

Arboricultural Report

Tree Survey
Arboricultural Impact Assessment
& Tree Protection Plan

New Gatehouse
Redwood
Penshurst Road
Kent
TN11 8HY

Prepared by:

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AR/102821

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1.0 Summary

1.1 Site summary:

The subject site is located on land at Redwood, Penshurst Road, Tonbridge, Kent, TN11 8HY. The proposal is to refurbish and extend an existing building.

1.2 Existing trees (Section 8 refers):

I surveyed seven individual trees and one group of trees in May 2021.

1.3 Condition of existing trees (Section 9 refers):

Two individual trees and one group of trees were found to be in such a condition that consideration should be given to their removal irrespective of the outcome of this proposal.

1.4 Consequences of development on trees (Section 9 refers):

Two individual trees would be lost as a direct consequence of implementing the proposal.

1.5 Tree Works (Section 10 refers):

No specific tree works are recommended in order to implement the proposal. Some minor crown lifting works may be required in order to facilitate access.

1.6 Tree Protection (Section 11 refers):

In order to protect the root systems of retained trees during the construction period, the following are recommended:

- The installation of one tree protection barrier
- The installation of one area of temporary ground protection
- The specification of an above ground slab foundation for the western extension to the property

1.7 Conclusion:

If the recommended tree protection measures are installed and adequately supervised, I consider that the proposal can be successfully implemented while protecting the retained trees to a level which complies with current arboricultural standards.

2.0 Survey details

The Site: New Gatehouse - Redwood, Penshurst Road, TN11 8HY

TMC Ref: AR/102821

Local authority: Sevenoaks District Council

Survey date: 27th May 2021

Report date: 3rd June 2021

Surveyed by: Clive Mayhew BA (Hons), MICFor, FArbor.A., CEnv

3.0 Instructions

3.1 I have been instructed to:

1. Survey the trees potentially affected by the proposal.
2. Produce an arboricultural report fully compliant with the recommendations contained within 'BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.'

3.2 My name is Clive Mayhew and I am the author of this report. I have over 35 years of experience in tree, landscape and ecology management in both the public and private sectors. I am a Chartered Arboriculturist within the Institute of Chartered Foresters, a Chartered Environmentalist, and a Fellow of the Arboricultural Association.

4.0 Site details

- 4.1 **Site description:** The subject site is located on land at Redwood, Penshurst Road, Tonbridge, Kent, TN11 8HY.
- 4.2 **Proposal details:** The proposal is to refurbish and extend an existing building.
- 4.3 **Existing structures:** The existing building is within the red line boundary of the site.
- 4.4 **Existing topography:** The ground slopes generally from north to south.
- 4.5 **Existing vegetation:** There was very little ground vegetation at the time of inspection due to localised activity around the building.
- 4.6 **Soils:** The soil type is of relevance because soils with a high clay content can be compacted, which in turn can be extremely damaging to tree roots. The British Geological website indicates the bedrock geology to be mudstone from the Wadhurst clay formation. The clay content within such soils is likely to be high, and therefore the tree protection measures advocated in this report are still at the highest level of current technical specifications.

5.0 Planning history

- 5.1 I have been given no specific details of the site's planning history.

6.0 Protected trees

- 6.1 Sevenoaks District Council's website indicates that the property is covered by Area 1 of a Tree Preservation Order TPO No: 1A of 1955. The Order was confirmed on 6th July 1955. The area is described as 'A garden and parkland area containing a variety of trees including Oaks, Elms, Beeches, pines, firs and Wellingtonias.' It should be noted that any trees that have grown since the serving of the order will not be covered by the provisions of that order.
- 6.2 It should also be noted that the legal status of trees can change at any time through the serving of a new Tree Preservation Order or the creation of a Conservation Area, and this should be checked prior to the commencement of any works.

7.0 Documents supplied

- 7.1 I have been supplied with scheme and proposal plans by Fluid Planning. Dwg No: 0234.1 Dated: April 2021.

8.0 Existing trees

8.1 I surveyed seven individual trees and one group of trees in May 2021. These have been plotted on the existing tree plan at Appendix A, and described within the schedule at Appendix C.

8.1.1 I classed the trees according to the classifications outlined within BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' (See Appendix E).

9.0 Arboricultural Impact Assessment (AIS)

9.1 The recommendations made here relating to tree retention, removal and planting are informed by current arboricultural, planning and urban design best practice, primarily British Standard 5837:2012 'Trees in relation to design, demolition and construction – Recommendations,' which advocates a pragmatic approach to tree removal and retention, based on sustainability.

9.2 Trees requiring removal *irrespective of the proposal*

9.2.1 Two individual trees and one group of trees were found to be in such a condition that consideration should be given to their removal irrespective of the outcome of this proposal.

9.3 Trees requiring removal as a *consequence of the proposal*

9.3.1 The following trees would be directly lost if the proposal were to be implemented:

9.3.2 T1 – Scot's pine and T2 – Sycamore

Reason for removal: T1 falls beneath the footprint of the proposed western extension, and T2's closeness to it means that it would be unlikely to sustainably survive the construction process.

Appraisal: These trees are located to the west of the existing building. The nearest public viewpoint to them is the B2176 Penshurst Road, located to the east of the property. The highway at this point has no footpaths, and no vehicle speed restrictions are in place. The identified trees are set back from the road and are effectively screened from it by mature existing roadside trees, along with additional tree growth within the estate, particularly to the north. Given the degree of existing tree cover, and the limitations with regards to public visibility, I consider that the removal of these trees will have a minimal impact on visual amenity and is therefore acceptable within the context of the proposed development.

10.0 Tree Works

- 10.1 No specific tree works are recommended in order to implement the proposal. Some minor crown lifting works may be required in order to facilitate access.
- 10.2 All works that may occur should comply with the recommendations contained within British Standard 3998:2010 'Tree Work' and undertaken with the consent of the local planning authority – if such consent is required.

11.0 Arboricultural Method Statement (AMS)

11.1 Root Protection Areas (RPAs)

The identification of Root Protection Areas is the primary means by which retained trees are protected on construction sites. No unspecified activity should occur within any prescribed RPA, access should only be permitted with prior approval of the Local Planning Authority, and encroachment should normally only take place if the ground beneath is suitably protected.

- 11.1.1 BS 5837:2012 provides arboriculturists with a method to determine the extent to which excavations associated with construction works might have a damaging effect on the roots of adjacent trees. The Standard enables an RPA to be calculated from the diameter of each retained tree, and this is usually described as a circle with a radius at the prescribed distance from that tree.

11.2 RPAs and the subject site:

- 11.2.1 Some aspects of the proposed development will potentially encroach into the nominal RPAs of retained trees on site, while other activity will occur close to them, and I make the following recommendations regarding specific tree protection measures.

11.3 Protective barriers

- 11.3.1 BS 5837:2012 recommends that the RPAs of the subject trees should be protected by the erection of barriers, the preferred form of which consists of welded mesh 'Heras' type panels 1.8 metres high, mounted on a braced scaffolding frame as detailed in Figure 2 & 3 of BS 5837:2012. (See Appendix F). The barriers should carry laminated signs stating: "Construction exclusion zone – No Access," or similar. (See Appendix G). It is recommended that gaps should be left beneath the bottom of any perimeter site fencing and the ground to allow for the passage of foraging mammals.

- 11.3.2 **The subject site:** The requirement for one Tree Protection Barrier has been identified and this has been illustrated at Appendix B.

- **TPB 1** - This barrier effectively encloses the site to the north and east. It is designed to protect the RPAs and stems of trees beyond the barrier from potential damage as a result of construction activity.

11.4 Temporary ground protection

11.4.1 BS 5837 recognises that temporary ground protection may be needed within construction sites and provides sample specifications for that protection.

11.4.2 **The subject site:** A requirement for one area of temporary ground protection has been identified and this has been illustrated in pink at Appendix B.

- **TGP 1** – This area of ground protection is located to the east and north of the existing building and its proposed extension. It is designed to provide protection to the RPAs of adjacent trees to the north and east.

11.4.3 BS 5837 states that any ground protection should be appropriately specified and capable of supporting any activity without being distorted or causing compaction of the underlying soil.

11.4.4 A specification for temporary ground protection where pedestrian movement and/or pedestrian operated plant with a gross weight of 2 t only is anticipated, might typically consist of proprietary inter-linked ground protection boards, placed on top of a compression-resistant layer (e.g., 150 mm depth of woodchip), laid onto a geotextile membrane.

11.4.5 If a greater – or lesser – degree of activity is envisaged than that described above, the specification of ground protection required can be adjusted accordingly depending upon the weight and frequency of the proposed activity within the RPA; guidance for such amendments should be sought from an appropriately qualified arboriculturist and structural engineer.

11.5 Specification of a slab foundation

11.5.1 The western extension will encroach into the RPAs of retained trees to the north. The footprint of this extension has been illustrated in green at Appendix B.

11.5.2 Roots from adjacent trees may be present beneath the footprint of the extension. Those roots would be afforded a degree of protection by constructing the structure off an above ground type foundation. While the final design of such a foundation would need to be determined by a suitably qualified engineer, it is likely that a slab foundation would be deemed most suitable. The principle behind the foundation's design and installation should be:

- That it involves the minimum degree of excavation works
- That no strip trenching should be undertaken
- That an impermeable separation membrane is incorporated between the underside of the foundation and the remaining soil in order to prevent contamination. See paragraph 7.4 of BS 5837:2012 for additional information.

11.6 Demolition

No specific demolition works are identified as part of this proposal. However, no works of any nature should commence until the tree protection measures specified above have been installed.

11.7 Utilities

11.7.1 Where supply of any underground utilities passes through the RPAs of retained trees BS 5837:2015 recommends that detailed plans should be drawn up in conjunction with an appropriately qualified arboriculturist - See Section 7.7.

11.8 Other general activities

11.8.1 Many of the activities which occur on construction sites are potentially damaging to trees. These include the location of site huts, parking arrangements, the storage of materials, the storage of rubbish, and the movement and operation of plant. It is important to understand the range of potentially damaging activities that might occur on a site and ensure at an early stage that these possible conflicts are recognised and avoided. Therefore, areas designated for site huts, parking and storage of materials should be identified prior to the commencement of works.

11.8.2 **The subject site:** There appears to be adequate space within the body of the site to ensure that areas for storage and other aspects of site accommodation are not in conflict with the tree protection measures recommended in this report. However, this aspect of site management should be established and agreed prior to the commencement of works.

12.00 Post development pressure

12.1 When new structures are located near to trees there may be pressure to prune or remove them because of concerns that the trees might fail in some way, or because of perceived shading. Inevitably the tolerance of individuals towards trees varies considerably; one may take exception to the proximity of adjacent trees while another will happily coexist with the same juxtaposition. In addition, the adopted fenestration configuration and internal layout of living rooms should be mindful of the perceived problems of shading, and as a consequence this issue can be successfully addressed at the design stage.

12.2 **The subject site:** The retained trees will significantly add to the general amenity of the development. Given the nature of the proposal and its indented usage within the estate - as opposed to sale on the open market - I consider that little post development pressure will be directed towards any of the retained trees. Most of the trees around the building are protected by virtue of the existing estate-wide tree preservation order, and as such the local authority is in a position to consider the merits (or otherwise) of any future proposed tree works.

13.0 Sequence of works

13.1 The sequence of works should be as follows:

1. Tree works
2. Erection of tree protection barrier
3. Installation of temporary ground protection
4. Construction works
5. Removal of temporary ground protection
6. Removal of tree protection barrier

14.0 Recommendations

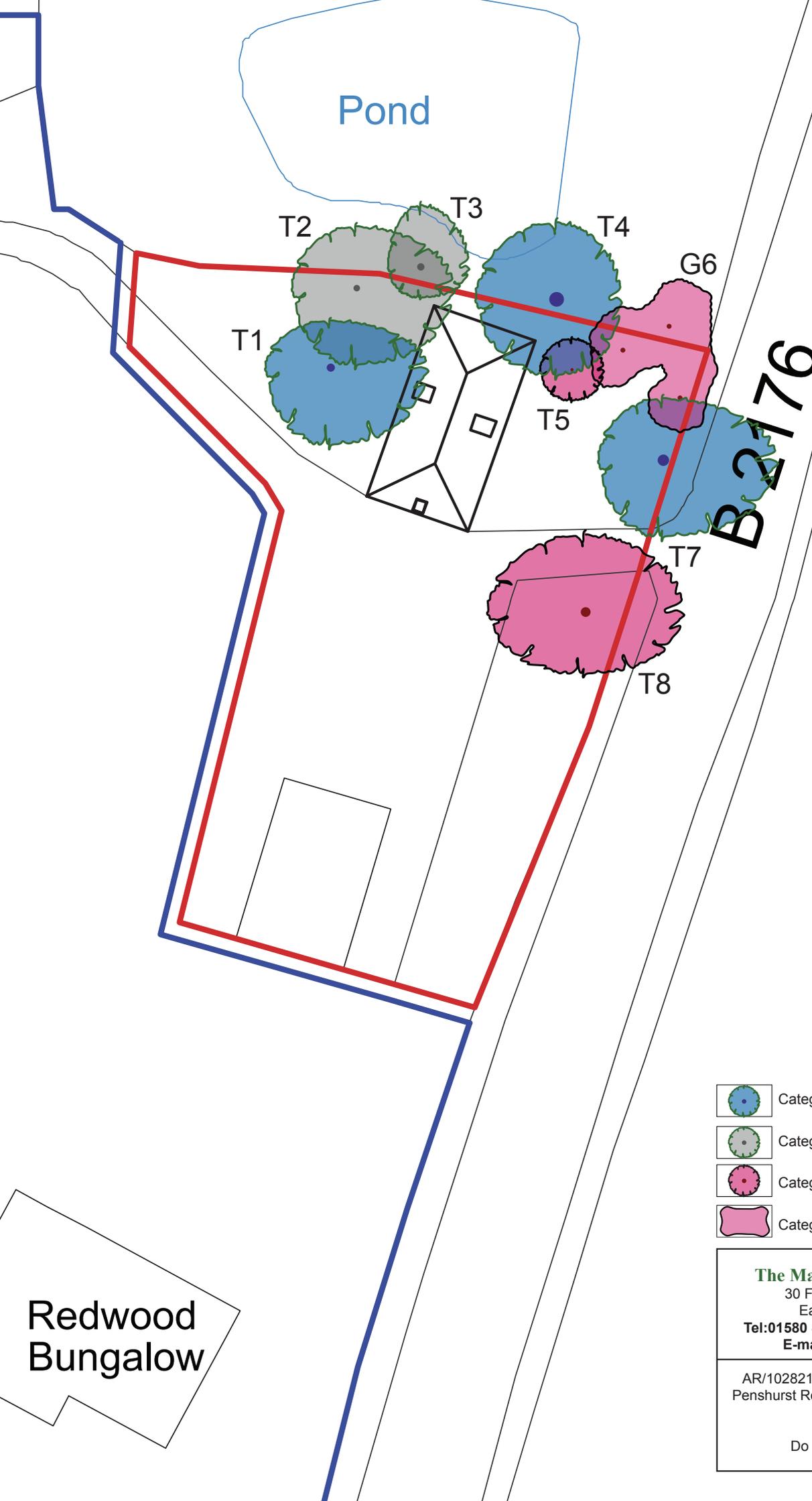
14.1 It is recommended that the tree protection measures advocated in this report should be followed at all times. Any deviation should only occur following consultation with the local authority's arboricultural officer, and then only with their specific approval.

14.2 It is recommended that a suitably qualified arboriculturist supervises the installation of the tree protection measures and confirms that they comply with BS 5837:2012, and if necessary, briefs the individual who will be responsible for the maintenance of tree protection measures for the duration of the works.

14.3 An individual should be identified as a point of contact for arboricultural matters for the duration of the works. This individual will need to be familiar with the arboricultural constraints presented by the site, the tree protection measures that have been installed, and the requirement to keep those measures adequately monitored and maintained.

15.0 Conclusion

15.1 I consider that this scheme is acceptable in arboricultural terms and that the subject trees can be protected according to current standards, providing the recommended mitigation measures are adopted.

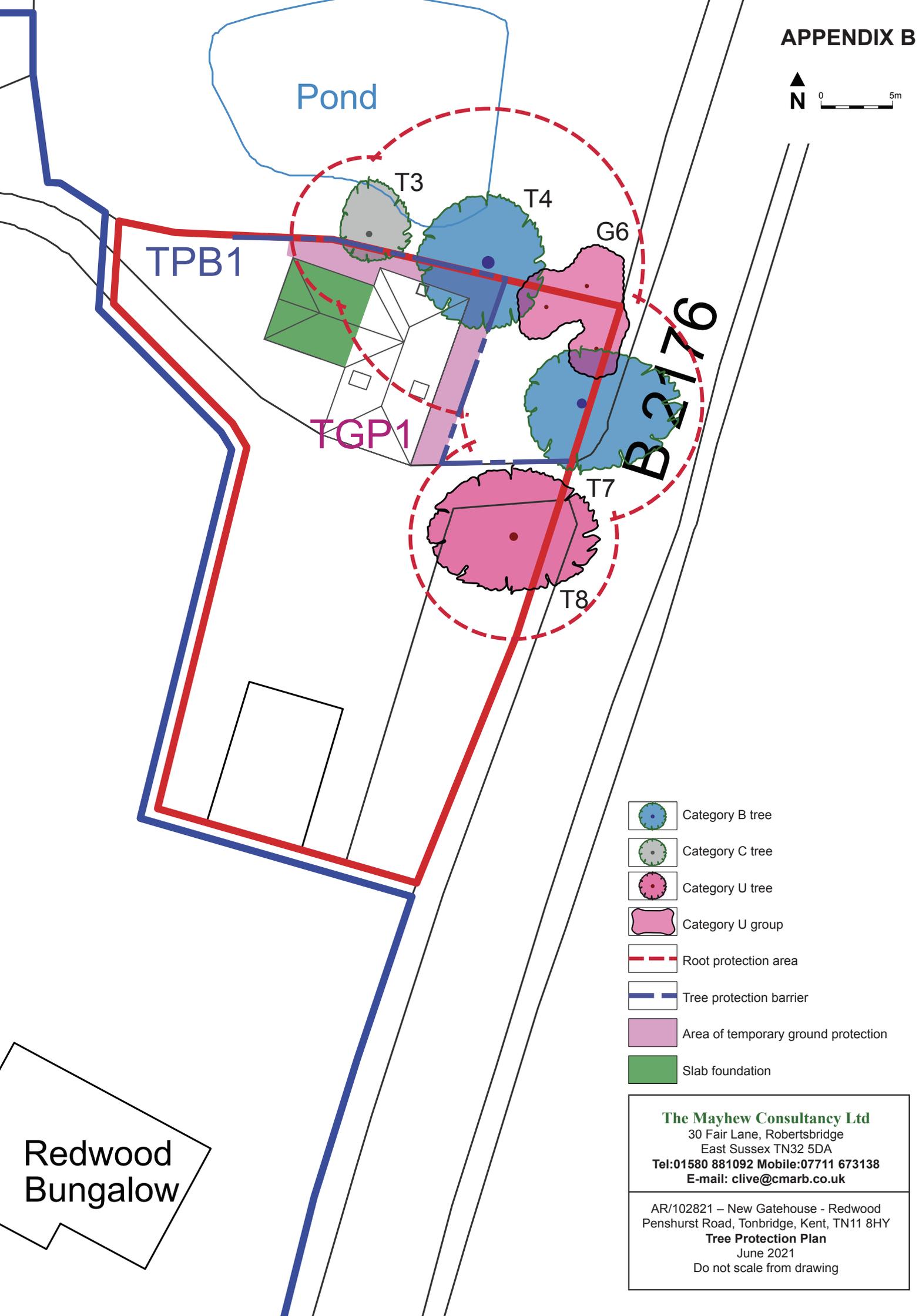


-  Category B tree
-  Category C tree
-  Category U tree
-  Category U group

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AR/102821 – New Gatehouse - Redwood
Penshurst Road, Tonbridge, Kent, TN11 8HY
Existing Tree Plan
June 2021
Do not scale from drawing

Redwood
Bungalow



-  Category B tree
-  Category C tree
-  Category U tree
-  Category U group
-  Root protection area
-  Tree protection barrier
-  Area of temporary ground protection
-  Slab foundation

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Redwood Bungalow

Tree Survey – 27th May 2021

Tree No	Species	Ht.	Stem dia.	RPA Rad	RPA Area	Crown spread N – S – E - W				CB	Age class	Phy con	Str con	ECR	Class	Observations & recommendations
T1	Scot's pine	21	50	6.0	113	3	5	6	4	15	M	G	F	L	B	Tall, mature tree.
T2	Sycamore	16	40	4.8	72	4	5	6	4	8	SM	G	G	L	C	Established, but essentially unexceptional.
T3	Cypress	13	45	5.4	92	4	2	3	2	7	SM	F	G	L	C	Established tree adjacent to pond. Dense ivy to crown.
T4	Coast redwood	22	90	10.8	366	5	5	4	5	5	SM	G	G	L	B	Established tree adjacent to pond.
T5	Cypress	16	20	2.4	18	2	2	2	2	1	Y	D	D	D	U	Appears to be dead.
G6	1x ash, 2x cypress	21	<30	3.6	41	As per plan				Var	SM	P	P	S	U	Three trees all in poor condition or dead.
T7	Cypress	<15	70	8.4	222	4	5	7	4	GL	M	G	F	L	B	Prominent to road. Side away from road devoid of foliage. NOTE: Dead hanging limb in crown.
T8	Atlantic cedar	14	60	7.2	163	5	4	6	6	3	M	P	P	S	U	Tre in poor, possibly failing condition. Dense ivy to crown and significant deadwood throughout. Given roadside position, recommendation is to remove ivy and once fully inspection made, potentially consider removal.

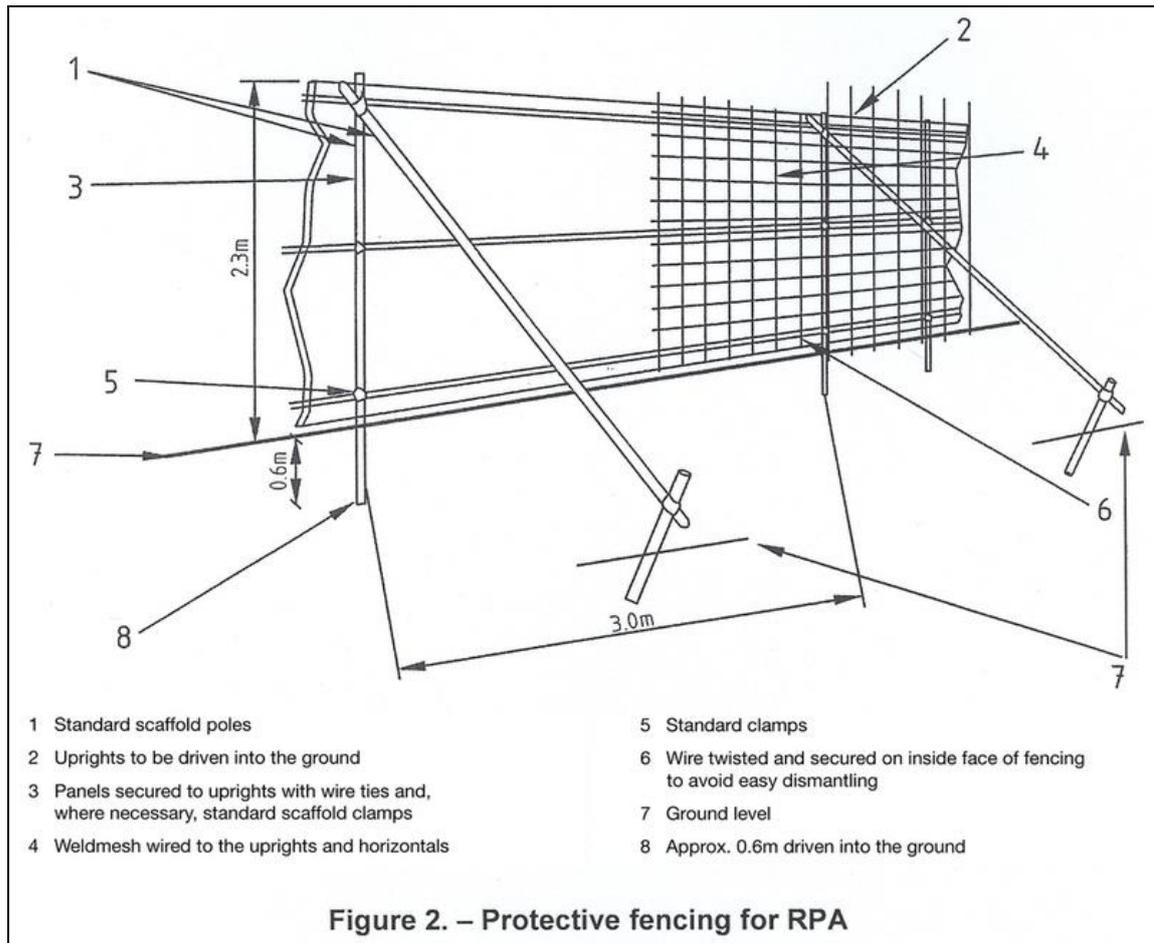
Survey sheet key

Tree No	Tree reference number as used in the report and survey plan T = Tree G = Group H = Hedge W = Woodland
Ht	Tree height in metres
Stem dia.	Stem diameter in millimetres Measured at 1.5 metres above ground level, or immediately above the root flare of multi-stemmed trees M = Multi-stemmed tree
Crown sp	Crown spread measured in metres from the stem to the four compass points
Crown break	Height of crown clearance above adjacent ground level, given in metres
Age class	Age class Y = Young: Staked or newly established tree SM = Semi-mature: An established tree at a stage of rapid growth EM = A tree nearing its ultimate canopy size for its situation M = Mature: A tree at its ultimate canopy size for its situation OM = Over mature: A mature tree smaller than its ultimate canopy size, often such trees are of great historical or ecological importance.
P. Con	Physiological condition of the tree expressed through an assessment of its general well-being G = Good, F = Fair, P = Poor, D = Dead
S. Con	Structural condition of the tree G = Good, F = Fair, P = Poor, D = Dangerous
R.C.	Estimated remaining contribution expressed in years D = <10, S = 10-20, M = 20-40, L = >40
BS Cat	Tree category graded as per the guidance given within Table 1 of BS 5837:2012 – See Appendix E A - Green = Trees of high quality with an estimated remaining life expectancy of at least 40+ years B - Blue = Trees of moderate quality with an estimated remaining life expectancy of at least 20 years C - Grey = Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm U – Red = Trees in such a condition that they cannot be realistically retained for longer than 10 years.
RPA ~ R	Root Protection Area radius, as measured in metres from the centre of the tree
RPA ~ A	Root Protection Area expressed in square metres

BS 5837:2012 Table 1 – Cascade chart for tree quality assessment

Category and Definition	Criteria (including subcategories where appropriate)	Identification on plan		
Trees unsuitable for retention				
<p>Category U Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.</p>	<ul style="list-style-type: none"> Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <p>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve.</p>	DARK RED		
	<p>1. Mainly arboricultural values</p>	<p>2. Mainly landscape values</p>	<p>3. Mainly cultural values, including conservation</p>	
Trees to be considered for retention				
<p>Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years</p>	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	LIGHT GREEN
<p>Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years</p>	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	MID BLUE
<p>Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm</p>	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	GREY

BS 5837:2012 - Tree protection fencing



On site examples of appropriate tree protection fencing installed as recommended within BS5837

Tree protection area warning sign



1.0 Scope of this report

- 1.1 I have been commissioned to produce base line survey data for trees, with a view to identifying constraints and opportunities for sustainable tree cover in the context of the development proposal for the site. The survey has been undertaken in accordance with British Standard 5837:2012 'Trees in relation to design, demolition and construction - Recommendations' and was made in the context of the site's current usage.
- 1.2 This report comprises the prerequisite information for the planning process recommended in BS 5837:2012
- The production of a Tree Survey
 - The production of an Arboricultural Impact Assessment
 - The production of a Tree Protection Plan if required.
 - The production of an Arboricultural Method Statement, if required.
- 1.3 The tree locations and canopy spreads are plotted on the indicative plans at Appendix A.
- 1.4 A detailed condition survey or hazard assessment of each tree has not been undertaken within the scope of this report. If a tree was noted as being in such a condition as to require more detailed assessment, then that observation is included in the tree survey notes at Appendix B.
- 1.5 The findings within this report have been made on the basis of evidence seen on the day of inspection. It should be understood that some indications of tree hazard, such as leaf appearance and density, fungal fruiting bodies, and specific pests and diseases, are only visible at specific times of the year. Should significant additional information become apparent following the submission of this report I would reserve the right to modify the conclusion made accordingly.
- 1.6 This report is valid until:
- The re-inspection dates given for any tree in the survey schedule
 - An episode of adverse weather conditions - for example winds over land measured at Beaufort scale force 8 or above.
 - For two years from the date of inspection.
- Whenever any of the above occurs first, the trees must be re-inspected, and any recommendations carried out. The presence of a hazard, the probability of harm and the value of the target area all help to determine the frequency of re-inspection.
- 1.7 Some trees are protected in law. Prior to any works to trees being undertaken a check should be made with the relevant Local Authority to ensure that prior permission is not required with regard to Tree Preservation Orders (TPOs), Conservation Areas (CAs) or planning conditions that may affect the site or its trees.
- 1.8 Works to trees can also be regulated because of the risk of harming wildlife which may live on, or around them. Wild birds and bats are protected under the Wildlife and Countryside Act (1981) for example, and it is an offence to knowingly disturb their nests or roosts, while works to trees in proximity to badger setts may require a license.
- 1.9 Any tree works should be undertaken in accordance with British Standard 3998:2010 'Tree work - Recommendations'.

1.10 If hard surfacing needs to be installed close to trees the principles prescribed in BS 5837:2012 and modified specifications contained within Arboricultural Practice Note 12, 'Through the Trees to Development,' should be adopted.

1.11 My expertise is within the field of arboriculture and this report is limited to the arboricultural aspects of the site only. Any comments made with regard to other matters are from a lay person's point of view.

2.0 Survey method

2.1 Each tree was inspected from ground level, noting only external features and defects. The Visual Tree Assessment (VTA) method was used to carry out the tree survey; this is an industry standard, best practice method for assessing the health, stability and, to some degree, the amenity of urban trees. A tree may be physiologically healthy, with vigorous growth, but also exhibit mechanical defects and therefore be structurally weak, consequently presenting a risk. VTA involves an assessment of each tree's physiological and structural condition. It is carried out from ground level, with the aid of binoculars as necessary.

2.2 No climbing inspection was made of the crown, no excavation was made of the root system, and no specific decay detection equipment was used.

2.3 The following instruments were available to carry out the inspection:

- Diameter tape – To measure stem diameters
- Nylon headed mallet – To sound trees for audible indications of decay
- Steel probe – To indicate the presence and extent of cavities
- Binoculars – To visually inspect above ground parts of the tree

2.4 No soil samples were taken, and no tissue samples were collected.

2.5 The following publications have been used to inform this survey, and the recommendations which follow from it:

1. British Standard 5837:2012
'Trees in relation to design, demolition and construction – Recommendations.'
2. British Standard 3998:2010 'Tree work - Recommendations.'
3. 'Diagnosis of ill-health in trees' by R.G. Strouts and T.G. Winter.
DoE booklet Research for Amenity Trees No. 2, 1994.
4. 'The body language of trees - A handbook for failure analysis'
by C. Mattheck and H. Breloer.
DoE booklet Research for Amenity Trees No. 4, 1994.