Pre-development Arboricultural Report

Prepared for:
Electricity North West

On:
29 August 2012

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

Treescapes Consultancy Ltd.

Reference No. AH/ALA/280812
## 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 Report Limitations ............................................................................................ 3

2 SITE VISIT AND OBSERVATIONS ........................................................................... 4
   2.1 Site Visit ............................................................................................................. 4
   2.2 Site Description .................................................................................................. 4
   2.3 Tree Identification and Location ....................................................................... 4
   2.4 Tree Observations ............................................................................................. 4

3 REFERENCES, PLANNING POLICY AND GUIDANCE ................................................. 5
   3.1 National Policy ................................................................................................... 5
   3.3 Blackburn and Darwen Borough Local Plan: Policy HD8 – Existing Trees and Landscaping .................................................................................................... 5
   3.4 Blackburn and Darwen Borough Local Plan: Policy HD9 – New Trees and Landscaping .................................................................................................... 5

4 TREE CONSTRAINTS .................................................................................................. 6
   4.1 Tree Retention Category – BS 5837 (2012) ......................................................... 6
   4.2 Tree Constraints – Above Ground .................................................................... 6
   4.3 Tree Constraints – Below Ground .................................................................... 6

5 ARBORICULTURAL IMPACT ASSESSMENT ................................................................. 7
   5.1 Above Ground – Tree Trunk and Crown Structure ........................................ 7
   5.2 Below Ground – The Roots and Soil ................................................................ 7
   5.3 Implication Table ............................................................................................... 7
   5.4 Site Access ....................................................................................................... 7
   5.5 Storage of Materials and Equipment ............................................................... 7

6 RECOMMENDATIONS ................................................................................................. 9
   6.1 General Precautions ......................................................................................... 9
   6.2 Poor Quality Trees – Trees in Retention Category ‘U’ ....................................... 9
   6.3 Tree Work Recommended for Construction ..................................................... 9
   6.4 Future Tree Management ................................................................................. 10
   6.5 Invasive Plants .................................................................................................. 10
   6.6 Design and Construction Considerations ......................................................... 10
   6.7 Tree Protection Fencing – Construction Exclusion Zone ............................... 10
   6.8 Tree Management – Future Inspections ......................................................... 11

7 LEGAL CONSIDERATIONS ...................................................................................... 12
   7.1 Protected Trees .................................................................................................. 12
   7.2 Wildlife Conservation Legislation .................................................................... 12

8 CONCLUSIONS ......................................................................................................... 13

9 REFERENCES ............................................................................................................. 13
TABLES

Table 1  Table showing the impact of the proposed development on the trees ........................................7
Table 2  Trees and groups recommended for removal to implement the proposals .................................9

PLANS

Plan 1  Tree survey plan showing the existing site layout .................................................................14
Plan 2  Tree survey plan showing the proposed site layout .............................................................15
Plan 3  Tree protection plan showing the proposed site layout ......................................................16

APPENDICES

Appendix 1  Alistair Hearn – Experience and Qualifications .........................................................17
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 ...........................................................................20
Appendix 4  Data Schedule and Remedial Action Explanatory Notes .............................................21
Appendix 5  Tree Data Schedule ....................................................................................................22
Appendix 6  Tree Works Schedule ................................................................................................23
1 INTRODUCTION

1.1 Instruction
Corstorphine and Wright Architects, on behalf of Electricity North West, have instructed me to inspect the significant trees at Whitebirk Depot, Whitebirk Drive, Blackburn, BB1 3HT, and provide a pre-development report on the arboricultural impacts of the development proposals. 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 when suggesting solutions to implement the proposals.

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

1.3 Documents and Provided Information
Corstorphine and Wright Architects provided me with digital copies of the following:

- the topographic survey plan (Ref. No.SSL:14626A:200:1-3:3) for the existing site; and
- the plan of the proposed site layout (Ref. No.12860-005)

1.4 Development Proposal
The proposal is to construct an electricity-infrastructure training centre on a disused part of the commercial property to include site access, parking, training facilities, and overhead power-line apparatus.

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 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 a site visit on 29 August 2012. 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 clear, dry, and still, with good visibility.

2.2 Site Description
Whitebirk Depot is a commercial property about 3km north-west of Blackburn at Ordnance Survey grid reference SD 703 291. The roughly square plot is generally flat, orientated north to south and covers an area of approximately 5.2ha.

The northern boundary borders a railway line and the eastern boundary borders a dual-carriageway – Whitebirk Drive (A6119). The southern and western boundaries adjoin other commercial properties.

The part of the site to be developed is to the west of the main depot and is currently disused ground mainly made up of hard standing area colonised by self-seeded trees and plants.

2.3 Tree Identification and Location
Plans 1, 2 and 3 show the locations of the significant trees on the site. Corstorphine and Wright Architects have based their plans on Ordnance Survey maps of the area and on a topographic survey carried out by Survey Systems Ltd, who plotted the boundaries of the tree canopies and scrub areas.

During my site visit, I roughly measured the canopy spread of the groups listed in my report to give a general idea of their canopy extent. These are the group boundaries shown on the plans, which are only indicative; the precise line may vary on site.

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
I surveyed the trees and groups visually and recorded information on their species, dimensions, and condition, and made recommendations for any remedial actions.

Cohesive groups of trees with similar attributes, both aerodynamically and visually, generally have a greater aesthetic value, so I have recorded the data as one record in the schedule.

Due to the site usage, a large quantity of semi-mature, self-seeded trees now cover large areas. These trees are of little aesthetic merit and, given the ground conditions, have a relatively short life expectancy. Therefore, I have shown them collectively on the plans as scrub trees.

Appendix 5 contains the schedule of the trees and groups.
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). Planning Policy Statements (PPS) also provide guidance on the acceptability of proposed development.

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 Blackburn and Darwen Borough Local Plan:
Policy HD8 – Existing Trees and Landscaping
Development will not be permitted if it would result in the loss of trees, particularly where they have been identified as Ancient Woodland, are protected by a Tree Preservation Order or are in a conservation area unless:

- the removal of one or more trees would be in the interests of good arboricultural practice; or
- the desirability of the proposed development outweighs the amenity and/or nature conservation value of the protected trees.

If the removal of one or more trees is permitted as part of a development, a condition may require that an equivalent number or more new trees are planted either on or near the site.

3.4 Blackburn and Darwen Borough Local Plan:
Policy HD9 – New Trees and Landscaping
New Built Development will not be permitted unless it incorporates appropriate landscaping treatment which complies with the following criteria:

1. It provides a high quality landscaping and boundary treatment;
2. It is an integral part of the development;
3. It incorporates existing landscape and habitat features of value;
4. It includes for the creation and management of wildlife habitats where opportunities exist;
5. It uses locally indigenous plant species wherever possible; and
6. It complements local surroundings and the wider landscape context.
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 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

4.2 Tree Constraints – Above Ground
Plan 1 shows the existing site layout, the locations of the trees and their crowns. If retained, tree crowns 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 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 Above Ground – Tree Trunk and Crown Structure
Plan 2 shows the proposed layout, the locations of the trees and their crowns.

Table 1 below lists the trees and groups growing within the footprint of the proposed development. It also includes those tree crowns overhanging the proposed development and those crowns that the construction process and traffic are likely to affect.

5.2 Below Ground – The Roots and Soil
Plan 2 also shows the root protection areas (RPAs) and their proximity to the proposed layout.

Table 1 below lists those trees and groups growing within the proposed footprint as well as the RPAs affected by the proposed layout.

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 Implication Table
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>
<thead>
<tr>
<th></th>
<th>TREE</th>
<th>RPA</th>
<th>CROWN</th>
<th>CONSTRUCTION</th>
<th>NONE</th>
<th>% Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category U</td>
<td>G4 &amp; Area of scrub trees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
</tr>
<tr>
<td>Category A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0%</td>
</tr>
<tr>
<td>Category B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0%</td>
</tr>
<tr>
<td>Category C</td>
<td>G1</td>
<td></td>
<td></td>
<td>G2 &amp; G3</td>
<td></td>
<td>75%</td>
</tr>
<tr>
<td>% Total</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 1
Table showing the impact of the proposed development on the trees

5.4 Site Access
Vehicles and plant equipment operating or parking on unprotected soil within the tree’s RPAs could compact and/or contaminate the soil. This could have a detrimental effect on the health and longevity of the trees. Vehicle movements under the crowns of retained trees could cause physical damage to trunks and/or branches, possibly creating a safety hazard.

5.5 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.
6 RECOMMENDATIONS

6.1 General Precautions
The following general precautions should ensure the health and longevity of the trees. I suggest enforcing these general precautions within the RPAs during the construction phase and in locations where new trees are to 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 National Joint Utilities Group Volume 4 (Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2, 2007); www.njug.org.uk) 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 Poor Quality Trees – Trees in Retention Category ‘U’
Using the guidance contained in BS 5837 (2012), I assessed group G4 and the areas of small scrub trees to be in retention category U. These trees have poor form, with significant defects, which I expect will last less than ten years. New trees can replace their contribution to the visual character of the area within a few years.

6.3 Tree Work Recommended for Construction
Appendix 6 contains a schedule of the recommended tree work.

6.3.1 Felling
Currently, to implement the proposals I recommend removing the following groups of trees.

<table>
<thead>
<tr>
<th>Groups recommended for removal to implement the proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
</tr>
</tbody>
</table>

Table 2
Trees and groups recommended for removal to implement the proposals
6.3.2 Pruning
Currently, to implement the proposals I do not consider specific pruning requirements necessary. Given the inaccuracies in the canopy spread shown on the plans, some trees in group G2 may require removal or pruning to accommodate the proposed 132KV training power line. Further pruning work might be required if conflicting branches become evident as the construction work progresses.

6.3.3 Implementing the Tree Work
A suitably qualified, competent, experienced, and insured contractor should carry out the recommended tree work. The contractor should carry out their work in accordance with 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 BS 3998 (2010) and current best practice.

6.4 Future Tree Management
The proposed development can integrate the two existing overgrown shelterbelts of trees (G2 & G3) into the scheme. These groups form the western boundary and part of the northern boundary of the site and provide a screen from neighbouring properties. In some places, damaged fencing running through or behind the groups needs repairing.

The groups are currently overcrowded and require management to ensure they continue to provide a screen of adequate density. Currently, some trees in group G2 may require removal or pruning to accommodate the proposed 132KV training power line. In the future, as these trees continue to grow they are likely to require further pruning.

6.5 Invasive Plants
In various parts of the site, Himalayan Balsam (*Impatiens glandulifera*) has colonized the site. This aggressive invasive plant should be controlled to prevent its spread to other areas of the site. Specialist companies offer services to successfully eradicate this plant.

6.6 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, I 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.

6.7 Tree Protection Fencing – Construction Exclusion Zone
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; or
- 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.

In areas where large machinery and construction traffic (typically >2t) will operate, I 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. I recommend employing arboricultural supervision during this operation.

6.8 Tree Management – Future Inspections

Due to the size of a number of the trees and their proximity to the proposed development, I recommend a suitably qualified, experienced, and insured arboriculturist inspect the trees every two to three years and after strong winds.
7 LEGAL CONSIDERATIONS

7.1 Protected Trees
I have not made enquiries with the Local Planning Authority (LPA) to establish if statutory regulations protect any of the trees on this site.

Where a Tree Preservation Order (TPO) protects these trees, or they are located in a conservation area, or protected by planning conditions, it will be necessary to obtain permission from the LPA before carrying out any work, except for certain exemptions.

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

7.2 Wildlife Conservation Legislation
Most bird’s 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 Forestry Commission produce a useful leaflet called: Woodland Management for Bats. This document is available to download from www.forestry.gov.uk/forestry/INFD-6K3CXY (viewed 29/08/12).

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.’
8 CONCLUSIONS

Based on the above discussions, and provided all the technical recommendations in this report are followed, I consider the proposed development can 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.

Involving the project arboriculturist during the architectural, engineering and landscape design processes will minimise unnecessary damage to the retained trees during the construction process.

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

9 REFERENCES


BS 5837:2012, *Trees in relation to design, demolition and construction - Recommendations*

BS 3998:2010, *Trees work - Recommendations*
Realistic root protection area (RPA) in accordance with Section 4.6.3 of BS 5837 (2012).

Approximate group canopy boundary, ID number and BS 5837 (2012) retention category.

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

NOTE: This is a colour drawing; monochrome reproductions might be difficult to interpret.
Realistic root protection area (RPA) in accordance with Section 4.6.3 of BS 5837 (2012)

Approximate group canopy boundary, ID number and BS 5837 (2012) retention category.

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

NOTE: This is a colour drawing - monochrome reproductions might be difficult to interpret.
Construction exclusion zone (CEZ) - Line of protective barrier

Trees proposed for removal to facilitate the development proposals

Approximate group canopy boundary, ID number and BS 5837 (2012) retention category.

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

NOTE: This is a colour drawing - monochrome reproductions might be difficult to interpret.
Appendix 1
Alistair Hearn – Experience and Qualifications

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 nearly 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

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 many years working with trees, some of which he considers to 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


**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).
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

<table>
<thead>
<tr>
<th>TRESSES UNSUITABLE FOR RETENTION (see Note)</th>
<th>TRESSES TO BE CONSIDERED FOR RETENTION</th>
</tr>
</thead>
</table>
| **Category U** | **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)**<br>**Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline**<br>**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**<br>Note Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7 below. | **Category A**<br>**Trees of high quality with an estimated remaining life expectancy of at least 40 years**<br>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)**<br>**Category B**<br>**Trees of moderate quality with an estimated remaining life expectancy of at least 20 years**<br>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**<br>**Category C**<br>**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**<br>Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories**<br>**Category and Definition** | **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**<br>**Trees present in groups or woodlands of particular visual importance as arboricultural and/or landscape features**<br>**Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)**<br>**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**<br>**Trees with material conservation or other cultural value**<br>**Trees with no material conservation or other cultural value**

BS 5837 (2012) Section 4.5.7 states:<br>

‘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.
- **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. Where the diameter is estimated an ‘E’ will appear in the column.
- **Height:** The height of the tree in metres, is measured with either; a Suunto clinometer; a Trupulse 200b, or Trupulse 360b laser rangefinder.
- **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;
  - Mild-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;
  - Sever 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; usually good vigour; 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:** 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

<table>
<thead>
<tr>
<th>ID</th>
<th>Feature</th>
<th>Species</th>
<th>Trunk Ø (cm)</th>
<th>Height (m)</th>
<th>Health</th>
<th>Age Class</th>
<th>Observations &amp; Defects</th>
<th>Life Expectancy</th>
<th>Recommended Work</th>
<th>Retention Category</th>
<th>RPA Radius (m)</th>
<th>RPA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group</td>
<td>Goat Willow &amp; Aspen &amp; Alder</td>
<td>E&lt; 25cm @ 1.5m</td>
<td>5-10m</td>
<td>Normal Vitality</td>
<td>Early mature</td>
<td>Trees are suppressed and weight biased due to the density of the group and the competition for the available light - [Significance=Observation]</td>
<td>10-20 years</td>
<td>Fell the group to accommodate the proposed development - [Priority=If permission is granted; Category=2]</td>
<td>C2 C2 C2 C2</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>Shelterbelt</td>
<td>Wild Cherry &amp; Common Ash &amp; Goat Willow &amp; Alder &amp; Aspen</td>
<td>E&lt; 30cm @ 1.5m</td>
<td>10-15m</td>
<td>Normal Vitality</td>
<td>Early mature</td>
<td>Trees are suppressed and weight biased due to the density of the group and the competition for the available light - [Significance=Observation]</td>
<td>10-20 years</td>
<td>Prune &amp; fell as required to accommodate the proposed development, where necessary replant to enhance the screen effect - [Priority=If permission is granted; Category=2]</td>
<td>C2 C2 C2 C2</td>
<td>4</td>
<td>41</td>
</tr>
<tr>
<td>3</td>
<td>Shelterbelt</td>
<td>Hawthorn &amp; Sessile Oak &amp; Wild Cherry &amp; Alder &amp; Aspen &amp; Downy Birch &amp; Common Ash</td>
<td>E&lt; 35cm @ 1.5m</td>
<td>10-15m</td>
<td>Normal Vitality</td>
<td>Early mature</td>
<td>Trees are suppressed and weight biased due to the density of the group and the competition for the available light - [Significance=Observation]</td>
<td>10-20 years</td>
<td>Prune &amp; fell as required to accommodate the proposed development, where necessary replant to enhance the screen effect - [Priority=If permission is granted; Category=2]; AND Thin out the group by 10-20% favouring the weaker specimens and strategically plant under-storey species where necessary to achieve the required density of trees - [Priority=If permission is granted; Category=2]</td>
<td>C2 C2 C2 C2</td>
<td>4</td>
<td>55</td>
</tr>
<tr>
<td>4</td>
<td>Group</td>
<td>Hawthorn &amp; Silver Birch &amp; Wild Cherry &amp; Crack Willow &amp; Goat Willow &amp; Common Ash</td>
<td>E&lt; 25cm @ 1.5m</td>
<td>5-10m</td>
<td>Normal Vitality</td>
<td>Early mature</td>
<td>Multiple stems have acute stem union (stable at time of inspection) at the base, mainly on the willow trees - [Significance=Minor]; AND Trees are suppressed and weight biased due to the density of the group and the competition for the available light - [Significance=Observation]</td>
<td>0-10 years</td>
<td>Fell the group to accommodate the proposed development - [Priority=If permission is granted; Category=2]</td>
<td>UU UU</td>
<td>3</td>
<td>28</td>
</tr>
</tbody>
</table>
# Appendix 6

## Tree Works Schedule

<table>
<thead>
<tr>
<th>ID</th>
<th>Feature</th>
<th>Species</th>
<th>Recommended Work</th>
<th>Retention Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group</td>
<td>Goat Willow &amp; Aspen &amp; Alder</td>
<td>• Fell the group to accommodate the proposed development -[Priority=If permission is granted; Category=2]</td>
<td>Q</td>
</tr>
<tr>
<td>2</td>
<td>Shelterbelt</td>
<td>Wild Cherry &amp; Common Ash &amp; Goat Willow &amp; Alder &amp; Aspen</td>
<td>• Prune &amp; fell as required to accommodate the proposed development, where necessary replant to enhance the screen effect -[Priority=If permission is granted; Category=2]</td>
<td>Q</td>
</tr>
<tr>
<td>3</td>
<td>Shelterbelt</td>
<td>Hawthorn &amp; Sessile Oak &amp; Wild Cherry &amp; Alder &amp; Aspen &amp; Downy Birch &amp; Common Ash</td>
<td>• Prune &amp; fell as required to accommodate the proposed development, where necessary replant to enhance the screen effect -[Priority=If permission is granted; Category=2]; AND • Thin out the group by 10-20% favouring the weaker specimens and strategically plant under-storey species where necessary to achieve the required density of trees -[Priority=If permission is granted; Category=2]</td>
<td>Q</td>
</tr>
<tr>
<td>4</td>
<td>Group</td>
<td>Hawthorn &amp; Silver Birch &amp; Wild Cherry &amp; Crack Willow &amp; Goat Willow &amp; Common Ash</td>
<td>• Fell the group to accommodate the proposed development -[Priority=If permission is granted; Category=2]</td>
<td>U</td>
</tr>
</tbody>
</table>