

**Land at Cliff Road, Darfield**  
**Pre-development Arboricultural Report**  
**Prepared at the request of**  
**Peter Thompson Architectural Design Ltd**

**20 March 2020**

**By**  
**Ian Kennedy**  
**Wharnccliffe Trees and Woodland Consultancy**

All rights in this report are reserved. No part of it may be reproduced or transmitted, in any form or by any means, electronic, mechanical, recording or otherwise, or stored in any retrieval system of any nature, without written permission. Its content and format are for the exclusive use of the addressee in respect of this site. It may not be sold, lent, hired out or divulged to any third party not directly involved in this site without written consent.

## Summary

I have been instructed to carry out a pre-development tree survey of the significant trees on land at the corner of Doncaster Road and Cliff Road, Darfield by Peter Thompson Architectural Design Ltd. The trees are growing in the garden of a large property on Doncaster Road. The approximate location of seven individual trees and three groups are recorded on Plan 1 that shows the existing site layout.

Table 1 records their species, dimensions, age, life expectancy, categorisation and root protection areas. This information was collected, interpreted and recorded in accordance with BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations*.

The trees vary in age from juvenile mature to mature, are principally broadleaved trees and are largely located around the boundaries of the site.

Two of the individual trees have been included in retention category 'B' (shown blue on plan 1) because of their favourable condition and high landscape value to the front of the site with Doncaster Road. Two of the groups have also been included in retention category 'B' because of the significance they have in the landscape as cohesive groups.

The remaining five individual trees and one group have been included in retention category 'C' (shown grey on plan 1) because they are either relatively small, have limited landscape value to the wider area, or have declining health, preventing them being included in a higher category.

No trees have been categorised 'A', the highest retention category reserved for the most important or significant trees. No trees have been included in retention category 'U' which is reserved for trees in poor condition and that cannot be retained within the current site use.

The proposed development of the site with ten new dwellings will require the removal of most of the category C trees (G2, T3, T4, T5 and T7) and some of the trees in G1. G3 has also been proposed for removal. T1 and T2, would be unaffected and it is proposed to retain the edge trees in G1. These have the most significant impact on landscape of the area. The access drive close to the retained trees in G1 would need to be constructed using a specially constructed driveway that is built on top of existing ground levels.

## Contents

1. Introduction	5
1.1 Instruction	5
1.2 Documents and Information Provided	5
1.3 Limitations	5
2. Site Visit and Observations	6
2.1 Site Visit	6
2.2 Brief Site Description	6
2.3 Development Proposals	6
2.4 Locations of the Trees	6
2.5 Tree Observations	7
2.6 Hedges and Other Vegetation	10
3. Interpretation of Information and References	11
3.1 BS5837:2012 Tree Retention Categories	11
3.2 Below Ground Constraints; Root Protection Areas (RPA)	11
3.3 Above Ground Constraints; Crown Spreads	12
3.4 Conception and Design	12
4. Arboricultural Impact Assessment and Method Statement	13
4.1 Arboricultural Impact Assessment	13
4.2 Arboricultural Method Statement	14
4.2.1 Permanent Ground Protection	14
4.3 Tree Protection	15
4.4 Tree Protection Plan	16
5. Conclusions	17
6. Legal Considerations	18
Plan 1 Tree Constraints Plan showing the existing site layout	19
Plan 2 Tree Constraints Plan showing the proposed site layout	20
Plan 3 Tree Protection Plan	21
Appendix 1. Qualifications and Experience of Ian Kennedy	22
Appendix 2. Tree retention categories	24
Appendix 3. Explanatory notes for terms used in this report	25
Appendix 4. Protective fencing	26

## **1.0 Introduction**

### **1.1 Instruction**

I was instructed by Peter Thompson Architectural Design Ltd to carry out a pre-development tree survey of the significant trees on land at the corner of Cliff Road and Doncaster Road, Darfield.

The tree survey is intended to provide a structured, impartial assessment of the tree population within the red line area proposed for development, together with any trees on neighbouring land that could be affected by development.

The survey is intended to be informative to all stages of the development process and was carried out in accordance with *BS5837: 2012 Trees in relation to design, demolition and construction – Recommendations*.

### **1.2 Documents and Information Provided**

I was provided with the following documents:

A plan from Barnsley Metropolitan Borough Council's Tree Preservation Order at the site.

A drawing of the proposed layout produced by Peter Thompson Architect. Revision K.

### **1.3 Limitations**

This report is concerned only with assessing the condition of the trees, their importance in the local landscape and any cultural and conservation values.

It takes no account of the affects the trees may have on the soil, such as heave where trees are removed or shrinkage where trees are retained.

Trees are dynamic organisms influenced by weather, pests and diseases. Therefore, this report can only remain valid for a period of 24 months.

Any works around the trees such as trenching, pruning, storage of materials and trafficking that has not first been approved by a suitably qualified arboriculturalist will invalidate this report.

No decay detection equipment was used to gather information on the condition of the trees. All survey and inspection was completed at ground level.

## **2.0 Site Visit and Observations**

### **2.1 Site Visit**

I initially visited the site on 23 May 2016 to complete the survey. I revisited the site on 27 January 2020 to update the survey because almost four years has elapsed since the initial visit. All dimensions were taken using recognised methodology and arboricultural measuring equipment, unless otherwise stated.

The weather at the time of reinspection in January 2020 was bright but overcast. Winds were light and visibility was good.

### **2.2 Brief Site Description**

The site is a large garden for a large stone property on Doncaster Road. The garden has boundaries with Doncaster Road to the north, Cliff Road to the west and Attlee Crescent to the south. The significant trees are generally confined to the boundaries of the garden. A number of smaller trees have regenerated naturally since the garden ceased being managed. The garden had originally been laid to lawn with shrubs and a number of hawthorn hedges.

### **2.3 Development Proposals**

Ten detached dwellings are proposed within the main garden area to the south of the existing house.

Five of the dwellings would be accessed from Cliff Road and five would be accessed from Attlee Crescent.

### **2.4 Locations of the Trees**

The positions of trees were plotted by me using fixed known points. I am not a land surveyor and the number of fixed points for the trees in Group 1 are limited. If more accuracy about the positions of the trees is necessary then the services of a land surveyor should be used.

## 2.5 Tree Observations

**Table 1. The Tree Survey**

Tree number	Species	Height (M)	Stem diameter (DBH in MM)	Branch spread (M)	Ht first branch above GL* (M)	Ht of canopy above GL (M)	Life stage	Vitality	General observations on the tree's condition	Estimated life in years	Category	RPA (m <sup>3</sup> )
T1	Sycamore	17.0	660	North-6.0# South - 8.0 East - 6.0 West - 6.3	2.0 to west	1.8 to 3.0	Mature	Normal	The tree has a prominent position on the frontage with Doncaster Road. It is in good health and free from significant defects.	20+	B (1&2)	188.2
T2	Sycamore	16.0	730	North-6.0# South-7.5 East - 8.0 West -6.5	2.0 to west	1.8 to 4.0	Mature	Normal	The tree has a prominent position on the frontage with Doncaster Road. The main stem divides in two at 3.5m but the union is stable.	20+	B (1&2)	218.5
T3	Sycamore	14.5	580	North - 6.4 South - 5.7 East - 6.0 West -6.0#	3.0 to west	3.0 to 4.5	Mature	Early decline	The tree has a prominent position of the boundary of the site with Cliff Road. The tree's health is declining but there are no significant defects.	10+	C (1)	149.6
T4	Hawthorn	10.0	475	North - 2.4 South - 5.0 East - 4.0 West -4.0#	1.5	1.0	Old mature	Early decline	An old tree for the species. The crown is biased to the south but is free from significant defects.	20+	C (1)	81.7

T5	Holly	12.0	320	North – 3.5 South – 3.5 East – 3.5 West – 3.5	GL	GL	GL	Young mature	Moder- ate vitality	There is an acute stem union at 2.5m. This is stable and considered a minor defect.	20+	C (1)	42.1
T6	Holly	8.0	247 and 262	North – 3.0 South – 3.0 East – 3.0 West – 3.0	GL	1.5	Young mature	Moder- ate vitality	There are a number of old pruning wounds on the main stem up to 5cm diameter that contain some decay and are forming cavities. These are minor defects.	There is a bark wound that is forming a decay cavity on the east side of the main stem between 1.5 and 2.0m.	20+	C (1)	40.7
T7	Apple	7.0	410 @ 0.5	North – 4.3 South – 4.2 East – 4.0 West – 4.0	2.5 to east	0.5	Old mature	Early decline	Normal	A large group of 25 mixed species trees that vary in age, condition and significance. The trees have been included as one group because it is their cohesion that provides the value. A number are quite insignificant as individuals.	10+	C (1)	76.1
G1	17 x sycamore 1 x ash 4 x cherry 1 x copper beech 1 x Scots pine 1 x hawthorn	6.0 to 17.0	<700	North – 8.0 South- 5.0# East – 4.0 West – 4.0	1.0	1.0	Juvenile mature to mature	Normal	There are a number of insignificant trees within the group that could be removed without detriment to the group as a whole. There are also some trees that it would be advisable to remove because of their close proximity to neighbouring dwellings on Atlee Crescent. Sycamores growing on the southern boundary close to the gable ends of dwellings on Atlee Crescent are encroaching significantly, touching the roofs of the properties and have the potential to grow significantly larger.	20+	B (1&2)		

G2	7 cherries	10.0	<440	North – 4.5 South – 6.6 East – 6.5 West – 6.6	2.0	2.0	2.0	Normal	This group of trees appear healthy but are quite insignificant in the local area. No significant defects were noted but a number of the stems are ivy covered and this could be obscuring defects.	20	C (1)	
G3	5 x sycamore 1 x ash 2 x hawthorn	<18.0		North – 9.6 South – 9.3 East – 5.0 West – 4.0	2.0	2.0	GL	Dead to Normal	There is one dead sycamore on the edge of the group. This is not a large tree and does not pose any threat to safety. The group is growing on a steep bank. The ash is growing in the tarmacked area at the bottom of the slope against a stone wall.	20	B (2)	

# Estimated \* Ground Level

## **2.6 Hedges and other vegetation**

There is a hawthorn hedge on the western boundary of the site with Cliff Road. This is approximately 2.5 to 3.0m high. It has been unmanaged for a number of years but forms a boundary to the site.

There also are two wide hawthorn hedges growing in a north to south direction towards the eastern end of the site. These have been unmanaged for a couple of years and have grown to a height of approximately 3m.

### **3.0 Interpretation of Information and References**

My interpretation and appraisal of information gathered from the survey is based on experience of tree species, visual risk hazard assessment and the guidance set out in BS5837:2012 *Trees in Relation to Design, Demolition, Construction – Recommendations*.

#### **3.1 BS5837:2012 Tree Retention Categories**

All trees have been assessed and assigned a retention category in accordance with Table 1 of the standard. Hedges and shrubs are not assigned retention categories but their heights and species are simply noted on the tree constraints plan. A copy of Table 1 is included as Appendix 2. This categorisation is intended to rank trees according to their importance in terms of quality, health, life expectancy, amenity and landscape value, together with wildlife and cultural importance. This ranking assists in determining the suitability and appropriateness of trees for retention in any development. Categories A to C are those considered for retention, 'A' being highest. Category 'U' trees are those not suitable for retention because of impaired condition.

Category A and B trees tend to be considered more valuable for retention than category C trees.

#### **3.2 Below Ground Constraints; Root Protection Areas (RPAs)**

The root protection area is the area of land considered necessary for trees should they be retained as part of any development. This is calculated using the stem diameter measured at 1.5 metres from ground level. This protection area is shown diagrammatically as a circle centred on the base of the tree where it is expected that rooting has not been impeded in any one direction and where disturbance has not taken place. Where rooting has been impeded or disturbance taken place then the shape and size of the root protection area is modified according to an assessment of where rooting is likely to take place.

Where trees are to be retained, it is optimal to locate structures and services outside the RPA. However, where incursion becomes necessary, technical solutions may be possible to limit damage, areas lost can be compensated elsewhere, or the soil environment can be improved. In these circumstances an arboricultural method statement will be necessary to ensure that works are undertaken sympathetically and do not damage the below ground parts of the trees.

### **3.3 Above Ground Constraints; Crown Spreads**

Ideally, working areas will be out with the crown spreads of trees to be retained.

Any permanent development proposed within the canopy spread of a tree should be assessed to determine whether the level of pruning necessary to accommodate the layout would be acceptable. However, the effects of shade and other perceived inconveniences of trees this close to property should also be considered, together with the future growth potential of the trees and the maintenance obligation this will bring.

Where temporary access by high sided vehicles and machinery for construction or erection of scaffolding is necessary within the crown spreads of trees to facilitate development an arboricultural method statement will be necessary to ensure pruning works are carried out sympathetically prior to demolition or construction works commencing.

### **3.4 Conception and Design**

The constraints imposed by trees should assist with site design and layout, together with the other competing needs of development.

As well as the footprint of buildings, the provisions of services and the access space required for construction itself should be considered.

## **4.0 Arboricultural Impact Assessment and Method Statement**

### **4.1 Arboricultural Impact Assessment**

#### Trees 1 and 2

These are the two most significant trees on the property. These are important landscape trees on the edge of the site with Doncaster Road. These would be unaffected by the development proposals.

#### Trees 3, 4, 5, 7 and Group 2

These trees are growing in the proposed footprint of some of the dwellings and the drives. These trees would need to be removed to accommodate the proposals. These trees are included in the lowest retention category because they are small insignificant and/or have relatively poor condition. They do not make a significant contribution to the local area. I do not believe their loss would have a significant impact on tree cover in the area.

#### Tree 6

This tree would be unaffected and could be retained.

#### Group 1

The proposed drive for five dwellings will run through the centre of this group. Five trees are in the proposed footprint of the drive and most others are within 2m of the driveway. The whole of the southern part of the site from the southern boundary to the edge of the proposed dwellings is a root protection area for the trees. The proposed driveway would need to be constructed on top of the existing levels using a specialist construction if the trees on the edge of the drive are to be retained. This would be necessary to ensure excavation and compaction of the soil is avoided.

If such a design could be implemented the most significant landscape trees on the boundary of the site could be retained, together with a number of trees that would be in the gardens of the dwellings.

#### Group 3

I believe that the trees in Group 3 are proposed for removal as part of the development.

## 4.2 Arboricultural Method Statement

It is important that a method statement appropriate to the scale of development around retained trees is prepared, particularly where development or access is necessary within the crown spreads and RPAs of retained trees. This should address any eventuality that may involve working within the root protection area or crown spreads of existing trees. This will include temporary workings during construction as well as permanent incursion for foundations, roads and driveways etc.

### 4.2.1 Permanent Ground Protection

The driveway proposed within the RPAs of retained trees in Group 1 should be constructed using a specialist design to protect the soil from compaction and contamination. The foundations of the drive must sit on top of existing levels and be capable of supporting the weight of traffic without causing undue soil compaction.

Normally, installing the specialist drive would be the first operation to take place after the tree protection barriers have been erected. The driveway must be installed in accordance with its manufacturer's instructions.

The following systems are available for use in accordance with BS 5837 (2012):

Cellweb products:

<http://www.terram.com/products/geocells/tree-root-protection-geocell.html>

<http://www.geosyn.co.uk/product/cellweb-tree-root-protection>

Root bridge product:

<https://greengridsystems.com/>

### 4.3 Tree Protection

To avoid damage to retained trees where no construction or access is necessary the following general precautions should be followed within RPAs and under canopies during the construction phase and in locations where new trees are to be established unless the soil is to be suitably remediated.

- No dumping or storing materials or waste, whether in a skip or on the ground.
- No temporary buildings, sheds, or offices without prior discussion with an arboriculturalist and agreement of the LPA.
- No storage of materials, equipment, plant, fuel or cement.
- No bonfires within 10m of the outer edge of the crown or RPA.
- No refuelling mechanical equipment or mixing of cement.
- No washing cement mixers within or uphill of the RPA.
- No vehicles and plant unless the soil is suitably protected as recommended an arboriculturalist and agreed by the LPA.
- No raising the soil level without prior discussion with an arboriculturalist and agreement of the Local Planning Authority (LPA).
- No excavations without prior discussion with an arboriculturalist and agreement of the LPA.
- No redirection of surface water runoff into or out of the RPA.
- Follow the guidance contained within the National Joint Utilities Group Volume 4 (Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2, 2007); [www.njug.org.uk](http://www.njug.org.uk) ) when installing underground services within the RPA of a retained tree.

## **4.4 Tree Protection Plan**

Protective fencing will be necessary to protect trees to be retained as part of development. Fencing and other protective barriers should be erected before work begins on site.

Fencing, once in place should be maintained in position throughout and should be of a standard that cannot be easily moved, damaged or knocked over during the course of development. The standard specified in Appendix 4 should be followed. A suitably robust alternative may be acceptable to the local planning authority for the discharge of any conditions associated with protective fencing.

Plan 3 is the Tree Protection Plan which shows the suggested line of fencing.

## 5.0 Conclusions

There are seven individual trees and three groups of trees included in this report.

Two groups and two individual trees are included in the second highest retention category because of the contribution they make to the local area.

The remaining four individual trees and one group are included in the lowest retention category (C) because of the limited value they have.

Trees 1 and 2, the most significant on the site could be retained, unaffected by the proposals.

The edge trees in Group 1 could be retained provided a suitable design of driveway can be constructed as discussed in section 4 of this report.

I recommend that consideration is given to removing or pruning two trees on the southern boundary next to the gable ends of properties on Attlee Crescent, irrespective of whether development proceeds. They significantly overhang the properties. This work would be subject to the consent from the local planning authority.

## 6.0 Legal Considerations

### Protected trees

Trees at the site are protected by a Tree Preservation Order (number 1 of 2003 A1). This is an area classification which means that all of the trees growing within the black line area at the time the order was made are protected. It will therefore be necessary to obtain the consent of the local planning authority for any works to the trees. Some exemptions from consent do apply for essential safety works.

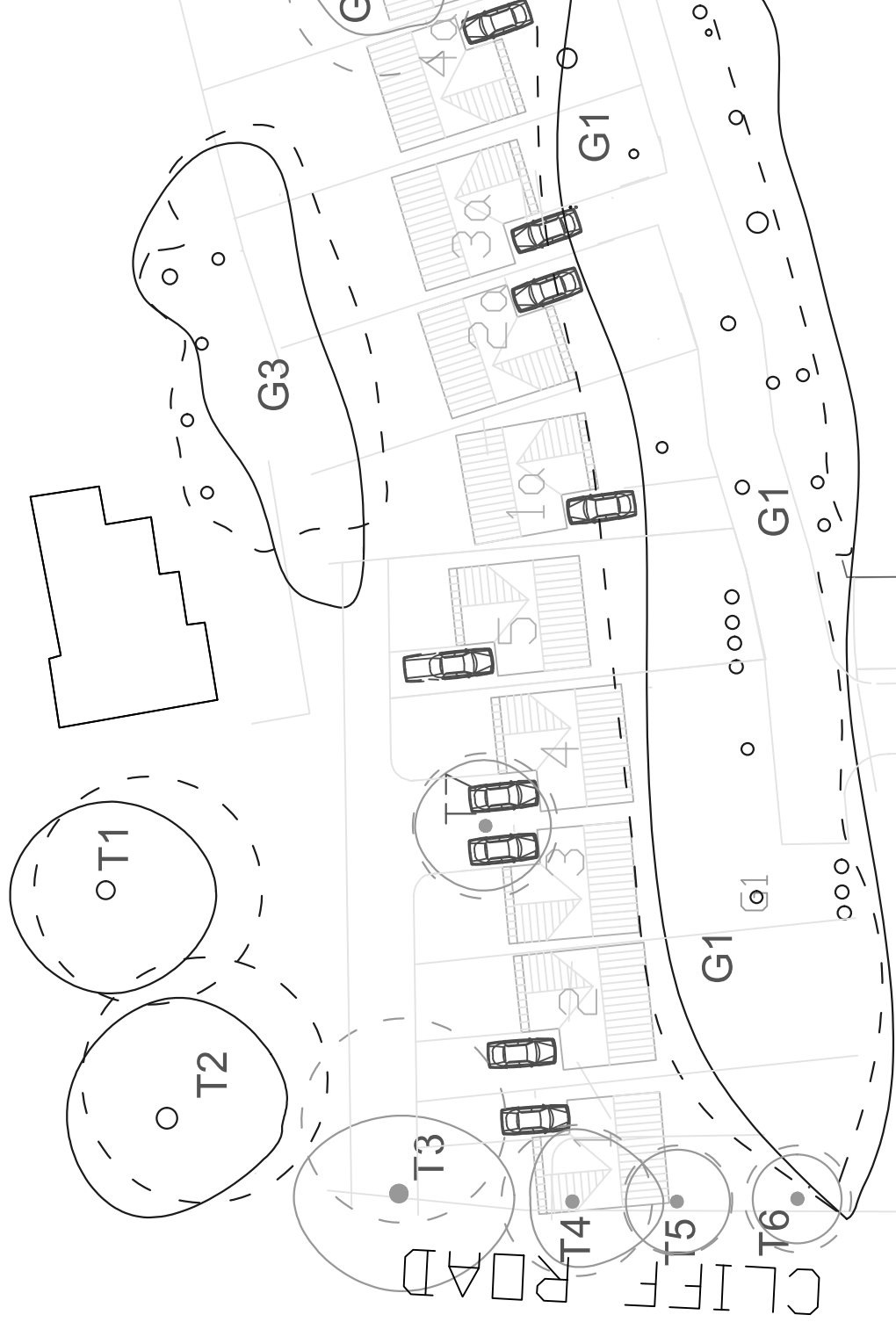
### Wildlife conservation legislation

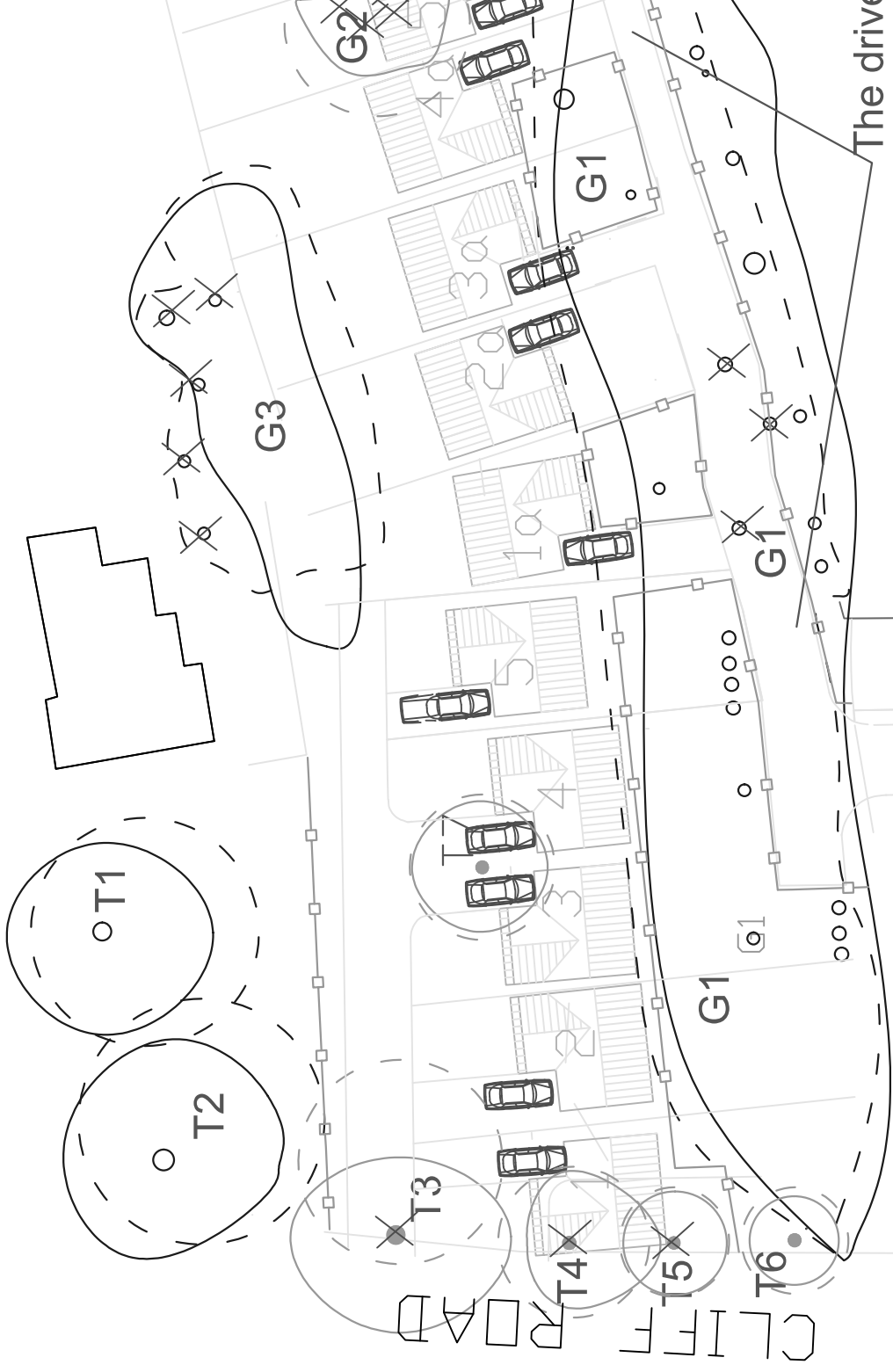
Breeding birds are protected, together with bats and their roosts are, whether their roosts are in use or not.

Consideration should be given to the presence of protected species prior to any proposed tree removal or maintenance. This will include breeding birds, principally between March and August, and bats at any time of year.

Tree surgeons should also be aware of their duties under legislation to protect wildlife and carry out their site assessment and work accordingly.







The driver  
using a s  
construc

## **Appendix 1. Qualifications and Experience of Ian Kennedy**

### **1. Qualifications**

Ian graduated from the Scottish Agricultural College in August 1995 with a Higher National Diploma in Horticulture (HND) with Distinction.

In 1998 Ian graduated from the University of Aberdeen with a BSc (Hons) Upper second class in Forestry with Arboriculture and Amenity Forestry.

He passed the LANTRA Professional Tree Inspection examination in 2006.

In 2009 his application to become a professional member of the Arboricultural Association was assessed to fulfil all the necessary requirements and he became a professional member of the Association that year.

In 2011 he passed the final examination of the Institute of Chartered Foresters and became a member of that institute in January 2012.

### **2. Practical experience**

Presently Ian is working in private practice as an independent arboricultural and woodland management consultant undertaking tree conditions surveys, pre-development tree surveys to the BS5837:2012 standard, mortgage reports and woodland management planning works. Clients range from home owners and farmers to architects, building companies, local authorities, schools and larger development companies.

Prior to private practice Ian held a number of positions in local government. Firstly he was the arboriculturalist within a planning office in Essex. Ian gained considerable experience regarding trees in relation to development, in particular BS 5837.

Development work formed the core of his duties and applications ranged from small back garden developments to major schemes such as the redevelopment of Ministry of Defence land for private residential development. Ian also undertook all functions associated with Tree Preservation Orders (TPOs), including the making of new TPOs, assessing suitability of applications to work on protected trees and trees in conservation areas.

Ian went on to manage a 500 hectare woodland estate for a local authority in South Yorkshire that included a mix of urban and rural woodlands. This included preparation and implementation of detailed management plans for multiple use woodlands. He undertook all aspects of silvicultural management from marking to contract tendering and monitoring. He also managed the access, conservation, landscape and archaeological requirements of the estate. Ian was directly involved in the estate achieving Forest Stewardship Council certification in 2003 and personally ensured continued certification.

Ian has worked extensively with Forestry Commission to obtain the necessary licences for management works and ensured the estate benefited fully from the full range of grants available.

Latterly at the same authority Ian went on to manage the trees and woodlands unit, having overall responsibility for management of the authority's tree and woodland stock and associated staff, together with delivery of other tree related services such as those associated with the Town and Country Planning Acts.

### **3. Continuing professional development**

Ian regularly attends meetings, seminars and training events hosted by The Arboricultural Association, Institute of Chartered Foresters, Royal Forestry Society and Forestry Commission and benefits from the respective journals, briefings and newsletters available to members of the first three of the organisations listed.

### **4. Relevant experience**

Ian Kennedy has spent 20 years working with trees, including as the arboricultural advisor to planning officers for a Local Planning Authority and manager of a trees and woodlands unit for another local authority with overall responsibility for trees, including in relation to the Town and Country Planning Acts.

## Appendix 2. Tree Retention Categories

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)	Identification on plan
<b>Trees unsuitable for retention (see Note)</b>		
<b>Category U</b> Those 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	<ul style="list-style-type: none"> <li>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)</li> <li>Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline</li> <li>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</li> </ul> <p><i>NOTE</i> Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</p>	See Table 2
<b>Trees to be considered for retention</b>		
<b>Category A</b> Trees of high quality with an estimated remaining life expectancy of at least 40 years		
<b>Category B</b> Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	<p><b>1 Mainly arboricultural qualities</b></p> <p>Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)</p> <p><b>2 Mainly landscape qualities</b></p> <p>Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features</p> <p><b>3 Mainly cultural values, including conservation</b></p> <p>Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)</p>	See Table 2
<b>Category C</b> Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	<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</p> <p>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</p> <p>Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits</p>	See Table 2

### Appendix 3. Explanatory notes for terms used in this report

- **Compass Bearing:** N = north; S = south; E = east; W = west;
- **Age Class:** Assessed as either:
  - Young = a size which could be easily transplanted;
  - Semi-mature = prior to seed bearing age and could be transplanted with care;
  - Young Mature = early maturity, not fully grown but of seed bearing age and may have achieved mature height;
  - Mature = fully grown, annual growth is much reduced;
  - Old Mature = old for the species, possibly starting to decline;
- **Trunk Diameter:** These figures relate to the diameter of the trunk at a given distance above ground level and are recorded in centimetres measured with a diameter tape.
- **Estimated size: #**
- **Health:**
  - Normal Vitality = normal growth and twig extension;
  - Moderate Vitality = reduced twig extension but other than that few signs of ill-health;
  - Early Decline = reduced twig extension and some dead twigs in the outer canopy;
  - Mid-decline = small internodes, the canopy may be thinning and contain dead twigs and/or branches in the outer canopy, older branch wounds that haven't occluded may be decaying and forming cavities;
  - Severe Decline = sparse crown, numerous dead twigs and branches in the outer canopy, older branch wounds likely to be decaying and forming cavities;
  - Dead.
- **Structural Condition**
  - Acute stem union = a weak union between two or more stems at the main forking point caused by the formation of reaction wood. Mechanical pressure at the forking point increases as secondary thickening occurs increasing the risk of failure at that point.
  - Acute branch union = the same principle as acute stem unions but between a stem and a branch or two branches rather than 2 main stems.

## Appendix 4. Protective Fencing

BS 5837:2012

BRITISH STANDARD

on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray (Figure 3b).

**NOTE 1** Examples of configurations for steel mesh perimeter fencing systems are given in BS 1722-18.

**NOTE 2** It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without damaging the retained trees or their rooting environment.

6.2.2.4 All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

Figure 2 Default specification for protective barrier

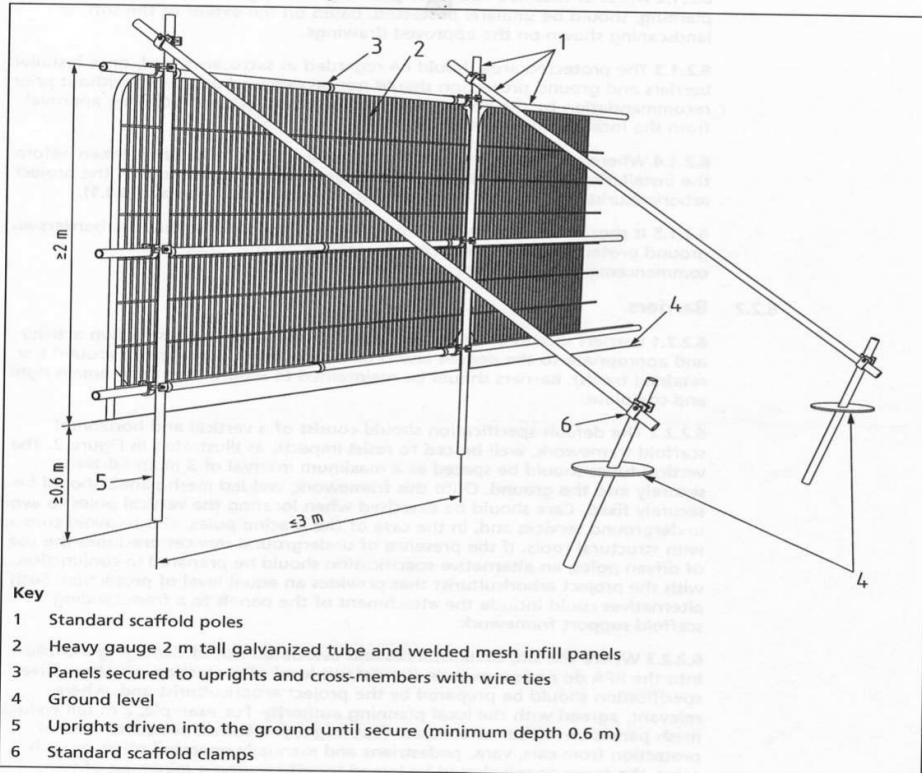
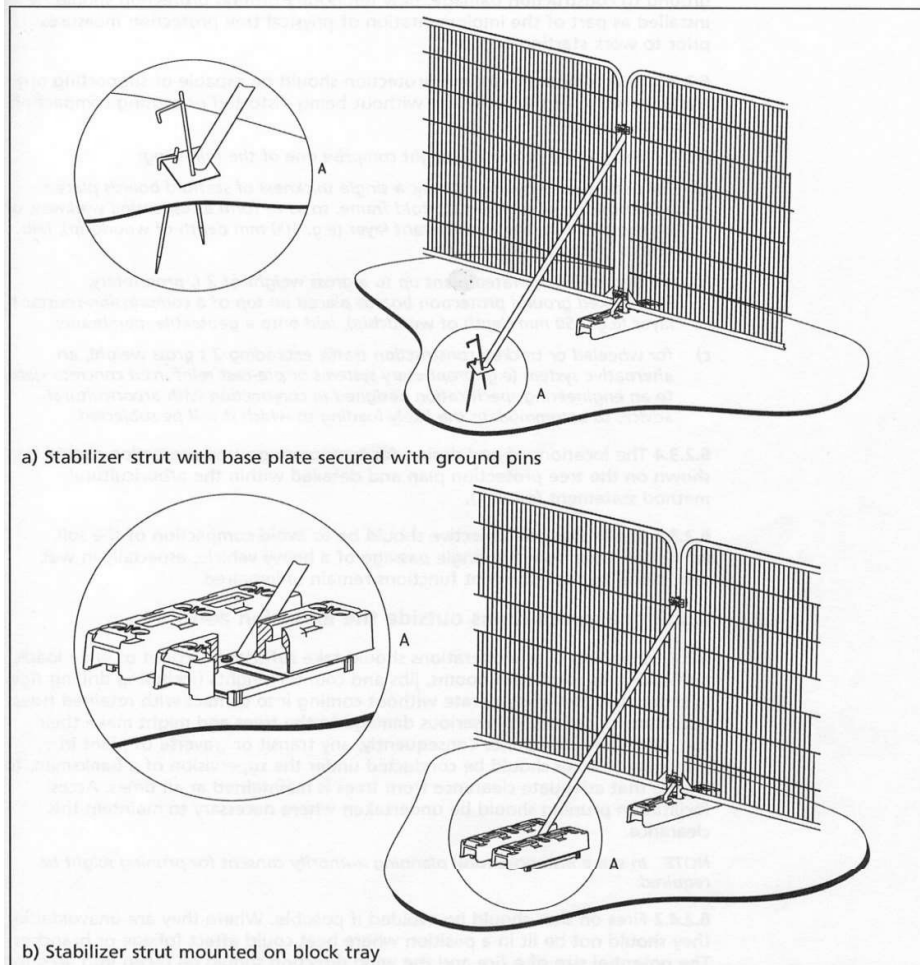


Figure 3 Examples of above-ground stabilizing systems



### 6.2.3 Ground protection during demolition and construction

6.2.3.1 Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a set-back in the alignment of the tree protection barrier. In such areas, suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during construction, rather than being removed during demolition. The suitability of such surfacing for this purpose should be evaluated by the project arboriculturist and an engineer as appropriate.

**Ian Kennedy**  
**Wharnccliffe Trees and Woodland Consultancy**  
**16 Hartcliffe View**  
**Thurgoland**  
**Sheffield**  
**S35 7BD**

**0114 288 5501**  
**07891 488303**

**[info@wharnccliffetwc.co.uk](mailto:info@wharnccliffetwc.co.uk)**