Arboricultural Report

& Impact Assessment





For planning purposes at

95 Chapel Street
Hoyland
Barnsley
S74 0NP

Dated
18th March 2014

CROWN Consultants

Tree consultants throughout England and Wales

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1. Introduction

1.1. Instruction

1.1.1. We are instructed by Richard Lawton to undertake an Arboricultural Survey at 95 Chapel Street and produce our findings in a report. We are also instructed to assess the likely impact of development proposals.

1.2. Scope and Purpose of the Report

1.2.1. This report is designed to accompany a planning application for development proposals at the above site. Its purpose is to assist and inform the planning process. It is produced according to the guidance and recommendations within *BS 5837: 2012 - Trees in Relation to Design, Demolition and Construction.*

1.3. Drawings

1.3.1. The tree locations shown on the accompanying plans which are reproduced in Appendix 6 have been plotted according to measurements taken on site.

1.3.2. The *Tree Constraints Plan* shows the existing layout. For each tree the stem location is indicated and scaled according to its diameter, the canopy is indicated according to measurements taken along the four cardinal points of the compass. Root protection areas (RPAs) are indicated which are calculated according to the guidelines within BS 5837 (2012).

1.3.3. Where appropriate, the shapes of the RPAs have been amended to reflect actual site conditions or where trees have been heavily pruned. The 'original' RPAs are indicated as a dashed line

1.3.4. The *Tree Removal Plan* and *Impact Assessment Plan* indicate the tree constraints with the proposals overlaid. Trees to be pruned or removed are notated, as are construction works which are proposed in Root Protection Areas. These plans accompany the Impact Assessment which is to be found in Section 5.

1.3.5. The *Proposed Layout Plan* shows the tree constraints after tree removal. Dimensions between proposed buildings and tree canopies are notated.

2. Site Overview

2.1. Brief Description (Existing Layout)

2.1.1. The site co-ordinates are 53.495224° -1.462510° and the altitude is 145m above sea level. (Co-ordinates may be pasted or typed into the following site: http://maps.google.co.uk/ where maps, satellite imagery and street views may be accessed).

2.1.2. Our survey covered the area indicated in Figure 1.



Figure 1 Extent of the survey (image is not current).

2.1.3. The trees surveyed are all located within a rear garden plot currently accessed via 95 Chapel Street. The south western boundary of the site runs alongside the A6135 Sheffield Road.

2.1.4. Along this boundary are a row of trees which includes five sycamores, an ash, an apple, a rowan and a laburnum. The apple, rowan, laburnum and one of the sycamores are insignificant, heavily suppressed specimens.

2.1.5. Within the site, set back from the road are five cypresses (Leyland and Lawson) and a small sycamore.

2.1.6. The Tree Constraints Plan and Tree Data Schedule should be referred to for descriptions and locations of all trees.

2.1.7. Photographs of the site are included in Section 7.

2.2. Proposals Overview

2.2.1. It is proposed to build a small detached dwelling with a new vehicular access onto Sheffield Road.

3. Tree Survey and Data Schedule

This page is largely generic. Tree officers and other persons familiar with arboricultural reports may go straight to the tree data in Appendix 6.

3.1. Survey Details

3.1.1. A ground level survey undertaken on Thursday 20th February 2014. The survey was conducted by Ivan Button. No climbed inspections or specialist decay detection were undertaken. Only trees with a stem diameter over 75mm were included, which lie within the site boundary or relatively close to it.

3.1.2. 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.

3.1.3. Wherever possible, dimensions are 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.

3.2. Data Schedule

3.2.1. The findings of the survey are presented in The Tree Data Schedule which is provided as a separate document as well as being appended to the end of this document within Appendix 6.

3.2.2. The Schedule includes scaled tree images based on measurements recorded for stem diameter, crown spread, crown height and overall height. Their purpose is to indicate, at a glance, the relative dimensions of each tree.

3.2.3. A definition of the Retention Categories can be found in Appendix 1. All other terms used within the Tree Data Schedule are defined and explained in Appendix 3.

3.3. RPA calculation - Single Stems & Multiple Stems

3.3.1. For single stemmed trees, the RPA is calculated according to the following formula:

RPA radius = 12 x stem diameter (measures at 1.5m above ground level)

3.3.2. 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.

3.3.3. Occasionally this method is not appropriate (e.g. for coppiced specimens where there are numerous stems). In such cases the diameter at ground level may be recorded or a stem diameter which would provide a suitable Root Protection Area calculation. The form of the tree is recorded in the notes section.

4. Vegetation Overview (independent of proposals)

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

4.1. Preliminary Management Recommendations

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

4.2. Future Inspections

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

Inspection Frequency (years)	Tree Number
0.5	None
1	None
1.5	None
3	T1, T2, G3, T4, T5, T6, T7, T8, T9, T10, T11, T12, G13, T14, T15

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

4.3. Tree Protection Status– Site Specific

4.3.1. On 10th February 2014, we were informed, by Rachel of Barnsley Metropolitan Borough Council that:

- The site is not within a conservation area.
- There are no tree preservation orders affecting trees within the site.

4.4. Tree Protection – General Notes

4.4.1. Heavy fines exist for carrying out unauthorised works to protected trees so we advise that further checks are made before any tree-works are undertaken.

4.5. Species Present – Additional Information

4.5.1. 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	Typical Canopy Spread at Maturity	General Notes
Apple	6	8	Deciduous tree native across Europe and W. Asia. Hundreds of cultivars available due to its popular fruit. Flowers white, pink or red in spring. Some species will self-pollinate. Older specimens are susceptible to a variety of rusts, moulds and cankers. Excellent habitat tree. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Malus+domestica for more info.
Ash	25	18	Large deciduous tree with a straight bole and a high open domed crown. Native to Britain and commonly found in woodlands and adjacent roadsides. Not suitable for small gardens. Easily identified by its oppositely arranged pinnate leaves and black buds. Branches are relatively brittle resulting in a fairly high incidence of small branch failure in windy conditions. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Fraxinus+excelsior for more info.
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.
Lawson Cypress	40	10	Erect, narrowly conical evergreen tree native to Southwest Oregon and N. W. California. Introduced to Britain in the 1850's and now a common tree in gardens and parks. Makes an excellent dense hedge. Many varieties are available including golden and miniature varieties. Easily distinguished from Leyland cypress by the presence of small cones. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Chamaecyparis+lawsoniana for more info.
Leyland Cypress	40	8	Evergreen tree, cultivated hybrid between Nootka Cypress and Monterey Cypress. Widely planted and widely hated. Excellent hedging species unless it is undermanaged in which case it forms a giant, dense wall of foliage. Very hardy. Size may be managed by regular trimming though if trimmed beyond the live foliage, now new growth will occur. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Cupressocyparis+leylandii for more info.
Rowan	14	12	Deciduous tree native across Europe and N Africa. Also known as mountain ash due to its pinnate leaves and ability to grow at high altitudes. Attractive autumn colour and berries along with spring flowers. Good wildlife tree. Often multistemmed at 2m. http://www.pfaf.org/user/Plant.aspx?LatinName=Sorbus+aucuparia 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

4.5.2. 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 presence of competing vegetation. The figures quoted are not the maximum dimensions that the species may attain.

5. Arboricultural Impact Assessment

5.1. Overview

5.1.1. It is proposed to build a small detached dwelling with a new vehicular access onto Sheffield Road.

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

Activity	Trees Potentially Affected
Tree Removal	T1, T2, G3, T5, T6, T7, T9, T10, T15
Building Close to Tree Canopies	T14
Foundations	None
New Surface	T4, T8
Underground Services	None
Change of Ground Levels	None
Soil Compaction	All trees throughout the Site (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.

5.1.2. All of the above potential impacts are considered in detail throughout this section.

5.2. Tree Removal

5.2.1. All trees to be removed are indicated on the Tree Removal Plan and are listed below:

5.2.2. **Retention Category A:** The site does not contain any Retention Category A trees.

5.2.3. **Retention Category B:** It is proposed to remove the following Retention Category B tree: T6. This is necessary in order to enable vehicular access into the site. Alternative layouts have been considered and it is not considered practicable to retain all of the Retention Category B trees along the frontage with Sheffield Road. This is because the finished surface of the new driveway needs to marry up with the road surface and therefore requires some excavation. To install such a driveway very close to buttress roots would cause significant damage to adjacent trees.

5.2.4. Three large Retention Category B trees are to be retained along the frontage with Sheffield Road so the general treescape will be unaffected and the impact on local amenity will be minimal.

5.2.5. **Retention Category C:** It is proposed to remove the following Retention Category C trees: T1, T2, G3, T5, T7, T9, T10 and T15. Of these, T1, T2 G3 and T15 are cypresses and a small sycamore located internally to the site. None are large trees and none are visible from public vantage points. Their removal shall have no significant impact on local amenity and they are not considered to be a material planning consideration. T5, T7 and T10 are small heavily suppressed trees with low vigour and a poor form. Their removal is entirely in accordance with good arboricultural management of the site, regardless of any development proposals.

5.2.6. T9 is the only significant Retention Category C tree though it is still quite small (height 9m, stem diameter 28cm) and is flanked by larger trees on either side which are to be retained.

5.2.7. **Retention Category U:** The site does not contain any Retention Category U trees.

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

5.3. Impact on Tree Canopies

5.3.1. The only canopy requiring any pruning is that of the cherry, T14 which is growing in an adjacent garden and overhanging the boundary. It is proposed to prune it back on one side only by 1.5m in order to create a clearance distance of 2m from the proposed build. Enough canopy will be retained for the tree to be reasonably balanced. This is a small tree and such pruning is not considered to be a material planning consideration.

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

5.4. Impact on Tree Roots

5.4.1. **Foundations:**

5.4.2. No foundations are proposed within the Root Protection Area of any retained tree.

5.4.3. **New Surfaces:**

5.4.4. Impact Assessment Plan indicates where it is proposed to install a new driveway over the Root Protection Areas of T4 and T8.

5.4.5. The portion of the RPAs that shall be affected are as follows:

Tree No	Total RPA (m^2)	Area of RPA affected (m^2)	% of RPA affected
T4	80	13.5	**16.9**
T8	49	9.6	**19.6**

5.4.6. The table shows that T8 is the tree most affected by new surfacing (19.6% of the RPA will be affected). This is just within the 20% maximum recommended in BS 5837 Section 7.4.2).

5.4.7. In order to minimise the impact on roots, it is proposed to utilise the Minimum-Dig method of installation:

5.4.8. A gravel sub-base containing no fine particles shall be incorporated into the design. This shall be contained within a 3D cellular confinement system to ensure that the weight of vehicles will be evenly spread over a wide area. This shall prevent excessive soil compaction and reduce the depth of sub-base required.

5.4.9. Excavation shall be limited to the removal of any existing vegetation and loose topsoil to a maximum depth of 100mm excepting where it is absolutely necessary to excavate deeper (in order to marry up the finished surface level with the road). The new access drive shall ramp up into the site in order to minimise the area where such deeper excavation is required,

5.4.10. A porous surface and sub-base are proposed which will enable passage of oxygen and water to the soils beneath.

5.4.11. The new surface shall be located far in excess of 0.5m from any buttress roots as recommended in BS 5837 (7.4.2.7) (actual distance shall be 3.2m). No retaining wall or structure is proposed that shall require any additional excavation.

5.4.12. To summarise: The proposed new surface shall be fully compliant with industry best practice when installing new surfaces over tree roots (BS 5837 (2012) Section 7.4, and arboricultural Practice Note 12 '*Through the Trees to Development*').

5.4.13. **Underground Services:**

5.4.14. It will be necessary to install drainage and other services within a trench and to connect to existing services beneath the adjacent road. This could potentially have a major impact on the health of retained trees if the trench is located too close them. The Tree Location Plan indicates two places where the trench may be excavated with no impact on trees. Any proposal to locate the trench elsewhere will need to be agreed and approved by the local authority along with the method of installation. Locating the trench any closer to retained trees may require specialist excavation techniques.

5.4.15. **Changes in Ground Levels:**

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

5.4.17. **Soil Compaction:**

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



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

5.4.20. 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 as recommended within BS 5837 (2012). The exact specification of protection measures should be specified in an Arboricultural Method Statement so that it may be agreed and approved by the local authority.

5.5. Demolition Activities

5.5.1. There are no structures that require demolition or significant surfaces that require removal.

5.6. Hazardous Materials

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 and cement run-off are contained outside of all Root Protection Areas.

5.7. Cabins and Site Facilities

5.7.1. There is ample room for the siting of cabins and storage of materials / spoil during the construction phase without impacting on trees.

5.8. Boundary Treatments

5.8.1. I understand that it is proposed to retain and repair the existing dry stone wall along the frontage with Sheffield Road. No new foundations are proposed within any Root Protection Areas. A fence along the new rear boundary would have no impact on trees.

5.9. Impact of Retained Trees on the Development

5.9.1. The dimensions between the property and the extent of the tree canopies are recorded on the Proposed Layout Plan. The closest canopies being those of T11, T14 and T8 at distances of 1.5m, 2m, and 2.2m respectively.

5.9.2. Some occasional trimming of the canopies of these trees will be required in the future to maintain an appropriate distance from the proposed buildings. The sycamore and ash (T8 and T11) will be able to tolerate such maintenance with no detrimental impact. The pruning of the cherry (T14) shall not be significant.

5.9.3. The retained sycamores and ash trees will cast some shade over the site. However, none of them are particularly large and could be prevented from outgrowing their location by occasional sensitive canopy reductions.

5.10. Summary

5.10.1. In order to facilitate the development, it is proposed to remove ten small, Retention Category C trees and one Retention Category B tree. Most are internal to the site. The three largest trees along the frontage with Sheffield Road are to be retained. This will ensure no significant impact on local the treescape and visual amenity.

5.10.2. One cherry tree requires minimal pruning to create an adequate clearance from the proposal.

5.10.3. Some future pruning will be required of a sycamore, and ash and a cherry in order to maintain an adequate clearance distance.

5.10.4. A new surface is proposed within the RPAs of T4 and T8. However, only 17% and 20% of the RPA shall be affected so the impact shall be minimal and within BS 537 defined limits. A porous surface is proposed using the Minimum-Dig Method as per BS 5837 recommendations.

5.10.5. No foundations are proposed within the Root Protection Area of any trees.

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.

5.11.2. So long as the protection measures are well specified and carefully implemented, there shall be no long term detrimental impact on the health of the adjacent trees.

6. Tree Works Schedule

6.1. Tree Works Specification

6.1.1. The following table specifies the tree works which will be required prior to the commencement of construction activity:

Tree Reference	Action Required	Notes
T1, T2, G3, T5, T6, T7, T9, T10, T15	Remove.	Stumps of trees within the RPAs of retained trees shall be retained or removed with a stump grinder NOT a mechanical excavator.
T14	Prune branches (extending towards the proposals to create a clearance of 2m from the proposed dwelling (leaving approximately 2.5m of canopy).	Branches to be pruned back to a secondary branch junction or the branch collar wherever possible. Pruning to be kept to a minimum to achieve the desired clearance of 2m. See below

6.1.2. **Pruning Standards:** Sympathetic pruning shall be carried out to BS 3998 (2010). Lopping of branches is to be avoided. Instead as system of 'drop crothching' or 'reduction via thinning' is to be used to achieve the desired clearance without spoiling the appearance, or form, of the trees. All pruning cuts shall be made close to the branch collar or a secondary growth point. Cuts to be made with sharp, clean tools. No wound sealants to be used.

7. Photographs

Refer to the Tree Constraints Plan for photo locations

Photo 1.



Photo 2.



Photo 3.



Photo 4.



Photo 5.



8. Signature

This report represents a true and factual account of the trees and potential impact of development at

95 Chapel Street
Hoyland
Barnsley
S74 0NP

Signed



.....

Ivan Button N.C.H. (Arb), FDSc (Arb), BSc (Hons), P.G.C.E., M. Arbor. A.

on behalf of

Crown Consultants Ltd

Dated

18th March 2014

CROWN Consultants
Tree consultants throughout England and Wales

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 of Existing Trees

This identifies the existing trees on and adjacent to the site. 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.

A1.1.2 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.

A1.1.3 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.

A1.1.4 **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.

A1.1.5 **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". For multiple-stemmed trees a more complex formula is used which may occasionally produce an RPA which seems inappropriately large relative to the trees canopy. This shape can then be modified to take into account site factors which influence rooting activity, e.g. foundations, soil type or impermeable surfaces. Where development works are proposed within the RPA they should be undertaken in a sympathetic manner to minimise root disturbance.

A1.1.5 **Shade Constraints.** The previous Standard (BS 5837 2005) suggested that shade constraints should be indicated on the TCP. This are denoted as a circle-segment drawn northwest to due east with a radius equal to the height of the tree. These do not represent the actual shade pattern which varies through the seasons. Rather, they indicate the area most shaded by the tree throughout the course of the year. Ideally habitable room windows should be located outside of these shade constraints. Where we consider it appropriate, we will include shade constraints information on our Impact Assessment Plan or Proposed Layout Plan.

A1.2 Stage 2: Arboricultural Impact Assessment

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

A1.3 Stage 3: Arboricultural Method Statement

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

Appendix 2: Explanation of Tree Data & Glossary

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

A4.1 General Observations

A4.1.1	**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.
A4.1.2	**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.
A4.1.3	**Species:**	Common names and Latin names are given.
A4.1.4	**Height:**	Measured from ground level to the top of the crown.
A4.1.5	**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.
A4.1.6	**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.
A4.1.7	**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.
A4.1.8	**Crown Spread:**	Measured N, E, S & W, taken from the centre of the stem and usually rounded up to the nearest metre.
A4.1.9	**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.
A4.1.10	**Recommendations:**	Usually based on any defects observed and intended to ensure that the tree is in an acceptable condition.
A4.1.11	**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.
A4.1.12	**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.
A4.1.13	**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.
A4.1.14	**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.
A4.1.15	**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.
A4.1.16	**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.
A4.1.17	**Life Expectancy:**	The estimated number of years before the tree may require removal. Classified as (<10), (10 – 20), (20 – 40), or (40+).
A4.1.18	**Retention Category:**	These are explained in detail in Appendix 1.

A4.2 Evaluation of Defects

A4.2.1 Cavities, wounds, deadwood etc are all evaluated as follows:

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

General Glossary

Adaptive growth	In tree biomechanics, the process whereby wood formation is influenced both in quantity and quality by the action of gravitational forces and mechanical stresses on the cambial zone.
Aerobic	Conditions in which oxygen is freely available, or to biomechanical processes that depend on the presence of oxygen.
Anaerobic	A condition marked by the absence of oxygen; Generally such areas are unsuitable for normal life and growth of plant tissues. These sites tend to be populated by bacteria capable of surviving low oxygen conditions often associated with Slime Flux.
Arboriculture	The culture and management of trees as groups and individuals primarily for amenity and other non-forestry purposes.
Arborist	A person possessing the technical competence through experience and related training to provide management of trees or other woody plants in a landscape setting. Generally involved with the development or management of trees for visual amenity or land management rather than the growth of trees for product or profit.
Barrier zone	A layer within an annual increment of wood which contains abnormal xylem cells, laid down by the cambium in response to wounding or other trauma.
Body language	In trees, the outward display of growth responses and or deformation in response to mechanical stress.
Bole	Or Trunk, the main stem of a tree below its first major branch.
Bracket	A type of fruiting body produced by various fungal species, plate like to hoof like in shape and often a one sided attachment to the wood or bark.
Branch bark ridge	A ridged area located at the union of a branch to a trunk or stem.
Branch Collar	Trunk tissue that forms around the base of a branch between the main stem and the branch, or between a main branch and a lateral branch. As a branch decreases in vigour or begins to die, the collar usually becomes more pronounced and completely encircles the branch.
Brown Rot	Form of decay where cellulose is degraded, while lignin is only modified.
Buttress Root	Roots that emerge from the base of the tree stem, normally large and well developed that rapidly reduce in diameter to create the Root Plate this offers structural support for the tree. Buttress roots divide rapidly forming the connection between the stem and the transport roots.
Cabling Bracing	Installing cables within the crown of a tree to prevent collapse.
Callus	Undifferentiated cells often formed at the edges of recent injuries. This tissue quickly becomes differentiated, forming cells of the type characteristic of that position on the tree (e.g. forming wood, bark, roots, etc.) see wound response tissue.
Cambium	A thin layer of actively growing and dividing cells, located between the xylem (sapwood) and bark of a plant; the part responsible for radial growth of a tree stem or branch.
Canopy	The topmost layer of twigs and foliage in a woodland, tree or group of trees.
Canker	A localised area of dead bark and cambium on a stem or branch, caused by fungal or bacterial organisms, characterised by woundwood development on the periphery. This may be annual or perennial.
Cavity	An open and exposed area of wood, where the bark is missing and internal wood has been decayed and dissolved.
Chlorotic	Also Chlorosis. A condition of the plant marked by yellowing of normally green foliage, often indicating nutrient deficiency or plant dysfunction.
Clinometer	Devices that measures vertical angles, and provides direct height measurements of objects by triangulation.
Co-dominant stems/trunk	Are forked branches or trunks of nearly the same size in diameter and lacking a normal branch union.
Compacted soils	Soils in which the air-space (oxygen space) has been reduced or eliminated, reducing water infiltration and percolation, reducing root presence and inhibiting new root development.
Compartmentalisation	The physiological process that creates the chemical and mechanical boundaries that act to limit the spread of disease and decay organisms.
Compression Failure	Localized buckling of fibres and other longitudinal elements produced by compression of wood along the grain; compression failures sometimes develop in standing trees.
Compression Strength	The ability of a material or structure to resist failure when subjected to compressive loading; measurable in trees using special drilling devices
Compression Wood	Abnormal wood formed on the lower side of branches and curved stems, with physical properties different from normal wood.
Conservation Area	In Great Britain, designated areas of architectural or historical interest, in which there are special procedures for planning applications. Additionally tree works cannot generally be undertaken without prior notification (Currently 6 weeks) to the relevant local planning authority. See also Tree Preservation Orders.
Core Sample	A sample of wood extracted from a trunk or branch, using an increment borer tool. The resulting core can be analysed for characteristics of growth, wood strength, structure, decay, and for species identification.
Crotch	The union of two or more branches; the auxiliary zone between branches.
Crown	The upper canopy of a tree, including upper trunk, scaffold branches, secondary branches, stems and leaves.
Crown lifting / raising	Crown Lift The removal of the lowest branches, usually to a given height. It allows more residual light and greater clearance underneath for vehicles etc.
Crown reduction	The reduction of a tree's height or spread while preserving its natural shape.
Crown thinning	The removal of some of the density of a tree's crown, usually 5-25% allowing more light through its canopy and reducing wind resistance.
Deadwood (noun)	Deadwood is often present within the crown or on the stems of trees. It may be an indication of ill health, however, it may also indicate natural growth processes. If a target is present beneath the tree, deadwood may fall and cause injury or damage and should be removed, otherwise deadwood can remain intact for conservation purposes (insects, fungi, birds etc.).
Deadwood (verb)	The removal of dead branches from a tree's canopy, usually of a specified size (in diameter).
Decay	Progressive deterioration of organic tissues, usually caused by fungal or bacterial organisms, resulting in loss of cell structure, strength, and function. In wood, the loss of structural strength.
Decay Detection	The assessment of decay within a tree has been traditionally difficult, but recent advances have made it possible to achieve accurate representations of the internal section of a tree in both 2D and 3D, removing doubt over the condition of the tree and allowing accurate management decisions.
Decurrent	In trees a, system of branching in which the crown is borne on a number of major widely spreading limbs of similar size. In fungi relates to toadstools whose gills run down the stem and leaves and other plant organs, which extend down the stem.
Defect	In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment.

Defoliation	**The losing of plants foliage.**
Dieback	**Progressive death of buds, twigs and branch tissues, on individual limbs resulting in Deadwood, or throughout the canopy, extreme cases can result in Stag Heading.**
Dripline	**A projected line on the ground that corresponds to the spread of branches in the canopy; the farthest spread of branches.**
Epicormic shoots	**Fast growing, weakly attached shoots/branches that often grow as a response to stress factors upon a tree or branch removal.**
Excurrent	**In trees, a system of branching that a single leader remains dominant, through the control of lateral branches.**
Failure	**In connection with tree hazards, a partial or total fracture within the wood tissue or loss of cohesion between roots and soil. (In total failure affected parts will snap or tear away completely, Partial failure there is a crack or deformation, which results in an altered distribution of mechanical stress.**
Feeder Roots	**Fine fibrous Water and nutrient absorbing roots located in the outer root system.**
Flush-Cut	**In trees and shrubs, a pruning cut close to the parent stem, which removes the branch bark ridge.**
Foliage	**The live leaves or needles of the tree; the plant part primarily responsible for photosynthesis.**
Formative pruning	**The trimming of a tree to remove weaknesses and irregularities which may lead to problems. The formative pruning operation is aimed at reducing the potential for future weaknesses or problems within the tree's crown.**
Gall	**An abnormal, disorganized growth of plant tissues, caused by parasitic or infectious organisms such as insects, fungi, bacteria, or viruses.**
Girdling	**In woody plants, any form of damage that destroys the bark and / or the Cambium all the way around the stem, branch or root, normally resulting in death of the damaged section.**
Girdling Root	**In woody plants, a root that grows across the buttress, or across other roots, eventually causing constriction of the radial growth.**
Growth Increment	**The incremental growth added as new annual ring develops each season over existing wood. This is seen as (growth) rings in cross-sections of wood.**
Hazard beam	**An upwardly curved branch in which strong internal stresses may occur without the compensatory formation of extra wood (longitudinal splitting may occur in some cases).**
Heartwood	**Inner non functioning tissues that provide structural support to trunk.**
Heave	**In relation to shrinkable clay soils, expansion due to rewetting of a volume of soil previously subjected to the removal or water by plant / trees following felling or root severance. Also in relation to root growth, the lifting of pavements and other structures by radial expansion. Also in relation to tree stability, the lifting of one side of a wind rocked root plate.**
Herbicide	**A chemical compound that causes the death of a plant.**
Included Bark	**Bark that becomes embedded in a crotch between branch and trunk or between co-dominant stems, usually found in narrow or tight crotches, and causes a weak structure.**
Increment Borer	**A tool that cuts and extracts a narrow cylinder of wood from a tree for analysis of the wood tissue and growth increments.**
Leader	**The primary terminal shoot or trunk of a tree.**
Limb	**A large lateral branch growing from the main trunk or from another larger branch.**
Lion Tailing	**Often the result of poor pruning practices; the main leader or branches are largely devoid of side branches, growth is restricted to the end of branches and is likely to suffer damage through end loading.**
Lopping	**In trees, a general term that related to the removal of branches from a tree.**
Monitoring	**Due to the relative life span of trees in relation to our own, long-term monitoring provides a valuable insight to the health of trees, identifying decline and or stabilisation and or improvement.**
Mulch	**A material laid over the root system of a tree to help conserve moisture within the soil. Additionally it may help control the development of weeds close to the tree.**
Mycelium	**A mass of growing filaments (hyphae) formed by fungi.**
Mycorrhizae	**The symbiotic relationship between roots and certain beneficial fungi. Mycorrhizae are the combined root / fungal growth.**
Natural Pruning	**The shedding of a branch or twig that has died back naturally and has become decayed at or near its base.**
Necrosis	**The failure and subsequent death of a branch, leader or tree.**
Negligence	**A failure to take reasonable action to deal with a hazard to prevent damage to property or person.**
Nutrient	**Substances that are absorbed by living organisms for the maintenance of internal processes.**
Occluding tissue	**The general tern of wood, cambium and bark that develop around the site of a wound on a woody plant**
Pathogen	**A microorganism that causes diseases within another organism.**
Phloem	**The principle conductive tissue that the products of Photosynthesis are transported around the plant**
Photosynthesis	**The process were light energy is used to create energy (Carbohydrate) for use within the plant.**
Pollard	**A term for a pollarded tree.**
Pollard head	**The swollen section of branch / stem that forms behind the pollarding cut.**
Pollarding	**The complete or partial removal of the crown of a young tree so as to encourage the development of numerous branches either for amenity or historically as fodder, repeated management is required cyclically to maintain the feature**
Prune or Pruning	**Selective removal of woody plant parts of any size, using saws, Loppers, Secateurs, or other pruning tools.**
Reaction Wood	**Wood with distinctive anatomical characteristics, formed in parts of leaning or crooked stems and in branches to provide additional strength / support. In hardwoods, tension wood usually forms. In conifers, compression wood is usually found.**
Reaction Zone	**A zone normally darker than surrounding wood that denoted the boundary often a defensive one between functional sapwood and dysfunctional or decaying wood.**
Re-grading	**The raising or lowering of a soil profile from its original grade.**
Rejuvenation pruning	**Where historically or environmentally important trees are to be retained, their life spans can be significantly extended through the adoption of particular pruning regimes.**
Rejuvenation root treatment	**Management of the root zone can have a significant positive effect upon the health of trees. Physical, mechanical and biological approaches are available and can be prescribed in accordance within the constraints of individual sites.**
Remedial pruning	**The removal of old stubs, deadwood, epicormic growth, rubbing or crossing branches and other unwanted items from the tree's crown.**
Resistograph	**Invasive decay detection technique whereby the resistance offered by the timber to a spinning probe is measured and plotted.**
Rib	**In tree body language, a long narrow, axial protuberance which often over lays a crack.**
Ring Barking	**Artificial Girdling of the stem, to result in the death of a tree. May be used in habitat creation were the retention of dead standing trees is required.**
Rod Bracing / Bolting	**Traditionally, this has relied upon the Installation of steel rods or bolts through the stems or limbs, to reduce twisting or splitting of the wood. The installation of such features does require legal interpretation.**

Root Barriers	**Both Buildings and services can benefit from the installation of root barriers to protect a soil volume from the ingress of roots.**
Root Collar	**The basal area of the tree; transition zone from trunk to root. Also sometimes called trunk flare.**
Root Plate	**The primary support area for the tree; an area of the root system close to the base that structurally anchors the tree to the soil.**
Root Rot	**Either a general term for decay within the wood of the lower stem / buttress roots, or a disease in which the fine roots are killed.**
Root System	**The portion of the tree containing the root organs, including buttress roots, transport roots, and fine absorbing roots; all underground parts of the tree.**
Root Zone	**The area and volume of soil around the tree in which roots are expected. May extend to three or more times the branch spread of the tree, or several times the height of the tree.**
Sail Area	**That area or the tree subjected to wind load.**
Sanitation	**In plant disease control, the removal of material that could a source of infection by a pathogen. Removal of diseased plant parts, such as fallen leaves and twigs, and pruning of dead and diseased branches. Diseased parts should be burned or buried under soil or active compost.**
Sapwood	**Xylem wood tissue, usually light in colour, representing the outer growth rings of the wood. Usually living, reactive wood tissue, in a healthy tree. See heartwood**
Scaffold limbs / scaffold Branches	**The branches that from the main network framework of the crown of a tree.**
Senescent	**A decline in growth and vigour due to age or stress factors.**
Shrub	**A woody plat that branches at or close to the ground level and so does not have a single stem.**
Slime Flux	**Relating to a toxic condition from the spreading of bacteria or their products from a source of infection; characterized by malodorous gases, or salt deposits upon the bark. If these products enter the sap stream, localised vessel necrosis can result, usually associated with anaerobic conditions.**
Soft Rot	**A kind of wood decay, were a fungi degrades cellulose within the cell wall, without causing overall degradation.**
Soil Compaction	**The compression of soil, causing a reduction of pore space and an increase in the density of the soil. Air is squeezed out and nutrients become locked. Tree roots cannot grow in compacted soil.**
Soil Profile	**The characteristics of a soil as regards to relative depth; the changes in soil texture and composition that occur with depth.**
Soil Texture	**The classification of the constituent particles of soil; includes sand, silt and clay particles. Directly related to soil porosity, permeability, and aeration.**
Sonic Decay Detection	**Non invasive method whereby sound waves are passed through the tree and the speed is measured. Slow speeds indicate decay and a tomography picture representing the inner stem is produced.**
Stag Heading	**In a tree, a state of dieback were dead branches protrude beyond the current living crown.**
Stress	**In plant physiology, conditions were one or more physiological functions Are not working within normal parameters.**
Stump Grinding	**The removal of a tree stump using a specialist grinding machine.**
Subsidence	**In relation to vegetation, the removal of water by plant growth resulting in localised shrinkage in the soil volume.**
Sucker	**Same as sprout.**
Suppressed	**Trees which are dominated by surrounding vegetation and whose crown development is restricted from above.**
Systemic	**Affecting the whole plant or organism. A systemic compound is carried throughout the entire plant to all parts through the vascular system.**
Target	**Any person or object within reach of a falling tree or part of a tree that may be injured or damaged.**
Target Pruning	**The pruning of a branch were the wound affects only branch material, often result in a target shaped wound.**
Tension Wood	**Reaction wood typically formed on the upper side of limbs or curved stems; characterized by lack of cell wall lignifications (higher ratios of cellulose to lignin).**
Tight Union / Tight Crotch	**Also, narrow crotch. A crotch with a narrow angle between branches, often having included bark.**
Tomography	**The comparison of sound or stress waves through the tree allows the creation of a 2D or 3D representation of the internal structure of a stem or branch section and highlights areas of damage. Virtually non-injurious.**
Topography	**The configuration of surface features, including the vertical and horizontal relationships of the ground and other features.**
Topping	**Cutting large limbs back severely, without regard to form or habit of the tree. Cuts are usually made between lateral branch nodes. This practice is extremely injurious to trees, and promotes decay and structural weakness within the crown.**
Tree	**A woody plant that typically has a single stem, at maturity has a height of a least 4 metres and a stem diameter at breast height of at least 75mm.**
Tree Preservation Order	**In Great Britain, an order made by the local planning authority, were consent must be gained before undertaking all but exempt works to a tree.**
Trunk Flare	**The basal area of the trunk that flares or widens, and merges with the main roots. See root collar**
Veteran Tree	**Veteran trees are often found in large parks or estates and commonly affected by extensive decay or have been subject to extensive works. These trees are retained for historical importance and often pose greater risk than normal, which is generally justified. They need careful management and often propping or bracing to support them, some require fencing to limit access.**
Vigour	**Active, healthy growth of plants: ability to respond to stress factors.**
Visual Tree Assessment (VTA)	**An assessment of the mechanical condition of trees based upon their 'body language'. Trees are dynamic and respond to faults / decay / environmental factors in various ways, these responses can be indicative of structural integrity.**
Wetwood	**An infection caused by bacteria living inside the plant tissues. The bacteria ferment the plant fluids, resulting in death of nearby cells, and often causing exudations of fluid from the bark, often referred to as a Slime Flux.**
White Rot	**A kind if wood decay were a fungi attacks the lignin within the wood matrix**
Wind loading	**Forces placed upon tree canopy, branches, trunk and roots of a tree under windy conditions.**
Wind Throw	**The failure of a tree due to wind loading.**
Witches Broom	**A deformed or unusual growth of twigs from adventitious buds, caused by insects, disease, or dieback of twigs and buds.**
Wood	**Secondary Xylem; the main structural support and water conducting tissue of trees and shrubs.**
Wound Response Tissue	**Also Occluding Tissue, Wound Wood or Callus. Differentiated wood tissue that grows around the margins of a wound or injury.**
Wound Wood	**Wood with atypical features, formed in the vicinity of a wound and a term to describe the occluding tissues around a wound**
Xylem	**Plant tissues with special function of translocation of water and dissolved nutrients.**

Appendix 3: Survey Methodology

A2.1 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).

A2.2 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.

A2.3 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.

A2.4 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.

A2.5 Measurements are obtained using a diameter tape, clinometer, distometer and loggers tape. Where this is not practical measurements are estimated.

A2.6 Some trees are surveyed as groups, though this is usually avoided close to areas likely to be developed.

A2.7 Finally, a *Retention Category* is allocated as described in Appendix 1.1.1.

Appendix 4: Author's Qualifications

Qualifications & Experience of Ivan Button N.C.H. (Arb), FDSc (Arb), BSc (Hons), P.G.C.E., M. Arbor. A.

Construction

Between 1983 and 1995 Ivan worked primarily within the construction industry and received training in a broad range of practical building skills and general construction principles. During this time he obtained a BSc (Hons) at Leeds University followed by a P.G.C.E at The University of Wales.

Arboriculture

He obtained a NCH (Arboriculture) at the University of Lincoln and became a member of the Arboricultural Association. He then worked for an Arboricultural Consultancy for one year before establishing a tree surgery and landscaping business in 1998. In 2005 Ivan commenced full time employment with a leading Arboricultural Association approved consultancy and soon adopted a senior role responsible for five consultants.

He obtained a FDSc in arboriculture at the University of Lancashire, which he passed with distinction and is now a Director and Principal Consultant of Crown Consultants Ltd. He is accredited as a LANTRA *Professional Tree Inspector*. A qualification produced in association with the Arboricultural Association and generally recognised as appropriate for all levels of tree inspection.

He is a member of the Consulting Arborist Society and is listed within their areas of professional expertise for QTRA and as an expert witness.

Ivan is a professional member of the Arboricultural Association and the International Society of Arboriculture.

He is a licensed Quantified Tree Risk Assessment user.

Ivan has undertaken professional expert witness training and has been registered as a Sweet and Maxwell Checked Expert Witness since 2008.

Throughout 2009 acted as the principal Tree Officer for Barnsley Metropolitan Borough Council.

Ivan has produced several hundred Arboricultural Reports for the purposes of Development, Safety, Management, Mortgage, Subsidence, Mitigation and Litigation.

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 3882: 2007. Topsoil.
BS 4428: 1989. General Landscaping Operations (excluding hard surfaces).

Permission to do Works to Protected Trees / Tree Law

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

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

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

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

Lighting Levels

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

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

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

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

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

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

High Hedges

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

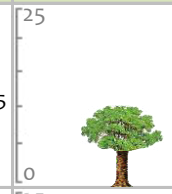
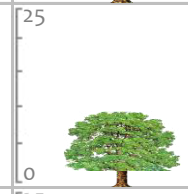
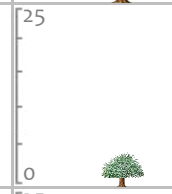
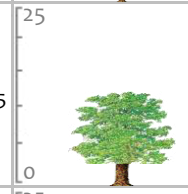
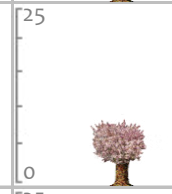
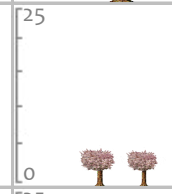
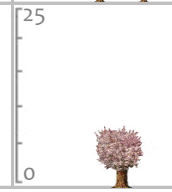
Tree Specific Websites

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

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

The Tree Data Schedule and all plans accompanying this report follow this page. They are also provided as separate documents for ease of printing and referring between when viewing on a screen.

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 / Physiological Condition / Structural Condition	Amenity Value / Life Expectancy (yrs) / Retention Category
								Priority	Inspect Freq (yrs)		
T1	Semi-Mature **Leyland Cypress** X Cupressocyparis leylandii.	8.5	0	42	N 1.5, W 1.5, E 1.5, S 1.5		Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. **Defects: No defects observed.**	No action required.	n/a / 3	High / Good / Good	Low / 40+ / C
T2	Semi-Mature **Lawson Cypress** Chamaecyparis lawsoniana.	5	0	30 @ Base	N 1, W 1, E 1, S 1		Form: Multi-stemmed at 0.5m with a narrow, upright habit. History: No evidence of significant pruning. **Defects: No defects observed.**	No action required.	n/a / 3	Moderate / Good / Good	Low / 40+ / C
G3	Semi-Mature **Leyland Cypress** X Cupressocyparis leylandii.	av 10	av 0	av 25	N av 1.2, W 1.2, E 1.2, S 1.2 each		Form: 3 close growing specimens. History: Typical form.	No action required.	n/a / 3	High / Good / Good	Low / 40+ / C
T4	Early-Mature **Sycamore** Acer pseudoplatanus.	9.5	3	42	N 4.5, W 4.5, E 5, S 4.5		Position: Adjacent boundary. Form: Multi-stemmed at 2m with a balanced crown. History: No evidence of significant pruning. **Defects: No defects observed.**	No action required.	n/a / 3	High / Good / Good	Moderate / 40+ / B
T5	Young **Sycamore** Acer pseudoplatanus.	5	3	11	N 1, W 3, E 1, S 2		Position: Adjacent boundary. Form: Single stemmed and vertical with a narrow, upright habit (spindly). History: No evidence of significant pruning. **Defects: No defects observed.** Other: Poor specimen.	No action required.	n/a / 3	Low / Fair / Good	Low / 20-40 / C
T6	Semi-Mature **Sycamore** Acer pseudoplatanus.	10	2	35	N 4, W 5, E 6, S 3		Position: Adjacent boundary. Form: Single stemmed and vertical with a well-formed crown. History: No evidence of significant pruning. **Defects: No defects observed.**	No action required.	n/a / 3	Moderate / Good / Good	Moderate / 40+ / B
T7	Young **Rowan** Sorbus aucuparia.	4	2	17	N 1, W 2, E 4.5, S 1		Position: Adjacent boundary. Form: Twin-stemmed at ground level with an unbalanced crown. History: No evidence of significant pruning. **Defects: No defects observed.** Other: Poor specimen.	No action required.	n/a / 3	Low / Fair / Poor	Low / 10-20 / C -

Reference (G = Group, H = Hedge)	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) W N E S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals) Priority	Inspect Freq (yrs)	Vigour / Physiological Condition / Structural Condition	Amenity Value / Life Expectancy (yrs) / Retention Category
T8	Semi-Mature **Sycamore** Acer pseudoplatanus.	10	5	33	W 4, N 2, E 4.5, S 2		Position: Adjacent boundary. Form: Twin-stemmed at 2.5m with a narrow, upright habit. History: No evidence of significant pruning. **Defects: No defects observed.** Other: 11cm branch at base.	No action required.	n/a	Moderate / Good / Good	Moderate / 40+ / **B -**
T9	Semi-Mature **Sycamore** Acer pseudoplatanus.	9	2.5	28	W 6, N 3, E 6, S 3		Position: Adjacent boundary. Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. **Defects: No defects observed.** Other: 9cm branch at base.	No action required.	n/a	Moderate / Good / Good	Low / 40+ / **C +**
T10	Young **Apple** Malus sp.	3	1	10	W 0, N 1, E 3, S 1		Position: Adjacent boundary. Form: Multi-stemmed at 1m with a poorly formed crown, leaning. History: No evidence of significant pruning. **Defects: No defects observed.** Other: Poor specimen.	No action required.	n/a	Low / Fair / Poor	Low / 10-20 / **C**
T11	Early-Mature **Ash** Fraxinus excelsior.	12	3	38	W 4.5, N 4, E 4.5, S 4		Form: Twin-stemmed at 2m with a well-formed crown. History: No evidence of significant pruning. **Defects: No defects observed.**	No action required.	n/a	High / Good / Good	Moderate / 40+ / **B**
T12	Mature **Cherry** Prunus sp.	9	3	40	W 2, N 1, E 5, S 6		Form: Twin-stemmed at 1m with an unbalanced crown. History: No evidence of significant pruning. **Defects: No defects observed.**	No action required.	n/a	Moderate / Good / Good	Low / 10-20 / **C**
G13	Semi-Mature **Cherry** Prunus sp.	av 4.5	av 2	av 9	W 2, N av, E 2, S 2 each		Position: Situated on third party land. Form: 2 close growing spindly specimens. History: No evidence of significant pruning. **Defects: No defects observed.**	No action required.	n/a	Low / Fair / Fair	Low / 40+ / **C**
T14	Semi-Mature **Cherry** Prunus sp.	8	2	34	W 0, N 4, E 4, S 4		Position: Situated on third party land. Adjacent boundary. Overhanging the boundary. Form: Twin-stemmed at ground level with a narrow, upright habit. History: No evidence of significant pruning. **Defects: Significant ib at base.**	No action required.	n/a	Moderate / Good / Poor	Low / 10-20 / **C**

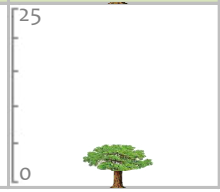
Reference (G = Group, H = Hedge)	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N / W / E / S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour / Physiological Condition / Structural Condition	Amenity Value / Life Expectancy (yrs) / Retention Category
								Priority	Inspect Freq (yrs)		
T15	Semi-Mature **Sycamore** Acer pseudoplatanus.	4.5	1.8	21	N 3 / W 2 / E 3 / S 2.5		Position: Centre of garden. Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. **Defects: No defects observed.**	No action required. n/a	3	High Good Good	Low 40+ C



Photo 1



Photo 2



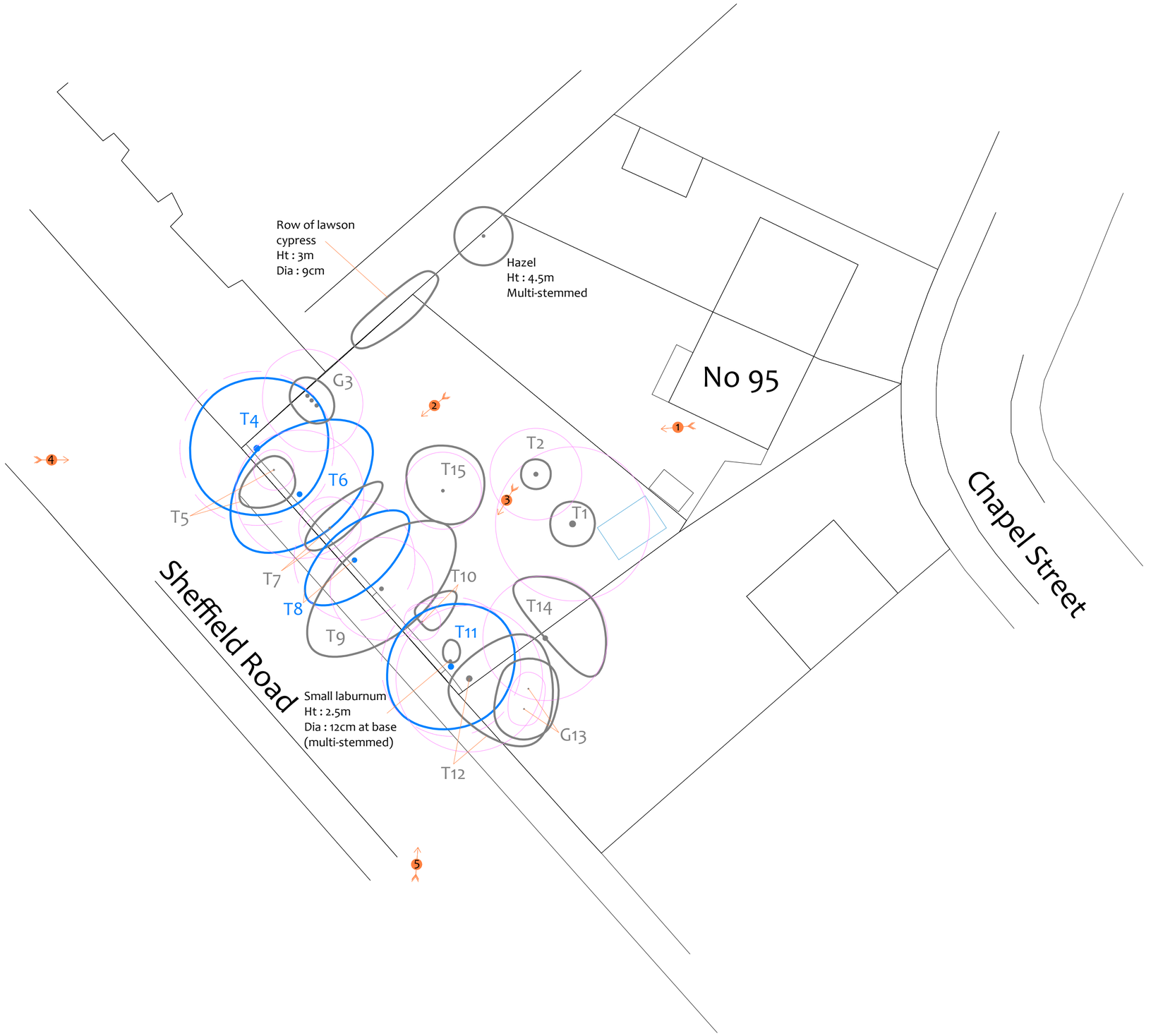
Photo 3



Photo 4



Photo 5



N

MN

Tree Constraints Plan

(Existing Layout)

Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m²	Square (m)
T1	Leyland Cypress	8.5	5.0	80	8.9
T2	Lawson Cypress	5	3.0	28	5.3
G3	Leyland Cypress	10	3.0	28	5.3
T4	Sycamore	9.5	5.0	80	8.9
T5	Sycamore	5	1.3	5	2.3
T6	Sycamore	10	4.2	55	7.4
T7	Rowan	4	2.0	13	3.6
T8	Sycamore	10	4.0	49	7.0
T9	Sycamore	9	3.4	35	6.0
T10	Apple	3	1.2	5	2.1
T11	Ash	12	4.6	65	8.1
T12	Cherry	9	4.8	72	8.5
G13	Cherry	4.5	1.1	4	1.9
T14	Cherry	8	4.1	52	7.2
T15	Sycamore	4.5	2.5	20	4.5

Drawing No:	CCL 092012 / TCP Rev: 1
Title:	Tree Constraints Plan (Existing Layout)
Site:	95 Chapel Street S74 0NP
Scale:	1:200 (0, 5, 10m)
Paper Size:	A2

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Arboricultural Consultants
01422 316660

Tree Retention Categories
Stems & canopies shown

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

Tree Constraints Plan

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

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

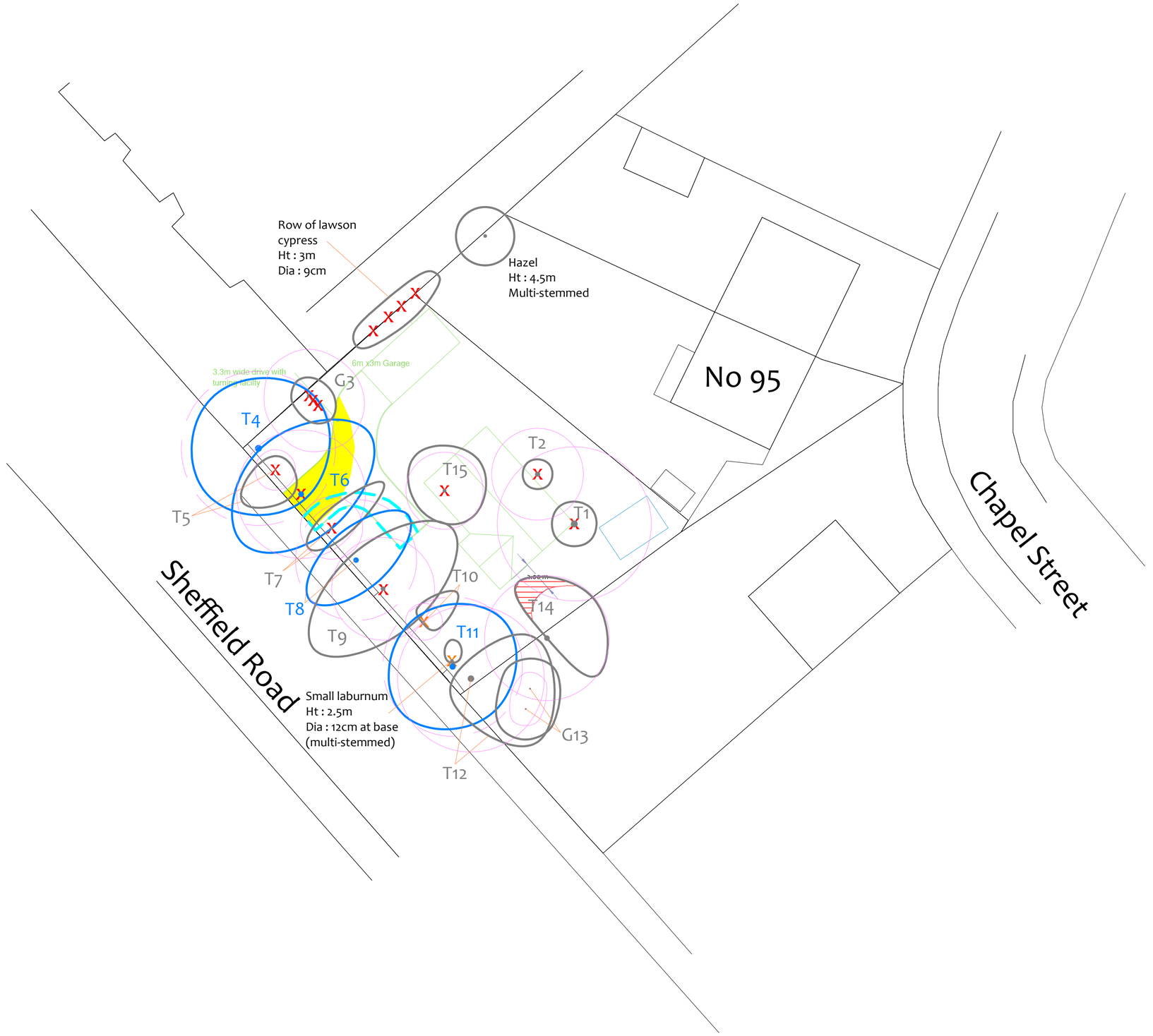
Root Protection Area having been amended to account for for site conditions

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

1 Photo 1

MN = Measured North:

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



Tree Removal Plan

(Existing Layout with Proposals Overlaid)

Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m²	Square (m)
T1	Leyland Cypress	8.5	5.0	80	8.9
T2	Lawson Cypress	5	3.0	28	5.3
G3	Leyland Cypress	10	3.0	28	5.3
T4	Sycamore	9.5	5.0	80	8.9
T5	Sycamore	5	1.3	5	2.3
T6	Sycamore	10	4.2	55	7.4
T7	Rowan	4	2.0	13	3.6
T8	Sycamore	10	4.0	49	7.0
T9	Sycamore	9	3.4	35	6.0
T10	Apple	3	1.2	5	2.1
T11	Ash	12	4.6	65	8.1
T12	Cherry	9	4.8	72	8.5
G13	Cherry	4.5	1.1	4	1.9
T14	Cherry	8	4.1	52	7.2
T15	Sycamore	4.5	2.5	20	4.5

Drawing No:	CCL 092012 / TRP Rev: 1
Title:	Tree Removal Plan (Existing Layout with Proposals Overlaid)
Site:	95 Chapel Street S74 0NP
Scale:	1:200 (0, 5, 10m)
Paper Size:	A2

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Tree Retention Categories
Stems & canopies shown

- Category A tree — Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.
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BS 5837 Root Protection Area (radius = 12xstem diameter)

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

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

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

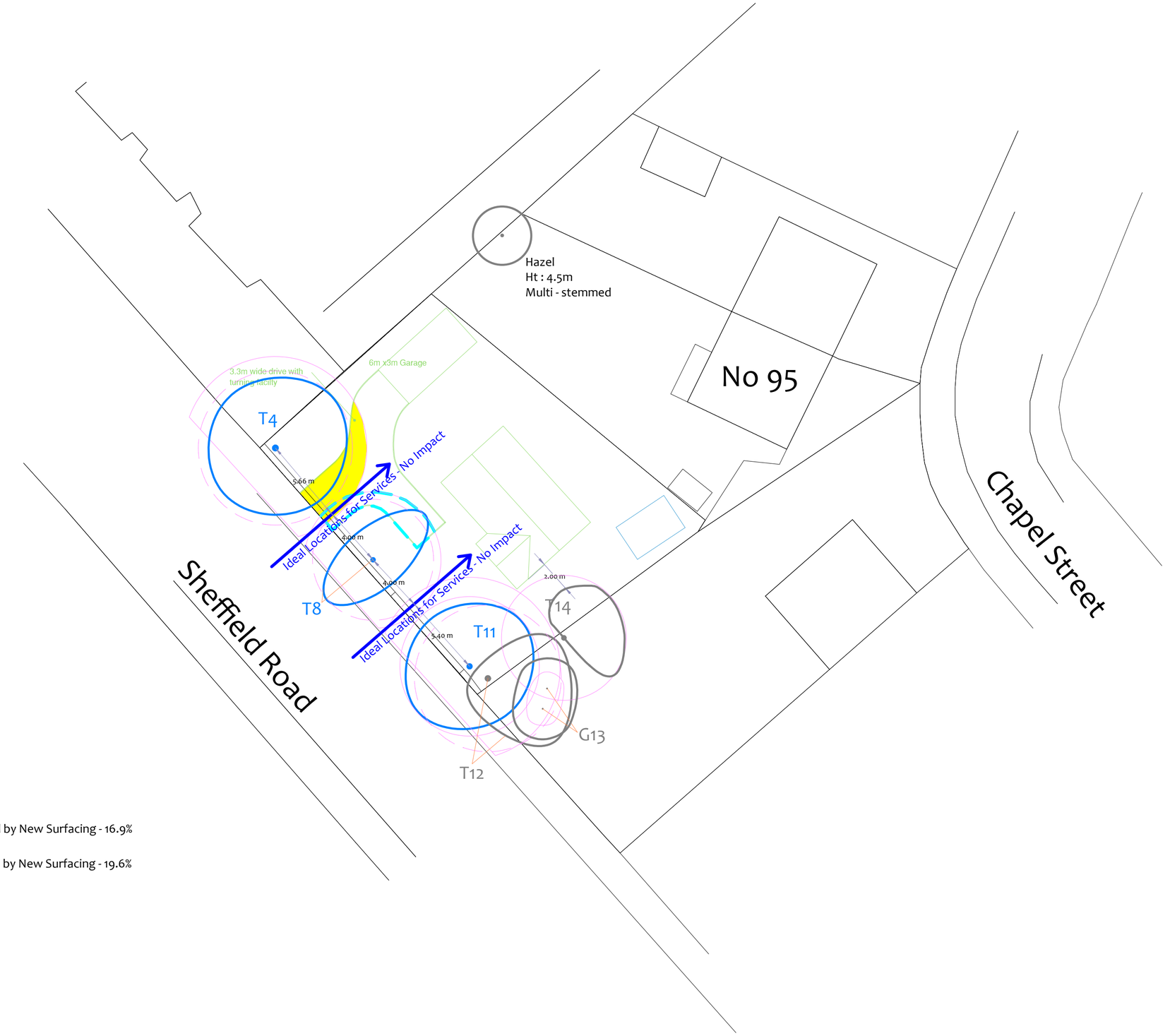
X — Tree to be removed to facilitate the proposal

X — 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.

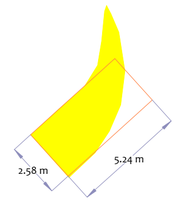


N
MN

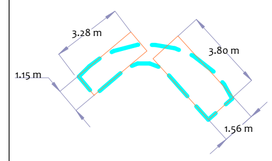
Impact Assessment Plan

(Existing Layout with Proposals Overlaid)

T4	RPA Affected by New Surfacing		
Total RPA (sqm)	RPA affected (sqm)	RPA affected (%)	
80	13.5	16.9	



T8	RPA Affected by New Surfacing		
Total RPA (sqm)	RPA affected (sqm)	RPA affected (%)	
49	9.6	19.6	



Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m²	Square (m)
T1	Leyland Cypress	8.5	5.0	80	8.9
T2	Lawson Cypress	5	3.0	28	5.3
G3	Leyland Cypress	10	3.0	28	5.3
T4	Sycamore	9.5	5.0	80	8.9
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T6	Sycamore	10	4.2	55	7.4
T7	Rowan	4	2.0	13	3.6
T8	Sycamore	10	4.0	49	7.0
T9	Sycamore	9	3.4	35	6.0
T10	Apple	3	1.2	5	2.1
T11	Ash	12	4.6	65	8.1
T12	Cherry	9	4.8	72	8.5
G13	Cherry	4.5	1.1	4	1.9
T14	Cherry	8	4.1	52	7.2
T15	Sycamore	4.5	2.5	20	4.5

Drawing No:	CCL 092012 / IAP Rev: 1
Title:	Impact Assessment Plan (Existing Layout with Proposals Overlaid)
Site:	95 Chapel Street S74 0NP
Scale:	1:200
Paper Size:	A2

0 5 10m

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Tree Retention Categories
Stems & canopies shown

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

Impact Assesment Plan

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

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

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

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

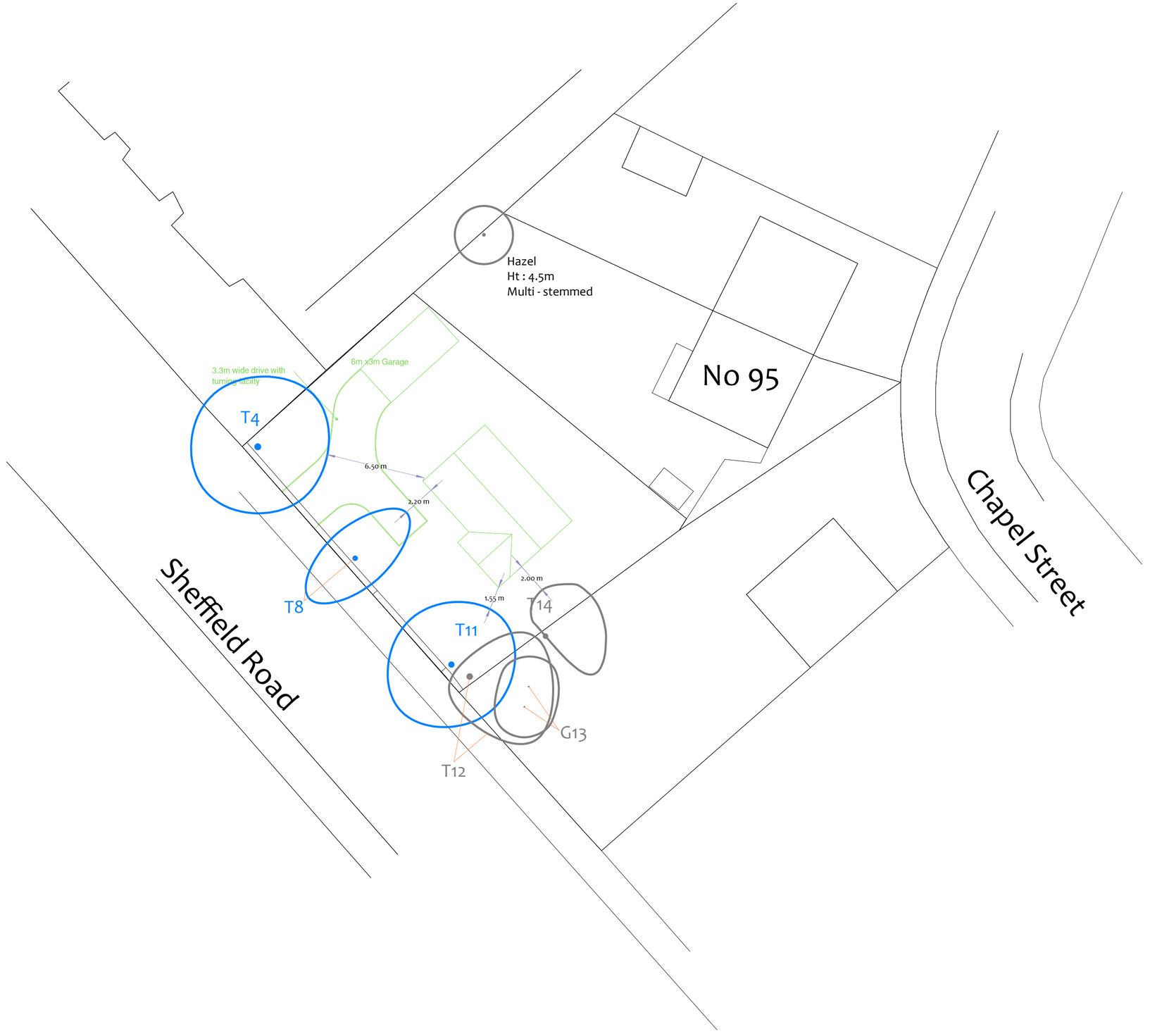
X — Tree to be removed to facilitate the proposal

X — 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.



N

MN

Proposed Layout Plan

Drawing No:	CCL 092012 / PLP Rev: 1
Title:	Proposed Layout Plan (Showing only retained trees)
Site:	95 Chapel Street S74 0NP
Scale: 1:200	Paper Size: A2

0 5 10m

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Arboricultural Consultants
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Tree Retention Categories
Stems & canopies shown

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

Proposed Layout Plan

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

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

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

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

MN = Measured North:

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