

Plot 7
Rheda Park,
Frizington.

Pre-development Arboricultural Report

Prepared for:

Mr J. Reed

On:

19/01/20

By:

Eddie Cruickshank

MIC.For., M.Arbor.A., FDSc.Arb.

Treescapes Consultancy Ltd.

Reference No. EJC/61-2017-Plot7

All rights in this report are reserved. You may not reproduce or transmit, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, or store in any retrieval system of any nature, any part of this report without our written permission. The content and format are for the exclusive use of the addressee in dealing with this site. You may not sell, lend, hire out, or divulge any of the content to a third party not directly involved with this site, without our written consent.

©2020 Treescapes Consultancy Ltd.

CONTENTS

1	INTRODUCTION	3
1.1	Instruction	3
1.2	Qualifications and Experience	3
1.3	Documents and Provided Information	3
1.4	Development Proposal	3
1.5	Relevant Background Information	3
1.6	Report Limitations	4
2	SITE VISIT AND OBSERVATIONS	5
2.1	Site Visit	5
2.2	Site Description	5
2.3	Tree Identification and Location	5
2.4	Tree Observations	5
3	REFERENCES, PLANNING POLICY AND GUIDANCE.....	6
3.1	National Policy	6
3.2	British Standard: BS 5837, <i>Trees in relation to design, demolition and construction – Recommendations</i> (2012)	6
3.3	Copeland Local Plan 2013-28:	6
3.4	Policy DM26 – Landscaping (extracts relevant to trees)	6
3.5	Policy DM28 – Protection of Trees (relevant extracts)	6
4	TREE CONSTRAINTS	7
4.1	Tree Retention Category – BS 5837 (2012)	7
4.2	Tree Constraints – Above Ground	7
4.3	Tree Constraints – Below Ground	7
5	ARBORICULTURAL IMPACT ASSESSMENT	8
5.1	Trees growing close to the proposed development	8
5.2	Future stability and vitality of retained trees following removals	10
5.3	Levels	10
5.4	Ground surface materials	10
5.5	Site access	10
5.6	Storing of fuel, materials and equipment	10
5.7	Activity under tree canopies	10
5.8	Mitigation for tree loss	10
6	RECOMMENDATIONS	11
6.1	General precautions	11
6.2	Poor quality trees – trees in Retention Category ‘U’	12
6.3	Poor quality trees – trees in Retention Category ‘C’	12
6.4	Trees likely to be part of an earlier designed landscape	12
6.5	Tree work required to implement the proposals	13
6.6	Recommended tree work	13
6.7	Implementing the tree work	15
6.8	Design and construction considerations	15
6.9	Temporary tree protection barriers	15
6.10	Temporary ground protection	16
6.11	Foundations	17
6.12	‘Over-dig’	17
6.13	Shallow excavations within the RPAs of retained trees	17
6.14	Tree establishment	17
6.15	Tree management – future inspections	17
7	LEGAL CONSIDERATIONS	18

7.1	Protected Trees	18
7.2	Forestry Legislation	18
7.3	Wildlife Conservation Legislation.....	18
7.4	Neighbouring Trees	18
8	CONCLUSIONS	19
9	REFERENCES	19

PLANS

Plan 1	Tree constraints plan showing the existing site layout	20
Plan 2	Tree constraints plan showing the proposed site layout	21
Plan 3	Tree protection plan showing the proposed approximate site layout and the tree protection measures	22
Plan 4	Tree planting plan showing the proposed approximate locations of trees to be planted in mitigation of removals and for site enhancement.	23

APPENDICES

Appendix 1	Eddie Cruickshank – Experience and Qualifications	24
Appendix 2	Extracts from the British Standard: BS 5837, <i>Trees In Relation To Design, Demolition and Construction – Recommendations (2012)</i>	26
Appendix 3	Extracts from the British Standard: BS 5837, <i>Trees In Relation To Design, Demolition and Construction – Recommendations (2012): Table 1 – Cascade Chart for Tree Quality Assessment</i>	30
Appendix 4	Data Schedule and Remedial Action Explanatory Notes	31
Appendix 5	Tree Data Schedule	32
Appendix 6	Tree Works Schedule	39
Appendix 7	British Standard: BS 5837 <i>Trees In Relation To Design, Demolition and Construction – Recommendations (2012): a: Tree Protection Barrier</i>	42
Appendix 8	Draft Planting Schemes and Post Planting Maintenance.....	45

1 INTRODUCTION

1.1 Instruction

Following Notice of Grant of Outline Planning Permission Mr J. Reed, has instructed me to report on the significant trees that will be affected by proposals to build a dwelling house with detached garage at Plot 7 of Rheda Park, Frizington., and to provide a tree protection plan along with a replacement tree planting plan. I have compiled this report in accordance with the British Standard: BS 5837, *Trees in relation to design, demolition and construction – Recommendations* (2012) and where necessary, followed this guidance.

1.2 Qualifications and Experience

I have based this report on my site observations and the information provided and reached my conclusions in the light of my experience. Appendix 1 lists details of my arboricultural experience and qualifications.

1.3 Documents and Provided Information

Arboricultural report by Treescapes Consultancy Ltd reference EJC/61-2016 dated 29/06/2016.

Copeland Borough Council Notice of Grant of Outline Planning Permission – 4/16/2393/001

Mr S. Woodall of Green Swallow North Ltd, Chartered Architects, provided me with the site plan file name 8 – Plot 8 Site Plan v2020.dwg , and 10003-Plot 3 Site plan v2020.pdf on 30/12/19.

In an email on 10/05/17 Mr J. Reed had provided me with a site plan - 4456- Site Plan TPO as a pdf file. It shows the approximate extent of what he advised me was an existing Tree Preservation Order in place over some of the wider site and the area covered by Plot 7.

1.4 Development Proposal

The proposal is for a house with detached garage to be built on what is currently an area of trees adjacent to other plots intended for development as residential properties. Plan 1 shows the existing site layout of Plot 7 with the approximate locations of the trees and Plan 2 shows the approximate proposed layout of Plot 7 with the approximate locations of the trees.

1.5 Relevant Background Information

A description of the wider site and details of the trees are included in Arboricultural report by Treescapes Consultancy Ltd reference EJC/61-2016 dated 29/06/2016.

1.6 Report Limitations

This report:

- is only concerned with assessing the condition of the trees on, or adjacent to, the site affected by the development proposals;
- does not take account of whether the trees could affect the soil in the area and cause tree related subsidence damage;
- is based on the documents provided and the information collected during the site visit;
- contains recommendations concerning work that should be carried out to responsibly manage the risks posed to and by the trees, and where necessary, reduce those risks to an acceptable level. However, even after carrying out the recommended work, there is a risk failure could still occur, especially during extreme weather conditions and/or if there are major hidden defects;
- does not take into account the possibility of extreme weather events;
- cannot account for future outbreaks of pests or diseases;
- does not take into account mechanical operations carried out in the vicinity of the trees which could affect their health and stability; and
- does not contain data collected with technical decay detection equipment

2 SITE VISIT AND OBSERVATIONS

2.1 Site Visit

I carried out site visits during March and April 2016, and on 03/04/18. My observations of the trees were from ground level, without detailed investigations and I estimated all dimensions unless otherwise indicated. The weather during my survey was generally dry and still, with good visibility but wet on 03/04/18.

2.2 Site Description

Plot 7 is located north of the road named Rheda Park in the northern part of the area around Ordnance Survey grid reference NY 021 170, for which outline planning permission has been granted. Plot 7 is a roughly rectangular plot that includes some of the trees within Groups 1, 2, 3 and 4. Closely abutting to the southwest is Plot 6, and to the northwest are trees within (proposed) Plot 8. To the southeast of Plot 7 is the garden of the separate property of what I believe to be called No 49 Rheda Park. To the northeast is agricultural pasture.

2.3 Tree Identification and Location

Plan 1 shows the locations of the significant trees that are either on, or close to, the site of Plot 7.

These plans are for illustrative purposes only and not for directly scaling measurements. All the relevant information on the trees is contained within this report.

2.4 Tree Observations

For the Arboricultural report by Treescapes Consultancy Ltd reference EJC/61-2016 dated 29/06/2016 I visually surveyed some of the trees and groups of trees across the wider site, including Plot 7, and recorded information on their species and stem diameter. I also indicated in that report those trees and groups of trees I thought likely to be of higher quality and provided broad retention categories accordingly.

Appendix 5 contains the schedule of the trees and groups in Plot 7 and also those trees in the plots nearby that might be affected by the development.

3 REFERENCES, PLANNING POLICY AND GUIDANCE

3.1 National Policy

Section 197 in the Town and Country Planning Act 1990 makes it the duty of local planning authorities, 'in the interests of amenity,' to protect trees, when granting planning permission, by imposing conditions or serving Tree Preservation Orders (TPOs). National policy is now enshrined in the National Planning Policy Framework (NPPF, March 2012).

The NPPF states at Para 118 (bullet point 5) that "*planning permission should be refused for development resulting in ... the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss*"; "This is dealt with in separate documentation by others.

3.2 British Standard: BS 5837, *Trees in relation to design, demolition and construction – Recommendations (2012)*

The British Standard: BS 5837, *Trees in relation to design, demolition and construction – Recommendations (2012)* contains guidance on how to assess trees in or close to proposed development sites and what information to include in a pre-development arboricultural report for submission with a planning application. Appendix 2 contains relevant extracts from BS 5837 (2012).

3.3 Copeland Local Plan 2013-28:

This replaces the 2001-2016 Local Plan and policies in that Plan relevant to trees (ENV10 and ENV12) have been replaced by new policies, these being DM26 and DM28. Former Policy ENV 11 expired in June 2009.

3.4 Policy DM26 – Landscaping (extracts relevant to trees)

All development proposals will be assessed in terms of their potential impact on the landscape.

Proposals will be assessed according to whether the proposals relate well in terms of visual impact, scale, character, amenity value and local distinctiveness and the cumulative impact of developments will be taken into account as part of this assessment.

Development proposals, where necessary, will be required to include landscaping schemes that retain existing landscape features, reinforce local landscape character and mitigate against any adverse visual impact

3.5 Policy DM28 – Protection of Trees (relevant extracts)

A. Development proposals which are likely to affect any trees within the Borough will be required to include an arboricultural assessment as to whether any of those trees are worthy of retention and protection by means of a Tree Preservation Order and submit proposals for the replacement or relocation of any trees removed, with net provision at a minimum ratio of 2:1, with preference for the replacement of trees on site and with native species

B. Any proposed works to Trees within Conservation Areas, or protected with Tree Preservation Orders, will be required to include an arboricultural survey to justify why works are necessary and that the works proposed will, where possible, not adversely affect the amenity value of the area.

4 TREE CONSTRAINTS

4.1 Tree Retention Category – BS 5837 (2012)

Using the guidance given in Table 1 of BS 5837 (2012), I have assessed the quality of some of the trees for retention and recorded the results in the schedule at Appendix 5. Appendix 3 contains a copy of Table 1 from BS 5837 (2012).

The following colour scheme represents the tree retention categories on the Plans:

- Red: Retention Category U – Those 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
- Green: Retention Category A – Trees of high quality with an estimated remaining life expectancy of at least 40 years
- Blue: Retention Category B – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years
- Grey: Retention 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 150 mm

Of the trees in Groups 1, 2, 3 and 4 that may be affected by the development of Plot 7 I have assessed 10 of the trees to be in either Retention Category C1 or C2, and 19 trees to be within Retention Category B2.

Those trees that I have assessed to be in Retention Category B I have done so because they are growing in numbers, as groups or woodlands, such that they attract a higher collective rating than they might as individuals (i.e. subcategory 2).

4.2 Tree Constraints – Above Ground

Plan 1 shows the existing site layout, the locations of the trees and some of their crowns. If retained, tree canopies are the vertical constraints to development. Pruning in accordance with good arboricultural practice can sometimes provide adequate clearance to implement the development proposals

4.3 Tree Constraints – Below Ground

Plan 1 also shows the root protection areas (RPAs) of some of the trees. This is the minimum area of soil required by the roots to maintain healthy growth and is a development constraint. In some locations, altering this area is necessary to reflect the topography of the site and the adjacent land.

Root damage is often not visible from the surface and can create safety issues with tree stability. Damaged roots and compacted soil can restrict the amount of moisture and nutrients available to the tree and possibly lead to a premature decline in tree health.

5 ARBORICULTURAL IMPACT ASSESSMENT

5.1 Trees growing close to the proposed development

Plan 2 shows the proposed layout, the locations of the trees, some of their crowns and RPAs.

The trees listed in Table 1 are growing within the footprint of the proposed development or have canopies and/or RPAs that are within 2m of it.

If any of the trees listed in Table 1 are retained, except those growing within the footprint which will have to be removed, they could be harmed if the proposals are implemented without regard for their requirements.

Table 1 illustrates how the proposed development affects the trees on the site. The following list explains the abbreviated table headings:

- *TREE* – trees growing within the footprint of the proposed development and groups growing wholly or partially within the footprint
- *RPA* – the RPAs affected by the proposed development
- *CROWN* – the crowns overhanging the footprint of the proposed development
- *CONSTRUCTION*– the crowns that could be affected by construction traffic or activity
- *NONE* – the trees unaffected by the proposed development

Table 1

Trees with RPAs and canopies that encroach into the footprint of proposed structures or within 2m of them.

ID	Species	Age Class	Retention Category	Height (m)	Growing in FP	Canopy	RPA	Canopy <2m	RPA <2m	Structure
2.09	Scots Pine	Old mature	B2						X	Proposed house.
2.10	Scots Pine	Old mature	B2				X			Proposed house
2.11	Scots Pine	Old mature	B2				X			Proposed house
2.12	Scots Pine	Old mature	B2		X					Proposed house
2.14	Scots Pine	Old mature	B2		X					Proposed house
2.15	Scots Pine	Old mature	B2				X			Proposed house
2.16	Scots Pine	Old mature	B2				X			Proposed house
3.01	Birch	Young mature	C1						X	Proposed house
4.01	Scots Pine	Old mature	B2		X					Proposed driveway
4.02	Birch	Young mature	C2		X					Proposed driveway
4.03	Birch	Young mature	C2		X					Proposed driveway
4.04	Lime (TBC)	Young mature	C2		X					Proposed access road
4.22	Birch	Young mature	C2		X					Proposed access road
4.23	Birch	Young mature	C2		X		X			Proposed access road
4.24	Birch	Young mature	C2		X					Proposed access road

5.2 Future stability and vitality of retained trees following removals

Retained trees, particularly those in the young mature age class within Plots 6, 7 and 8 may be less stable during strong winds in future as a result of neighbouring trees being removed and no longer providing mutual shelter and support.

Over time the stability of any retained individuals may improve as stem and root growth, stimulated by the effects of greater exposure, develop.

Any root damage affecting the amount of moisture and nutrients available to any retained trees, or other factors impacting negatively on them, may affect their future vitality, their ability to adapt to altered circumstances and could lead to a premature decline in tree health.

5.3 Levels

Altering the ground level within the RPA of a retained tree may have a detrimental impact on its health and longevity.

5.4 Ground surface materials

Altering the ground cover, such as by using impervious or semi-pervious surface materials to cover areas that were previously vegetated soil, will alter the moisture content and recharge of the soil, and its oxygen and carbon dioxide content. This could have a detrimental effect on the health of tree roots growing there.

5.5 Site access

Vehicles and plant operating or parking on unprotected soil within the RPA of a retained tree could compact or contaminate it and this could have a detrimental impact on its long-term condition and longevity.

Vehicle movements under the crown of a tree could cause physical damage to its trunk and branches. This could potentially create a safety hazard and reduce its life expectancy.

5.6 Storing of fuel, materials and equipment

Storing fuel, equipment and materials close to trees increases the risk of damage to trunks and branches, soil compaction and/or contamination with toxic substances.

5.7 Activity under tree canopies

Activity under a tree canopy, such as mixing cement, bonfires or storing equipment, plant and materials, may damage its branches or stem(s). It may also be detrimental to soil within its RPA and utilised by its roots.

5.8 Mitigation for tree loss

Unavoidable tree loss can often be mitigated by the implementation of a robust tree planting scheme that may confer greater benefits to the site than retained poor quality trees.

6 RECOMMENDATIONS

6.1 General precautions

The following general precautions should ensure the health and longevity of retained trees. They should be enforced within their RPAs and under their canopies during the construction phase and in locations where new trees are to be established unless the soil is to be suitably remediated.

- No storing materials, equipment, plant or fuel.
- No refuelling mechanical equipment.
- No storing or mixing cement.
- No washing cement mixers within or uphill of the RPA.
- No bonfires within 10m of the outer edge of the crown or RPA.
- No raising the soil level without prior discussion with Treescapes Consultancy Ltd. and agreement of the Local Planning Authority (LPA).
- No excavations without prior discussion with Treescapes Consultancy Ltd. and agreement of the LPA.
- No redirection of surface water runoff, either into or out of the RPA.
- No temporary buildings, sheds, or offices without prior discussion with Treescapes Consultancy Ltd. and agreement of the LPA.
- No dumping or storing materials or waste, whether in a skip or on the ground.
- No vehicles and plant unless the soil is suitably protected as recommended by Treescapes Consultancy Ltd. and agreed by the LPA.
- Only operate or park vehicles and plant in areas where new trees will be established if the soil is suitably protected, as recommended by Treescapes Consultancy Ltd. and agreed by the LPA. Alternatively, soil compaction should be relieved prior to the establishment of the trees once the construction phase has been completed.
- 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); <http://streetworks.org.uk/wp-content/uploads/2016/09/V4-Trees-Issue-2-16-11-2007.pdf> (accessed 29/11/19) when installing or maintaining underground services within the RPA of a retained tree.

If necessary Treescapes Consultancy Ltd. can monitor the implementation and adequacy of tree protection measures at critical stages of the project to ensure they are in accordance with BS 5837 (2012) and conditions listed on the planning consent notice.

I recommend that suitable members of the project team, including the main contractor and Arboricultural Consultant, should prepare a definitive Tree Protection Plan showing the locations of temporary and permanent tree protection measures to be installed during the construction phase and prepare a method statement for their installation.

6.2 Poor quality trees – trees in Retention Category ‘U’

I consider that these are poor trees that should not be constraints to development.

6.3 Poor quality trees – trees in Retention Category ‘C’

In the Arboricultural report by Treescapes Consultancy Ltd reference EJC/61-2016 dated 29/06/2016 using the guidance contained in BS 5837 (2012) I assessed the trees listed in Table 2 (below) in Plot 7 to be in Retention Category C. I considered then that these were poor trees that should not be constraints to development and outline planning permission was granted.

Table 2

Trees assessed to be in Retention Category C

ID	Species	Age Class	Retention Category
1.20	Larch	Old Mature	C2
1.26	Larch	Old Mature	C2
3.01	Birch	Young mature	C1
4.02	Birch	Young mature	C2
4.03	Birch	Young mature	C2
4.04	Birch	Young mature	C2
4.21	Birch	Young mature	C2
4.22	Birch	Young mature	C2
4.23	Birch	Young mature	C2
4.24	Birch	Young mature	C2

6.4 Trees likely to be part of an earlier designed landscape

Trees within Plot 7 that are likely to be part of any earlier designed landscape are mainly in Groups 1 and 2 in the north and northwest part of the plot.

6.5 Tree work required to implement the proposals

Appendix 6 contains a schedule of the recommended tree work.

Some further tree work may be necessary, particularly to trees that may become unstable following removal of close neighbouring trees.

Pruning work might be required if conflicting branches become evident as the construction work progresses

6.5.1 Felling

I recommended that the following trees and groups of trees should be felled to allow the proposals to be implemented or due to the likelihood that they may become unstable following removal of neighbouring trees.

Table 3

Trees and groups of trees recommended to be removed in order to implement the proposals.

Trees and groups recommended for removal to implement the proposals		
2.10	2.11	2.12
2.14	2.15	2.16
2.17	3.01	4.01
4.02	4.03	4.04
4.21	4.22	4.23
4.24		

6.5.2 Pruning

To implement the proposals, I recommend pruning might be required if conflicting branches become evident as the construction work progresses.

Table 4

Trees and groups of trees recommended to be pruned in order to implement the proposals.

Trees and groups recommended for pruning to implement the proposals
Provisional

6.6 Recommended tree work

Appendix 6 contains prioritised tree work recommendations.

Currently, I recommend that no tree works in either Category 1 or Category 2 are necessary now, but it is likely that some will be required in the future.

6.6.1 Risk abatement tree work

Recommended risk abatement work is listed as Category 1 and has been prioritised as:

- High priority – carry out this work as soon as possible;
- Medium priority – this work doesn't need to be carried out straight away, but these trees should be inspected every two years and after adverse weather conditions. If it is decided not to carry out this work straight away, I recommend that provision is made in future budgets to have it carried out at a later date.
- Low priority – this work doesn't need to be carried out straight away, but these trees have notable defects that could develop over time. I therefore recommend that these trees should be inspected every two years and after adverse weather conditions.

6.6.2 Tree work category

- Category 1 work is necessary to manage risks posed by the trees and has been prioritised as described above.
- Category 2 work is recommended to establish high levels of arboricultural and silvicultural management and is not necessary to abate safety concerns and therefore hasn't been prioritised.

6.7 Implementing the tree work

Recommended tree work should be carried out by a suitably qualified, competent, experienced and insured contractor. The contractor should carry out all tree work in accordance with the guidance contained in the British Standard: *Tree Work – Recommendations* (BS 3998, 2010).

If required, Treescapes Consultancy Ltd. will obtain quotations for required tree work and oversee its implementation.

6.8 Design and construction considerations

Construction processes and site operations can adversely affect trees in many ways. Consequently, I suggest that it would be beneficial for all members of the project team to be aware of tree protection recommendations contained within this report and tree protection conditions listed on the planning consent notice and make provision for them throughout the project. To avoid unnecessary damage to retained trees I recommend that Treescapes Consultancy Ltd. should be involved throughout the project at all stages, from pre-planning to hand-over.

We are able to provide feedback at each stage of the project and carry out a supervisory role to ensure that retained trees are adequately protected.

6.9 Temporary tree protection barriers

Temporary tree protection barriers should be erected outside the RPAs and canopies of retained trees unless the trees and soil within their RPAs can be protected by other means. Plan 3 is a Tree Protection Plan that shows suggested locations of temporary tree protection barriers. These barriers must be robust enough to withstand impacts from machinery and plant that will operate close to them. If relatively small plant is to be used, I recommend that the barriers should be constructed using:

- 75-100mm diameter, by 1.8m long, wooden posts firmly inserted 300mm into the ground 2m apart;
- the posts should be spanned by 30mm x 100mm x 2m wooden rails between their tops and bottoms; and
- 1.5m high chestnut paling should be attached to both the top and bottom rails at 300-500mm intervals.

If large machines will operate on the site, I recommend the barrier design depicted in BS 5837 (2012) and reproduced in Appendix 7.

The protective barriers should be erected prior to any other development activity taking place and remain in-situ for the duration of the construction phase and should not be moved without the written consent of the LPA or until the completion of construction activity.

I recommend that suitable members of the project team, including the main contractor and Arboricultural Consultant, should prepare a definitive Tree Protection Plan showing the locations of temporary and permanent tree protection measures to be installed during the construction phase and prepare a method statement for their installation.

6.10 Temporary ground protection

The ground within the RPAs of retained trees should be protected throughout the project from compaction and contamination. If construction activity is to take place within the RPAs of retained trees the soil should be protected against compaction and contamination. The following suggestions may be appropriate.

- For heavy construction vehicles (>2t), use reinforced concrete slabs, the three-dimensional cellular confinement system described below, or an alternative engineered solution capable of supporting the likely loading without deforming and compacting the underlying soil.

The soil protection measures to be used where plant and vehicles will operate should be capable of supporting the weight of traffic without causing undue compaction and therefore prevent root suffocation and moisture deficiency/excess. The load bearing support system should be installed in accordance with its manufacturer's instructions. Installing the load bearing support system should be the first operation to take place after the tree protection barriers have been erected.

BS 5837 (2012) recommends using a three-dimensional cellular confinement system, such as:

- Cellweb – <http://www.geosyn.co.uk/product/cellweb-tree-root-protection> (accessed 03/01/20);
- Geocell – <http://www.terram.com/products/geocells/tree-root-protection-geocell.html> (accessed 03/01/20); or
- Arborraft – <https://infragreen-solutions.com/arborraft/> accessed 03/01/20).

The cells of these products should be filled with an inert, 'no-fines', angular stone gravel and covered with a porous wearing course.

For lighter machinery (<2t), use inter-linked ground protection boards placed on a 150 mm deep layer of woodchip laid on a geotextile membrane.

For pedestrian traffic, use a single thickness of scaffold boards placed either on a driven scaffold frame, so as to form a suspended walkway, or placed on top of a 100 mm deep layer of woodchip laid on a geotextile membrane.

The diagram at Appendix 7 illustrates the example of boards placed on woodchip, laid on a geotextile membrane.

I recommend that suitable members of the project team, including the main contractor and Arboricultural Consultant, should prepare a definitive Tree Protection Plan showing the locations of temporary tree protection measures to be installed during the construction phase and prepare a method statement for their installation.

6.11 Foundations

The proposed development encroaches into the RPAs of a number of trees. These are all included in the list of trees that I recommend be felled to allow the proposed development. If any of these were to be retained the affected structure(s) should be constructed using foundations that require minimal excavations within its/their RPA(s). Pile and beam foundations with the beams installed above the existing ground level, or a raft foundation, may be suitable foundations types.

6.12 'Over-dig'

I recommend that it would demonstrate a level of commitment to carry out the construction to a high standard if measures could be implemented to minimise 'over-dig' to the minimum. Suitable measures may include using shuttering to prevent soil falling into the excavated trench.

6.13 Shallow excavations within the RPAs of retained trees

In areas where shallow excavations are required within the RPAs of retained trees – less than 300mm deep – they should be carried out with hand tools and a pneumatic excavation lance such as an:

- 'Air-spade' – <https://www.airspade.com/> (accessed 03/01/20); or
- 'Soil pick' – <https://www.mbw.com/products/utility/pneumatic-soil-excavators> (accessed 03/01/20).

I recommend that suitable members of the project team, including the main contractor and Arboricultural Consultant, should assess where shallow excavations are required close to trees and prepare a method statement for carrying them out.

Treescaping Consultancy Ltd. have a Soil Pick and are able to assist with this work if required.

6.14 Tree establishment

A number of trees of suitable species could be established in appropriate locations to enhance the visual character of the site and ensure that trees remain part of the landscape for decades to come.

A draft tree planting plan showing the proposed approximate site layout is shown in Plan 4. Information on the plants, materials and maintenance are included in Appendix 8.

Areas where trees are to be established should be protected from soil compaction and contamination during the construction phase by the same design of temporary barriers and/or ground protection used to protect existing trees and the soil within their RPAs. Alternatively, if compacted or contaminated, the soil will have to be suitably remediated or replaced to enable the trees to grow.

6.15 Tree management – future inspections

Due to the size of a number of the trees, their condition and locations close to proposed residential buildings, roads, gardens, public open space, car parks and associated features, I recommend that they should be inspected every two to three years and after tree altering weather events, such as drought or windstorms, by a suitably qualified, experienced and insured Arboricultural Consultant.

7 LEGAL CONSIDERATIONS

7.1 Protected Trees

I have been informed by the developer of Rheda Park, Mr J. Reed, that there is an existing Tree Preservation Order (TPO) in place over some of the wider site. He has indicated to me that part of Plot 7 falls within the TPO.

Where a Tree Preservation Order protects trees it will be necessary to obtain permission from the LPA before carrying out any work. Certain exemptions require five days' notification to the LPA apart from in extremely dangerous circumstances.

Full planning consent allows the minimum work required to implement the development proposals to be carried out to protected trees.

7.2 Forestry Legislation

A felling licence is required from the Forestry Commission to fell more than a small amount of timber in any calendar quarter unless the trees fall into one of the exempted categories.

Information about felling licences is available from the Forestry Commission website –

www.forestry.gov.uk (viewed 31/05/19). A felling licence may be required if more than 2m³ of timber is to be felled and sold, or more than 5m³ is to be removed and used for personal use.

7.3 Wildlife Conservation Legislation

Most birds' nests are legally protected while in use; also, bats and their roosts have legal protection whether in use or not. Tree surgeons should be aware of their duties under the legislation to protect wildlife and should carry out their site assessment and work accordingly. If you suspect bats use the area, consult Natural England.

The Forestry Commission produce a useful leaflet called: *Woodland Management for Bats*. This document is available to download from <https://www.forestryresearch.gov.uk/research/woodland-management-for-bats/> (viewed 03/01/20).

Page 14 of this publication states:

'The Wildlife and Countryside Act 1981 makes it an offence to disturb, damage or destroy bats or their roosts (even if bats are not present in the roost at the time of any incident). The Act applies in both England and Wales, and requires consultations with the appropriate Statutory Nature Conservation Organisation [English Nature or The Countryside Council for Wales] before carrying out activities which might harm or disturb bats or their roosts (even if unoccupied).'

'The Act is amended by the Countryside and Rights of Way Act 2000 in England and Wales. This adds 'reckless' to the offence of damaging or destroying a place a bat uses for shelter or rest, or disturbing a bat while using a roost. Under EU Regulations damaging or destroying a breeding site or resting place is an absolute offence, regardless of whether the act of doing so may be considered reckless or deliberate.'

7.4 Neighbouring Trees

Under common law, you, or a neighbour, can prune overhanging branches back to the boundary line without the owner's permission. However, the material belongs to the tree owner and the same guidance on statutory controls applies, as discussed above.

8 CONCLUSIONS

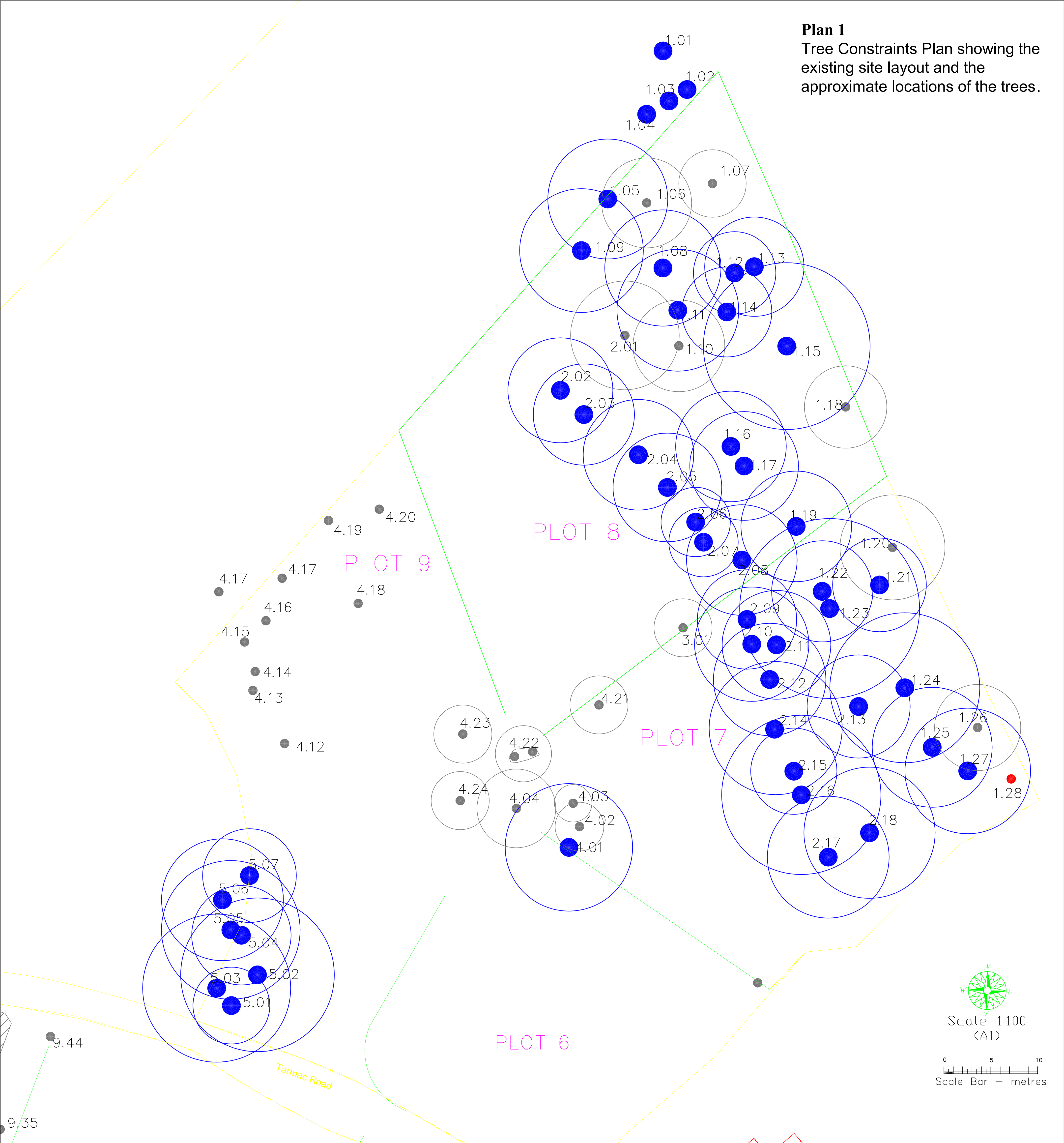
Based on the above discussions and provided all the technical recommendations in this report are followed I consider this residential development could be carried out in accordance with the guidance in the British Standard: BS 5837, *Trees in relation to design, demolition and construction – Recommendations* (2012), with a minimal impact on the retained trees.

Eddie Cruickshank MIC.For, M.Arbor.A., FDScArb

9 REFERENCES

- Anon, 2005. *Woodland Management for Bats*. Forestry Commission, Wetherby. 15 pp.
- BS 5837:2012, *Trees in relation to design, demolition and construction - Recommendations*
- BS 3998:2010, *Trees work - Recommendations*

Rheda Park, Plot 7



Key to Plan 1

The approximate location of a tree and its respective number.

- Trunk
- Crown Spread
- Root Protection Area (RPA)

Green Retention Category A
Blue Retention Category B
Grey Retention Category C
Red Retention Category U

The approximate location of a tree group and its respective number.

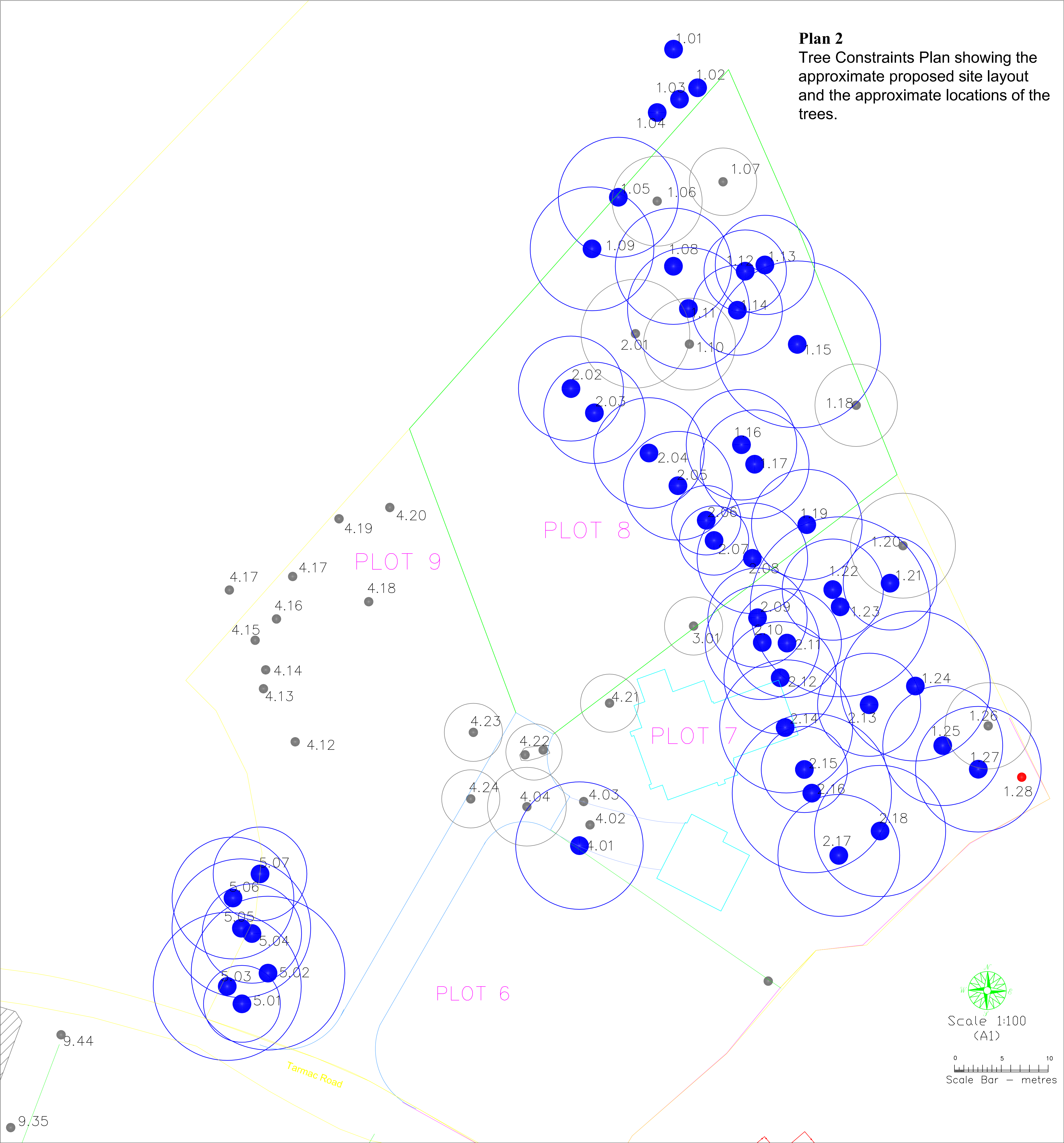
Green Retention Category A
Blue Retention Category B
Grey Retention Category C
Red Retention Category U

The approximate location of a tree that has not been surveyed

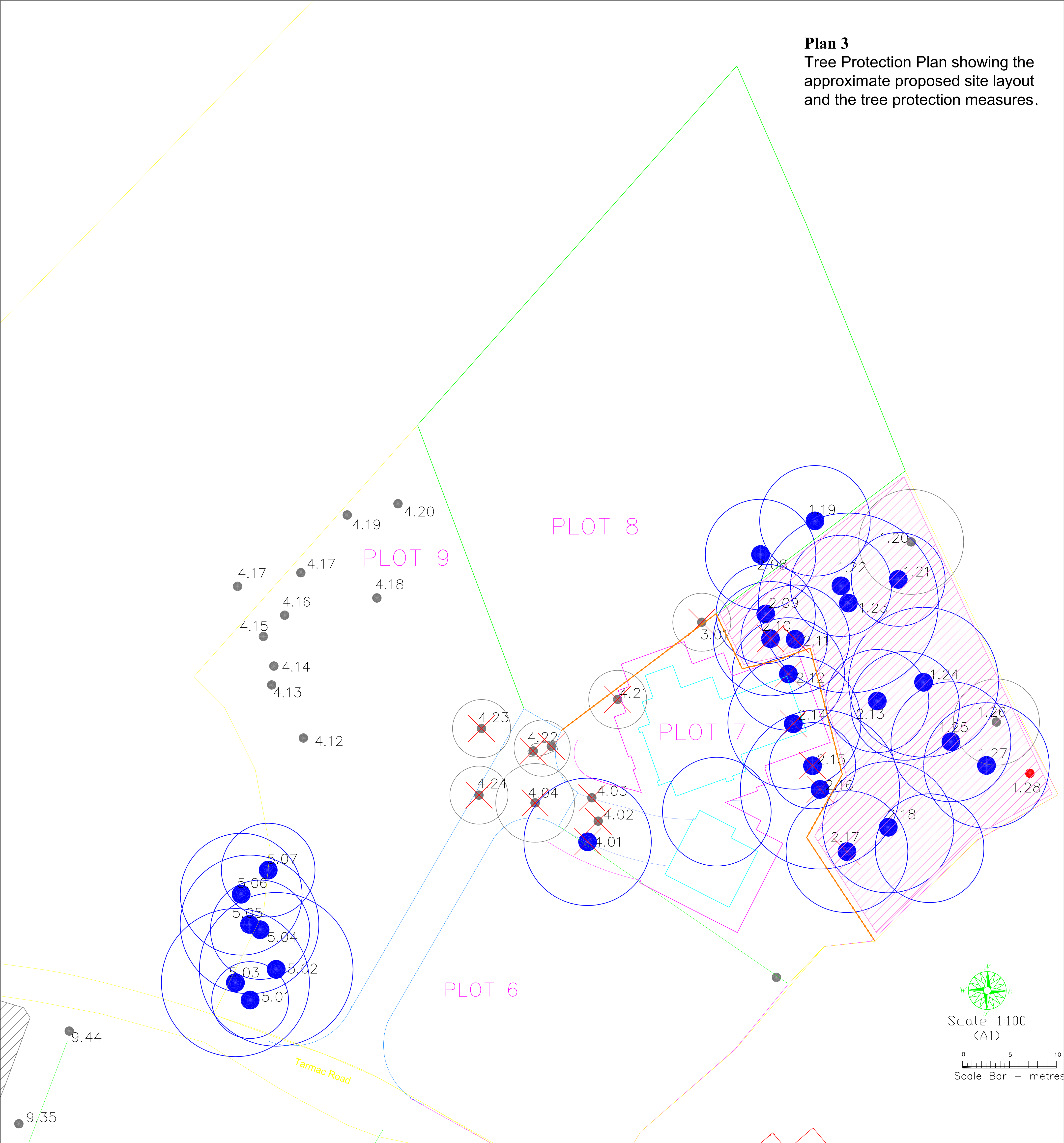
The approximate outline of an existing structure

The approximate extent of the existing roadway

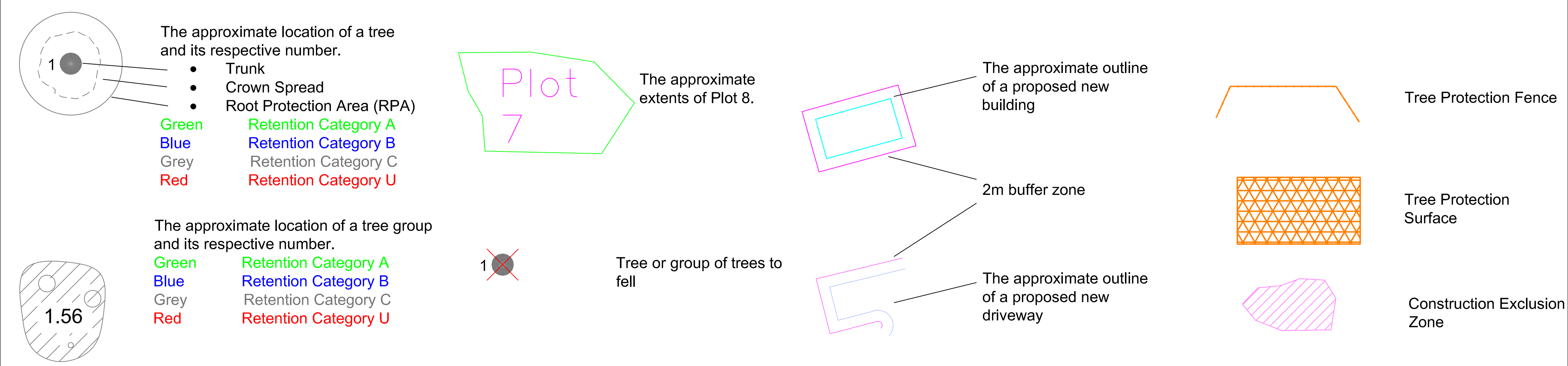
Rheda Park, Plot 7



Rheda Park, Plot 7



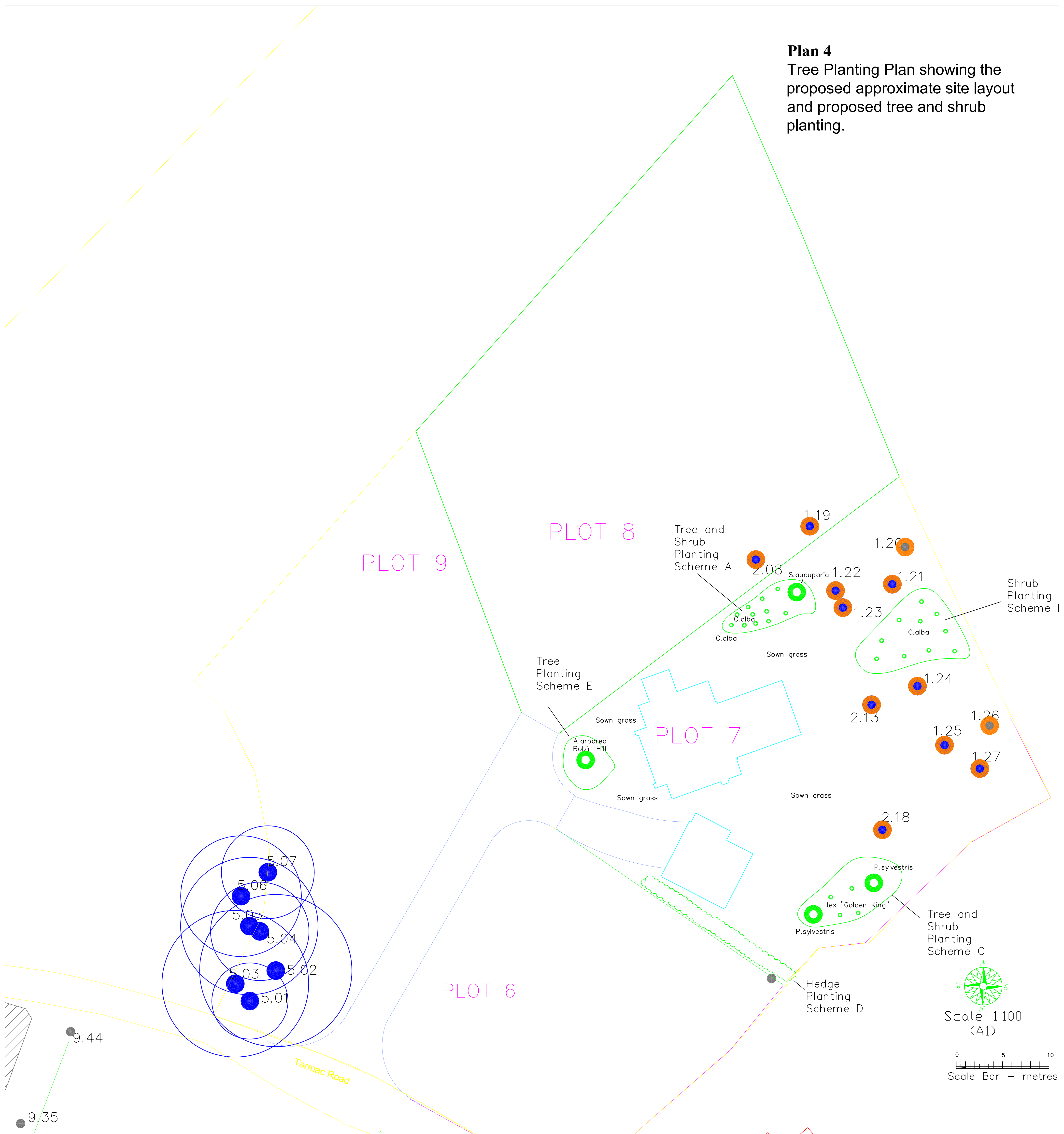
Key to Plan 3



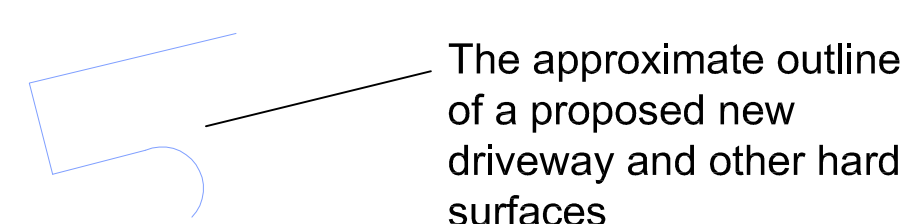
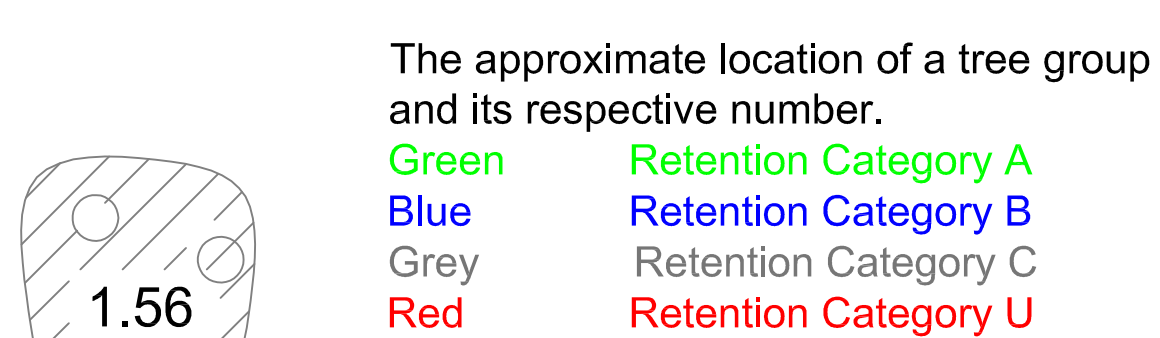
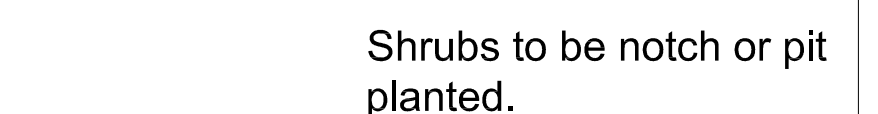
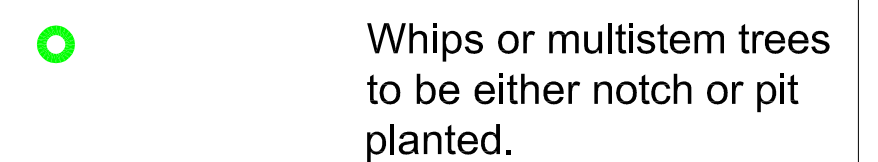
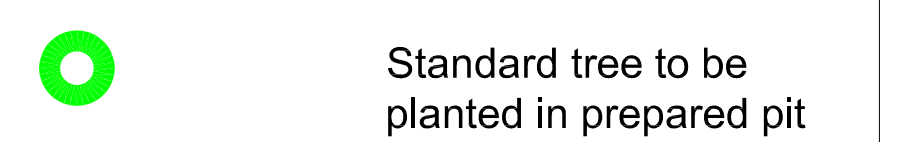
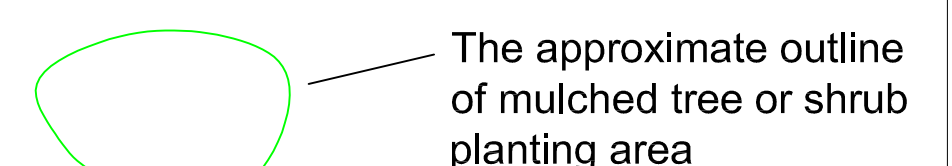
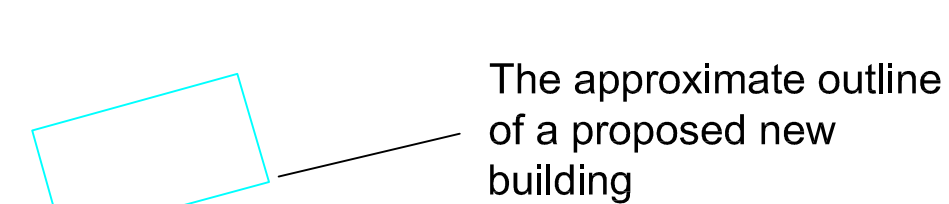
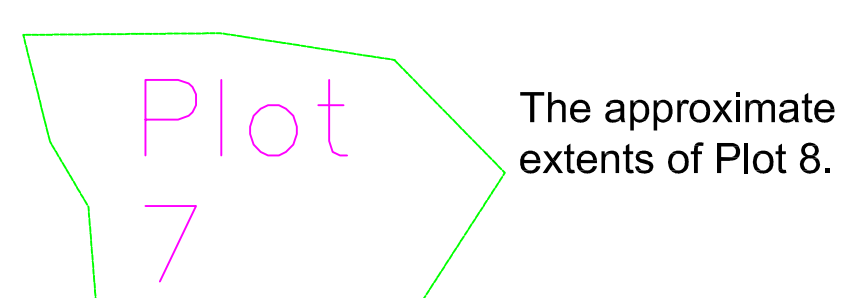
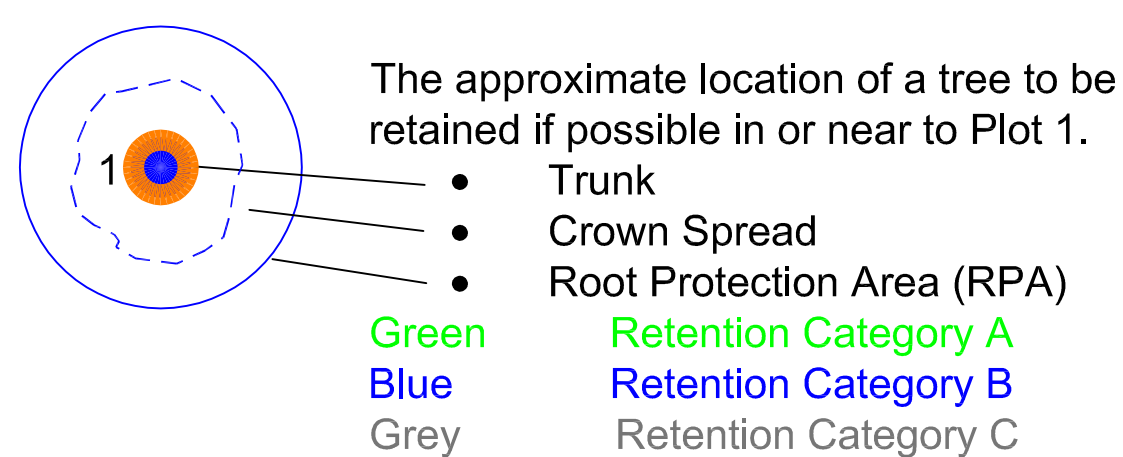
Rheda Park, Plot 7

Plan 4

Tree Planting Plan showing the proposed approximate site layout and proposed tree and shrub planting.



Key to Plan 4



Appendix 1

Eddie Cruickshank – Experience and Qualifications

PROFESSIONAL EXPERIENCE

I have worked and studied continuously within forestry and arboriculture since 1978:

- Currently self-employed as a **Forestry and Arboriculture Consultant** associated with Treescapes Consultancy Ltd, Cumbria (2012 to present).
- **Head Forester** - Morden Estates Company Ltd (2000 – 2010) - Morden Estates Company Ltd manages collectively the interests of various family trusts and individual members of the Drax family, centred around Charborough in Dorset. I managed approximately 950 Ha of woodlands to various objectives and supervised a direct labour force supplemented by contractors as necessary.
- **Manager** - Fountain Forestry /Fountains plc (1994 - 1999) - Fountain Forestry Ltd (and latterly Fountains plc) provided services for private and corporate landowners, utilities and local authorities throughout the UK and USA.
- **Head Forester** - Harewood Estate, West Yorkshire (1983 – 1994).
- Full time study at National School of Forestry, Newton Rigg, Penrith (1982 – 83).
- Assistant to the Head Forester at Eling Estate nr Newbury (1981-82).
- Full time study at National School of Forestry, Newton Rigg, Penrith (1980 – 81).
- Forest worker with the Forestry Commission at Affric Forest in Invernesshire (1978 – 80).

QUALIFICATIONS

- Foundation Degree in Arboriculture (Merit) 2012 – University of Central Lancashire, Myerscough College, Bilborough, Preston.
- Certificate of Higher Education in Arboriculture (Distinction) 2006 - Bournemouth University, Kingston Maurward College, Dorchester.
- Institute of Chartered Foresters - Part 2.
 - Management Plan - Little Oak Forest - Gwyned. 1994
- Institute of Chartered Foresters - Part 1.
 - Paper 3a - Harvesting Marketing and Utilisation. 1994
 - Paper 2 - Policy, Economics and Management. 1993
 - Paper 1 - Scientific Principles and Practice of Growing trees. 1991
- Ordinary National Diploma in Forestry (Credit) 1983 – Cumbria College of Agriculture and Forestry, Newton Rigg, Penrith.

Membership of professional organisations

- Institute of Chartered Foresters.
- Arboricultural Association (Professional member)
- CONFOR.
- Royal Forestry Society.
- Forestry Contracting Association.

Continuing professional development.

I attend conferences, seminars and workshops run by forestry and arboriculture organisations, colleges and universities. Some of these have been:

- Forbes-Laird Arboricultural Consultancy Seminar 2019 - including Tree Risk Assessment and Identification of Hazards in Trees
- Simon Scotting, in association with Paul Cleaver Tree Consultancy, Training Event (2018) - Intermediate Tree Inspection.
- Arboricultural Association Training Course (2016) – Assessment of tree forks
- Arboricultural Association Training Event (2016) – BS5837: Advanced: Tree assessment for Planning.
- Arboricultural Association Training Event (2016) – BS5837: Advanced: Managing Trees on Construction Sites.
- Judge for the 2015 Royal Forestry Society James Cup.
- Arboricultural Association Training Event (2015) – BS5837: Tree Surveying and Categorisation.
- Arboricultural Association Training Event (2014) – Arboricultural Consultancy.
- Arboricultural Association 2 in1 Training Course (2012).
BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.
The Town and Country Planning (Tree Preservation) (England) Regulations 2012.
- Ancient Tree Forum (2012) - Summer Field Trip to Cumbria.
- Arboricultural Association Northern Branch (2011) – Tree care seminar.
- Treework Environmental Practice - Seminar XVIII (2011) - Finding Holistic Solutions to Disease and Decline - Kew.
- Arboricultural Association Training Course (2011) - BS 3998:2010 Tree Work – Recommendations.
- LANTRA Awards Certificate of Training (2007) – Professional Tree Inspection

Appendix 2

Extracts from the British Standard: BS 5837, *Trees In Relation To Design, Demolition and Construction – Recommendations* (2012)

TREE CATEGORISATION

The trees have been categorised as recommended in Section 4.5, Tree categorization method and Table 1 of the standard (BS 5837, 2012). A copy of Table 1 is included as Appendix 3.

TREE CONSTRAINTS

Section 5 of BS 5837 recommends producing a tree constraints plan (TCP) showing the trees and an area around them referred to as the root protection area (RPA). The RPA is a calculated area of soil sufficient to provide enough water and nutrients for the tree to remain in a healthy condition. The RPA is equal to the area of a circle with a radius 12 times the diameter of the trunk measured 1.5m above the ground. Alternatively, for multi-stemmed trees with more than five stems, the RPA is equal to the area of a circle with a radius equal to 12 times their mean trunk diameter measured at 1.5m above the ground level.

In Section 5.2.3, the Standard states:

‘The following factors should also be taken into account during the design process:

- a) the presence of tree preservation orders, conservation areas or other regulatory protection;*
- b) potential incompatibilities between the layout and trees proposed for retention;*
- c) the working and access space needed for the construction of the proposed development;*

NOTE This might involve access facilitation pruning, or the use of a height restriction bar to prohibit tall vehicles accessing a site containing trees with low canopies.

- d) the effect that construction requirements might have on the amenity value of trees, both on and near the site, including the effects of pruning to facilitate access and working space;*
- e) the requirement to protect the overhanging canopies of trees where they could be damaged by machinery, vehicles, barriers or scaffolding, where it will be necessary to increase the extent of the tree protection barriers to contain the canopy;*
- f) infrastructure requirements in relation to trees, e.g. easements for underground or above-ground apparatus; highway safety and visibility splays; and other infrastructural provisions, such as substations, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines;*
- g) the proposed end use of the space adjacent to retained trees;*
- h) the potential for new planting to provide mitigation for any losses.’*

TREE PROTECTION

The RPA forms the basis for a construction exclusion zone (CEZ) and requires protection during the development by means of barriers and/or ground protection fit for ensuring the successful long-term retention of the trees. Section 6.2.1.1 of the standard states:

‘All trees that are being retained on site should be protected by barriers and/or ground protection (see 5.5) before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone.

Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection should be installed.'

TREE PROTECTION FENCES

With regard to barriers erected to protect the retained trees, Section 6.2.2.1 of the standard states:

'Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.'

In addition, Section 6.2.2.2 states:

'The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 2. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.'

Appendix 7 of this report is a diagram of a tree protection barrier based default specification shown in BS 5837 (2012).

GROUND PROTECTION

With regard to protecting the soil within the RPA from compaction, Section 6.2.3.3 of BS 5837 (2012) states:

'New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.'

NOTE The ground protection might comprise one of the following:

- a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;*
- b) for pedestrian-operated plant up to a gross weight of 2 t, 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;*
- c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.'*

CONSTRUCTION WITHIN THE RPA

Section 7.5.1

'The use of traditional strip footings can result in extensive root loss and should be avoided. The insertion of specially engineered structures within RPAs may be justified if this enables the retention of a good quality tree that would otherwise be lost (usually categories A or B). Designs for foundations that would minimize adverse impact on trees should include particular

attention to existing levels, proposed finished levels and cross-sectional details. In order to arrive at a suitable solution, site-specific and specialist advice regarding foundation design should be sought from the project arboriculturist and an engineer. In shrinkable soils, the foundation design should take account of the risk of indirect damage'

Section 7.5.2

'Root damage can be minimized by using:

- piles, with site investigation used to determine their optimal location whilst avoiding damage to roots important for the stability of the tree, by means of hand tools or compressed air soil displacement, to a minimum depth of 600 mm;*
- beams, laid at or above ground level, and cantilevered as necessary to avoid tree roots identified by site investigation.'*

Section 7.5.5

'Where piling is to be installed near to trees, the smallest practical pile diameter should be used, as this reduces the possibility of striking major tree roots, and reduces the size of the rig required to sink the piles. If a piling mat is required, this should conform to the parameters for temporary ground protection given in 6.2.3. Use of the smallest practical piling rig is also important where piling within the branch spread is proposed, as this can reduce the need for access facilitation pruning. The pile type should be selected bearing in mind the need to protect the soil and adjacent roots from the potentially toxic effects of uncured concrete, e.g. sleeved bored pile or screw pile.'

HARD SURFACES WITHIN THE RPA OF RETAINED TREES

Section 7.4.2 of BS 5837 (2012) states:

'7.4.2.1 The design should not require excavation into the soil, including through lowering of levels and/or scraping, other than the removal, using hand tools, of any turf layer or other surface vegetation. If it is intended to use the new surface for construction access, it is essential that the extra loading and wear arising from this are taken into account during the design process.

7.4.2.2 The structure of the hard surface should be designed to avoid localized compaction by evenly distributing the loading over the track width and wheelbase of any vehicles expected to use the access.

7.4.2.3 New permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

7.4.2.4 If the new surface is likely to be subject to de-icing salt application, an impermeable barrier should be incorporated to prevent contamination of the rooting area. Run-off should be directed away from the RPA (see also 8.6.5).

7.4.2.5 Where a permeable surface is to be used by vehicular traffic, a geotextile should be used at the base of construction to help prevent pollution contamination of the rooting area below.

7.4.2.6 Permeable hard surfacing can result in soil volume moisture content remaining at or near field capacity for long periods. Where there is a risk of waterlogging, the design should incorporate appropriate land drainage (see also 4.3 and 8.6.5). Land drainage within the RPA should be designed to avoid damage to the tree and the soil structure, e.g. sand slitting formed by compressed air soil displacement with the slits set radially to the tree.

7.4.2.7 *The hard surface should be resistant to or tolerant of deformation by tree roots, and should be set back from the stem of the tree and its above-ground root buttressing by a minimum of 500 mm to allow for growth and movement. Resulting gaps may be filled using appropriate inert granular material.*

NOTE 1 Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems. Alternatively, piles, pads or elevated beams can be used to support surfaces to bridge over the RPA or, following exploratory investigations to determine location, to provide support within the RPA while allowing the retention of roots greater than 25 mm in diameter.

NOTE 2 The use of two-dimensional load suspension systems is not recommended for surfaces intended for use by vehicles.'

Appendix 3

Extracts from the British Standard: BS 5837, Trees In Relation To Design, Demolition and Construction – Recommendations (2012): Table 1 – Cascade Chart for Tree Quality Assessment

TREES UNSUITABLE FOR RETENTION (see Note)

Category U

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

- 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

NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7 below.

TREES TO BE CONSIDERED FOR RETENTION

Category and Definition	1. Mainly arboricultural qualities	2. Mainly landscape qualities	3. Mainly cultural values, including conservation
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	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)	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)
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	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
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 150 mm	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 collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value

BS 5837 (2012) Section 4.5.7 states:

Where trees would otherwise be categorized as U, but have identifiable conservation, heritage or landscape value, even though only for the short term, they may be upgraded, although they might be suitable for retention only where issues concerning their safety can be appropriately managed.'

Appendix 4

Data Schedule and Remedial Action Explanatory Notes

- **Mathematical abbreviations:** < = Less than & > = Greater than
- **Compass Bearing:** N = north; NE = north-east; E = east; SE = south-east; S = south; SW = south-west W = west; NW = north-west.
- **ID No.:** This is the number used to identify the trees or groups on the plans and correlates to the ID No. in the Tree Data Schedule and Tree Works Schedule.
- **Species:** Common English name of what the tree appeared to be, based on observations at the time.
- **Trunk Ø:** The diameter of the trunk at 1.5m above ground level and recorded in centimetres measured with a diameter tape. If, for whatever reason, the height was measured at a different height above the ground, that height will be mentioned. If the diameter has been estimated an 'E' or 'Est' will appear in the column. For multiple stemmed trees, each significant stem diameter is recorded.
- **Height:** The height of the tree in metres, is measured with either; a Suunto clinometer; a Trupulse 200b, or Trupulse 360b laser rangefinder.
- **Crown Radius:** These measurements are taken at all or some of the eight cardinal points of the compass. Measurements are in metres and if estimated an 'E' or 'Est' will appear in the column.
- **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 have not 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.*
- **Age Class:** Assessed as either:
 - *Sapling or newly established* = recently planted; not fully established; a size that could be transplanted;
 - *Semi-mature* = prior to seed bearing age; establishing; usually good vigour; limited significance in the landscape;
 - *Early Mature* = early maturity, established; not fully grown but of seed bearing age; may have achieved mature height; normally vigorous; increasing landscape significance
 - *Mature* = fully established and fully grown, generally retaining good vigour and achieving full height but the crown is still spreading;
 - *Old Mature* = fully mature trees in last quarter of their usual life-expectancy; old for the species; vigour declining;
 - *Ancient* = exceptionally old for the species, possibly low vigour and in decline; the crown could be retrenching; likely to provide an important habitat; may include important Veteran Trees.
- **Defect & Observations:** The location, type, and detailed description of the defect. Information could include size, direction, or location etc.
 - *Defect Significance:* A subjective assessment of a combination of the likelihood of failure occurring. The defect is categorised as either: Minor, of little significance; Moderate, of some significance; or Major, a major defect that could cause failure at any time.
- **Recommended Remedial Actions:** This is a description of recommended work.
 - **Work Priority:**
 - *High priority* – carry out this work as soon as possible;
 - *Medium priority* – this work does not need carrying out straight away, but these trees have significant defects and should be inspected every two years and after strong winds. If you decide not to carry out this work straight away, I recommend provision is made in future budgets to have it carried out at a later date.
 - *Low priority* – this work does not need carrying out straight away, but these trees have notable defects that could develop over time. I therefore recommend inspecting these trees every two years and after strong winds.
 - **Work Category:**
 - *Category 1* work is necessary to manage the risks posed by the trees.
 - *Category 2* work is recommended to establish high levels of arboricultural and silvicultural management and not to abate safety concerns.
- **BS 5837 Retention category:** The retention category assessed using the guidance in the Tree Categorisation Table in BS 5837 (2005) in the Appendix.
 - U) (Red on plan) 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
 - A) (Green on plan) Trees of high quality with an estimated remaining life expectancy of at least 40 years
 - B) (Blue on plan) Trees of moderate quality with an estimated remaining life expectancy of at least 20 years
 - C) (Grey on plan) 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
- **RPA Radius:** The radius of a circular root protection area (RPA) in metres as specified using the guidance contained in BS 5837 (2012). For multi-stemmed trees, the mean diameter is calculated before calculating the RPA.
- **RPA Area:** The area of the root protection area (RPA) in square metres as specified using the guidance contained in BS 5837 (2012). For multi-stemmed trees, the mean diameter is calculated before calculating the RPA.

Appendix 5

Tree Data Schedule

Plot 7

Id No.	Species	Height (m)	Age Class	Health	Crown Radius (m)				RPA	Location of Defect	Defects	Description of Defect	Severity	BS 5837 Retention Category
		Trunk Ø (cm)	Life Expectancy		N	E	S	W	Radius Area		Type of Defect			
1.2	Larch		Old Mature						5.6 m					C2
		47 @ 1.5						100 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
1.21	Sycamore		Early mature						5.0 m					B2
		42 @ 1.5						80 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
1.22	Scots Pine		Old Mature						5.4 m					B2
		45 @ 1.5						92 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
1.23	Scots Pine		Old Mature						9.6 m					B2
		80 @ 1.5						290 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
1.24	Scots Pine		Old Mature						8.0 m					B2
		67 @ 1.5						203 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
1.25	Scots Pine		Old Mature						6.4 m					B2
		53 @ 1.5						127 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														

Plot 7

Id No.	Species	Height (m)	Age Class	Health	Crown Radius (m)				RPA Radius Area	Defects				BS 5837 Retention Category								
		Trunk Ø (cm)	Life Expectancy		N	E	S	W	Location of Defect	Type of Defect	Description of Defect	Severity										
1.26	Larch		Mature					4.6 m						C2								
		38 @ 1.5						65 m²														
Clear Stem (m):		Height to Lowest Part of Crown (m):																				
Notes:																						
1.27	Scots Pine		Old Mature					6.7 m						B2								
		56 @ 1.5						142 m²														
Clear Stem (m):		Height to Lowest Part of Crown (m):																				
Notes:																						
1.28	Red Oak TBC		Mature											U								
Clear Stem (m):		Height to Lowest Part of Crown (m):																				
Notes:																						
2.09	Scots Pine		Old Mature		#3	#3	#3	#3	5.3 m					B2								
		44 @ 1.5							88 m²													
Clear Stem (m):		Height to Lowest Part of Crown (m):																				
Notes:																						
2.1	Scots Pine		Old Mature		#1	#3	#2		6.1 m					B2								
		51 @ 1.5						#4	118 m²													
Clear Stem (m):		Height to Lowest Part of Crown (m):																				
Notes:																						
										<table><tr><th>Recommended Tree Work</th><th>Details</th><th>Work Priority</th><th>Category</th></tr><tr><td>• Fell</td><td></td><td>If permission is granted</td><td></td></tr></table>					Recommended Tree Work	Details	Work Priority	Category	• Fell		If permission is granted	
Recommended Tree Work	Details	Work Priority	Category																			
• Fell		If permission is granted																				
2.11	Scots Pine		Old Mature		#3	#2	#2	#2	5.8 m					B2								
		48 @ 1.5							104 m²													
Clear Stem (m):		Height to Lowest Part of Crown (m):																				
Notes:																						
										<table><tr><th>Recommended Tree Work</th><th>Details</th><th>Work Priority</th><th>Category</th></tr><tr><td>• Fell</td><td></td><td>If permission is granted</td><td></td></tr></table>					Recommended Tree Work	Details	Work Priority	Category	• Fell		If permission is granted	
Recommended Tree Work	Details	Work Priority	Category																			
• Fell		If permission is granted																				

Plot 7

Id No.	Species	Height (m)	Age Class	Health	Crown Radius (m)				RPA	Defects				BS 5837 Retention Category
		Trunk Ø (cm)	Life Expectancy		N	E	S	W	Radius	Location of Defect	Type of Defect	Description of Defect	Severity	
2.12	Scots Pine		Old Mature						6.0 m	• Whole Tree	Leans	to NE	Moderate	B2
		50 @ 1.5						113 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
2.13	Scots Pine		Old Mature		0	0	3	0	5.5 m					B2
		46 @ 1.5						96 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
2.14	Scots Pine		Old Mature						7.1 m	• Structural branches	Dead	NE	Moderate	B2
		59 @ 1.5						157 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
2.15	Scots Pine		Old Mature						4.6 m					B2
		38 @ 1.5						65 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														
2.16	Scots Pine		Old Mature						8.5 m					B2
		71 @ 1.5						228 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														

Plot 7

Id No.	Species	Height (m)	Age Class	Health	Crown Radius (m)				RPA Radius Area	Defects				BS 5837 Retention Category
		Trunk Ø (cm)	Life Expectancy		N	E	S	W	Location of Defect	Type of Defect	Description of Defect	Severity		
2.17	Scots Pine		Old Mature						6.5 m					B2
		54 @ 1.5						132 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):								Recommended Tree Work		Details	Work Priority	Category
Notes:										• Fell			If permission is granted	
2.18	Scots Pine		Old Mature		#7	#4	#4	#4	7.0 m					B2
		58 @ 1.5						152 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):								Recommended Tree Work		Details	Work Priority	Category
Notes:										• Fell			If permission is granted	
4.01	Scots Pine	15-20	Old Mature		#5	#5	#5	#5	6.8 m					B2
		57 @ 1.5						147 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):								Recommended Tree Work		Details	Work Priority	Category
Notes:										• Fell			If permission is granted	
4.02	Birch		Young mature		3	3	3	3	2.6 m					C2
		22 @ 1.5						22 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):								Recommended Tree Work		Details	Work Priority	Category
Notes:										• Fell			If permission is granted	
4.03	Birch		Young mature		2	1	1	1	2.0 m					C2
		17 @ 1.5						13 m²						
Clear Stem (m):		Height to Lowest Part of Crown (m):								Recommended Tree Work		Details	Work Priority	Category
Notes:										• Fell			If permission is granted	

Plot 7

Id No.	Species	Height (m)	Age Class	Health	Crown Radius (m)				RPA	Defects				BS 5837 Retention Category
		Trunk Ø (cm)	Life Expectancy		N	E	S	W	Radius Area	Location of Defect	Type of Defect	Description of Defect	Severity	
4.04	Lime (TBC)		Young mature					4.2 m						C2
		25 @ 1.5						57 m²						
		25 @ 1.5												
Clear Stem (m): Notes:		Height to Lowest Part of Crown (m):												
		Recommended Tree Work Details Work Priority Category Fell If permission is granted												
4.21	Birch		Young mature					3.1 m						C2
		26 @ 1.5						31 m²						
		#												
Clear Stem (m): Notes:		Height to Lowest Part of Crown (m):												
		Recommended Tree Work Details Work Priority Category Fell If permission is granted												

4.21	Birch		Young mature						3.1 m					C2							
		26 @ 1.5							31 m ²												
		#																			
Clear Stem (m):		Height to Lowest Part of Crown (m):																			
Notes:																					
										Recommended Tree Work											
										Details											
										Work Priority											
										Category											
										● Fell											
										If permission is granted											

Plot 8

Id No.	Species	Height (m)	Age Class	Health	Crown Radius (m)				RPA Radius Area	Defects				BS 5837 Retention Category		
		Trunk Ø (cm)	Life Expectancy		N	E	S	W	Location of Defect	Type of Defect	Description of Defect	Severity				
1.19	Scots Pine		Old Mature						5.9 m					B2		
		49 @ 1.5						109 m²								
Clear Stem (m):		Height to Lowest Part of Crown (m):														
Notes:																
2.08	Scots Pine		Old Mature		#3	#3	#3	#3	5.9 m					B2		
		49 @ 1.5						109 m²								
Clear Stem (m):		Height to Lowest Part of Crown (m):														
Notes:																
3.01	Birch		Young mature						3.1 m					C1		
		26 @ 1.5						31 m²								
Clear Stem (m):		Height to Lowest Part of Crown (m):														
Notes:																
										Recommended Tree Work		Details		Work Priority		Category
										● Fell				If permission is granted		

Plot 8

Id No.	Species	Height (m)	Age Class	Health	Crown Radius (m)				RPA Radius Area	Defects				BS 5837 Retention Category
		Trunk Ø (cm)	Life Expectancy		N	E	S	W		Location of Defect	Type of Defect	Description of Defect	Severity	
4.22	Birch		Young mature						3.0 m					C2
		22 @ 1.5												
		12 @ 1.5												
Clear Stem (m):		Height to Lowest Part of Crown (m):												
Notes:														

Appendix 6

Tree Works Schedule

RECOMMENDED TREE WORK

Plot 7

ID No.	Species	Remedial Action	Details	Priority	Category
2.1	Scots Pine	Fell		If permission is granted	
2.11	Scots Pine	Fell		If permission is granted	
2.12	Scots Pine	Fell		If permission is granted	
2.14	Scots Pine	Fell		If permission is granted	
2.15	Scots Pine	Fell		If permission is granted	
2.16	Scots Pine	Fell		If permission is granted	
2.17	Scots Pine	Fell		If permission is granted	
2.18	Scots Pine	Fell		If permission is granted	
4.01	Scots Pine	Fell		If permission is granted	
4.02	Birch	Fell		If permission is granted	
4.03	Birch	Fell		If permission is granted	
4.04	Lime (TBC)	Fell		If permission is granted	
4.21	Birch	Fell		If permission is granted	

Plot 8

ID No.	Species	Remedial Action	Details	Priority	Category
3.01	Birch	Fell		If permission is granted	

RECOMMENDED TREE WORK

Plot 8

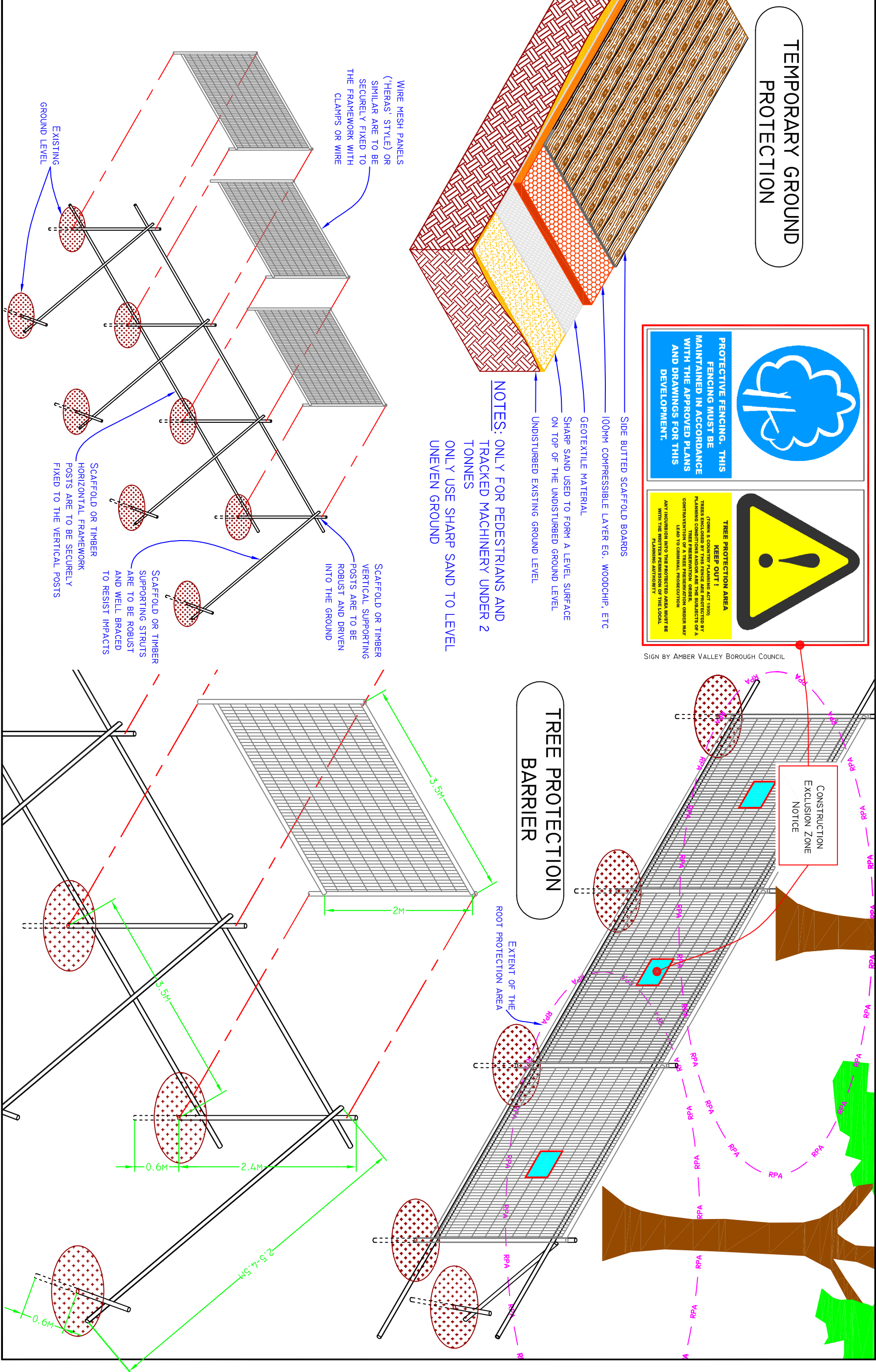
ID No.	Species	Remedial Action	Details	Priority	Category
4.22	Birch	Fell	Both stems.	If permission is granted	

Plot 9

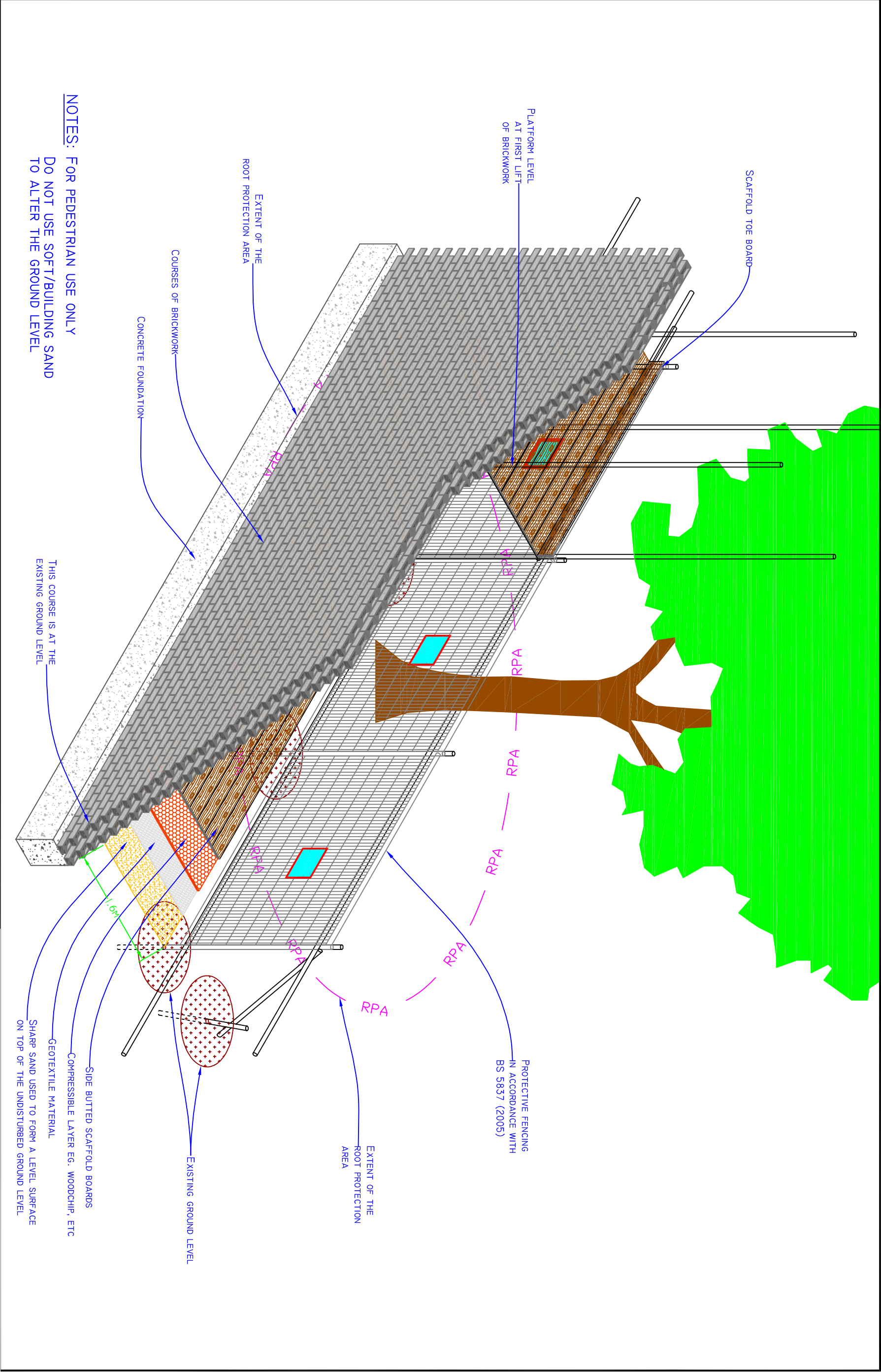
ID No.	Species	Remedial Action	Details	Priority	Category
4.23	Birch	Fell		If permission is granted	
4.24	Birch	Fell		If permission is granted	

Appendix 7

British Standard: BS 5837 *Trees In Relation To Design, Demolition and Construction – Recommendations* (2012): a: Tree Protection Barrier



British Standard: BS 5837 *Trees In Relation To Construction* (2005): Scaffolding Construction Area



Appendix 8

Draft Planting Schemes and Post Planting Maintenance.

Planting Scheme A – Tree and shrub planting, mulched.

Qty	Species	Common Name	Preferred Variety	Form	Pot size TBC	Planting pattern and density	Support	Notes
1	Sorbus aucuparia	Rowan or Mountain ash	'Edulis'	Standard	35-45 Ltr	Random at 6m - 12m centres	3 x stakes with rubber ties and spacers per tree	Hardy, heavier fruiting than type, and with larger leaves.
10	Cornus alba	Dogwood	'Aurea'	Shrub	3 Ltr	Random at 0.75-1.5m centres.		Young bark red in winter plus leaves suffused with soft yellow

Planting Scheme B – Shrub planting, mulched.

Qty	Species	Common Name	Preferred Variety	Form	Pot size TBC	Planting pattern and density	Support	Notes
10	Cornus alba	Dogwood	'Aurea'	Shrub	3 Ltr	Random at 0.75-1.5m centres.		Young bark red in winter plus leaves suffused with soft yellow

Planting Scheme C – Tree and shrub planting, mulched.

Qty	Species	Common Name	Preferred Variety	Form	Pot size TBC	Planting pattern and density	Support	Notes
2	Pinus sylvestris	Scots Pine		Standard / Character	35-45 Ltr	Spaced at 4m - 5m centres	3 x stakes with rubber ties and spacers per tree	Landscape "framework trees"
5	Ilex x altaclerensis	Variegated Holly	Golden King	Shrub	3 Ltr	Random at 0.75-1.5m centres.		Tolerant and slow growing. Variegated foliage and berries.

Planting Scheme D – Hedge planting, mulched.

Qty	Species	Common Name	Preferred Variety	Form	Pot size TBC	Planting pattern and density	Support	Notes
80	Mix of: Acer campestre, Crataegus monogyna, Viburnum opulus, Ilex aquifolium and Corylus avellana	Field maple, hawthorn, guelder rose, holly and hazel.	Native seed sources	Pot or CG	P9 or CG	blocky mix of 4-8 plants in random groups planted in a staggered double row at 40 cm between rows and 50cm between plants	Cane and spiral guard.	A hedgerow of native species.

Planting Scheme E – Tree planting, mulched.

Qty	Species	Common Name	Preferred Variety	Form	Pot size TBC	Planting pattern and density	Support	Notes
1	Amelanchier arborea	Seviceberry or Snowy Mespilus	'Robin Hill'	Standard	< 35 Ltr	Single tree	3 x stakes with rubber ties and spacers per tree	Small tree with abundant spring flowers and red autumn foliage.

Maintenance Years 1-5

Qty	Scheme	Item	Notes
Item	A - E	Maintenance of planted trees and shrubs including watering as necessary and adjustment of supports as required.	Subject to weather watering is likely to be most beneficial during the early part to middle of the growing season. Support adjustment is necessary during years 1-3 on a routine (annual) basis or at any time if the ties appear likely to become tight around the stem. If too loose the ties can allow excessive movement and/or bark abrasion.
Item	A - E	Replacement/beat up of any failures among planted trees and shrubs as necessary	To same or very similar specification as original planting - (Provisional) Year 3.
Item	A - E	(Provisional) Removal of supports from standard trees.	Subject to satisfactory establishment - (Provisional) Year 5. Once root development is sufficient to provide root stability then some flexing of the stem will encourage its radial growth.

Treescapes Consultancy Ltd.

Melbourne
17 Millans Park
Ambleside
Cumbria
LA22 9AG

Website: www.treescapesconsultancy.co.uk

Luke Steer –
Eddie Cruickshank –