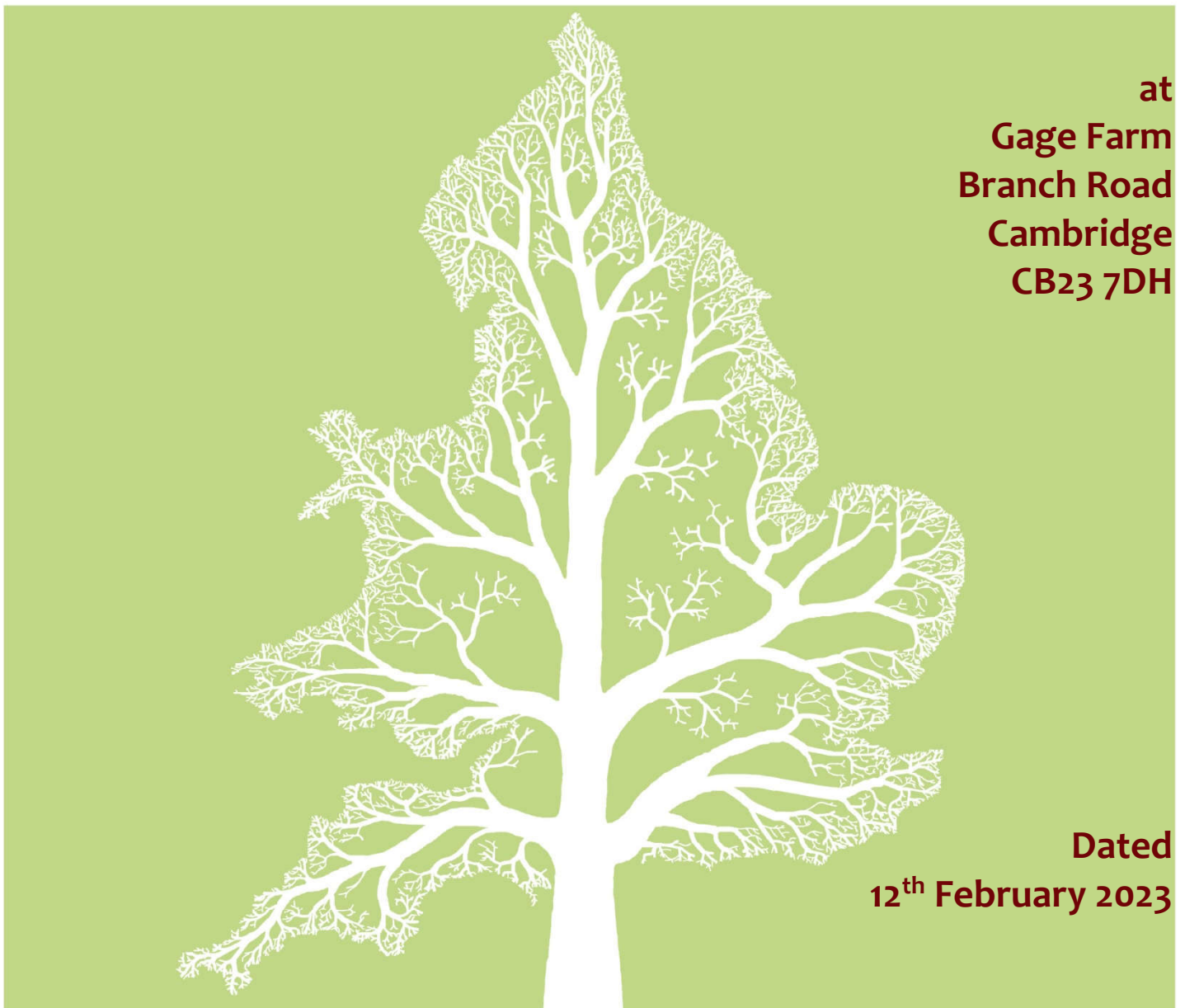


BS 5837 Arboricultural Report

& Impact Assessment



at
Gage Farm
Branch Road
Cambridge
CB23 7DH

Dated
12th February 2023



CROWN
Tree Consultancy

Branching out through England and Wales

Contents

1.	Introduction	3
1.1.	Instruction	3
1.2.	Purpose of this Report	3
1.3.	References	3
1.4.	Survey Details	3
1.5.	Author	3
2.	Site Overview	4
2.1.	Brief Site Description	4
2.2.	Coordinates	4
2.3.	Survey Extent	4
3.	Vegetation Overview (independent of proposals)	5
3.1.	Preliminary Management Recommendations	5
3.2.	Work Priority and Future Inspections	5
3.3.	Species Present – Additional Information	6
4.	Local Geology and Soils	8
4.1.	Desktop Research	8
4.2.	Site Investigations	8
4.3.	Conclusion and Relevance	8
5.	Statutory Protection – TPOs and Conservation Area Status	9
5.1.	Desktop Research	9
5.2.	Felling Licences	9
6.	Arboricultural Impact Assessment	10
6.1.	Overview	10
6.2.	Tree Removal	10
6.3.	Mitigation Planting	11
6.4.	Impact on Tree Canopies	11
6.5.	Impact on Tree Roots	11
6.6.	Demolition Activities	12
6.7.	Waste and Materials Storage	12
6.8.	Cabins and Site Facilities	13
6.9.	Boundary Treatments	13
6.10.	Impact of Retained Trees on the Development	13
6.11.	Summary	13
6.12.	Arboricultural Method Statement	13
7.	Photographs	14
	Appendix 1: BS 5837: 2012 – Guidance Notes	17
	Appendix 2: Survey Methodology	18
	Appendix 3: Tree Data Glossary	19
	Appendix 4: Qualifications	20
	Appendix 5: Further Information	21
	Appendix 6: Tree Data Schedule and Drawings	22

1. Introduction

1.1. Instruction

1.1.1. We are instructed by Neil Dusheiko Architects to:

- Undertake a Tree Survey to BS 5837 at Gage Farm 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.

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. 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 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

1.4.1. A visual ground-level assessment of all trees was undertaken on the 6th of January 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 drawings are based on a measured drawing of the site supplied to Crown Tree Consultancy. This drawing had the tree positions already plotted. Where applicable, additional trees have been plotted by us 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. Gage Farm is a detached residential property with extensive gardens to the front and rear.
- 2.1.2. The property contains and large variety of Retention Category U, Retention Category C, Retention Category B and Retention Category A trees.
- 2.1.3. In adjacent properties and along the boundaries are several Retention Category C and Retention Category B trees. The Root Protection Areas of these trees extend into the site.
- 2.1.4. The site is approximately flat with no abrupt level changes. Boundary features consist predominantly of hedges.
- 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 52°11'44.10"N 0° 1'21.50"E, and the altitude is approximately 45m above sea level¹.

2.3. Survey Extent

- 2.3.1. The area indicated below² shows the extent of the site.



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 following recommendations are made in order to maintain the trees in an acceptable condition:
- 3.1.2. The two ash trees which make up G5 are in a hazardous condition and positioned adjacent to a road. These trees will require removal to prevent possible damage due to tree or limb failure. Alternatively, if retention of these trees is preferred, further inspection with specialist decay detection equipment is recommended to help determine alternative pruning works.
- 3.1.3. Trees which are potentially hazardous and require works to make them safe are G6 and T11. These works should be prioritised as indicated on the Tree Data Schedule.
- 3.1.4. Trees which are considered to be in an acceptable condition at present, but which have defects that require monitoring include G7 and G31. The Tree Data Schedule indicates the recommended inspection frequency.

3.2. Work Priority and Future Inspections

- 3.2.1. The table below suggests a schedule for completing the works recommended in the Tree Data Schedule based on the perceived risk:

Work Priority	Definition	Tree Number
Urgent	As soon as possible	None
Very High	Within 1 Month	None
High	Within 3 Months	G5
Moderate	Within 1 year	G6, G7 and G31
Low	Within 3 years	T11

- 3.2.2. 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	G5 and G6
1.5	G7, T16, T20 and G31
3	All other trees surveyed

- 3.2.3. 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
Alder	20	10	Common deciduous tree native to Britain and Europe, often found near water or in wetlands. Often with an upright form. Its seeds are encased on a brown woody 'cone'. Has a high habitat value, important source of winter food for finches. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Alnus+glutinosa for more info.
Apple	6	8	Deciduous tree native across Europe and W. Asia. Hundreds of cultivars available due to its popular fruit. Flowers white, pink or red in spring. Some species will self pollinate. Most species have a relatively untidy habit. Older specimens are susceptible to a variety of rusts, moulds and cankers. Excellent habitat tree. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Malus+domestica for more info.
Ash	25	18	Large deciduous tree with a straight bole and a high open domed crown. Native to Britain and commonly found in woodlands and adjacent roadsides. Not suitable for small gardens. Easily identified by its oppositely arranged pinnate leaves and black buds. Branches are relatively brittle resulting in a fairly high incidence of small branch failure in windy conditions. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Fraxinus+excelsior for more info.
Blue Spruce	20	8	Evergreen tree native to the USA. Long lived and quite slow growing in the wild. Tolerates cold windy conditions but not pollution or coastal winds. Adds colour interest to large tree collections. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Picea+pungens 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.
Dawn Redwood	25	7	Coniferous tree, but unusually it is deciduous rather than evergreen. Usually a very smart, upright, uniform and healthy looking tree which thrives in all but the colder parts of Britain. Easily propagated. Originally from south-west China where it became endangered in the wild. Similar in appearance to swamp cypress but with opposite leaves. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Metasequoia+glyptostrobooides for more info.
Field Maple	12	10	Deciduous tree native to England & Wales, central and southern Europe, Turkey and west Asia to North Africa. Good hedging species as it has a habitat value and responds well to pruning. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Acer+campestre for more info.
Goat Willow	10	8	Also called Pussy Willow or Great/Common Sallow. Native and abundant in Britain except on the lightest soils. One of the first pioneer species to colonise an abandoned site due to its light far-blown seeds. Traditionally coppiced and used for basket making. rarely planted as an ornamental due to its untidy habit. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Salix+caprea for more info.
Golden Weeping Willow	20	16	Deciduous fast-growing tree with spectacular weeping habit, best viewed reflected in water. Visit http://en.wikipedia.org/wiki/Salix_babylonica#Selections_and_related_hybrids for more info.
Indian Bean Tree	16	12	The 'Indian Bean Tree'. Native to S. Catalpa, Florida, Alabama and Mississippi. More frequent in the southern UK as it prefers a warmer climate. Leaves are very large and smell foul when crushed. Flowers in large candles at the branch ends in summer followed by slender hanging seed pods to 40cm long. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Catalpa+bignonioides 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+lawsioniana for more info.
Maidenhair Tree	25	12	Deciduous tree native to Eastern China - a living fossil with no known relatives. Slow growing. Angular crown with long erratic branches. Occasionally planted as a street tree. Female trees are to be avoided due to their unpleasant smell. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Ginkgo+biloba for more info.
Monterey Cypress	40	12	Evergreen, narrow, upright tree native to California. Very rapid growing, especially in W. Britain – may reach mature height in 40 years. Once planted as a hedge but now superseded by its offspring Leyland cypress. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Cupressus+macrocarpa for more info.

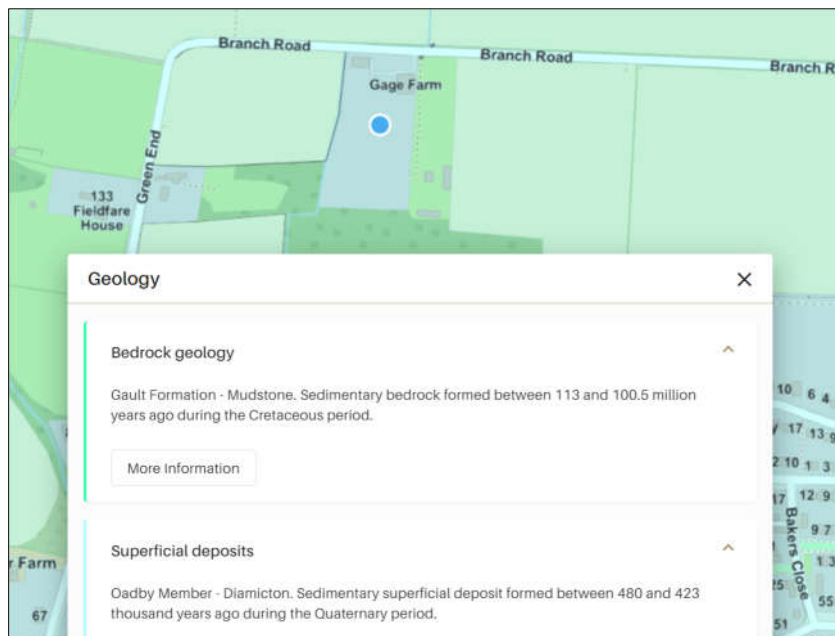
Species	Typical Height at Maturity (m)	Typical Canopy Spread at Maturity (m)	General Notes
Norway Spruce	40	10	Evergreen tree native to Europe, often planted as a plantation tree and harvested for timber. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Picea+abies for more info.
Pear	8	8	Deciduous tree native across Europe and W Asia. Hundreds of cultivars available due to its popular fruit. White flowers in spring along with bright green foliage. More upright growth habit than most apples.
Scots Pine	35	16	Evergreen tree native to Scotland Spain and Norway. Distinguished from other pines by an orange tinge to the bark of the upper stem. One of Britain's few native conifers. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Pinus+sylvestris for more info.
Silver Birch	16	10	Deciduous native tree. A pioneer species requiring good lighting levels that will readily colonise open ground. Relatively short lived and surpassed in woodland by dominant species such as oak and beech. Attractive white bark and graceful, delicate form make this a popular garden tree. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Betula+pendula for more info.
Silver Maple	30	20	Deciduous tree native to N. E. America. Cut leaved version is regularly planted. Outstanding autumn colour. Irregular, airy domed crown, often with weeping outer branches.
Swamp Cypress	30	8	Deciduous conifer native to south east and north America also known as a Bald Cypress. It is fast growing, can cope with water logged conditions and has good autumnal colour. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Taxodium+distichum for more info.
Sycamore	25	16	Deciduous tree native to S. Europe, widely naturalised in the UK. Often regarded as a weed species due to its invasive nature and ability to tolerate most conditions. Responds well to pruning. Not a good tree to park beneath in summer due to the sticky sap secreted by aphids. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Acer+pseudoplatanus 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.

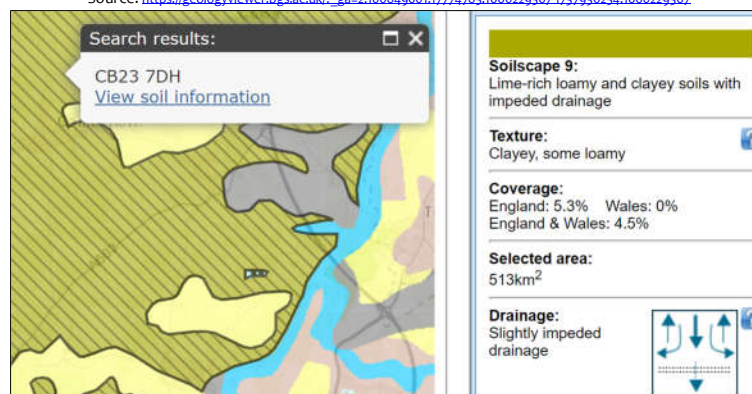
4. Local Geology and Soils

4.1. Desktop Research

4.1.1. Desktop research into local geology based on the postcode CB23 7DH obtained the following results:



Source: https://geologyviewer.bgs.ac.uk/?_ga=2.100849601.17274785.1660229567-1737936254.1660229567



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 4.1, local soils are assumed to have a clayey texture.

4.3.2. Clay soils may be especially prone to compaction and slurring caused by general construction activity. Both of which significantly impair root function. This must be guarded against using boards to protect any soils where roots are growing. When planting new trees, species should be selected that can tolerate heavy soils.

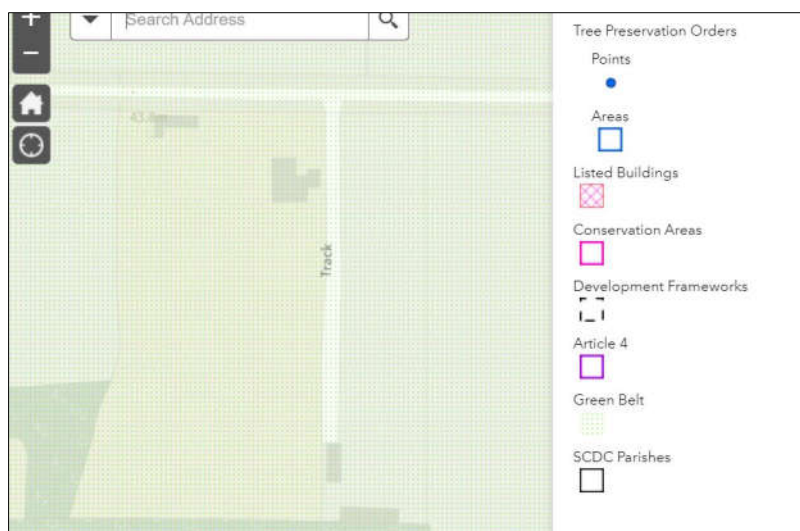
4.3.3. Trees of most species are less likely to root deeply in clay soils. Any new surfacing over tree roots should avoid deep excavation and have good load-spreading properties.

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. On 1st December 2022, we accessed the local authority website. A screenshot is produced below:



5.1.2. This indicates that:

- The site is not within a conservation area.
- There are no TPO's affecting trees within the site.
- There are no TPO's 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>

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 demolish the existing buildings and construct a new residential property and detached garage as indicated on the drawings in Appendix 6. The existing layout is indicated in black, and the footprint of the proposed layout is indicated in pink. Existing vehicular access from shall be maintained and resurfaced.

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	T10, T12 and two small Elder
Tree Removal: Retention Category U	G5
Tree Pruning	T3, T4, T11 and an Elder
RPA: Building Foundations	T3
RPA: Other Foundations	None
RPA: New Hard Surface	T3, T4, G6 and T11
RPA: Replace Existing Hard Surface	T3
RPA: Underground Services	G8
RPA: Change of Ground Levels	T3
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.

6.2. Tree Removal

6.2.1. All trees to be removed are indicated on the Impact Assessment Plan and are listed below:

6.2.2. **Retention Category A:** It is proposed to retain all Retention Category A trees.

6.2.3. **Retention Category B:** It is proposed to retain all Retention Category B trees.

6.2.4. **Retention Category C:** It is proposed to remove T10, T12 and two Elder. These are relatively small trees (maximum height 6.5m) and have very limited visibility from the public highway. They are considered to have a low amenity value and their removal shall have little impact on local visual amenity.

6.2.5. **Retention Category U:** It is proposed to remove G5. These two Category U trees are recommended for removal regardless of the development proposals. Consequently, the removal of these Category U trees is not considered to be a direct impact of the development.

6.2.6. Details specific to each tree can also be found in the Tree Data Schedule.

6.3. Mitigation Planting

- 6.3.1. The site offers ample opportunity to plant new trees to mitigate the loss of G5, T10 and T12. It is understood the client intends to implement new tree planting once the development works are completed.

6.4. Impact on Tree Canopies

- 6.4.1. It is proposed to prune back the branches of T3 that are growing towards the proposal in order to create a clearance distance of 2.5m. Such pruning shall also increase clearance for construction activity. This shall require the removal of relatively small branches which should be pruned back to a suitable growth point.
- 6.4.2. The canopies of T4, T11 and an Elder are also to be crown lifted to a height of 3m to provide clearance over areas of new surfacing.
- 6.4.3. The proposed pruning shall not have a significant impact on tree health or local levels of visual amenity so long as the works are undertaken sympathetically (working to BS 3998 guidelines).
- 6.4.4. All other tree canopies shall be unaffected by the proposals.

6.5. Impact on Tree Roots

Building Foundations:

- 6.5.1. The foundations for the new dwelling will extend into the periphery of the Root Protection Area of T3. Because such a tiny portion of the root system shall be affected, the impact is considered to be negligible and no restrictions on foundation design are considered necessary.
- 6.5.2. Furthermore, it is also proposed to prune the canopy of T3. This pruning will result in a reduction in demand for water and nutrients from the root system. Maintaining a balanced root:shoot ratio in this manner will ensure no branches die back and no detrimental impact due to the incursion into the Root Protection Area.

New Surfaces:

- 6.5.3. A new 'gravel garden' is proposed at the front of the new dwelling which includes a combination of soft landscaping and permeable gravel. The following restrictions are proposed:
- A suitable load spreading surface should be in place at all times during all construction activities.
 - Any excavation required to replace existing hard surfacing over RPAs should be limited to the removal of the existing surface and sub-base to be removed. No further excavation should occur beyond this depth.
 - Excavation of soft ground over RPAs should be limited to the removal of turf and loose topsoil.
 - Hand tools only should be used to excavate within 2m of any tree stem and overseen by the project arborist.
 - Where the gravel surface is proposed for vehicle use, the gravel should be retained in a rigid cellular confinement system such as that shown in the adjacent illustration. These rigid slabs are specifically designed for spreading the load of vehicles and are ideal for use over tree roots. This type of driveway maximises oxygen and rainwater availability to roots below.
 - No retaining edge or structure shall be used that requires any additional excavation.
 - The finished surfaces should be porous to enable the passage of oxygen and water to the soils beneath.



New Pedestrian Surfaces:

- 6.5.4. The Impact Assessment Plan shows where it is proposed to install new pedestrian surfacing over the RPA of T11. It is proposed to limit excavation to a depth of 150mm, excavate using hand tools and install a permeable surface to ensure minimal impact.

Underground Services:

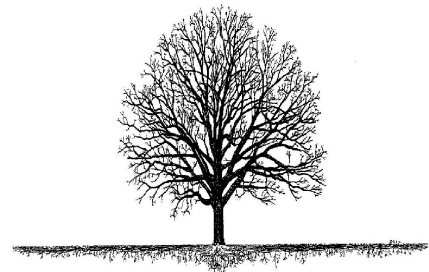
- 6.5.5. Excavation is required in the periphery of G8's RPAs to install a new treatment plant. Such a tiny portion of the RPA shall be affected, the impact is considered to be negligible, and no restrictions are deemed necessary.
- 6.5.6. Other underground service locations are yet to be finalised. Wherever possible, these should be located outside of RPAs. Where this is not possible, the project arborist should be consulted prior to any excavation. Trenching for underground services is one of the most damaging activities on construction sites, and NJUG guidelines⁵ should be followed (<http://streetworks.org.uk/wp-content/uploads/2016/09/V4-Trees-Issue-2-Operatives-Handout.pdf>) in accordance with a site-specific Arboricultural Method Statement.

Changes in Ground Levels:

- 6.5.7. Where ground levels changes are proposed at the front of the dwelling in the vicinity of T3, they should only be raised where new permeable surfacing is proposed.

Soil Compaction:

- 6.5.8. 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.
- 6.5.9. 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.
- 6.5.10. It is important therefore 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.



6.6. Demolition Activities

- 6.6.1. No demolition is proposed particularly close to significant trees; however, care should be taken when working adjacent G2 in order to avoid any accidental damage. Tree protection measures should be installed prior to the commencement of all demolition activities (including soil stripping) to prevent any detrimental impact on tree health.
- 6.6.2. Adequate tree protection methods should be specified in an Arboricultural Method Statement, and approved by the local authority before demolition takes place. Areas should be designated for the storage of debris.

6.7. Waste and Materials Storage

- 6.7.1. 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.
- 6.7.2. 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.

⁵ NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Issue 2

6.8. Cabins and Site Facilities

- 6.8.1. Consideration should be given to the location of any site welfare facilities in terms of potential impact on trees. Where it is proposed to install cabins or site facilities in Root Protection Areas, the project arborist should be consulted, and approval obtained from the local authority.
- 6.8.2. 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.

6.9. Boundary Treatments

- 6.9.1. We are not aware of any changes proposed to the existing boundary features that might impact upon trees.

6.10. Impact of Retained Trees on the Development

- 6.10.1. Adequate space has been allowed between retained trees and habitable rooms of the proposal. The canopy of T3 is fairly close proximity to the proposed dwelling, however there are no windows proposed directly facing T3, so the reduced availability of light is not considered to be a significant issue.
- 6.10.2. All other retained trees are located at sufficient distances from any proposed buildings and shall have ample room for future growth.
- 6.10.3. 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.

6.11. Summary

- 6.11.1. Small Retention Category C trees require removal to facilitate the proposed development and two Category U trees are to be removed. The loss of Category U trees is not considered a direct impact of development.
- 6.11.2. New tree planting is proposed once the development is complete.
- 6.11.3. Pruning works are proposed to T3, T4, T11 and an Elder to ensure clearance from buildings and/or over areas to be resurfaced.
- 6.11.4. Building foundations are proposed within the periphery of the Root Protection Area of T3. Such a tiny portion of the RPA shall be affected, the impact is considered to be negligible and shall be off-set by the canopy pruning which shall maintain a balanced root-shoot ratio.
- 6.11.5. A new treatment plant is proposed in the periphery of G8's RPA. Such a tiny portion of the RPA is likely to be affected, the potential impact is considered to be negligible.
- 6.11.6. A new 'gravel garden' is proposed at the front of the property. A combination of gravel surfacing and soft ground is proposed over the RPAs of T3, T4, G6 and an Elder. All new surfacing within RPAs shall be installed sympathetically and with minimal excavation. In the areas to be used for vehicles, a 3D cellular confinement system is to be installed to minimise soil compaction.

6.12. Arboricultural Method Statement

- 6.12.1. BS 5837 recommends that a detailed methodology is agreed in the form of an Arboricultural Method Statement, which shall ensure that trees are well protected during the construction phase. This should detail all tree protection measures and limitations on construction activity.

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.



Photo 10.



Photo 11.

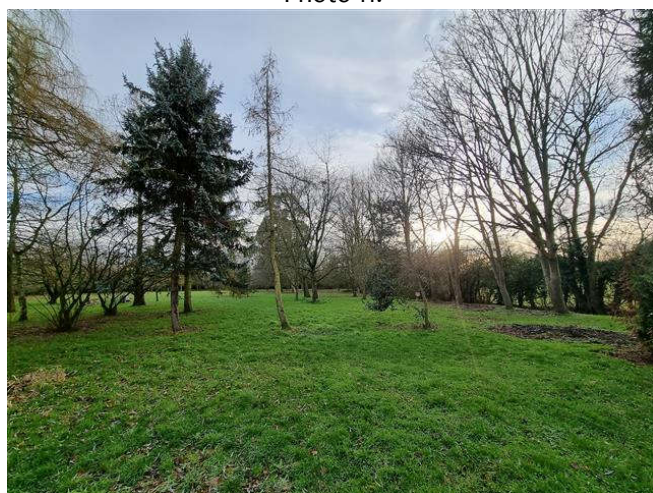


Photo 12.



Photo 13.



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: 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 unlikely to develop into a major defect.

Appendix 4: 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/wgfsfell.pdf/\\$FILE/wgfsfell.pdf](http://www.forestry.gov.uk/website/pdf.nsf/pdf/wgfsfell.pdf/$FILE/wgfsfell.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/>

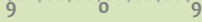







Tree Specific Websites


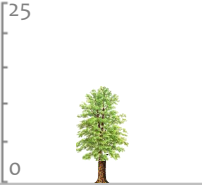


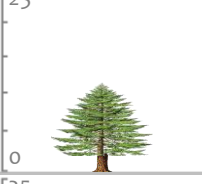

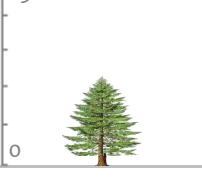
www.crowntrees.co.uk	Crown Consultants site containing useful information
www.trees.org.uk	Arboricultural Association
www.rfs.co.uk	Royal Forestry Society of England, Wales and N. Ireland
www.treehelp.info	The Tree Advice Trust
www.woodland-trust.org.uk	The Woodland Trust
www.treecouncil.org.uk	The Tree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

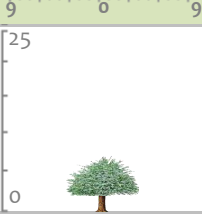



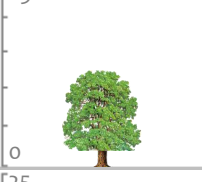
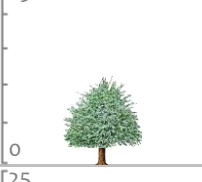
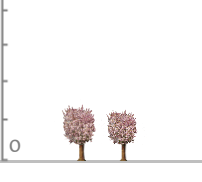
Appendix 6: Tree Data Schedule and Drawings








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.

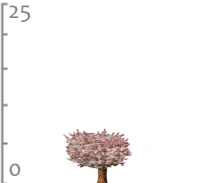

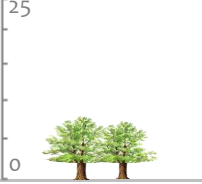
Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)		Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour		Amenity Value	
					N	E			Priority	Inspect Freq (yrs)	Physiological Condition		Life Expectancy (yrs)	
											W	S	Structural Condition	Retention Category
G1	Semi-Mature Ash Fraxinus excelsior.	av 9.5	av 3	av 15	2	2		Position: Situated within boundary hedge. Form: Group of close growing specimens. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required.	Moderate Good Good	Low 40+ C	n/a	3	
G2	Semi-Mature Ash Fraxinus excelsior.	av 9.5	av 3	av 10	2	2		Position: Situated within boundary hedge. Form: Group of close growing specimens. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required.	Moderate Good Good	Low 40+ C	n/a	3	
T3	Early-Mature Scots Pine Pinus sylvestris.	13	1	55	4	5		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate Good Good	Moderate 40+ B	n/a	3	
T4	Semi-Mature Norway Spruce Picea abies.	11	0.5	25	3	3		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate Good Good	Moderate 40+ B	n/a	3	
G5	Early-Mature Ash Fraxinus excelsior.	av 16	av 2.5	av 50	9.5	9		Position: Hedgerow trees adjacent road. Form: Two close growing specimens, both twin-stemmed at ground level with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Both specimens have major decay at base and symptoms of ash dieback. Other: Limited inspection, dimensions estimated.	Remove or decay detection required.	Low Poor Poor	Moderate <10 U	High	1	
G6	Semi-Mature Ash Fraxinus excelsior.	av 17	av 3	av 40	7	9.5		Position: Adjacent road and drainage ditch. Form: Three close growing specimens. History: No evidence of significant pruning. Defects: Occasional minor decay pockets and broken branch stubs. Symptoms of ash dieback.	Reduce height and radial spread by 2.5m.	Moderate Fair Fair	Moderate 10-20 C	Moderate	1	
G7	Semi-Mature Ash Fraxinus excelsior.	av 17	av 3	av 60	10	10		Position: Hedgerow trees adjacent drainage ditch. Form: Similar specimens in a row (lapsed hedge). Defects: Signs of decay at base of some specimens - acceptable condition at present.	Monitor.	Moderate Fair Fair	Moderate 10-20 B	Moderate	1.5	

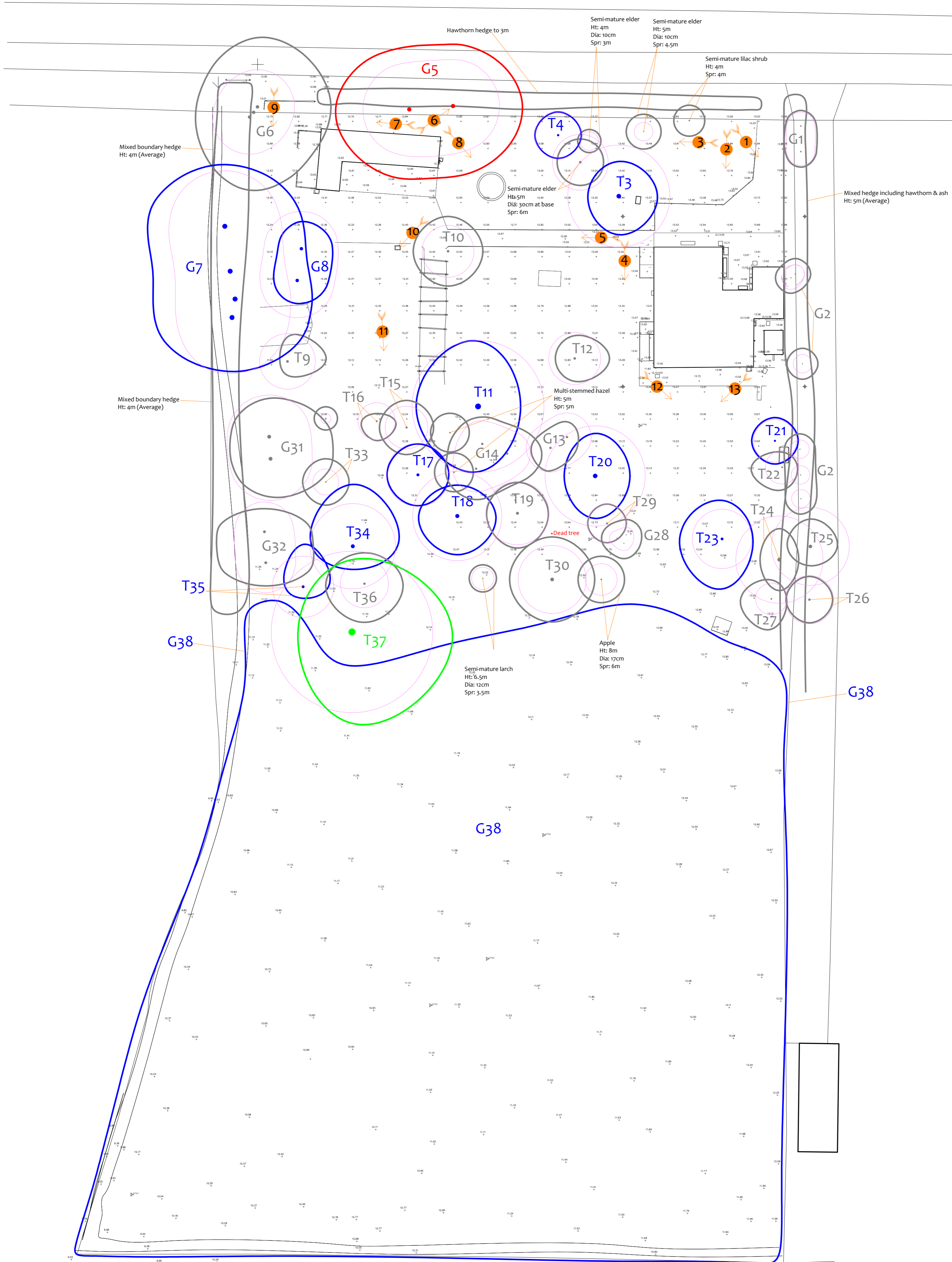
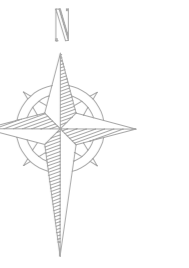
Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N W S E	Scaled Tree Diagram (m) 	Notes	Recommendations (Independent of any development proposals)		Vigour	Amenity Value
								Priority	Inspect Freq (yrs)	Physiological Condition	Life Expectancy (yrs)
										Structural Condition	Retention Category
G8	Semi-Mature Arborvitae Thuja sp.	av 15	av 0	av 40	av 3.5 3 each		Form: Two close growing specimens, both single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. Defects: No significant defects. Other: Vegetation prevented detailed inspection.	No action required.	Moderate Good Good	Moderate 40+ B	
											n/a
T9	Semi-Mature Arborvitae Thuja sp.	12	0	30	3.5 1 2		Form: Single stemmed and leaning with a narrow, upright habit. History: No evidence of significant pruning. Defects: South side of canopy has brown foliage.	No action required.	Moderate Fair Good	Low 20-40 C	
											n/a
T10	Semi-Mature Goat Willow Salix caprea.	6.5	1.5	28	4.5 4.5 4.5		Form: Twin-stemmed at ground level with a balanced crown. History: No evidence of significant pruning. Defects: Significant included bark at base - acceptable condition at present. Other: Recorded stem diameter is equivalent for two stems (Both 20cm).	No action required.	Moderate Good Fair	Low 40+ C	
											n/a
T11	Early-Mature Golden Weeping Willow Salix x sepulcralis 'chrysocoma'.	15	0.5	71	8.5 8 8.5		Form: Twin-stemmed at 3m with a weeping habit. History: Previously topped at 7m. Defects: Occasional significant dead wood.	Remove dead branches >10cm diameter.	Moderate Good Fair	Low 40+ B +	
											Low
T12	Semi-Mature Apple Malus sp.	5.5	1.5	28	3 2.5 3 4.5		Form: Multi-stemmed at 0.5m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Recorded stem diameter is equivalent for three stems (16cm, 16cm, 13cm).	No action required.	Moderate Good Fair	Low 40+ C	
											n/a
G13	Semi-Mature Lawson Cypress Chamaecyparis lawsoniana.	av 10	av 0	av 26	av 2.5 3 each		Form: Two close growing specimens. History: No evidence of significant pruning. Defects: No significant defects. Other: Vegetation prevented detailed inspection.	No action required.	Moderate Good Good	Low 40+ C +	
											n/a
G14	Semi-Mature Silver Birch Betula pendula.	av 12	av 2	av 25	av 3.5 4 4 each		Form: Three close growing specimens, all single stemmed and vertical 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

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)		Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour		Amenity Value	
					W	E			Priority	Inspect Freq (yrs)	Physiological Condition		Life Expectancy (yrs)	
											Structural Condition	Retention Category		
T15	Semi-Mature Blue Spruce Picea pungens.	12	1.5	23	3.5	3.5		Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Low 40+ C +		
					3.5	0							n/a	3
T16	Semi-Mature European Larch Larix decidua.	12	3	20	1	2.5		Form: Single stemmed with a slight lean and an unbalanced crown. History: No evidence of significant pruning. Defects: Significant mower damage to surface roots.	No action required.		Moderate Fair Fair	Low 40+ C		
					2.5	0							n/a	1.5
T17	Semi-Mature Norway Spruce Picea abies.	16	1	34	4	4		Form: Single stemmed and vertical with a weeping habit. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Moderate 40+ B		
					4	0							n/a	3
T18	Semi-Mature Dawn Redwood Metasequoia glyptostroboides.	17	2	48	4	5		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Moderate 40+ B		
					5	0							n/a	3
T19	Semi-Mature Swamp Cypress Taxodium distichum.	11	2	34	4	4		Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Low 40+ C		
					4.5	0							n/a	3
T20	Mature Alder Alnus sp.	13	1.5	54	5.5	4.5		Form: Single stemmed and vertical with a well-formed crown. History: No evidence of significant pruning. Defects: Evidence of internal decay at base - acceptable condition at present.	No action required.		Moderate Good Good	Moderate 40+ B		
					5.5	0							n/a	1.5
T21	Semi-Mature Norway Spruce Picea abies.	11	0.5	23	3	3		Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Moderate 40+ B -		
					3	0							n/a	3

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)		Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour		Amenity Value	
					W	E			Priority	Inspect Freq (yrs)	Physiological Condition		Life Expectancy (yrs)	
											Structural Condition	Retention Category		
T22	Semi-Mature Apple Malus sp.	6.5	1.5	18	4	2		Form: Single stemmed and vertical with an unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate Good Good	Low 40+ C			
														n/a
T23	Early-Mature Indian Bean Tree Catalpa bignonioides.	9	2	32	5.5	4		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: Snapped hanging branch circa 5m above ground level - acceptable condition at present.	No action required.	Moderate Good Good	Moderate 40+ B			
														n/a
T24	Semi-Mature Monterey Cypress Cupressus macrocarpa.	14	0	47	2.5	2.5		Form: Twin-stemmed at 2m with an unbalanced crown. History: No evidence of significant pruning. Defects: Significant included bark at primary fork - acceptable condition at present.	No action required.	Moderate Good Poor	Low 40+ C			
														n/a
T25	Semi-Mature Monterey Cypress Cupressus macrocarpa.	14	2	42	3	3.5		Position: Ownership unclear, adjacent boundary. Form: Twin-stemmed at 2m with an unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate Good Good	Low 40+ C -			
														n/a
T26	Semi-Mature Field Maple Acer campestre.	12	2	26	3	3		Position: Ownership unclear, adjacent boundary. Form: Multi-stemmed at 2m with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate Good Good	Low 40+ C			
														n/a
T27	Semi-Mature Apple Malus sp.	11	2	17	4	2		Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate Good Good	Low 40+ C			
														n/a
G28	Young Cherry Prunus sp.	av 7	av 1.5	av 8	2	2		Form: Three close growing specimens. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate Fair Fair	Low 40+ C			
														n/a

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)		Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour		Amenity Value	
					W	E			Priority	Inspect Freq (yrs)	Physiological Condition		Life Expectancy (yrs)	
											Structural Condition	Retention Category		
T29	Semi-Mature Pear Pyrus sp.	6	2	21	2.5	2.5		Form: Multi-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate	Fair	Low	20-40	C
					2.5	0								
T30	Early-Mature Cherry Prunus sp.	7	2	44 @ Base	5.5	5.5		Form: Multi-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate	Good	Low	40+	C
					5.5	0								
G31	Semi-Mature Sycamore Acer pseudoplatanus.	av 16	av 2.5	av 45	av 5	8		Form: Two close growing specimens, both twin-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Northern most specimen has significant areas of necrotic bark & patches of black exudates.	Monitor.	Moderate	Fair	Low	10-20	C
					5 each	0								
G32	Semi-Mature Ash Fraxinus excelsior.	av 16	av 7	av 32	av 3	6		Form: Two close growing specimens. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate	Good	Low	40+	C
					3 each	0								
T33	Semi-Mature Maidenhair Tree Ginkgo biloba.	11	1	14	3	3		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate	Good	Low	40+	C
					3	0								
T34	Mature Cherry Prunus sp.	14	1.5	46	8	6		Form: Multi-stemmed at 3m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects observed.	No action required.	Moderate	Good	Low	20-40	B
					3	0								
T35	Semi-Mature Maple Acer sp.	15	4	33	5.5	3.5		Form: Twin-stemmed at 3m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate	Good	Moderate	40+	B
					1.5	0								

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)			Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour		Amenity Value	
					W	N	E			Priority	Inspect Freq (yrs)	Physiological Condition		Life Expectancy (yrs)	
												Structural Condition		Retention Category	
T36	Semi-Mature Cherry Prunus sp.	7	1.5	26	5	4	5	5		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.	Moderate Good Good	Low 40+ C		
T37	Mature Silver Maple Acer saccharinum.	22	2	87	7	9.5	13	12		Form: Multi-stemmed at 3m with a balanced crown. History: No evidence of significant pruning. Defects: Several large (>20cm diameter) dead stumps to lower canopy - acceptable condition at present.	No action required.	Moderate Good Fair	Low 40+ A-		
G38	Semi-Mature Mixed Species Mixed species.	av 7	av 2	av 25	3	3	3	3 each		Form: Large group of mixed trees. Other: Limited inspection, dimensions estimated.	No action required.	Moderate Good Fair	Moderate 40+ B		



Tree Ref.	Species	Height (m)	Radius (m)	Area (sq. m)
G1	Ash	9.5	1.8	3.2
G2	Ash	9.5	1.2	2.1
T3	Scotts Pine	13	6.6	137.17
T4	Norway Spruce	11	3.0	28.53
G5	Ash	16	6.0	113.10
G6	Ash	17	4.8	72.85
G7	Ash	17	7.2	163.12
G8	Arborvitae	15	4.8	72.85
T9	Arborvitae	12	3.6	41.64
T10	Goat Willow	6.5	3.4	35.60
T11	Golden Weeping Willow	15	8.5	228.15
T12	Apple	5.5	3.4	35.60
G13	Lawson Cypress	10	3.1	31.55
G14	Silver Birch	12	3.0	28.53
T15	Blue Spruce	12	2.8	24.49
T16	European Larch	12	2.4	18.43
T17	Norway Spruce	16	4.1	52.72
T18	Dawn Redwood	17	5.8	104.10
T19	Swamp Cypress	11	4.1	52.72
T20	Alder	13	6.5	132.15
T21	Norway Spruce	11	2.8	24.49
T22	Apple	6.5	2.2	15.38
T23	Indian Bean Tree	9	3.8	46.68
T24	Monteary Cypress	14	5.0	100.00
T25	Monteary Cypress	14	5.0	80.89
T26	Field Maple	12	3.1	31.55
T27	Apple	11	2.0	13.36
G28	Cherry	7	1.0	3.17
T29	Pear	6	2.5	20.45
T30	Cherry	16	4.4	61.78
G31	Sycamore	7	5.4	92.95
G32	Ash	16	3.8	46.68
T33	Madderhair Tree	11	1.7	9.30
T34	Cherry	14	5.5	96.95
T35	Maple	15	4.0	49.70
T36	Cherry	7	3.1	31.55
T37	Silver Maple	22	10.4	342.18
G38	Mixed Species	7	3.0	28.53

Drawing No: CCL 11343 / TCP Rev: 1
 Title: Tree Constraints Plan (Existing Layout)
 Site: Gage Farm CB23 7DH
 Scale: 1:300 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.

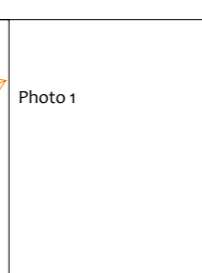
Trees unsuitable for retention due to their very poor condition.

Tree Constraints Plan

Existing Layout

B5 S837 Root Protection Area (radius = 1/2 stem 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



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 (Red)

X G5 are recommended for removal regardless of the development proposals due to their poor condition.

A new 'gravel garden' is proposed in the area shaded in beige. This includes a combination of soft planting and permeable gravel surfacing. In order to ensure impact on trees is kept to the minimum amount possible, it is recommended to limit excavation over RPAs to the removal of turf and loose topsoil only. Any excavation within 2m of a tree stem should be undertaken using hand tools only. In areas to be used for vehicles, a 3D cellular confinement system should be installed to minimise soil compaction.

There is adequate clearance between T6 and the proposed building such that no pruning is required to increase clearance. However, the canopy of T11 will require pruning of the lower hanging foliage to create clearance over to paved area. Such pruning will have little impact on its health or amenity value.

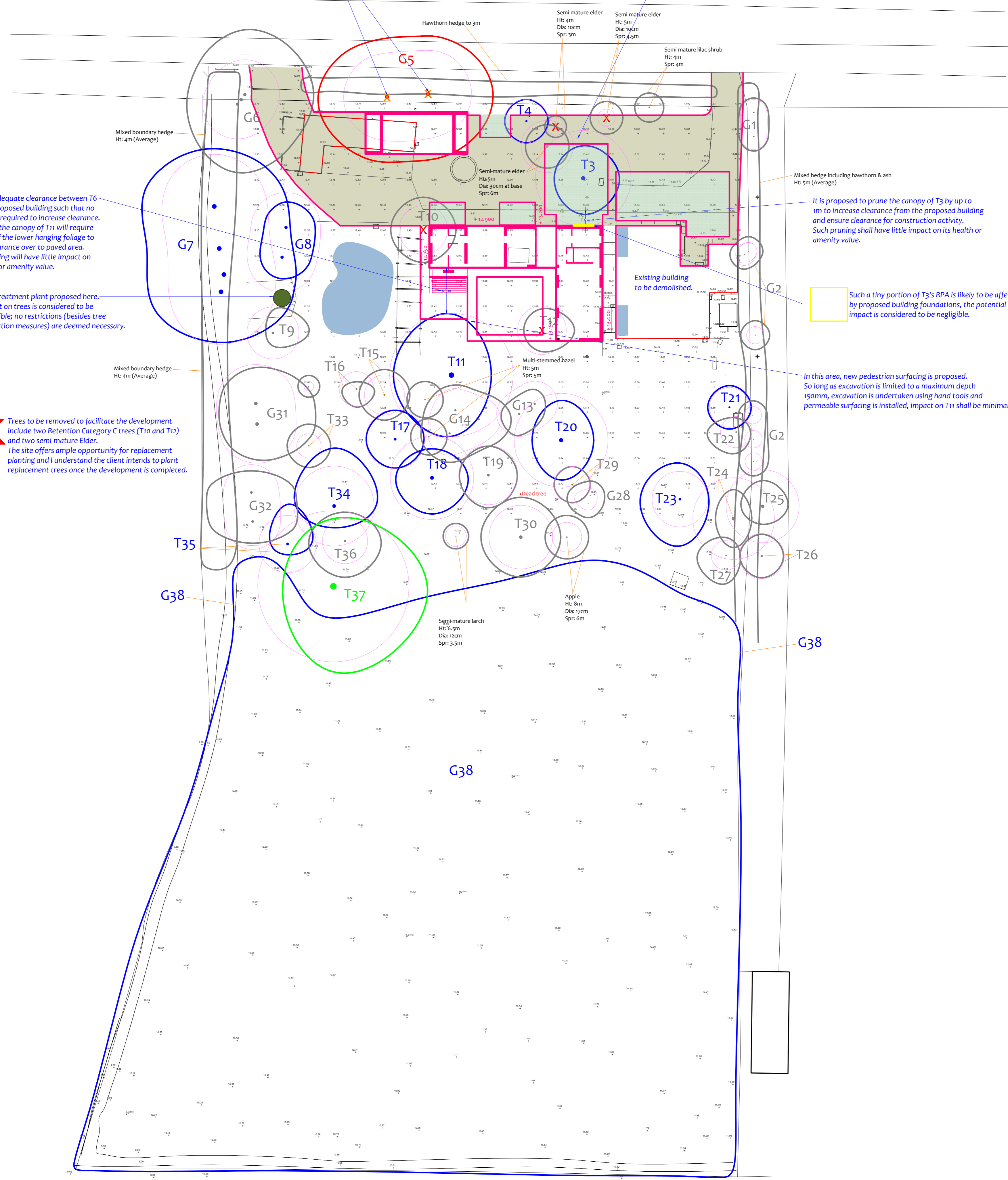
New treatment plant proposed here. Impact on trees is considered to be negligible; no restrictions (besides tree protection measures) are deemed necessary.

X Trees to be removed to facilitate the development include two Retention Category C trees (T10 and T12) and two semi-mature Elder. The site offers ample opportunity for replacement planting and I understand the client intends to plant replacement trees once the development is completed.

It is proposed to prune the canopy of T3 by up to 1m to increase clearance from the proposed building and ensure clearance for construction activity. Such pruning shall have little impact on its health or amenity value.

Such a tiny portion of T3's RPA is likely to be affected by proposed building foundations, the potential impact is considered to be negligible.

In this area, new pedestrian surfacing is proposed. So long as excavation is limited to a maximum depth 150mm, excavation is undertaken using hand tools and permeable surfacing is installed, impact on T11 shall be minimal.



Tree Ref.	Species	Height (m)	Radius (m)	Area (sq. m)	Root Protection Area
G1	Ash	9.5	1.8	10	3.2
G2	Ash	9.5	1.2	5	2.1
T3	Scots Pine	13	6.6	137	11.7
T4	Norway Spruce	11	3.0	28	5.3
G5	Ash	16	6.0	113	10.6
G6	Ash	17	4.8	72	8.5
G7	Ash	17	7.2	163	12.8
G8	Arborvitae	15	4.8	72	8.5
T9	Arborvitae	12	3.6	41	6.4
T10	Goat Willow	6.5	3.4	35	6.0
T11	Golden Weeping Willow	15	8.5	228	15.1
T12	Apple	5.5	3.4	35	6.0
G13	Lawson Cypress	10	3.1	31	5.5
G14	Silver Birch	12	3.0	28	5.3
T15	Blue Spruce	12	2.8	24	4.9
T16	European Larch	12	2.4	18	4.3
T17	Norway Spruce	16	4.1	52	7.2
T18	Dawn Redwood	17	5.8	104	10.2
T19	Swamp Cypress	11	4.1	52	7.2
T20	Alder	13	6.5	132	11.5
T21	Norway Spruce	11	2.8	24	4.9
T22	Apple	6.5	2.2	15	3.8
T23	Indian Bean Tree	9	3.8	46	6.8
T24	Montezuma Cypress	14	5.6	100	10.0
T25	Montezuma Cypress	14	5.0	80	8.9
T26	Field Maple	12	3.1	31	5.5
T27	Apple	11	2.0	13	3.6
G28	Cherry	7	1.0	3	1.7
T29	Pear	6	2.5	20	4.5
T30	Cherry	16	4.4	61	7.8
G31	Sycamore	7	3.4	35	6.0
G32	Ash	16	3.8	46	6.8
T33	Madagascar Tree	11	1.7	9	3.0
T34	Cherry	14	5.5	96	9.8
T35	Maple	15	4.0	49	7.0
T36	Cherry	7	3.1	31	5.5
T37	Silver Maple	22	10.4	342	18.5
G38	Mixed Species	7	3.0	28	5.3

Drawing No: CCL 11343 / IAP Rev: 1
 Title: Impact Assessment Plan (Existing Layout with Proposals Overlaid)
 Site: Gage Farm CB23 7DH
 Scale: 1:1000
 Paper Size: A1



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 Stems & canopies shown

- Category A tree
- Category B tree
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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

Existing Layout with Proposals Overlaid

B5 5837 Root Protection Area (radius = 1/2 stem 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
 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.