

BS 5837 Arboricultural Report

& Impact Assessment



at
**Land adjacent to Flint House
North End
SG8 9SD**



**Dated
22nd March 2024**



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 Domus Architects to:

- Undertake a Tree Survey to BS 5837 at Domus Architects and Project Managers Ltd 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.
- 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 showing locations of tree protection barriers and where ground protection will be required.

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 architects 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 21st February 2024 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

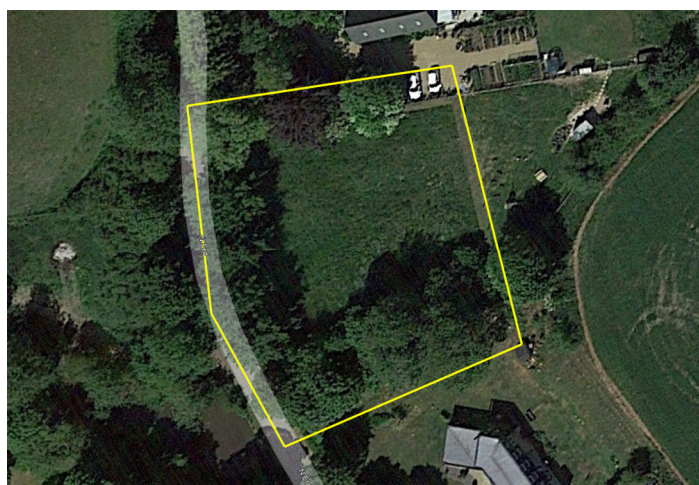
- 2.1.1. The land adjacent to Flint House (the site) comprises a large field with trees adjacent to the north, south and western boundaries. Flint House is located to the north of the field.
- 2.1.2. North End (road) is located adjacent to the western boundary of the field.
- 2.1.3. Within our survey, we identified twelve Retention Category B trees (T1, T2, T3, G5, T8, T9, T10, T11, T14, T16 and T18), fourteen Retention Category C trees (T4, T6, T7, T12, G13, T15, T17, G19, T21 and T22) and one Retention Category U tree (T20).
- 2.1.4. Tree species present predominantly include Ash and Beech, with other occasional trees such as Elder, Horse Chestnut, Sycamore, Maple, Laburnum, Willow, Spruce, Hawthorn and Hazel.
- 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° 0'48.61"N 0° 3'56.16"W, and the altitude is approximately 158m above sea level¹.

2.3. Survey Extent

- 2.3.1. The area indicated below² shows the extent of our survey.



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

² Image taken from Google Earth and may not be current

3. Vegetation Overview (independent of proposals)

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

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. T22 is a mature Ash situated on third party land. This tree was observed to have significant deadwood overhanging the road, and a major cavity to a wound at circa 4m above ground level at the point of the crown break. It is recommended that a decay detection investigation be carried out on this tree and that the deadwood be removed from its crown. These works are recommended as a matter of high priority.

3.1.3. All other trees were deemed to be in satisfactory condition.

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	T22
Moderate	Within 1 year	None
Low	Within 3 years	None

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	None
1.5	T11 and T22
3	T1, T2, T3, T4, G5, T6, T7, T8, T9, T10, T12, G13, T14, T15, T16, T17, T18, G19, T20 and T21

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. Statutory Protection

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.

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.

3.4. Species Present – Additional Information

- 3.4.1. 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.

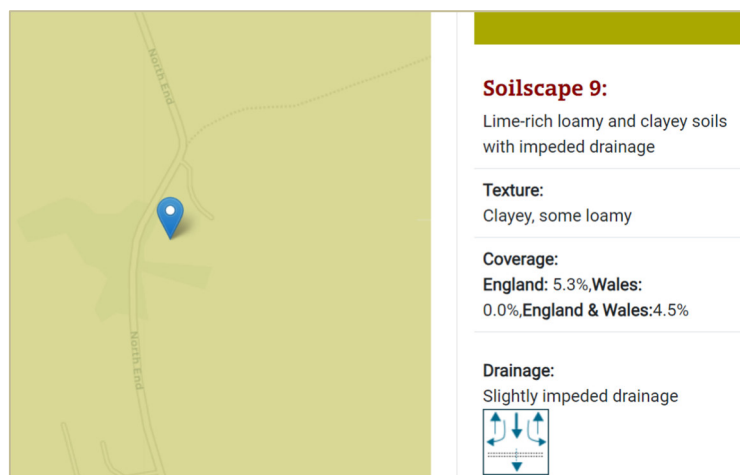
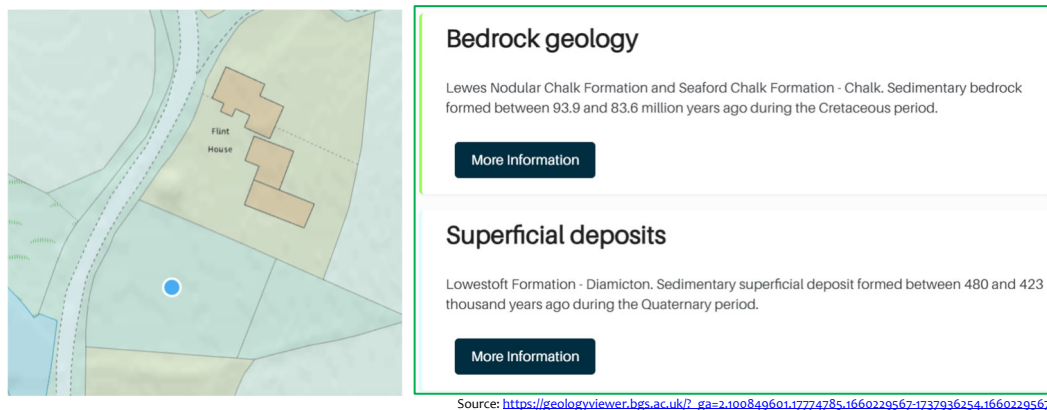
Species	Typical Height at Maturity (m)	Typical Canopy Spread at Maturity (m)	General Notes
Ash	25	18	Large deciduous tree with a straight bole and a high open domed crown. Native to Britain and commonly found in woodlands and adjacent roadsides. Not suitable for small gardens. Easily identified by its 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.
Beech	25	18	Deciduous tree native to W and S Europe. Does not have resilient heartwood, therefore typically lives for 100 - 150 years before decay may cause structural failure if unmanaged. Can be an extremely attractive tree at maturity due to its size and majesty. Young branches may retain their foliage through winter as is evidenced in beech hedges. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Fagus+sylvatica for more info.
Copper Beech	27	20	Purple variety of the common beech. A majestic tree with grey bark and purple leaves. The best forms are grafted though this species does occasionally appear in the wild. Visit http://en.wikipedia.org/wiki/Fagus_sylvatica for more info.
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.
Hawthorn	6	6	Arguably Britain's most common tree due to its abundance in field and roadside hedges. Deciduous, prickly and one of our most hardy trees, it will tolerate almost all conditions including drought, pollution and coastal winds. Also known as Mayflower because of its abundance of white flowers in May. Red 'haws' ripen from September to November and have only one pip (unlike Midland hawthorn which contains 2 pips). Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Crataegus-monogyna for more info.
Hazel	8	8	Deciduous tree native across Europe. Widely coppices and valued for its straight poles. Good wildlife value. Often found in field side hedges. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Corylus+avellana for more info.
Horse Chestnut	25	18	Deciduous tree native to Albania and N Greece. Naturalised throughout the UK. Iconic landscape tree. Susceptible to attack by Bleeding Canker, as well as Leaf Miner and Leaf Blotch. Should be inspected regularly if located close to high public use areas. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Aesculus+hippocastanum for more info.
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.
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.
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

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 **SG8 9SD** obtained the following results:



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 clayey, some 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. 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.
- 4.3.4. 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. Arboricultural Impact Assessment

5.1. Overview

5.1.1. It is proposed to construct a new detached residential property and 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. A new vehicular access is to be created from North End.

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

Activity	Trees Potentially Affected
Tree Removal	None
Tree Pruning	T2, T3, G5, T6 and T8
RPA: House Foundations	None
RPA: Garage Foundations	None
RPA: New Hard Surface	T2, T6 and T8
RPA: Replace Existing Hard Surface	None
RPA: Underground Services	Unknown – To be confirmed
RPA: Change of Ground Levels	None
RPA: Soil Compaction	Trees adjacent the construction area (preventable by installing tree protection measures)

5.1.1. 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.

5.2. Tree Removal

5.2.1. All trees within the site are to be retained.

5.3. Proposed Tree Planting

5.3.1. The site offers ample opportunity to plant new trees as part of a post-development landscaping scheme should any be proposed.

5.4. Impact on Tree Canopies

5.4.1. It is proposed to prune back the branches of T3, G5 and T6 that are growing towards the proposed garage and over the proposed driveway in order to create suitable clearance for their installation (see annotated photos on the Impact Assessment Plan). This shall require the removal of small tertiary branches from T3 and G5, and slightly larger branches of T6 (Elder). All branches should be pruned back to a suitable growth point.

5.4.2. It is also proposed to remove the lower branches of T2 (back to the boundary) and T8 to a height of 5m where they overhang the vehicular entrance leading into the field (please also see the photo on the accompanying Impact Assessment Plan). This shall ensure adequate clearance for construction and delivery vehicles in order to prevent any accidental damage to branches.

5.4.3. So long as the pruning works are undertaken sympathetically (working to BS 3998: 2010 guidelines) the trees shall not be significantly harmed or disfigured and the proposed pruning shall not have a significant impact on local visual amenity.

5.4.4. All other tree canopies shall be unaffected by the proposals.

5.5. Impact on Tree Roots

House Foundations:

- 5.5.1. No new building foundations for the proposed dwelling require installation within the Root Protection Area of any tree. Consequently, no restrictions on foundation design or implementation are considered necessary from an arboricultural perspective.

Garage Foundations:

- 5.5.2. No new foundations for the proposed garage require installation within the Root Protection Area of any tree. Consequently, no restrictions on foundation design or implementation are considered necessary from an arboricultural perspective.

New Surfaces:

- 5.5.3. The Impact Assessment Plan indicates where it is proposed to install a new driveway over the Root Protection Areas of T2, T6 and T8. The portions of the RPAs that shall be affected, are detailed below:

Tree No	Total RPA (m ²)	Area of RPA affected (m ²)	% of RPA affected
T2	43	3.31	7.69
T6	13	2.38	18.30
T8	113	10.87	9.61

- 5.5.4. The table shows that less than 10% of the RPAs of T2 and T8 shall be affected. T6, a Retention Category C Elder, is the tree most affected by new surfacing. This is less than the BS 5837 recommended maximum of 20% (BS 5837 Section 7.4.2).

- 5.5.5. It is also proposed to reduce the canopy of T6 back towards the boundary. 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 reduce the chances of dieback should any roots require severing to install the new driveway.

- 5.5.6. To minimise the impact on tree roots when installing the new driveway, the following methodology is proposed:

- A suitable load spreading surface shall be in place at all times during construction activities.
- A permeable, resin bound aggregate surface is to be installed.
- The aggregate shall be retained in a rigid cellular confinement system, such as that illustrated adjacent. 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.
- Excavation shall be limited to the removal of any existing vegetation and loose topsoil to a maximum depth of 150mm. If any roots in excess of 50mm are encountered, the excavation shall cease, and the new surface shall be installed above them.
- No retaining edge or structure shall be used that requires any additional excavation.
- The finished surface shall be porous to enable the passage of oxygen and water to the soils beneath.
- The new surface shall be located beyond the BS 5837 (section 7.4.2.7) recommended maximum distance of 0.5m from any buttress roots.
- The project arborist shall oversee the excavation where tree roots are likely to be present.



- 5.5.7. These measures accord with industry best-practice⁵ and shall ensure impact is minimised as best possible.
- 5.5.8. Furthermore these trees have good rooting conditions throughout the remainder of their Root Protection Areas which shall remain undisturbed. The remaining root systems will therefore be extensive and easily able to supply the canopy with sufficient water and nutrients.

Underground Services:

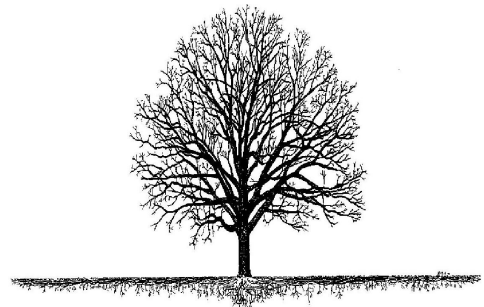
- 5.5.9. Underground service locations are yet to be finalised. Wherever possible, these should be located outside of RPAs. Where this is not possible, the project arborist should be consulted prior to any excavation. Trenching for underground services is one of the most damaging activities on construction sites, and NJUG guidelines⁶ 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:

- 5.5.10. We are not aware of any proposed ground level changes that are proposed over Root Protection Areas.

Soil Compaction:

- 5.5.11. 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.
- 5.5.12. 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.
- 5.5.13. 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.



5.6. Demolition Activities

- 5.6.1. No demolition is proposed close to trees.
- 5.6.2. 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.

5.7. Waste and Materials Storage

- 5.7.1. 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.
- 5.7.2. 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 BS 5837(2012 section 7.4) and Arboricultural Association Guidance Note 12: The Use of Cellular Confinement Systems near Trees

⁶ NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Issue 2

5.8. Cabins and Site Facilities

- 5.8.1. 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.
- 5.8.2. On this site, there is ample room for the siting of cabins and site facilities without impacting on trees.

5.9. Boundary Treatments

- 5.9.1. If it becomes necessary to replace existing fences over the Root Protection Areas of trees, existing post holes should be reused.
- 5.9.2. Where new fences are to be installed within Root Protection Areas, this must be done in a manner that involves minimal excavation. A flexible fencing system that allows for exploratory holes to be excavated and the siting of posts where there is little rooting activity would be acceptable. Post holes shall need to be hand excavated and any roots greater than 25mm diameter should be retained.

5.10. Impact of Retained Trees on the Development

- 5.10.1. Adequate space has been allowed between all trees and habitable rooms of the proposal. Consequently, the proposal shall not result in increased pressure to remove or overly prune any of the retained trees.
- 5.10.2. The gutters of the garage will need occasional maintenance to avoid blockage. This will be relatively easy to manage as the garage is a single storey building.
- 5.10.3. 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.

5.11. Summary

- 5.11.1. The proposal seeks to retain all of the vegetation surveyed.
- 5.11.2. Pruning works are proposed to T2, T3, G5, T6 and T8 to provide clearance from the proposed garage, or to ensure suitable clearance over the proposed driveway for vehicle use. All pruning works should be undertaken sympathetically in accordance with BS 3998.
- 5.11.3. No new building foundations are proposed within Root Protection Areas.
- 5.11.4. A new permeable driveway is proposed over the RPAs of T2, T6 and T8 using the Minimum-Dig Method as per BS 5837 recommendations. The new driveway shall be installed sympathetically, with minimal excavation.
- 5.11.5. So long as suitable protection measures are implemented prior to construction, I see no arboricultural reasons why the proposal should not proceed.

5.12. Arboricultural Method Statement

- 5.12.1. 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. All of the issues raised within this Impact Assessment should be covered by the Method Statement.

6. 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's 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

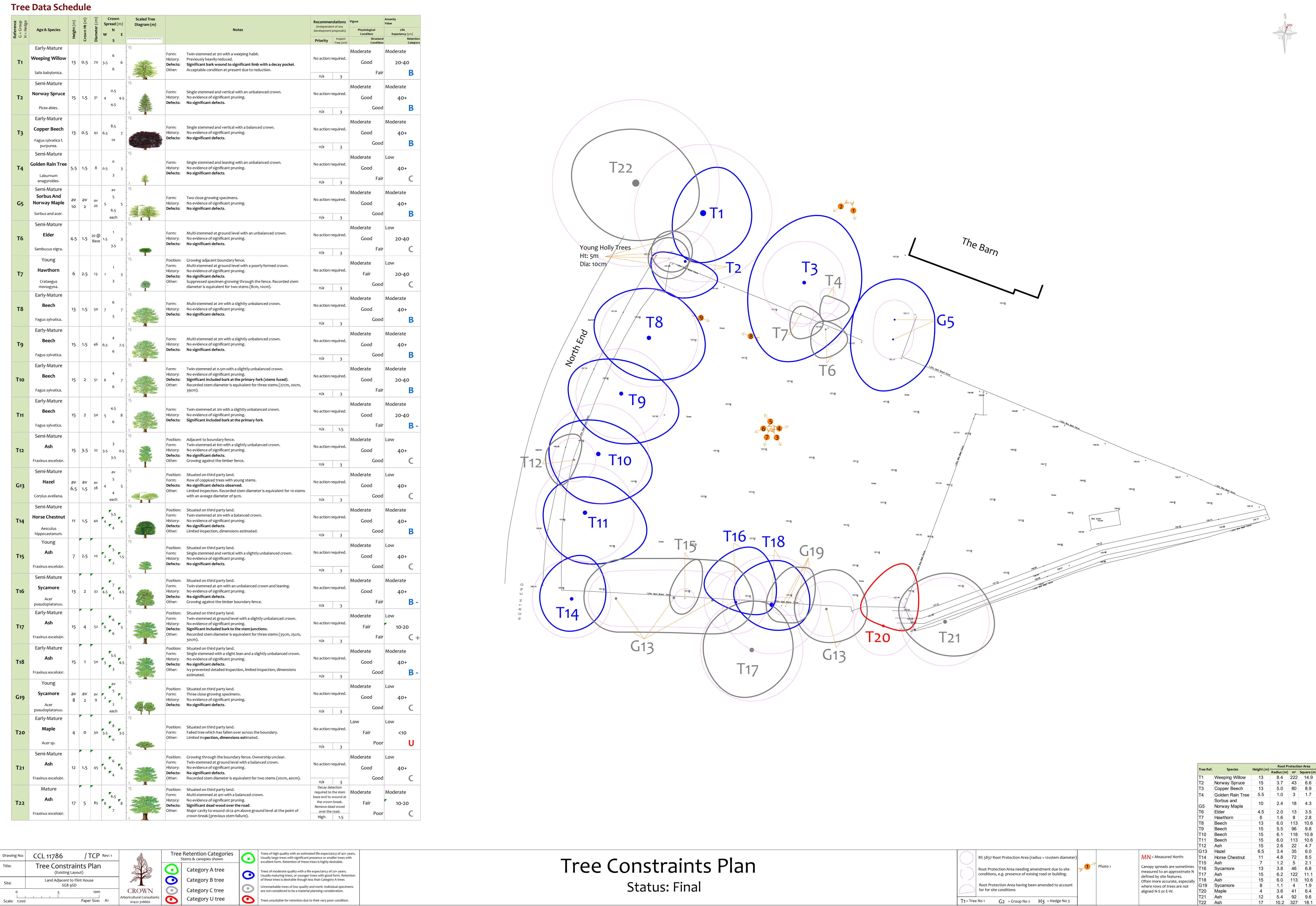
The Tree Data Schedule and any drawings accompanying this report follow this page. They are also provided as separate documents for ease of printing and screen viewing.

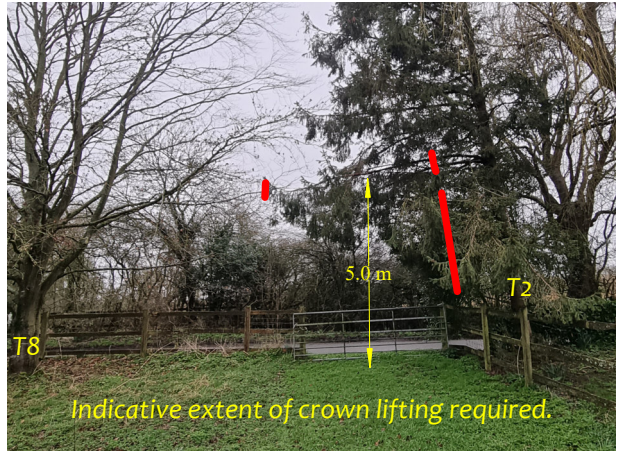
Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N W E S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour	Amenity Value
										Physiological Condition	Life Expectancy (yrs)
								Priority	Inspect Freq (yrs)	Structural Condition	Retention Category
T1	Early-Mature Weeping Willow Salix babylonica.	13	0.5	70	6 3.5 6 6		Form: Twin-stemmed at 2m with a weeping habit. History: Previously heavily reduced. Defects: Significant bark wound to significant limb with a decay pocket. Other: Acceptable condition at present due to reduction.	No action required.		Moderate Good Fair	Moderate 20-40 B
								n/a	3		
T2	Semi-Mature Norway Spruce Picea abies.	15	1.5	31	0.5 4 4.5 4.5		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	Moderate 40+ B
								n/a	3		
T3	Early-Mature Copper Beech Fagus sylvatica f. purpurea.	13	0.5	42	8.5 6.5 7 10		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 Golden Rain Tree Laburnum anagyroides.	5.5	1.5	8	0 0.5 3 3		Form: Single stemmed and leaning with an unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Fair	Low 40+ C
								n/a	3		
G5	Semi-Mature Sorbus And Norway Maple Sorbus and acer.	av 10	av 2	av 20	av 5 5 5 6.5 each		Form: Two close growing specimens. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Moderate 40+ B
								n/a	3		
T6	Semi-Mature Elder Sambucus nigra.	4.5	1.5	20 @ Base	1 1.5 3 3.5		Form: Multi-stemmed at ground level with an unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Fair	Low 20-40 C
								n/a	3		
T7	Young Hawthorn Crataegus monogyna.	6	2.5	13	1 1 3 3		Position: Growing adjacent boundary fence. Form: Multi-stemmed at ground level with a poorly formed crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Suppressed specimen growing through the fence. Recorded stem diameter is equivalent for two stems (8cm, 10cm).	No action required.		Moderate Fair Good	Low 20-40 C
								n/a	3		

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
T8	Early-Mature Beech Fagus sylvatica.	13	1.5	50	6 7 7 5		Form: Multi-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Moderate 40+ B
								n/a	3		
T9	Early-Mature Beech Fagus sylvatica.	15	1.5	46	4 6.5 7.5 6		Form: Multi-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Moderate 40+ B
								n/a	3		
T10	Early-Mature Beech Fagus sylvatica.	15	2	51	4 6 7 6		Form: Twin-stemmed at 0.5m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Significant included bark at the primary fork (stems fused). Other: Recorded stem diameter is equivalent for three stems (27cm, 20cm, 39cm).	No action required.		Moderate Good Fair	Moderate 20-40 B
								n/a	3		
T11	Early-Mature Beech Fagus sylvatica.	15	2	50	4.5 5 8 6		Form: Twin-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Significant included bark at the primary fork.	No action required.		Moderate Good Fair	Moderate 20-40 B -
								n/a	1.5		
T12	Semi-Mature Ash Fraxinus excelsior.	15	3.5	22	3 3.5 0.5 3.5		Position: Adjacent to boundary fence. Form: Twin-stemmed at 6m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Growing against the timber fence.	No action required.		Moderate Good Good	Low 40+ C
								n/a	3		
G13	Semi-Mature Hazel Corylus avellana.	av 6.5	av 1.5	av 28	av 5 5 4 4 each		Position: Situated on third party land. Form: Row of coppiced trees with young stems. Defects: No significant defects observed. Other: Limited inspection. Recorded stem diameter is equivalent for 10 stems with an average diameter of 9cm.	No action required.		Moderate Good Good	Low 40+ C
								n/a	3		
T14	Semi-Mature Horse Chestnut Aesculus hippocastanum.	11	1.5	40	5.5 4 4 4		Position: Situated on third party land. Form: Twin-stemmed at 2m with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required.		Moderate Good Good	Moderate 40+ B
								n/a	3		

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
										Physiological Condition	Life Expectancy (yrs)
								Priority	Inspect Freq (yrs)	Structural Condition	Retention Category
T15	Young Ash Fraxinus excelsior.	7	2.5	10	5 2 1.5 2		Position: Situated on third party land. Form: Single stemmed and vertical with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Low 40+ C
								n/a	3		
T16	Semi-Mature Sycamore Acer pseudoplatanus.	13	2	32	7 4.5 4.5 1		Position: Situated on third party land. Form: Twin-stemmed at 4m with an unbalanced crown and leaning. History: No evidence of significant pruning. Defects: No significant defects. Other: Growing against the timber boundary fence.	No action required.		Moderate Good Fair	Moderate 40+ B -
								n/a	3		
T17	Early-Mature Ash Fraxinus excelsior.	15	4	52	6 6 5 6		Position: Situated on third party land. Form: Twin-stemmed at ground level with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Significant included bark to the stem junctions. Other: Recorded stem diameter is equivalent for three stems (35cm, 25cm, 30cm).	No action required.		Moderate Fair Fair	Low 10-20 C +
								n/a	3		
T18	Early-Mature Ash Fraxinus excelsior.	15	1	50	5.5 5 4.5 3		Position: Situated on third party land. Form: Single stemmed with a slight lean and a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Ivy prevented detailed inspection, limited inspection, dimensions estimated.	No action required.		Moderate Good Good	Moderate 40+ B -
								n/a	3		
G19	Young Sycamore Acer pseudoplatanus.	av 8	av 2	av 9	av 5 2 2 2 each		Position: Situated on third party land. Form: Three close growing specimens. History: No evidence of significant pruning. Defects: No significant defects.	No action required.		Moderate Good Good	Low 40+ C
								n/a	3		
T20	Early-Mature Maple Acer sp.	4	0	30	8 3.5 3.5 0		Position: Situated on third party land. Form: Failed tree which has fallen over across the boundary. Other: Limited inspection, dimensions estimated.	No action required.		Low Fair Poor	Low <10 U
								n/a	3		
T21	Semi-Mature Ash Fraxinus excelsior.	12	1.5	45	6 6 6 4		Position: Growing through the boundary fence. Ownership unclear. Form: Twin-stemmed at ground level with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Recorded stem diameter is equivalent for two stems (20cm, 40cm).	No action required.		Moderate Good Good	Low 40+ C
								n/a	3		

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
T22	Mature Ash Fraxinus excelsior.	17	5	85	8 8 6.5 7		Position: Situated on third party land. Form: Multi-stemmed at 4m with a balanced crown. History: No evidence of significant pruning. Defects: Significant dead wood over the road. Other: Major cavity to wound circa 4m above ground level at the point of crown break (previous stem failure).	Decay detection required to the stem base and to wound at the crown break. Remove dead wood over the road.		Moderate Fair Poor	Moderate 10-20 C
								High	1.5		





Clearance of 5m beneath the canopies of T2 and T8 will be required for construction vehicle access. Canopies should be neatly pruned to provide the required clearance to avoid any accidental damage to branches. Such pruning shall not have a significant impact on tree health.

The orange arrow suggests a suitable location for underground services to be installed outside of RPAs.

Two lowest southwestern facing branches of T3 will require pruning back to provide clearance over the proposed driveway. Such pruning shall not have a significant impact on the trees health or amenity value.



A portion of T6's RPA shall be affected by the proposed surface and its canopy requires pruning back towards the boundary fence to provide clearance for the installation of the garage. It is considered likely that the potential impact on this Elder is within tolerable limits. Hand tools only should be used for excavation in this area to a maximum depth of 150mm and a permeable surface installed.

Less than 8% of the RPA of T8 shall be affected by the proposed driveway. Such an incursion is considered to be relatively minor and is less than half of the maximum recommended limit of 20%, as per BS 5837. Furthermore, a permeable, resin-bound aggregate surface is proposed which shall ensure the roots are not starved of oxygen and rainwater.

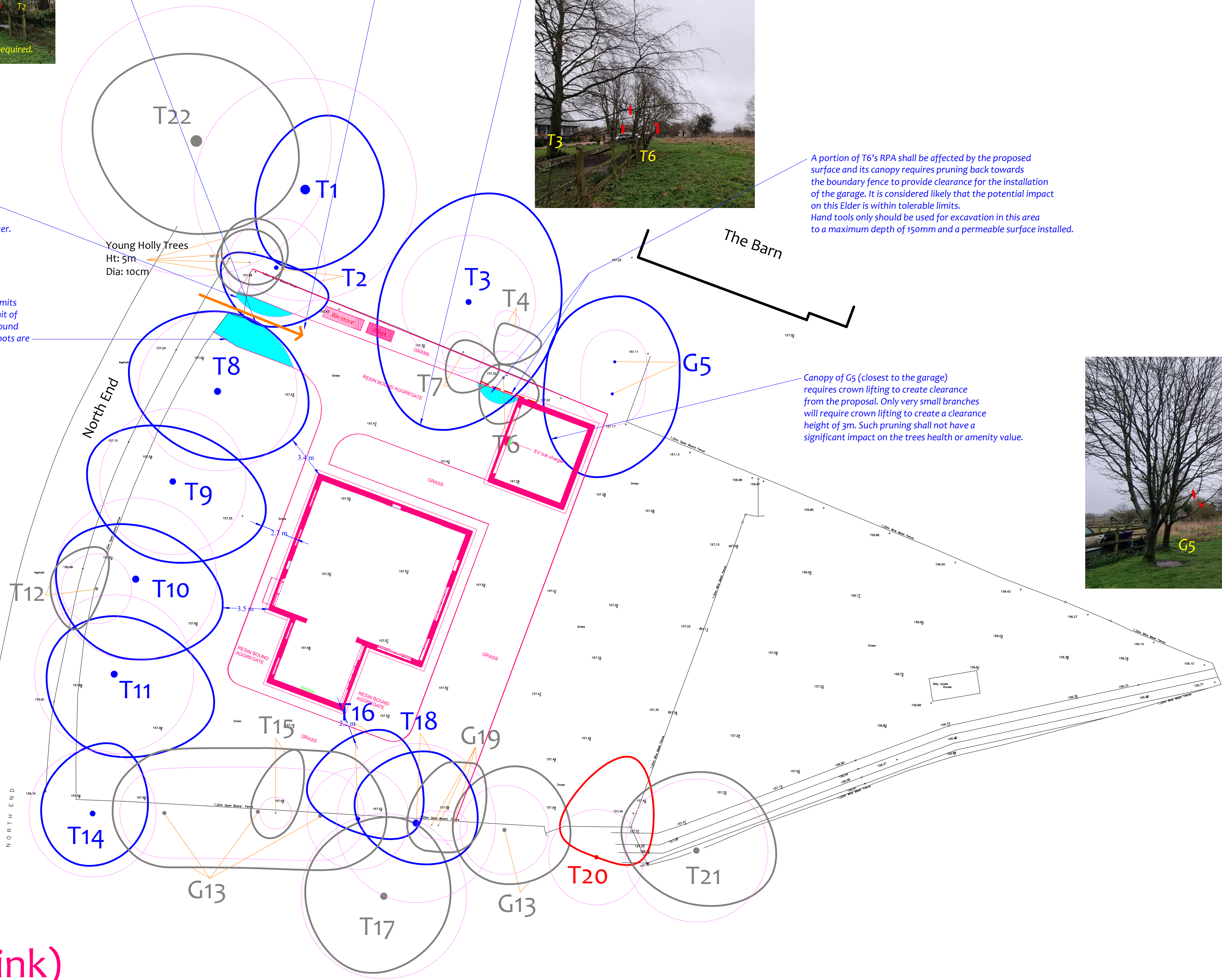
Less than 10% of the RPA of T8 shall be affected by the proposed driveway. Such an incursion is considered to be within tolerable limits and is less than half of the maximum recommended limit of 20%, as per BS 5837. Furthermore, a permeable, resin-bound aggregate surface is proposed which shall ensure the roots are not starved of oxygen and rainwater.

In order to ensure minimal impact on RPAs when installing the new surface, the following restrictions are proposed:
- Excavation depth limited to 150mm.
- Excavation supervised by the project arborist.
- 3D cellular confinement system installed to minimise soil compaction over the RPAs of T2 and T8.
- Permeable surface installed.

There is considered to be sufficient clearance between the tree canopies and the proposed dwelling, such that no facilitative pruning is deemed necessary.



Canopy of G5 (closest to the garage) requires crown lifting to create clearance from the proposal. Only very small branches will require crown lifting to create a clearance height of 3m. Such pruning shall not have a significant impact on the trees health or amenity value.



Proposed Layout (Pink)

Drawing No:	CCL 11786 / IAP Rev: 1
Title:	Impact Assessment Plan
Site:	Land Adjacent to Flint House SG8 9SD
Scale:	0 5 10m 1:2500
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 mature 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

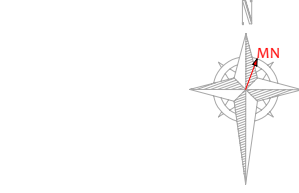
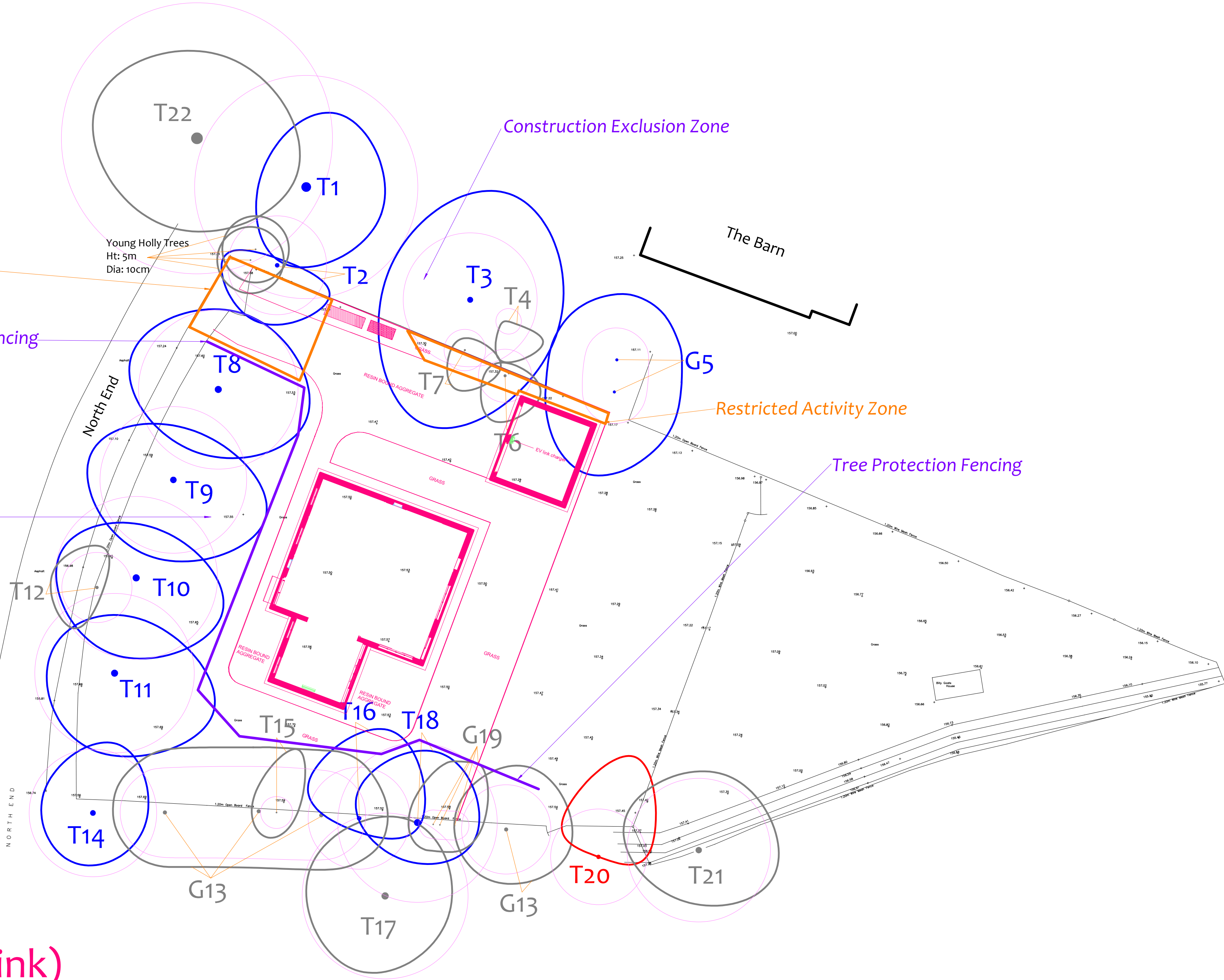
	BS 5837 Root Protection Area (radius = 1xstem diameter)
	Root Protection Area needing amendment due to site conditions, e.g. presence of existing road or building.
	Root Protection Area having been amended to account for site conditions
T1 = Tree No 1	G2 = Group No 2
H3 = Hedge No 3	

	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)	Radius (m)	Area (sqm)
T1	Weeping Willow	13	8.4	222
T2	Norway Spruce	15	3.7	43
T3	Copper Beech	13	5.0	80
T4	Golden Rain Tree	5.5	1.0	3
T5	Sorbus and Norway Maple	10	2.4	18
G5	Hazel	6.5	3.4	35
T6	Elder	4.5	2.0	13
T7	Hawthorn	6	1.6	8
T8	Beech	13	6.0	113
T9	Beech	15	5.5	96
T10	Beech	15	6.1	118
T11	Beech	15	6.0	113
T12	Ash	15	2.6	22
G13	Hazel	6.5	3.4	35
T14	Horse Chestnut	11	4.8	72
T15	Ash	7	1.2	5
T16	Sycamore	13	3.8	46
T17	Ash	15	6.2	122
T18	Ash	15	6.0	113
G19	Sycamore	8	1.1	4
T20	Maple	4	3.6	41
T21	Ash	12	5.4	92
T22	Ash	17	10.2	327

Proposed Layout (Pink)

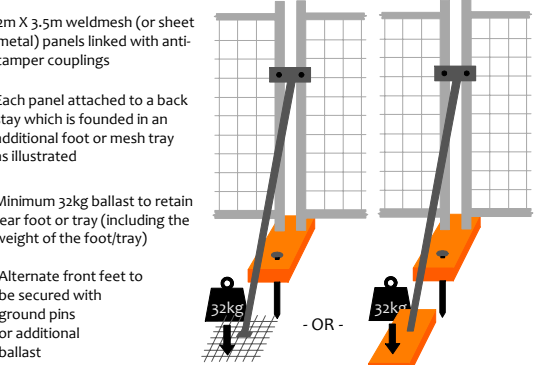


Tree Protection Plan

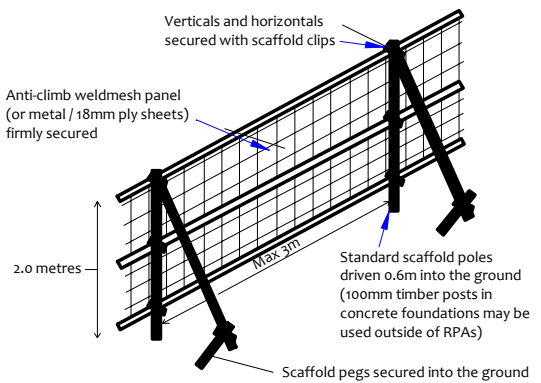
Tree Protection Barriers:

	Fixed protective barrier: The 'In-Ground System' or the 'Backstay System'. To remain in place for all construction activity		Construction Exclusion Zone Stem protected to a height of 2.5m with thick cloth & wire Tree Protection Boiling 1.2 x 1.2 x 2.4m high 25mm plywood
	Moveable protective barrier: The 'Backstay System'. To remain in place except when approved works are being undertaken in the Restricted Zone		Orange Barrier Mesh Fencing, 1.8m, on steel fencing pins and wooden posts To remain in place throughout all construction activity

The 'Back Stay System'



The 'In-Ground' System



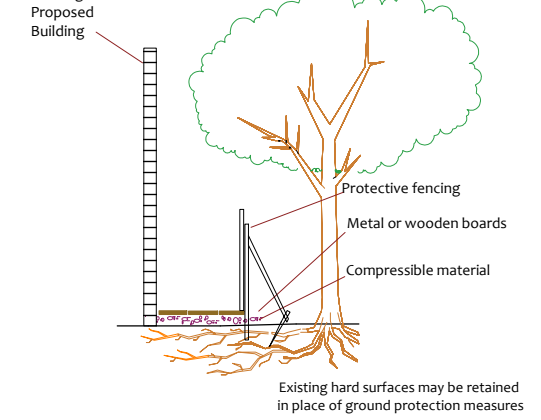
Construction Exclusion Zone

Within this area the following restrictions shall apply:

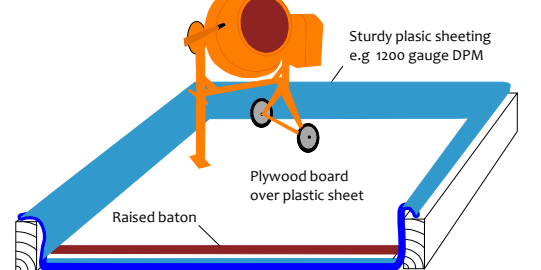
- No occupation or land regarding whatsoever.
- No storage of materials, rubble, soil or spoil.
- No fire within the exclusion zone or within 10m of any tree canopy.
- No site cabins or other temporary structures.
- No discharge of polluted water, cement or chemicals of any kind.
- No use of any machinery, or passage or parking of vehicles.
- No tree works without council consent.

Restricted Activity Zone

Ground Protection where specified in Restricted Zones



Dedicated Mixing and Cleaning Area



Drive Construction: Minimum-Dig Method

