

BS 5837 Arboricultural Report

& Impact Assessment



at
28b Glenilla Road
London
NW3 4AN

Dated
10th April 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 John Fitzpatrick to:

- Undertake a Tree Survey to BS 5837 at 28b Glenilla Road and assess all trees potentially within influencing distance of proposed development within the site.
- Plot the trees on a Tree Constraints Plan and record the data in a Tree Data Schedule.
- Provide an overview of the site and any management recommendations.
- 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 to show where tree protection measures 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 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 27th March 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

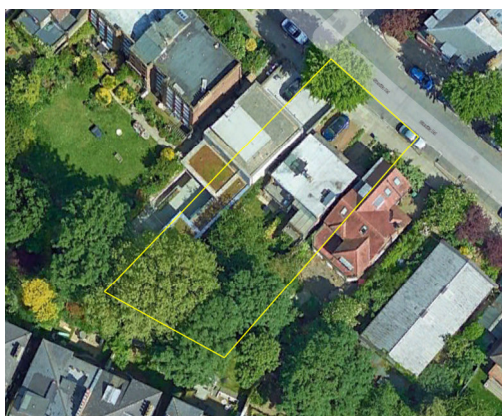
- 2.1.1. 28b Glenilla Road is a semi-detached residential property with a driveway at the front of the property and a garden to the rear. No significant vegetation grows at the front of the property.
- 2.1.2. The rear garden is narrow and rectangular; a patio area is located at the very rear of the dwelling. The rear garden is retained at a higher level than the rear patio, and is occupied by soft ground and paving slabs. Two trees (T2 and T3) grow within the rear garden.
- 2.1.3. In adjacent gardens are two Retention Category C trees (T1 and T4). The roots of these trees may extend into the site. Within the public footway along Glenilla Road is a Retention Category B Lime tree.
- 2.1.4. 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 0°10'4.79"W / 51°32'54.72"N, and the altitude is approximately 62m 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. T1 is a Cotoneaster which overhangs the rear garden of the property. This tree is smothered in ivy. It is recommended that the ivy be removed from the stem and canopy of this tree.
- 3.1.3. T2 is a Cherry tree situated within the rear garden. This tree has a very sparse canopy and is in decline. No remedial works are recommended at this time; however it is considered to have a very limited Safe Useful Life Expectancy.
- 3.1.4. T3 is considered to be in an acceptable condition at present; however, its stem is pressing against the rear boundary wall, concrete fence posts have been installed very close to the tree's stem and the soil levels appear to have been built up against the stem. It is recommended that the tree's condition be monitored.
- 3.1.5. T5 is a street tree located in the public footway along Glenilla Road. Occasional decay pockets are forming and a significant failed branch is hung up in the canopy at circa 7m above ground level. It is recommended that the failed branch is removed from the tree's canopy as a matter of very high priority.
- 3.1.6. 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	T5
High	Within 3 Months	None
Moderate	Within 1 year	T1 and T3
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	T3
1.5	T2 and T5
3	T1 and T4

- 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.

3.4. 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
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.
Cotoneaster	6	6	Semi-evergreen native to the Himalayas. Small shrub like tree with attractive red berries which persist into the winter. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Cotoneaster+x+watereri for info.
Lime	25	12	Very common street tree. Several species exist; the one most often found in woods is 'common lime' which produces a mass of suckers at the stem base, making it very cheap to propagate. Limes have non-symmetrical heart shaped leaves which are much loved by aphids (hence the sticky honeydew on cars parked beneath). Limes are tolerant of heavy pruning and are often managed as pollards. Old limes tend to support a lot of small dead branches. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Tilia+x+europaea 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.
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.

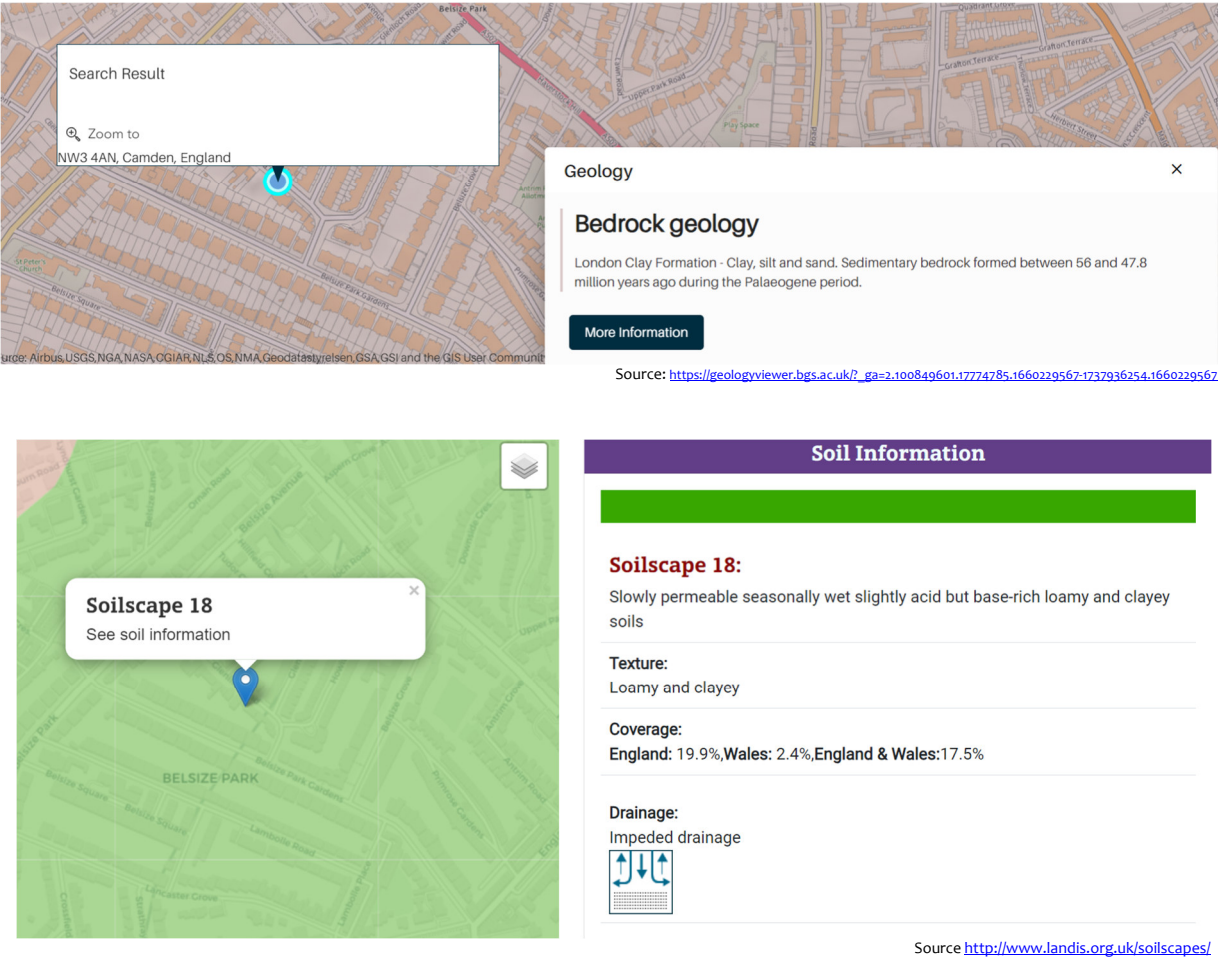
³ <https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas>

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.

4. Local Geology and Soils

4.1. Desktop Research

4.1.1. Desktop research into local geology based on the postcode NW3 4AN 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 loamy & clayey 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.

5. Arboricultural Impact Assessment

5.1. Overview

5.1.1. It is proposed to install a rear extension and extend the existing patio into the rear garden, 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.

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	T1
RPA: Extension Foundations	None
RPA: Other Foundations	T1
RPA: New Hard Surface	None
RPA: Replace Existing Hard Surface	None
RPA: Underground Services	None
RPA: Change of Ground Levels	None
RPA: Soil Compaction	Trees adjacent to 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 are to be retained.

5.3. Impact on Tree Canopies

5.3.1. It is proposed to prune back the canopy of T1 (a Cotoneaster) back towards the boundary to increase clearance from the proposed extension and over the proposed patio. This shall require the removal of relatively small branches which should be pruned back to a suitable growth point.

5.3.2. The proposed pruning shall not have a significant impact on tree health or local levels of visual amenity. The pruning works should be undertaken sympathetically (working to BS 3998: 2010 guidelines).

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

5.4. Impact on Tree Roots

Extension Foundations:

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

Other Foundations:

- 5.4.2. An extension of the patio is proposed at the rear of the dwelling and existing ground levels are to be lowered. Excavation to facilitate the new patio steps and planter shall affect a portion of the theoretical Root Protection Area of T1. Less than 10% of the Root Protection Area shall be affected by the excavations (see the Impact Assessment Plan) which is considered to be within tolerable limits. In order to keep impact to the minimum amount possible, the following restrictions are proposed:
- Hand tools shall be used along the footprint of the excavation to a depth of 750mm (where applicable) as indicated in yellow on the accompanying Impact Assessment Plan.
 - Beyond this depth, and inside the area of the proposed patio, soils may be removed using a small mechanical excavator (if required), so long as it operates from outside all Root Protection Areas.
 - If any tree roots are encountered when undertaking the hand tool excavations, they should be neatly severed using clean, sharp secateurs.
- 5.4.3. The potential impact on T1 is considered to be within tolerable limits. Furthermore, it is also proposed to prune the canopy of T1 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 canopy dieback and lessen the impact due to the incursion into the Root Protection Area.

New Surfaces:

- 5.4.4. No new hard surfaces are proposed within the Root Protection Areas of any trees.
- 5.4.5. If it becomes necessary to remove the paving from the rear of the garden during any light-touch landscaping works, only hand tools should be used for lifting existing paving, and excavation should not exceed the depth of any existing surface that is in place.

Underground Services:

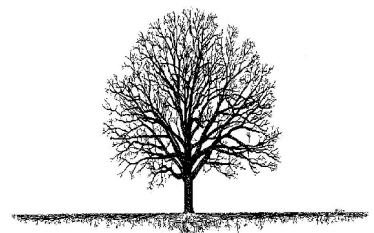
- 5.4.6. The proposal requires no underground services to be excavated through any Root Protection Areas.

Changes in Ground Levels:

- 5.4.7. Except where excavations are proposed to facilitate the new patio and planter, no further changes to ground levels are proposed over Root Protection Areas.

Soil Compaction:

- 5.4.8. 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.
- 5.4.9. 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.
- 5.4.10. 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.



5.5. Demolition Activities

- 5.5.1. No demolition is proposed close to trees.
- 5.5.2. 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.

5.6. Waste and Materials Storage

- 5.6.1. All hazardous materials (including cement and petrochemical products) will need to be controlled according to COSHH regulations in order to ensure there is no detrimental impact on tree health. Provision shall need to be made to ensure that cement spillage avoids all Root Protection Areas.
- 5.6.2. 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.

5.7. Cabins and Site Facilities

- 5.7.1. 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.
- 5.7.2. 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.

5.8. Boundary Treatments

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

5.9. Impact of Retained Trees on the Development

- 5.9.1. All other retained trees are located at sufficient distances from any proposed buildings and shall have ample room for future growth.
- 5.9.2. The foundations and any new surfaces should be designed to accommodate all potential impacts due to future tree rooting activity. These include potential vegetation related subsidence, vegetation related heave, and lifting of surfaces / light structures due to direct root pressure.

5.10. Summary

- 5.10.1. The proposal seeks to retain all of the vegetation surveyed.
- 5.10.2. One tree (T1) requires pruning to create an adequate clearance from the proposed extension. Such pruning shall not have a significant negative impact on tree health or local visual amenity. The canopy of this tree is already quite close to the existing dwelling and patio, therefore, similar pruning would likely be required at some point in the future, regardless of the development proposals.
- 5.10.3. The foundations for the proposed extension do not encroach into any Root Protection Areas.
- 5.10.4. Excavations are proposed within the RPA of T1 to facilitate the patio steps and planter. However, only a relatively small portion of the RPA shall be affected, so the impact shall be minimal and shall be offset by the canopy pruning, which shall maintain a balanced root-shoot ratio.
- 5.10.5. No new hard surfacing is proposed in Root Protection Areas.
- 5.10.6. So long as suitable protection measures are implemented during demolition and construction stages, I see no arboricultural reasons why the proposal should not proceed.

5.11. Arboricultural Method Statement

- 5.11.1. 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.



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'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/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

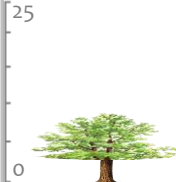




Communities and Local Government website with numerous downloadable documents, from: <http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/>

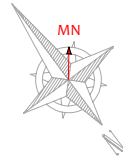
Tree Specific Websites

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

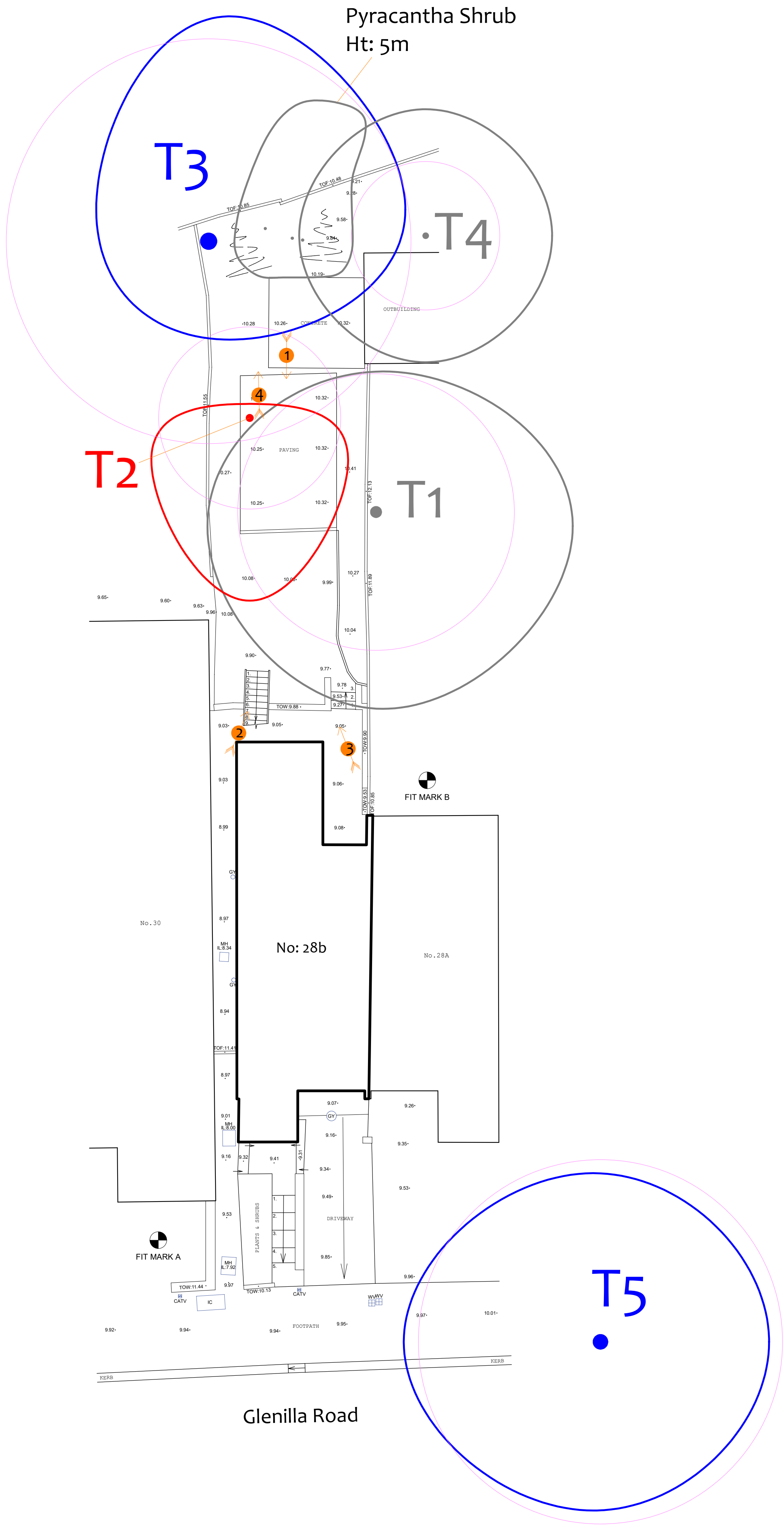
Appendix 6: Tree Data Schedule and Drawings

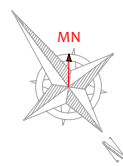
The Tree Data Schedule and any drawings accompanying this report follow this page. They are also provided as separate documents for ease of printing and screen viewing.

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N W E S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour	Amenity Value
								Priority	Inspect Freq (yrs)	Physiological Condition	Life Expectancy (yrs)
										Structural Condition	Retention Category
T1	Semi-Mature Cotoneaster Cotoneaster sp.	7.5	3	41	6 5 7 7		Position: Situated on third party land. Form: Multi-stemmed tree. History: No evidence of significant pruning. Defects: Ivy smothered specimen. Other: Ivy prevented detailed inspection, dimensions estimated. Recorded stem diameter is equivalent for four stems (20cm, 25cm, 18cm, 18cm).	Remove ivy.		Moderate	Low
								Moderate	3	Good	40+ C
T2	Semi-Mature Cherry Prunus sp.	7	2.5	27	0.5 3.5 6.5		Form: Single stemmed and leaning with an unbalanced crown. Defects: Significant pruning wound 1.5m above ground level with decay developing. Very sparse canopy with dead wood throughout. Other: Tree is in decline.	No action required.		Very Low Very Poor	Low <10
								n/a	1.5	Poor	U
T3	Early-Mature Sycamore Acer pseudoplatanus.	16	6	60	8 4 7 3.5		Form: Single stemmed and leaning with an unbalanced crown. History: Reduced. Defects: No significant defects observed. Other: Stem is pressed against the rear boundary wall. Soil level appears to have been built up against the stem on the north east side - newly erected fence with concrete posts adjacent to the tree.	Monitor.		Moderate Fair	Moderate 20-40
								Moderate	1	Fair	B -
T4	Early-Mature Monterey Cypress Cupressus macrocarpa.	10	4.5	22	4.5 4.5 4.5		Position: Situated on third party land. Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required.		Moderate Good	Low 40+
								n/a	3	Good	C
T5	Early-Mature Lime Tilia sp.	15	2	54	6 7 6 6		Position: Street tree. Form: Twin-stemmed at 3m with a balanced crown. History: Reduced. Defects: Occasional decay pockets forming (acceptable condition at present due to the reduction). Significant failed branch is caught up in the crown circa 7m above ground level.	Remove the failed branch.		Moderate Fair	High 40+
								Very High	1.5	Fair	B

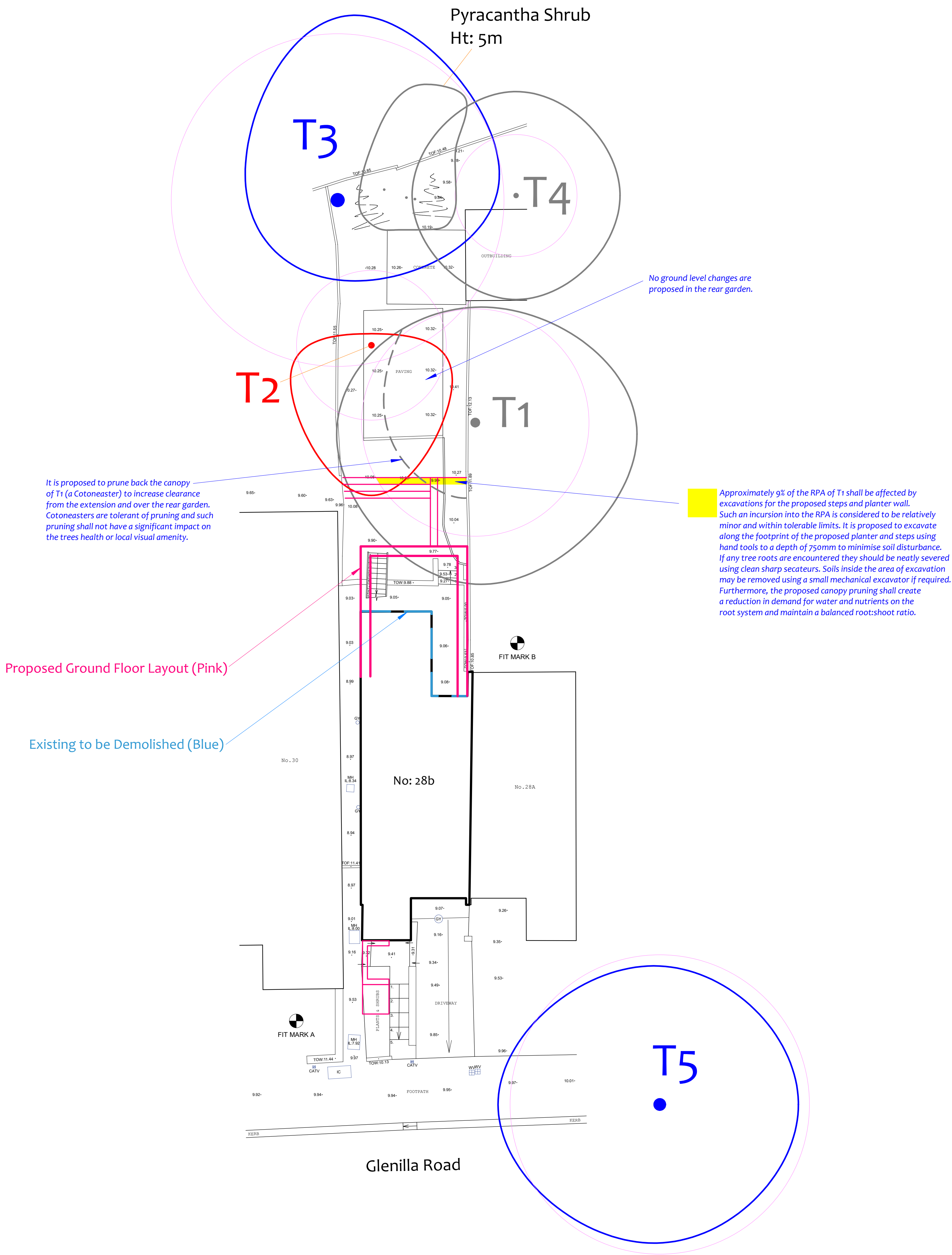


Tree Constraints Plan





Impact Assessment Plan
(Existing Layout with Proposals Overlaid)



Drawing No: CCL 11827 / IAP Rev: 1

Title: Impact Assessment Plan
(Existing Layout with Proposals Overlaid)

Site: 28b Glenilla Road
NW3 4AN

Scale: 1:100 Paper Size: A1



Tree Retention Categories
Stems & canopies shown

Category A tree

Category B tree

Category C tree

Category U tree

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

Trees of moderate quality with a life expectancy of 20+ years. Usually maturing trees, or younger trees with good form. Retention of these trees is desirable though less than Category A trees

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

Trees unsuitable for retention due to their very poor condition.

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

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

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

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

X

X

Tree to be removed to facilitate the proposal

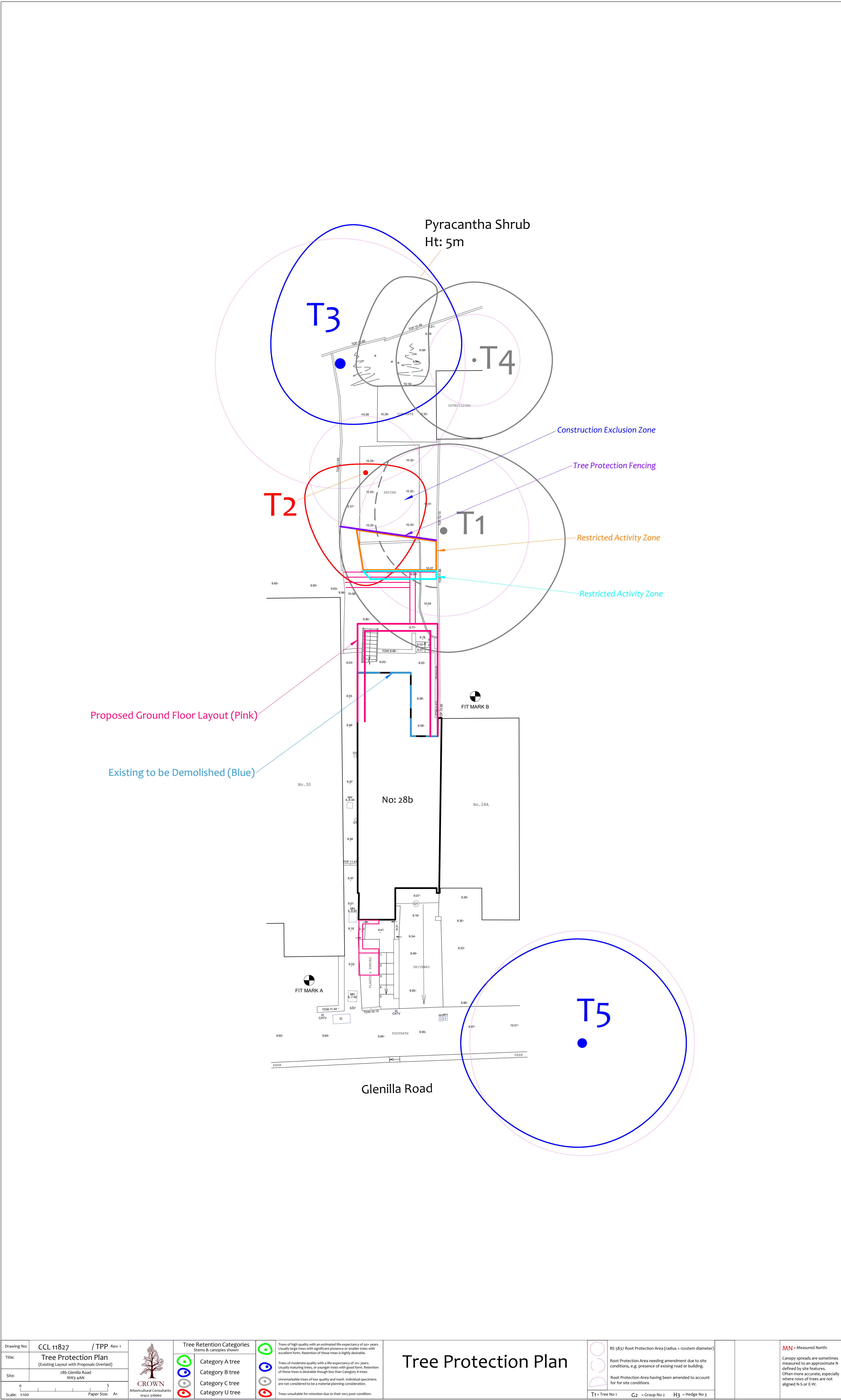
Tree to be removed due to its low quality

Proposed pruning

MN = Measured North:

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

Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m ²	Square (m)
T1	Cotoneaster	7.5	4.9	76	8.7
T2	Cherry	7	3.2	33	5.7
T3	Sycamore	16	7.2	163	12.8
T4	Monterey Cypress	10	2.6	22	4.7
T5	Lime	15	6.5	132	11.5



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 Bough 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, 1m, on steel fencing pins and wooden posts To remain in place throughout all construction activity

The 'Back Stay System'

2m x 3.5m weldmesh (or sheet metal) panels lined with anti-tamper couplings

Each panel attached to a back stay which is founded in an additional foot or mesh tray as illustrated

Minimum 25kg ballast to retain rear foot or tray (including the weight of the foot/tray)

Alternate front feet to be secured with groundpins or additional ballast

The 'In-Ground' System

Verticals and horizontals secured with scaffold clips

Anti-climb weldmesh panel (or metal / 18mm ply sheets) firmly secured

2.0 metres

Standard scaffold poles driven 6m into the ground (concrete foundations may be used outside of 6m)

Scaffold pegs secured into the ground

The Barrier Mesh System

High visibility plastic safety fencing, 1m high, minimum grade 140g/m2, supported on steel fencing pins located at 2.5m intervals and driven into the ground.

Tree Protection Plywood Boxes (indicated by a 1mm turquoise line)

1.2m x 1.2m x 2.4m high 25mm exterior grade plywood boxing on 750 x 50mm timber frame

Secured to ground or adjacent structures. Box not to be affixed to the tree.

Construction Exclusion Zone

Within this area the following restrictions shall apply:

- No excavation or land regrading whatsoever.
- No storage of materials, rubble, soil or spoil.
- No fires 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.

Ground Protection where specified Restricted Zones

Protective fencing

Metal or wooden boards

Compressible material or 3D cellular confined in fine gravel

Tree Ref.	Species	Height (m)	Radius (m)	m ²	Square (m)
T1	Cotoneaster	7.5	4.9	76	8.7
T2	Cherry	7	3.2	33	5.7
T3	Sycamore	16	7.2	163	12.8
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