

WEST CUMBERLAND HOSPITAL WHITEHAVEN

Pre-development Arboricultural Report

Prepared for:
SAP Ecology Ltd

On:
03 June 2021

By:
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Treescapesc Consultancy Ltd.

Reference No. AH/AIA/050521

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1 INTRODUCTION

1.1 Instruction

SAP Ecology Ltd instructed Treescapes Consultancy Ltd to inspect the significant trees that construction of the proposed development may affect at West Cumberland Hospital, Homewood Road, Hensingham, Whitehaven, CA28 8JG. The instruction includes providing a pre-development report on the arboricultural impacts of the development proposals.

We have compiled our 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 when suggesting solutions to implement the proposals.

1.2 Qualifications and Experience

We have based our report on our site observations and information provided and reached our conclusions in light of our experience. We have experience and qualifications in arboriculture and list the details in Appendix 1.

1.3 Documents and Information

SAP Ecology Ltd provided us with a plan of the proposed site layout (Ref. No. CHPH2-ITR-00-XX-DR-L-0001 P02). We have not checked the accuracy of these plans.

1.4 Development Proposal

Plan 1 shows the existing site layout and Plan 2 shows the proposed site layout

1.5 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

We visited the site and inspected the trees on 05 May 2021. All our observations were from ground level without detailed investigations, and we estimated all dimensions unless otherwise indicated.

The weather during our survey was clear, dry, and still, with good visibility.

2.2 Tree Identification and Location

Plan 1, Plan 2 and Plan 3 show the locations of the significant trees on the site.

We used a Laser Rangefinder to plot the locations of the trees. As we are not qualified land surveyors, we cannot guarantee their positioning accuracy.

The plans included in this report are for illustrative purposes only and should not be used for directly scaling measurements: all measurements should be checked on site. The relevant information about the trees is contained within this report and other documents submitted with the planning application.

2.3 Tree Observations

We visually inspected the significant trees and recorded information on their species, dimensions and condition, as well as any initial management recommendations. Appendix 5 contains a schedule of the trees and groups.

Cohesive groups of trees, which have similar attributes both aerodynamically and visually, often have greater value as a group rather than individuals. Consequently, we have recorded data for these trees as a distinct group in the schedule at Appendix 5.

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 (LPAs), '*in the interests of amenity*,' to protect trees, when granting planning permission, either by the imposition of conditions or serving Tree Preservation Orders (TPOs).

The National Planning Policy Framework (NPPF) mentions trees and should be taken into account.

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

175. When determining planning applications, local planning authorities should apply the following principles:

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists;

Annex 2: Glossary

Ancient or veteran tree: A tree which, because of its age, size and condition, is of exceptional biodiversity, cultural or heritage value. All ancient trees are veteran trees. Not all veteran trees are old enough to be ancient but are old relative to other trees of the same species. Very few trees of any species reach the ancient life-stage.

Ancient woodland: *An area that has been wooded continuously since at least 1600 AD. It includes ancient semi-natural woodland and plantations on ancient woodland sites (PAWS).*

Irreplaceable habitat: *Habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. They include ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.*

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

The British Standard: *Trees in relation to design, demolition and construction – Recommendations* (BS 5837, 2012) contains guidance on how to assess trees in or close to proposed development and information to include in pre-development arboricultural reports submitted with planning applications. Appendices 2 and 3 contain relevant extracts from BS 5837 (2012).

3.3 Copeland Local Plan: Policy ENV5 – Protecting and Enhancing the Borough's Landscapes

'The Borough's landscapes will be protected and enhanced by:

A Protecting all landscapes from inappropriate change by ensuring that development does not threaten or detract from the distinctive characteristics of that particular area.

B Where the benefits of the development outweigh the potential harm, ensuring that the impact of the development on the landscape is minimised through adequate mitigation, preferably on-site.

C Supporting proposals which enhance the value of the Borough's landscape.'

4 TREE CONSTRAINTS

4.1 Tree Retention Category – BS 5837 (2012)

Using the guidance given in Table 1 of BS 5837 (2012), we have assessed the quality of the trees retention category 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 Plan 1, Plan 2 and Plan 3:

- Red:** Retention Category U – A tree in such a condition that it cannot realistically be retained as a living tree in the context of the current land use for longer than 10 years unless it is in a little frequented area and it is desired to retain it for wildlife.
- 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.

BS 5837 (2012) states in Table 1 that trees with trunk diameters less than 150mm should be allocated to Retention Category C. Section 4.5.10 states:

‘Particular care is needed when evaluating young trees, especially where they occur as individual specimens. Where these are less than 150 mm stem diameter at 1.5m above adjacent ground level, it might be acceptable and relatively straightforward to mitigate their loss, if necessary, with similar new tree planting. Alternatively, it might be practicable to relocate such trees within the site (e.g. using a tree spade). Whilst the presence of young trees of good form and vitality is generally desirable (i.e. those trees which have the potential to develop into quality mature specimens), they need not necessarily be a significant constraint on the site’s potential.’

‘NOTE It is sometimes possible to relocate mature trees. However, as this is a costly and complex operation with a variable chance of success, it is a viable option only in exceptional cases.’

We classified the nine trees affected by the proposed development as four groups. We assessed the nine trees as:

- 0 as Category A;
- 0 as Category B;
- 9 as Category C; and
- 0 as Category U

The trees and groups assessed as categories A and B are of moderate to high quality and therefore should be considered a constraint to development. The low and poor quality trees and groups in categories C and U should present less constraint to development.

We consider the trees with trunk diameters less than 150mm at 1.5m should not constrain the development of the site.

4.2 Tree Constraints – Above and Below Ground

Plans 1 and 2 show the existing and proposed site layouts, the locations of the trees, their crowns, and Root Protection Areas (RPA) calculated following the guidance contained in BS 5837 (2012). If retained, tree canopies are the vertical constraints to development. Pruning trees can sometimes provide adequate clearance to implement development proposals but should be carried out in accordance with the guidance contained in the British Standard: *Tree work – Recommendations* (BS 3998, 2010).

The RPA of a tree is described to be the minimum area of soil required by its roots to maintain healthy growth and should be considered a constraint to development if retained.

5 ARBORICULTURAL IMPACT ASSESSMENT

5.1 Above Ground – Tree Trunk and Crown Structure

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

No trees are growing within the footprint of the proposed development layout.

No tree crowns overhang the proposed development layout.

5.2 Below Ground – The Roots and Soil

Plan 2 also shows the root protection areas (RPAs) and their proximity to the proposed layout.

The proposed development layout does not encroach into the realistic RPAs for the trees.

Constructing the development without due regard to the RPAs of the retained trees could have a detrimental effect on their health and longevity.

5.3 Site 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 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.

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 damage its trunk and/or branches. This could potentially create a safety hazard and reduce its life expectancy.

5.6 Storage of Materials and Equipment

Storing equipment and materials close to trees increases the likelihood of physical damage to trunks and branches. Fuel spillages and cement-mixer washings are detrimental to the soil and root systems. Storage of materials and plant equipment should be on existing hard-standing areas, ideally outside the RPAs. If there is no alternative, adequately protect any nearby trees and protect the soil to minimise any harmful impacts.

5.7 Activity under Trees

Activity under tree crowns, such as mixing cement, storing equipment, plant and materials, or lighting fires, may damage tree branches or stems, or could compact or pollute the soil.

5.8 Ash Dieback Disease

There are a number of ash trees growing around the site. Within the last few years a disease of ash trees has been identified in the UK (www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/ash-dieback-hymenoscyphus-fraxineus/ accessed 03/06/2021). This disease is caused by a fungus which initially kills twigs followed by branches and eventually, in some situations, can kill the tree. It appears that some ash trees have a level of resistance to the disease or may be immune.

Trees infected by ash dieback disease often become host to other organisms including wood decay fungi which can increase the risk of branch or basal failure.

6 RECOMMENDATIONS

6.1 General Precautions

The following general precautions should ensure the health and longevity of the trees. We suggest enforcing these general precautions within the RPAs during the construction phase and in locations where new trees will be established:

- No soil disturbance, including compaction
- No change in the soil level, by stripping or filling
- No excavation, without prior discussion with the Arboricultural Consultant and/or the Local Planning Authority
- No redirection of surface water runoff into or out of the RPA
- No temporary buildings, sheds, or offices, without prior discussion with the Arboricultural Consultant and/or the Local Planning Authority
- No storage of materials or fuel
- No dumping of materials, whether into a skip or onto the ground
- No fires within 10m of the RPA or tree canopy, whichever is greater
- No vehicles, including parking
- No operation of plant equipment, without prior discussion with the Arboricultural Consultant and/or the Local Planning Authority
- No refuelling of mechanical equipment
- No storage or mixing of cement
- No washing of cement mixers within or uphill of the RPA
- Follow the guidance contained within the Street Works UK Volume 4 (Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2, 2007); www.streetworks.org.uk (accessed 03/06/21)) when installing underground services within the RPA of a tree.

If necessary, we can provide a site monitoring role to ensure adequate tree protection measures are employed at critical stages of the construction process and in accordance with BS 5837 (2012).

6.2 Tree Work – Construction Recommendations

No trees require removal as part of this development.

Some pruning work might be required if conflicting branches become evident as the construction work progresses.

6.3 Tree Work – Safety Recommendations

We recommend removing tree No.3 in group 2G as it is dying from Ash Dieback disease.

6.4 Tree Work Standards

We recommend using a suitably qualified, competent, experienced, and insured contractor to carry out the tree work. The contractor should carry out their work in

accordance with current industry safety standards and the recommendations contained in the British Standard – BS 3998, *Tree work – Recommendations* (2010) – as modified by research that is more recent.

Where necessary, we can organise prospective contractors to submit tenders for the proposed tree work. We can also provide a supervisory role to ensure the works comply with current safety standards and BS 3998 (2010) and current best practice.

6.5 Design and Construction Considerations

The construction process and site operations can adversely affect trees in many ways. Consequently, all members of the design team will need to be aware of the tree protection requirements and make provision for them throughout the development process. To avoid unnecessary damage to the retained trees during the construction process, we recommend involving the project arboriculturist during the architectural, engineering and landscape design processes.

Where necessary, we can provide feedback at each stage of the architectural, engineering and landscape design processes. We can also provide a site supervisory role to ensure the retained trees have adequate protection during the construction process.

6.6 Root Protection Area – Tree Protection Barriers

Erect protective fencing along the line of the construction exclusion zone (CEZ) shown in Plan 3. This will prevent construction activity that could cause damage close to the retained trees. No plant equipment or vehicles should operate within the protective fencing without suitable ground protection and authorisation.

The fencing must be robust enough to withstand impacts from machinery and plant equipment operating in the area. In areas where lighter plant and machinery (typically <2t) are operating, I recommend using either:

- 2 m tall welded mesh panels on rubber or concrete feet joined together using a least two anti-tamper couplers, installed so that they can only be removed from inside the fence. Support the panels on the inner side with stabilizer struts, secured with ground pins. Where the fencing is erected on hard surfacing or it is otherwise unfeasible to use ground pins, mount the stabilizer struts onto a block tray;
- wooden posts (Ø75-100mm x 1.8m) driven securely into the ground (300-500mm) every 2m, with top and bottom wooden rails (2m x 25mm x 100mm) attached securely to the posts to create a rigid structure and chestnut paling fencing (1.25-1.5m high) attached securely to the rails every 300-400mm; or, if ground conditions dictate,
- metal road-pins (1.2m) securely driven into the ground (200-300mm) at 2m centres, supporting orange mesh barrier fencing (1m high) securely attached to the pins using strong cable ties (4.8mm x 300mm).

In areas where large machinery and construction traffic (typically >2t) will operate, we advise using the fencing detailed in Appendix 7, the default specification recommended in BS 5837 (2012).

The protective fencing should be erected prior to any other development activity taking place and remain in place for the duration of the construction phase.

We recommend suitable members of the project team, including the main contractor, engineer 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.

6.7 Tree Management – Future Inspections

Due to the size of a number of the trees, their condition and locations close to buildings, roads and footpaths, and car parks, we recommend a suitably qualified, experienced and insured arboricultural consultant inspect them every two to three years and after tree altering weather events, such as drought or windstorms.

7 LEGAL CONSIDERATIONS

7.1 Protected Trees

We have not made enquiries with the Local Planning Authority (LPA) to find out whether any of the trees discussed in this report are legally protected.

If these trees are protected by a Tree Preservation Order (TPO), located in a conservation area or protected by planning conditions, it will be necessary to obtain permission from the LPA before any work, other than certain exempted operations, can be carried out to them. The work specified in this report is necessary for their reasonable management and should be acceptable to the LPA but tree owners should appreciate that they may take an alternative point of view and have the option to refuse to grant consent.

We understand that full planning consent allows the minimum amount of work to protected trees necessary to implement the consented development without requiring permission under tree protection legislation – this should be checked with a solicitor or planning consultant.

7.2 Wildlife Conservation Legislation

Most birds' nests have legal protection 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 English Nature.

The Bat Conservation Trust produce a useful webpage for managing trees and bats: www.bats.org.uk/our-work/landscapes-for-bats/bats-and-woodland/woodland-wildlife-toolkit (viewed 03/06/21). This links to a Government webpage (www.gov.uk/guidance/manage-and-protect-woodland-wildlife – viewed 03/06/21), which states:

'You must comply with regulations protecting wildlife species and habitats when you're managing woodland and planning forestry operations. These include the European protected species (EPS) listed in the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981.

It's an offence to:

deliberately capture, injure, kill or cause significant disturbance to a protected species

deliberately destroy the eggs of a protected species

damage or destroy protected species' breeding sites or resting places (such as a bat roost in a tree or a dormouse nest on the woodland floor)

You must carry out planned operations carefully, making the necessary checks, and you may need a wildlife licence in certain circumstances. If you follow good practice you should be able to carry out most activities without the need for a licence – but to do so you may just have to modify or reschedule some of your management proposals or practices.'

8 CONCLUSIONS

Based on the information discussed in this report, and provided all the technical recommendations it contains are followed, I consider the proposed development can be implemented in accordance with the guidance contained in BS 5837 (2012) with minimal impact on important trees to be retained.

We recommend involving the project arboriculturist during the architectural, engineering and landscape design processes to avoid unnecessary damage to the retained trees during the construction process.

We recommend removing tree No.3 in group 2G due to declining health, irrespective of whether the development proposals proceed.

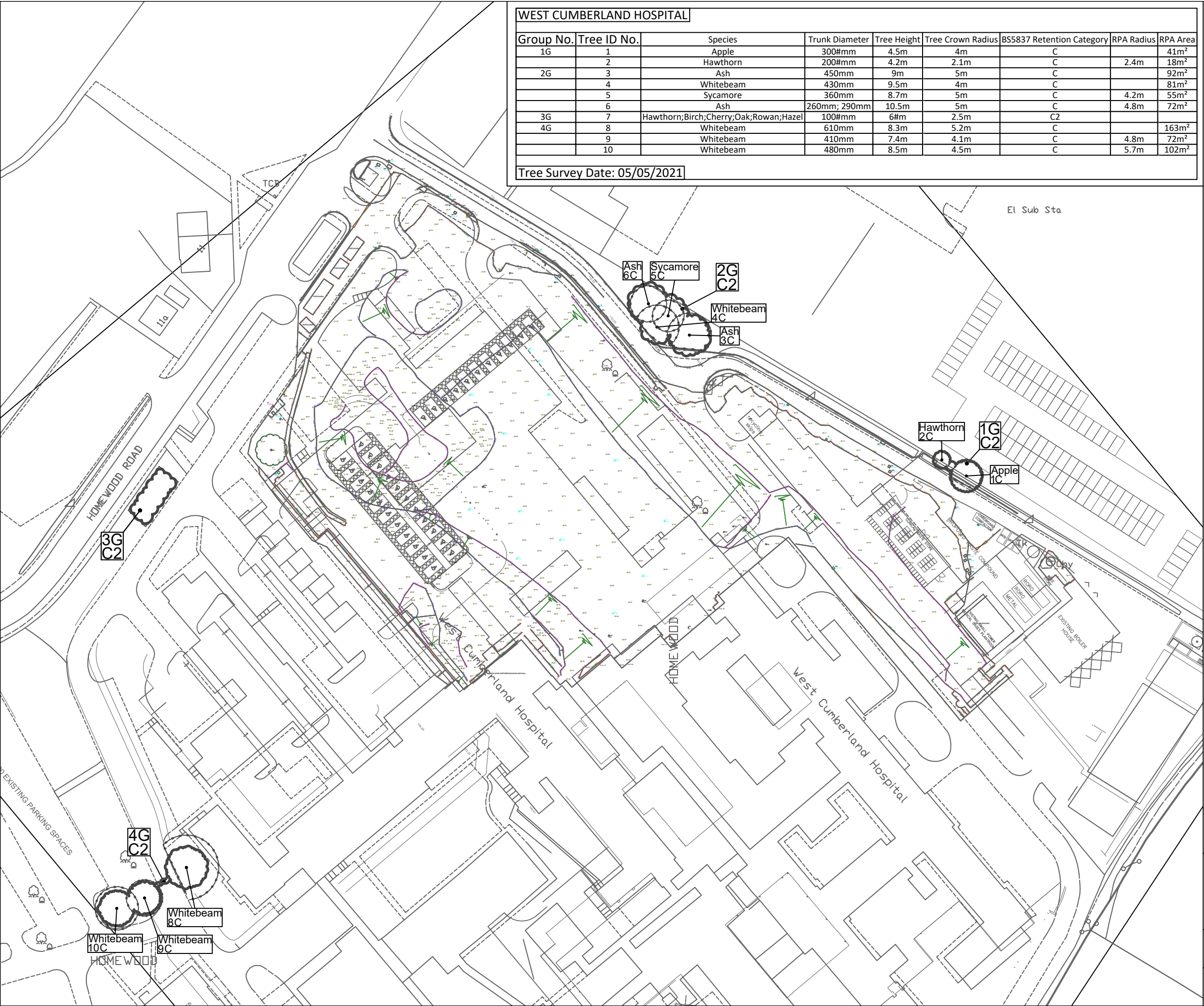
Alistair Hearn HND(Urb.For.), Cert.Arb.(RFS), M.Arbor.A.

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. Tree work - Recommendations



WEST CUMBERLAND HOSPITAL

Group No.	Tree ID No.	Species	Trunk Diameter	Tree Height	Tree Crown Radius	BS5837 Retention Category	RPA Radius	RPA Area
1G	1	Apple	300#mm	4.5m	4m	C		41m ²
	2	Hawthorn	200#mm	4.2m	2.1m	C	2.4m	18m ²
2G	3	Ash	450mm	9m	5m	C		92m ²
	4	Whitebeam	430mm	9.5m	4m	C		81m ²
	5	Sycamore	360mm	8.7m	5m	C	4.2m	55m ²
	6	Ash	260mm; 290mm	10.5m	5m	C	4.8m	72m ²
3G	7	Hawthorn; Birch; Cherry; Oak; Rowan; Hazel	100#mm	6#m	2.5m	C2		
4G	8	Whitebeam	610mm	8.3m	5.2m	C		163m ²
	9	Whitebeam	410mm	7.4m	4.1m	C	4.8m	72m ²
	10	Whitebeam	480mm	8.5m	4.5m	C	5.7m	102m ²

Tree Survey Date: 05/05/2021

1G
C2

Legend
1C

Tree groups - showing the approximate canopy spread and labelled with the Feature number and group BS 5837 retention category.

Individual trees - showing the trunk location and labelled with the species, ID number and the BS 5837 retention category.

BS 5837 RETENTION CATEGORIES

High Quality Trees

Green = Category A

Blue = Category B

Low Quality Trees

Grey = Category C

Red = Category U

Root protection area (RPA) line calculated in accordance with Section 4.6.1 of BS 5837 (2012).

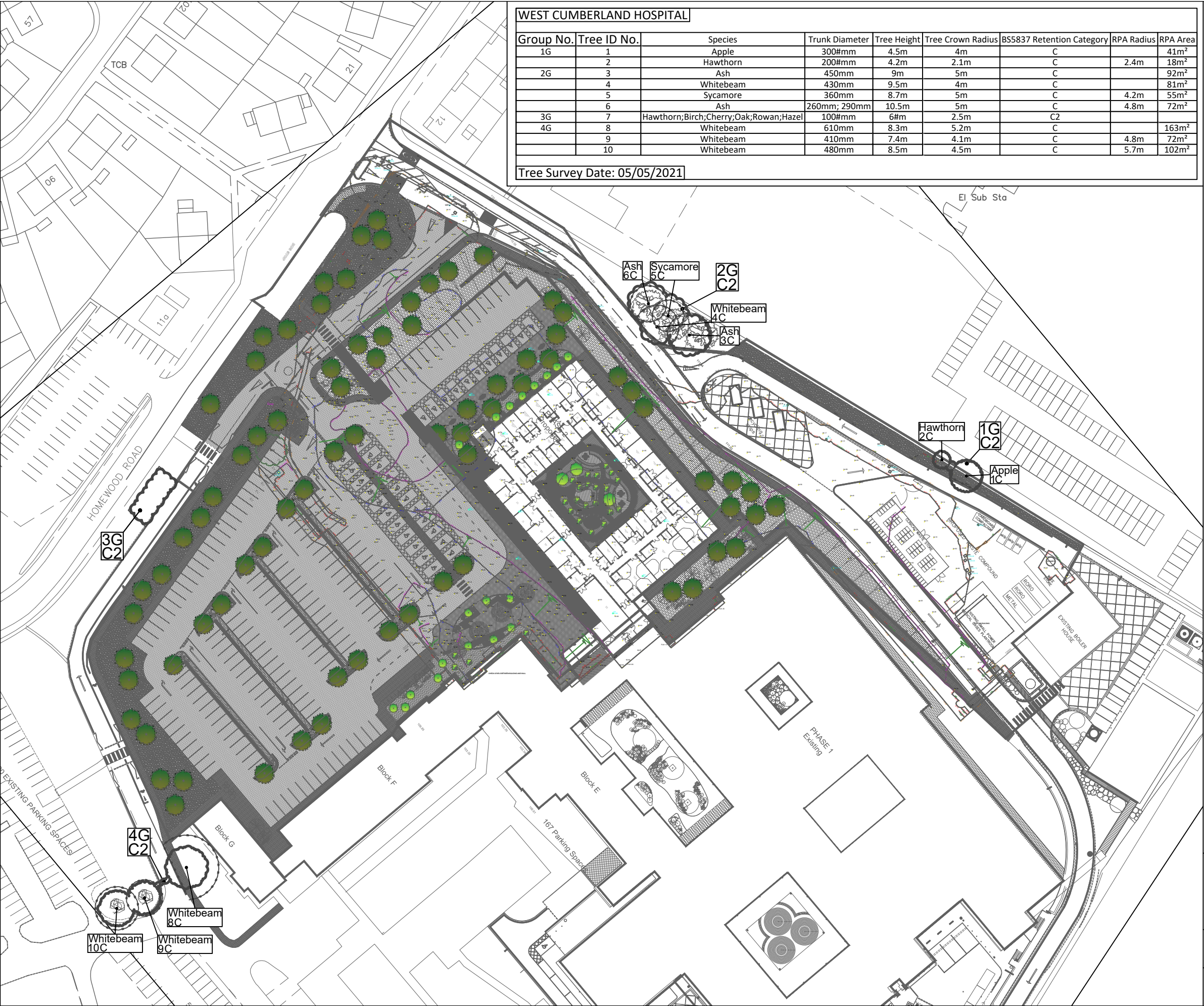
SCALE: 1:1000 @ A3

NOTES:

This is a colour drawing. Black and white reproductions might be difficult to interpret

Treescapesc Consultancy Ltd plotted the location of the trees using a laser rangefinder and the adjacent buildings as a datum. We are not qualified land surveyors so cannot guarantee the positioning accuracy. Check all dimensions on site.

PLAN 1	Tree constraints plan showing the existing site layout			
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Group No.	Tree ID No.	Species	Trunk Diameter	Tree Height	Tree Crown Radius	BS5837 Retention Category	RPA Radius	RPA Area
1G	1	Apple	300#mm	4.5m	4m	C		41m ²
	2	Hawthorn	200#mm	4.2m	2.1m	C	2.4m	18m ²
2G	3	Ash	450mm	9m	5m	C		92m ²
	4	Whitebeam	430mm	9.5m	4m	C		81m ²
	5	Sycamore	360mm	8.7m	5m	C	4.2m	55m ²
3G	6	Ash	260mm; 290mm	10.5m	5m	C	4.8m	72m ²
	7	Hawthorn; Birch; Cherry; Oak; Rowan; Hazel	100#mm	6#m	2.5m	C2		
4G	8	Whitebeam	610mm	8.3m	5.2m	C		163m ²
	9	Whitebeam	410mm	7.4m	4.1m	C	4.8m	72m ²
	10	Whitebeam	480mm	8.5m	4.5m	C	5.7m	102m ²

Tree Survey Date: 05/05/2021

1G
C2

Legend
1C

Tree groups - showing the approximate canopy spread and labelled with the Feature number and group BS 5837 retention category.

Individual trees - showing the trunk location and labelled with the species, ID number and the BS 5837 retention category.

BS 5837 RETENTION CATEGORIES

High Quality Trees

Green = Category A

Blue = Category B

Low Quality Trees

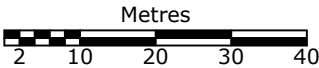
Grey = Category C

Red = Category U

Root protection area (RPA) line calculated in accordance with Section 4.6.1 of BS 5837 (2012).



SCALE: 1:1000 @ A3



NOTES:

This is a colour drawing. Black and white reproductions might be difficult to interpret

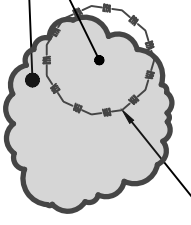
Treescaples Consultancy Ltd plotted the location of the trees using a laser rangefinder and the adjacent buildings as a datum. We are not qualified land surveyors so cannot guarantee the positioning accuracy. Check all dimensions on site.

PLAN 2		Tree constraints plan showing the proposed site layout		
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1G
C2

Legend
1C



Tree groups - showing the approximate canopy spread and labelled with the Feature number and group BS 5837 retention category.

Individual trees - showing the trunk location and labelled with the species, ID number and the BS 5837 retention category.

BS 5837 RETENTION CATEGORIES

High Quality Trees

Green = Category A

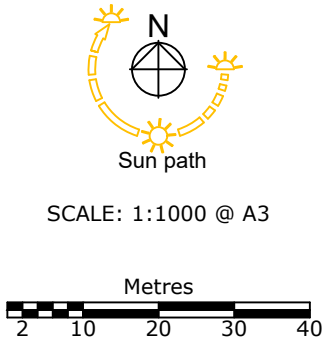
Blue = Category B

Low Quality Trees

Grey = Category C

Red = Category U

Root protection area (RPA) line calculated in accordance with Section 4.6.1 of BS 5837 (2012).



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Treescaples Consultancy Ltd plotted the location of the trees using a laser rangefinder and the adjacent buildings as a datum. We are not qualified land surveyors so cannot guarantee the positioning accuracy. Check all dimensions on site.

PLAN 3		Tree protection plan showing the proposed site layout		
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Appendix 1

The Experience and Qualifications of Alistair Hearn

Qualifications

In 2001, the Royal Forestry Society awarded Alistair the Certificate in Arboriculture, from the National School of Forestry at Newton Rigg, Penrith.

In 2004, Alistair passed a Higher National Diploma in Urban Forestry, from the National School of Forestry at Newton Rigg, Penrith.

In 2005, Alistair became a Professional Member of the Arboricultural Association.

Practical Experience

Alistair has been working and studying within the field of arboriculture for over 20 years, first as a tree surgeon and latterly in an advisory capacity. Until July 2004, Alistair worked within the practical field of arboriculture, carrying out tree surgery for local and national clients. Since August 2004, Alistair has been working as an arboricultural consultant with Capita Symonds Ltd. This work involved various large-scale tree condition and safety surveys, along with carrying out detailed tree inspections. More recently, he concentrated on trees in relation to construction and the planning system. This involved providing the relevant tree surveys, implication assessments and protection plans for development applications. Alistair also provided Salford City Council with advice on tree preservation orders, trees in conservation areas and trees in development applications. While acting as an arboricultural consultant he has been involved with a number of commissions covering a variety of different aspects of arboriculture:

- surveying and making safety recommendations for trees on school sites in Cumbria;
- putting tree work out to tender and managing the resulting contracts;
- evaluating tree quality on development sites, assessing the impacts of development proposals on those trees to be retained, making recommendations, advising on protection methods, and outlining mitigation measures; and
- involved with carrying out a 'drive-by' scoping survey of 2500 miles of highway for Lancashire County Council
- Assessing trees affected by development proposals and where necessary making recommendations to minimise damage.
- Compiling arboricultural reports to advise property owners about the risks trees may pose.

Continuing Professional Development

Alistair Hearn attends conferences, seminars and workshops run by forestry and arboricultural organisations, colleges and universities.

Relevant Experience

Alistair Hearn has spent over 25 years working with trees, some of which he considers pose a high level of risk. This has informed his decision making process for judging how much risk the trees pose and the remedial work required to make a tree safe.

Membership of Professional Organisations

In addition to being a Professional Member of the Arboricultural Association, Alistair Hearn is a member of the Royal Forestry Society of England, Wales, and Northern Ireland.

Appendix 2

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

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).

Appendix 3

Table 1 from the British Standard: *Trees In Relation To Design, Demolition and Construction – Recommendations* (BS 5837, 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

Explanatory notes for some of the terms used in Appendix 5

Mathematical abbreviations: > = Greater than; < = Less than.

Compass Bearing: N = north; S = south; E = east; W = west; NE = north-east; NW = north-west; SE = south-east; SW = south-west.

Estimated measurements: The symbol '#' will be used to indicate when measurements have been estimated.

Feature and Tree ID Number: The number used to indicate the tree feature and the approximate position of the trees on the plans. This number is also used in Appendix 5.

Species: The species identification is based on visual observations and the common English name of what the tree appeared to be.

Trunk Diameter: The trunk diameter measured 1.5m above ground level with a diameter tape, recorded in centimetres. If branches are below 1.5m, the trunk diameter will be measured just above ground level. More than one figure indicates the individual has a number of stems. If the measurement is estimated '#' will appear in the column.

Tree Height: The height of the tree measured with a Truepulse laser rangefinder and recorded in metres.

Crown Radius: The distance recorded in metres from the tree trunk to one or some of the cardinal points of the compass.

Age Class: Assessed as either:

- Sapling = a size which could be easily transplanted;
- Semi-mature = prior to seed bearing age and could be transplanted with care;
- Early 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;
- Ancient = exceptionally old for the species, the crown may be retrenching, provides many opportunities for wildlife and is likely to be an important habitat.

Health Class: Classified as either:

- 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 Class: A visual assessment of the tree's current condition and simple evaluation. Described as either: Good, Moderate, or Poor.

BS 5837 Retention Category: The retention category assessed using the guidance in Table 1 of BS 5837, 2012 [see Appendix 3].

- 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

Recommended Work: General description of recommended work.

RPA Radius: The radius of a circular Root Protection Area (RPA) in metres as specified using the guidance contained in BS 5837 (2012).

RPA Area: The area of the Root Protection Area (RPA) in square metres as specified using the guidance contained in BS 5837 (2012).

Appendix 5

Tree Data Schedule

Feature No.	Tree ID No.	Species	Trunk Diameter	Number of Stems	Tree Height	Crown Radius	Age Class	Health Class	Structural Condition Class	BS5837 Retention Category	Recommended Work	RPA Radius	RPA Area
1G	1	Apple	300#mm	1 No. Stems	4.5m	4m	Mature	Moderate Vitality	Good	C	None	Altered	41m ²
	2	Hawthorn	200#mm	1 No. Stems	4.2m	2.1m	Mature	Normal Vitality	Good	C	None	2.4m	18m ²
2G	3	Ash	450mm	1 No. Stems	9m	5m	Mature	Mid-decline	Moderate	C	Fell due to declining health	Altered	92m ²
	6	Ash	260mm; 290mm	2 No. Stems	10.5m	5m	Mature	Early Decline	Moderate	C	None	4.8m	72m ²
	5	Sycamore	360mm	1 No. Stems	8.7m	5m	Mature	Normal Vitality	Good	C	None	4.2m	55m ²
	4	Whitebeam	430mm	1 No. Stems	9.5m	4m	Mature	Normal Vitality	Good	C	None	Altered	81m ²
3G	7	Hawthorn; Birch; Cherry; Oak; Rowan; Hazel	100#mm	1 No. Stems	6#m	2.5m	Early Mature	Normal Vitality	Good	C2	None	0.5m Offset	N/A
4G	8	Whitebeam	610mm	1 No. Stems	8.3m	5.2m	Mature	Normal Vitality	Good	C	None	Altered	163m ²
	9	Whitebeam	410mm	1 No. Stems	7.4m	4.1m	Mature	Normal Vitality	Good	C	None	4.8m	72m ²
	10	Whitebeam	480mm	1 No. Stems	8.5m	4.5m	Mature	Normal Vitality	Good	C	None	5.7m	102m ²

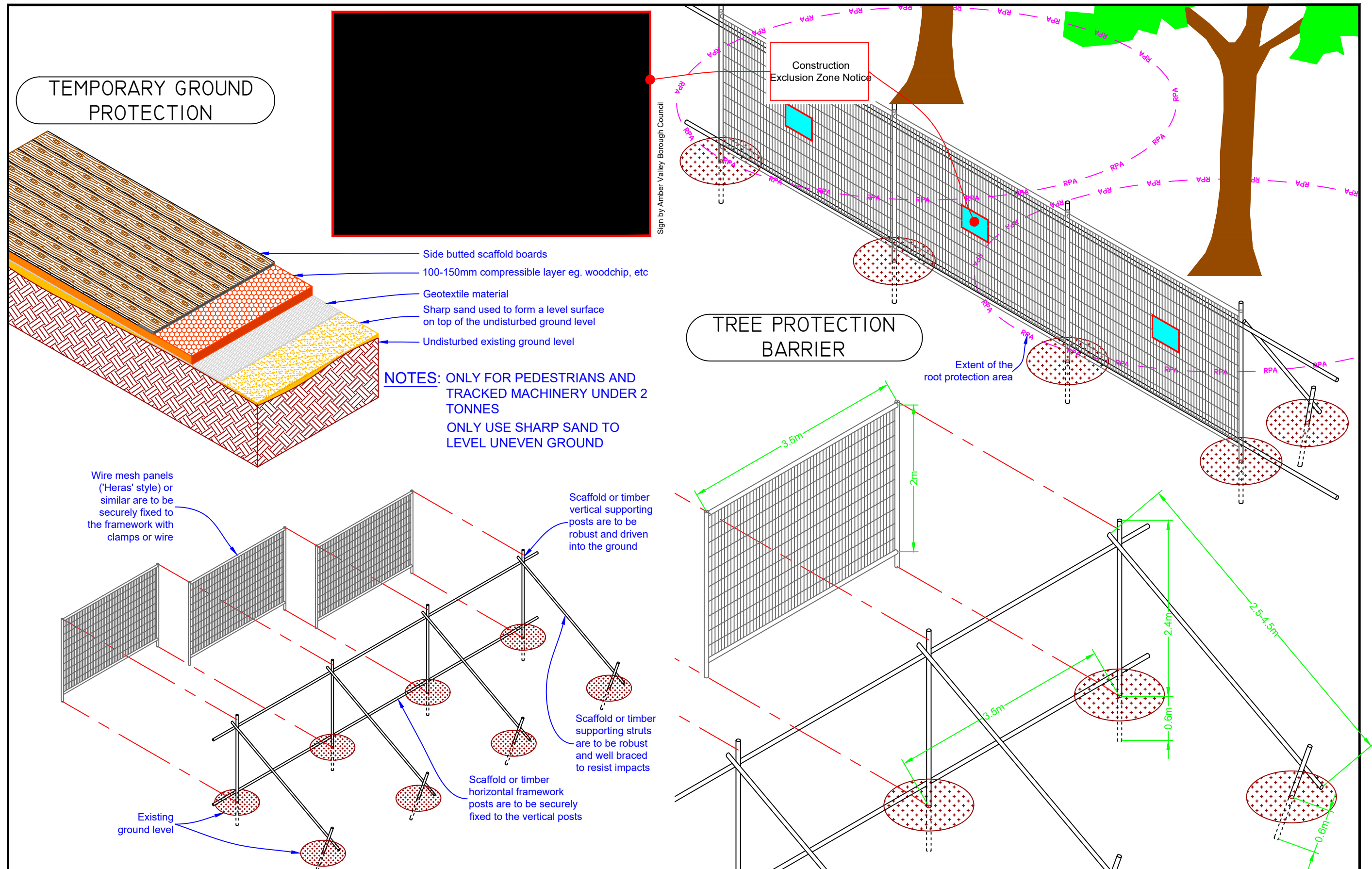
Appendix 6

Tree Work Schedule

Feature No.	Tree ID No.	Species	Trunk Diameter	Tree Height	BS5837 Retention Category	Recommended Work
2G	3	Ash	450mm	9m	C	Fell due to declining health

Appendix 7

British Standard: BS 5837 *Trees in Relation to Design, Demolition and Construction - Recommendations*
(2012): Default Specification for Protection Barrier



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