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BS 5837:2012

Arboricultural Method Statement

Site

**Clitheroe Hospital
Chatburn Road
Clitheroe
Lancashire
BB7 4JX**

Author

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**Instructed By
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Contents

Contents

Executive Summary

1.0 Introduction

2.0 Tree Works

3.0 Tree Protection Barriers

4.0 Pre-Construction Phase

5.0 Construction Phase

6.0 Post-Construction Phase

7.0 Work Timescale

Appendix A - Tree Protection Plan

Appendix B - Tree Categorisation and the Proposal

Appendix C Tree Schedule

Appendix D - Glossary

Appendix E - BS 5837:2012 Cascade Chart for Tree Quality Assessment

Appendix F - General Tree Protection Considerations

Appendix G - Author's Signature and Declaration

Executive Summary

McDermott Developments Ltd were commissioned to complete a survey to specifications set out in British Standard 5837:2012 *Trees in relation to design, demolition & construction - Recommendations*. The site consisted of the old hospital and its surrounding land owned by the NHS Property Services Ltd. To the rear of the grounds are predominately buildings and hard standing surfaces. To the front is a large grassed area with many large mature trees with high amenity value. To the west is a neglected area of very large trees. The survey included 75 trees being mostly mature and of category A (high quality), these range from being individual trees to avenues and rows. There are also several hedges and groups of trees.

Most of the proposed development is to the rear of the grounds where there are still a few category A trees and a couple of orchards and hedges. The majority of the existing trees to the front of the grounds are to be retained. The entire front area will need to be fenced off with access being made via the current road surface. The proposal would see the installation of a new road over the rooting areas of these trees. Trees to be retained affected by the construction of highways will be protected by cellular confinement system, prior to any construction, this will then allow plant machinery access and the new road surface can be installed. The protection of all these trees during the construction procedure will be required in order to prevent root damage to some of the conflicting tree Root Protection Areas. This will require monitoring from council and the Arboricultural Consultant. This can be achievable through the implementation of a 'No-Dig' methodology and expert arboricultural supervision during works in these highly sensitive areas. Details of this approach can be provided via an Arboricultural Method Statement. Japanese Knotweed has been identified within the RPA of a few mature trees, the excavation will see the removal of large areas of their root mass. However the development will benefit from the retention of a significant number of trees, 53 in total, 5 trees are to be removed due to their condition and 13 trees are to be removed due to the development proposal / effects of knotweed removal. Replacement tree planting within plot curtilage and POS areas will be considered to enhance the development with native species lost due to development. It should be noted that there is capacity within the site for remedial planting of any trees removed, but this could be outside of the area of proposed development.

1.0 Introductions

1.1 Terms of Reference

- 1.1.1 Under instruction from McDermott Developments Ltd, an arboricultural report has been prepared to accompany a planning application for a proposed development of the hospital for the creation of residential housing estate.
- 1.1.2 The aim of this Method Statement is to ensure best practices with regards to the protection of all trees on site during the proposed development.
- 1.1.3 The Method Statement is based on, and is intended to accompany, a Pre-Development Arboricultural Report, which was devised by Treestyle Consultancy and should be made available with this document. The survey was in line with the most up to date specifications and recommendations laid out in BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*.
- 1.1.4 Development plans have been provided by McDermott Developments Ltd, and then an appropriate Tree Protection Plan (TPP) has been drafted and revised as necessary from this.

1.2 Standing of Method Statement

- 1.2.1 The Method Statement is to be made available on site for inspection by all relevant parties, including the LPA, developers and any subcontractors working on site.
- 1.2.2 It is intended that this Method Statement forms part of the developer's contract and be included alongside the schedule of works and specification.

2.0 Tree Work

2.1 Pre-Construction Tree Work

- 2.1.1 Before any construction work begins, all tree removal and remedial pruning works are to be carried out - trees on site can be located in **Appendix A**. Details of recommended works are described within the tree schedule located in **Appendix C**. A key to terms & abbreviations used throughout the schedule and this document can be found in an attached glossary located in **Appendix D**. A breakdown of the process used to determine tree retention categories can be found in **Appendix E**. All tree work is to be carried out in accordance with BS 3998:2010 Recommendations for tree work (BS 3998) and be carried out by a fully qualified professional contractor with the appropriate public liability insurance.

2.2 Tree Work During Construction

- 2.2.1 Arboricultural works should not be taking place during the construction phase as access will not be available within the Construction Exclusion Zone (CEZ), which is to have been established through the installation of tree protection barriers in the agreed positions. Any tree damage should be prevented by the presence of the CEZ and all on site personnel should be made aware of the limitations to access by CEZ signs applied at three metre intervals on the tree protection barriers (see **Appendix F**).
- 2.2.3 If any tree damage does occur, Treestyle Consultancy are to be informed immediately to discuss appropriate level of remedial work necessary.

2.3 Post Construction Tree Work

- 2.3.1 Once construction is completed, some minor tree works may be judged as necessary - for example, the lifting of crowns or drawing back of canopies in order to aesthetically complement the new development. These works will not occur until all construction work has been completed and the tree protection barriers dismantled.
- 2.3.2 No post-construction tree works are to be undertaken until agreed between Treestyle Consultancy and the LPA representative and written confirmation from the LPA has been received.

2.4 Tree Work Recommendations

- 2.4.1 All tree work should be carried out in accordance with BS 3998 by a competent, qualified arborist. They must also hold sufficient public/employees liability insurance.
- 2.4.2 Any observations regarding tree defects identified by the client or other third parties which have been missed by the consultant (or occurred after the initial survey) should be brought to the attention of Treestyle Consultancy immediately.
- 2.4.3 No liability is to be accepted by Treestyle Consultancy with regards to trees on site if the recommendations of this method statement are not carried out under our supervision.

3.0 Tree Protection Barriers

3.1 Pre-Construction Tree Protection Barriers

- 3.1.1 Following tree removal works, tree protection barriers must be erected before any other work begins and must remain in place for the duration of the development process.
- 3.1.2 The barriers must be installed as specified in BS 5837. Please see **Appendix F** for details of construction techniques and **Appendix A** for details of the positioning of said barriers. Ideally, the tree protection barriers should enclose the entire area of the Root Protection Area (RPA), however this is not always possible due to limitations to access and the presence of existing hard surfaces over the RPA. For this reason, the specific locations of the tree protection barriers are to be confirmed by Treestyle Consultancy after discussion with a representative of the LPA and the developers. Once erected, all protective fencing will be regarded as sacrosanct and will not be removed or altered without prior recommendation by the project arborist and approval by the LPA.
- 3.1.3 No work, including preliminary excavation, soil removal or the arrival of materials and machinery, is to occur until the barriers have been installed and inspected. Where the circumstances are deemed exceptional by Treestyle Consultancy and an LPA representative, some operations may be allowed prior to the erection of the barriers if overseen by Treestyle Consultancy.
- 3.1.4 Once installed, the barriers must be fitted with laminated signs which read with the following sentence: 'CONSTRUCTION EXCLUSION ZONE - KEEP OUT'. A full sign has been prepared on the third page of **Appendix F**. These must be placed at intervals of three metres in order to ensure that the restrictions in place are clear to all on site staff and subcontractors.
- 3.1.5 BS 5837 stipulates that the tree protection barriers constructed on site are to comprise of a vertical and horizontal scaffold framework, which is well braced to resist potential impacts. Vertical tubing should be spaced at a maximum interval of three metres and driven securely into the ground, with care being taken to avoid any underground utilities or structural roots. Weld mesh panels are then to be securely attached to the scaffold framework (see **Appendix F**). Alternatively, a similar wooden construction would be suitable if made of sturdy materials such as those used for fencing off development sites from the public.
- 3.1.6 Work will not commence until both the LPA and Treestyle Consultancy are satisfied with the installation of the tree protection barriers and then given a written go ahead for construction to commence.

3.2 Tree Protection Barriers During Construction

- 3.2.1 Tree Protection Barriers will be inspected daily for faults or damage by the site manager and any breaches repaired as soon as is reasonably practicable. Written documentation of any faults or repairs will be kept by the site manager.
- 3.2.2 No works will take place which require entering the CEZ without prior written agreement with the LPA and Treestyle Consultancy.

3.3 Tree Protection Barrier Dismantling

- 3.3.1 Once construction work is completed, site machinery and equipment can be removed and the LPA invited to make an inspection of the trees on site and give formal approval for the removal of all tree protection barriers. Once approval has been received, the tree protection barriers can be removed.

4.0 Pre-Construction Phase

4.1 Ground Investigations within RPAs

- 4.1.1 No exploratory excavations within the rooting areas of the trees in question have at this time taken place.
- 4.1.2 Therefore, trees which Treestyle Consultancy anticipates as being liable to face significant development related pressure (such as significant root disturbance) are to be left undisturbed for as long as possible on site. Final works, such as the installation of paved surfaces and establishment of green spaces within the RPAs of these trees, will be done under direct supervision from Treestyle Consultancy. Test hole may be carried out within RPA's to ascertain if roots exist beneath the surface.

5.0 Construction Phase

5.1 Site Facilities

- 5.1.1 Any site facilities, such as site office, mess area, toilets and parking areas, should be located as far away from any retained trees as possible. The RPA of all retained trees is not to be infringed upon during the construction of these facilities.
- 5.1.2 Cement mixers and toxic materials should be kept away from trees and care is to be taken to avoid any chemical spillages, especially petrol or diesel fuel and/or oil which may contaminate the soil of the trees being retained. Absorbent spill kits should be kept on hand and used immediately in the event of any spillage.

5.2 Changes in Ground Level - 'No-Dig' Methodology

- 5.2.1 Where required, existing surfaces should be removed, ideally by hand or using a tracked machine working outside of the root protection zone. Should machinery be used, the work should be carried out by an experienced machine operator and banksman with the machine stationed outside the spread of the trees canopy and only the boom extending in the work area.
- 5.2.2 Care should be taken so as not to disturb the soil immediately beneath any existing hard surface to be removed.
- 5.2.3 Arising debris must be transported to a suitable receptacle stationed outside of the root protection area. No materials, machinery, chemicals or fuel shall be stored within the RPA for the duration of the development. Material that will contaminate the soil, e.g. concrete mixings, diesel and vehicle washings should not be discharged within 10m of the tree stem. It is essential that allowance be made for the slope of the ground so that damaging materials cannot run towards trees.
- 5.2.4 Any tree roots exceeding 25 mm in diameter which are unintentionally damaged during these operations should be cut cleanly with a sharp knife or hand saw. Should this occur, these damages are to be brought to the attention of Treestyle Consultancy. Any roots exposed by removal of hard surfaces should be covered immediately with clean, moist topsoil.
- 5.2.5 Any work involving the removal of existing surfaces within the tree's RPAs is to be supervised by Treestyle Consultancy. This applies to resurfacing of the ground levels within the RPA.

5.3 Removal of Existing Hard Surfaces Within RPAs (Where Required)

- 5.3.1 All existing features which must be removed in order to construct soft landscaped areas must be removed using the same 'No-Dig' approach as described in Section 5.2.
- 5.3.2 Following removal of existing hard surfaces which are designated to become areas of soft landscape, no vehicles are to be allowed to enter or cross these areas (should an RPA have been modified due to a hard surface being in place previously, it should now extend to its full extent into the created soft area).
- 5.3.3 Top soiling of those areas which lie within protected areas is to be carried out by hand immediately after existing hard surfaces have been removed.
- 5.3.4 New topsoil should be gently feathered by hand to match the existing level and any roots exposed by the removal of hard surfacing should be covered with moist topsoil immediately.

5.4 Cellular Confinement System

- 5.4.1 Where paved areas are required to be created within or close to the RPA of any retained trees, permeable paving solutions are to be employed. Beneath these surfaces, a root cellular confinement system is to be implemented, so as to allow for continued undisturbed root development, whilst also allowing adequate drainage and, most importantly from the developer's point of view, adequate structural stability for the intended usage above.
- 5.4.2 The installation of a cellular confinement system would have to be done so under supervision from Treestyle Consultancy, along with a suitable 'no-dig' policy. Where specified, 'Cellweb™' Tree Root Protection System or similar cellular confinement system is suggested as a suitable product, please see attached file - [cellweb_flyer.pdf](#) for specifications of this suggested product.

5.5 Installation of Utilities

- 5.5.1 Any underground services positioned near to trees will need to be installed in accordance with guidance given in BS 5837 along with the National Joint Utilities Group (NJUG) publication Volume 4 'Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees' – 2007. Please see attached file - [njug_v4_trees_issue2.pdf](#) for details.

5.6 Trenching Works for Underground Services

- 5.6.1 Ideally, there should be no disturbance within the RPA of any retained trees and, therefore, if it is possible to position any utilities outside of these RPAs then this is to be the preferred option.
- 5.6.2 Where this is not possible, specific advice should be sought from Treestyle Consultancy on whether the proposed impact is significant (for example, an electric cable may be required to be laid on the edge of a mature tree's RPA). In this situation, it may be possible to carry out trial excavations by hand, under supervision by an arborist, removing minor roots where necessary and if larger roots are discovered then a decision must be made as to whether the root be severed, the tree removed/reduced in accordance to the loss of roots associated or the location of the utilities re-positioned.
- 5.6.4 If the utility must be placed in close proximity to a known area of rooting activity, pneumatic excavation using an 'Air-Spade' could be used. This uses compressed air to remove soil particles in a manner which causes limited long term damage to the root system of the tree in question, and is an effective method for laying underground utilities in sensitive areas.

5.7 Demolition Works

- 5.7.1 No demolition work should take place before the finalisation of this method statement and implementation of agreed tree protection measures. Treestyle Consultancy does not consider it to be impractical to carry out demolition works on the site in question outside of the RPA of any of the retained trees on site. Existing recommendations regarding measures to avoid toxic run off should still be employed during this process.
- 5.7.2 Should damage have already occurred to any trees on site which have not been protected at the demolition stage (as is, unfortunately, often the case), Treestyle Consultancy would need to be brought onto site to assess the condition of any trees damaged in this way. It should then be decided as to whether tree retention is still a realistic prospect (depending on above ground damage and root damage). Should this occur, it would be a breach of planning regulations and would most likely cause significant disharmony between the developer and LPA. Therefore, this situation should be avoided at all costs through the swift implementation of appropriate tree protection methods.

6.0 Post-Construction Phase

6.1 Completion Meeting

- 6.1.1 Once on site construction works have been completed, a meeting between Treestyle Consultancy and an appropriate member of the LPA (ideally with arboricultural training) will be arranged. During this meeting, any final tree work which may aid the final development in terms of new sightlines/access routes can be confirmed.
- 6.1.2 Any work agreed in this manner must be carried out to BS3998. It is a criminal offence to cut down, top, lop, uproot, wilfully damage or destroy any tree covered by a TPO unless the Council has specifically permitted the work. Given that fines for illegal work can be as much as £20,000 per tree, it is recommended by Treestyle Consultancy that confirmation for these works from the LPA is received in writing before being carried out.

6.2 Post Construction Landscaping Works

- 6.2.1 A landscaping plan has not been made available to Treestyle Consultancy which would list tree, shrub and herbaceous planting. One should be prepared and adhered to once construction work has been completed and tree protective barriers will have been removed.
- 6.2.2 Planting and landscaping works within the RPAs of any retained trees must be carried out in a manner which does not involve any changes in ground level or significant digging such as mechanical rotovation.
- 6.2.3 Any tree planting agreed as part of the planning agreements should be undertaken during this phase, preferably in the dormant season. A tree planting scheme can help achieve successful tree establishment and avoiding high tree loss.
- 6.2.4 Any herbicides used must be appropriate to the task and applied by qualified professionals, with care being taken to avoid damage to any retained trees. Spraying within the drip-line of retained trees is to be avoided without prior discussion between the contractor and Treestyle Consultancy.

7.0 Work Scale

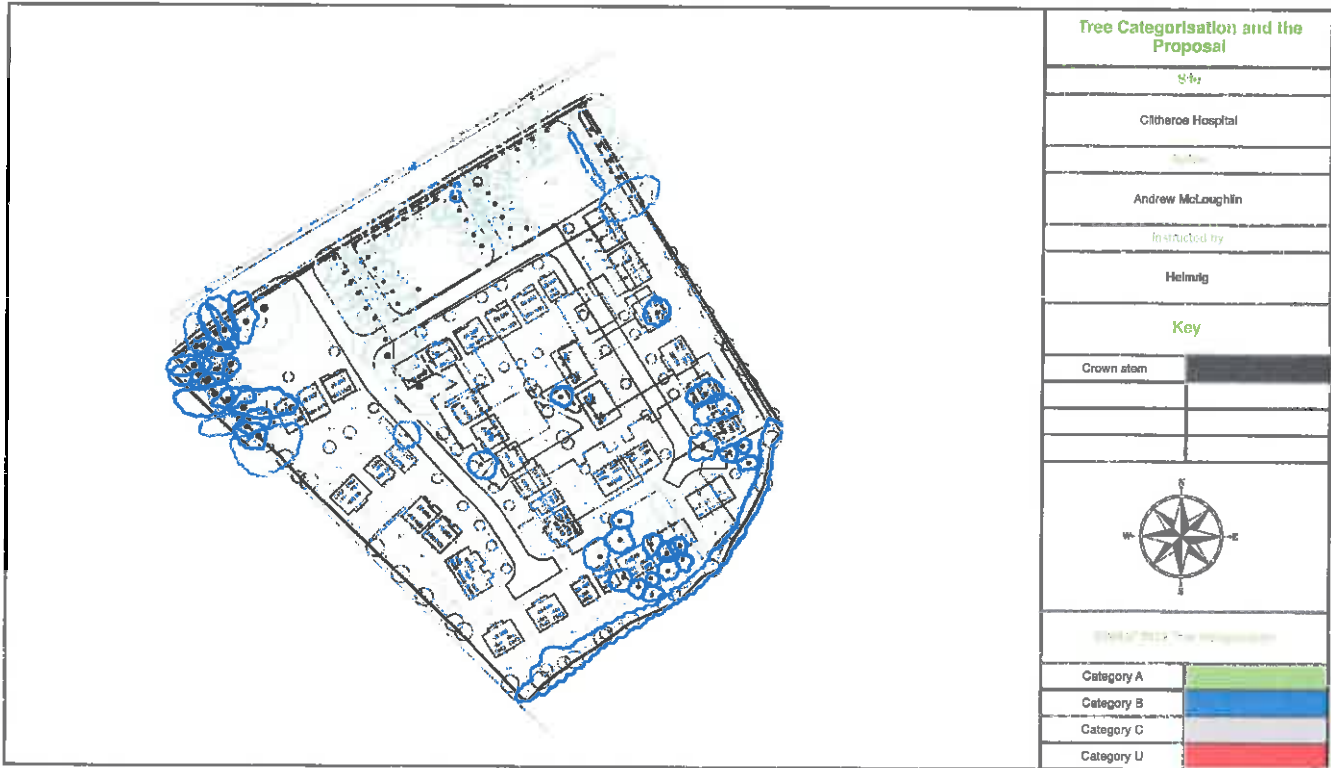
7.1 On site works should be undertaken in the order detailed below:

		Initial	Date
1	Fulfilment of all requirements listed by Local Authority planning department.		
2	Carry out scheduled tree works (must conform to BS 3998), see Appendix C – Tree Schedule .		
3	Install tree protection barriers as detailed in Appendix E and positioned as detailed on the Tree Protection Plan (Appendix A).		
4	Organise a meeting between the LPA and developers to inspect fencing and ground protection measures on site before work commences. Once approval is achieved the protective fencing must not be moved until work is completed.		
5	Undertake construction works, a brief monthly meeting between Treestyle Consultancy and the site supervisor is suggested to ensure that tree protection measures are adequate and continuing to be effective.		
6	Once all on site construction work has been achieved and the majority of heavy plant and machinery has been removed from site, the tree protection barriers can be dismantled.		
7	For sensitive works within the RPAs of any retained trees, Treestyle Consultancy consultant is to be brought onto site and the necessary tree protection barriers is to be dismantled and sensitive works carried out under direct supervision from Treestyle Consultancy and with strict adherence to advice given regarding individual trees within this method statement.		
8	Any judicious remedial tree works to be undertaken post construction, for example crown lifting or drawing back of canopies to benefit new development.		
9	Carry out landscaping and tree/shrub planting scheme. Mechanical rotoavation is to be avoided within the RPAs of any retained trees.		

Appendix A- Tree Constraint Plan



Appendix B - Tree Categorisation and the Proposal



Appendix C Tree Schedule

Tree number	Basic Information				BS5637 date				Basic				BS5637 data					
	Tree species	Age	DBH mm	Branch N	Branch E	Branch S	Leaf W	Height	Condition	Measurement recommendations	Comments	RPA m's	Life span	Category	Sub cat	RPA DBH	RPA m ²	Constr aims as a %
1	Lime (Tilia cordata)	Mature	600	5	6	3	5	20	Good with low crown	Retention crown raise	Part of Avenue	7.2	40	A	2	600	163	50
2	Lime (Tilia cordata)	Mature	600	3	6	3	5	20	Good with low crown	Retention crown raise	Part of Avenue	7.2	40	A	2	600	163	50
3	Lime (Tilia cordata)	Mature	500	2	6	5	6	18	Good with low crown	Retention crown raise	Part of Avenue	6	40	A	2	500	113	50
4	Lime (Tilia cordata)	Mature	700	5	6	6	7	20	Covered in ivy	Remove ivy	Part of Avenue	8.4	40	A	2	700	222	50
5	Ash (Fraxinus excelsior)	Mature	500	5	6	6	7	17	Below average crown canopy	None	Part of Avenue	6	40	C	2	500	113	50
6	Cypress (Cupressus spp)	Mature	375	2	2	2	2	6	Good	Possible retention	Removal req due to development	4.5	20	B	2	375	64	70
7	Cypress (Cupressus spp)	Mature	150	2	2	2	2	6	Good	Possible retention	Removal req due to development	1.8	20	B	2	150	10	70
8	Birch (Betula pubescens)	Mature	350	4	4	3	4	16	Good	Possible retention	Removal req due to development	4.2	20	B	2	350	55	90
9	Maple (Acer capadocicum)	Mature	550	4	6	4	6	16	Good	Possible retention	Removal req due to development	6.6	20	B	2	550	137	90
10	Copper Beech (Fagus sylvatica purpurea)	Mature	500	4	7	6	7	18	Good	Possible retention	Removal req due to development	6	20	A	2	500	113	90
11	Norway maple (Acer platanoides)	Mature	450	5	5	5	5	14	Good	Good feature tree with semipermeable surface	Removal req due to development	5.4	20	B	2	450	92	90
G12	Apple (Malus spp)	Mature	200	2	2	2	2	3	Average	Potential retention	Removal req due to development	2.4	20	B	2	200	18	10
G13	Various	Mature	150			3			Average	Potential retention	Screening could be maintained as hedge	1.8	20	B	2	150	10	1.8
H14	Beech (Fagus sylvatica)	Mature	150	2	2	2	2	3	Good	None	Removal req due to development	1.8	20	A	2	150	10	1.8
G15	Apple (Malus spp)	Mature	200	2	2	2	2	3	Good orchard of 11 trees	Potential retention	Deadwood with low crowns	2.4	20	B	2	200	18	10
16	Maple (Acer capadocicum)	Mature	400	4	4	4	4	7	Average	Low retention	Removal req due to development	4.8	20	C	2	400	72	10
17	English oak (Quercus robur)	Early maturity	350	4	4	4	4	8	Average	Possible retention	Below average crown canopy	4.2	10	B	1	350	55	30
18	Ash (Fraxinus excelsior)	Early maturity	250	3	3	3	3	8	Average	Low retention	Removal req due to development	3	20	C	2	250	28	3

Appendix C Tree Schedule

Tree number	Basic information			BS5837 data					Basic					BS5837 data					
	Tree species	Age	DBH mm	Pr N	Pr S	Sr S	Sp W	Height	Condition	Management recommendations	Comments	RPA m's	Life span	Cate cry	Sub cat	RPA DBH	RPA m2	Constr Amend res %	
19	Copper Beech (Fagus sylvatica purpurea)	Mature	950	9	9	8	7	20	Good	Possible removal due to Knotweed	Heavily suppression has resulted in extreme crown deformity, removal of T20 T21 will leave T19 looking deformed with an high chance of windthrow	11.4	20	A	1	950	408	80	15
20	Lime (Tilia cordata)	Mature	1110	8	6	5	7	20	Good	Remove due to Knotweed	Removal req due to development	13.32	40	A	2	1110	547	50	15
21	Copper Beech (Fagus sylvatica purpurea)	Mature	950	9	9	8	7	20	Good	Remove due to Knotweed	Knotweed within rooting area of tree	11.4	20	A	2	950	408	80	15
22	Lime (Tilia cordata)	Mature	500	3	4	5	6	20	Good	Possible removal due to Knotweed	Knotweed within rooting area of tree	6	40	A	2	500	113	50	9
23	Lime (Tilia cordata)	Mature	500	4	4	2	6	20	Good	Retention, remove epicormic	Part of Avenue	6	40	A	2	500	113	50	9
24	Lime (Tilia cordata)	Mature	500	3	3	3	5	20	Good	Retention, remove epicormic	Part of Avenue	6	40	A	2	500	113	50	9
25	Lime (Tilia cordata)	Mature	550	3	3	3	6	20	Good	Retention, remove epicormic	Part of Avenue	6.6	40	A	2	550	137	50	9.9
26	Lime (Tilia cordata)	Mature	500	5	3	2	5	20	Good	Retention, remove epicormic	Part of Avenue	6	40	A	2	500	113	50	9
27	Lime (Tilia cordata)	Mature	500	6	2	1	6	20	Average covered in Ivy	Retention, remove epicormic and Ivy	Part of Avenue	6	40	A	2	500	113	50	9
28	Lime (Tilia cordata)	Mature	600	6	3	2	6	20	Good	Retention, crown raise 5.2m over	Part of Avenue	7.2	40	A	2	600	163	75	12.6
29	Lime (Tilia cordata)	Mature	400	2	4	2	2	20	Good	Retention, remove epicormic	Part of Avenue	4.8	40	A	2	400	72	50	7.2
30	Lime (Tilia cordata)	Mature	525	3	6	3	4	20	Good	Retention, remove epicormic	Part of Avenue	6.3	40	A	2	525	124	50	9.45
31	Lime (Tilia cordata)	Mature	450	3	3	3	3	20	Good	Retention, remove epicormic and Ivy	Part of Avenue	5.4	40	A	2	450	92	50	8.1

Appendix C Tree Schedule

Tree number	Basic information				BS5837 data					Basic				BS5837 data					
	Tree species	Age	DBH mm	Bra N	Branch E	Spex S	Lead W	Height	Condition	Management recommendations	Comments	RPA m's	Life span	Category	Sub cat	RPA DBH	RPA m ²	Constr aims as a %	
32	Lime (<i>Tilia cordata</i>)	Mature	500	3	4	5	3	20	Good	Retention, remove epicormic	Part of Avenue	6	40	A	2	500	113	50	9
33	Lime (<i>Tilia cordata</i>)	Mature	500	3	6	5	4	20	Good	Retention, remove epicormic	Part of Avenue	6	40	A	2	500	113	50	9
34	Lime (<i>Tilia cordata</i>)	Mature	600	5	3	6	3	20	Good	Ivy removed	Great screening tree	7.2	40	A	2	600	163	50	10.8
35	Lime (<i>Tilia cordata</i>)	Mature	650	6	8	7	3	20	Good	Ivy removed, remove hanging branch	Great screening tree	7.8	40	A	2	850	191	50	11.7
36	Lime (<i>Tilia cordata</i>)	Mature	300	4	3	5	2	20	Good	Ivy removed	Great screening tree	3.6	40	A	2	300	41	50	5.4
37	Lime (<i>Tilia cordata</i>)	Mature	700	6	5	6	5	20	Good	Ivy removed	Great screening tree	8.4	40	A	2	700	222	50	12.6
38	Lime (<i>Tilia cordata</i>)	Mature	450	4	5	4	3	20	Good	Ivy removed	Great screening tree	5.4	40	A	2	450	92	50	8.1
39	Wych Elm (<i>Ulmus glabra</i>)	Mature	350	3	1	0	1	3	Average	Feature tree with large cavity	Great feature tree	4.2	40	C	2	350	55	50	6.3
40	Lime (<i>Tilia cordata</i>)	Mature	500	7	4	2	7	20	Good	Retention, remove epicormic	Part of Avenue	6	40	A	2	500	113	30	7.8
41	Lime (<i>Tilia cordata</i>)	Mature	450	4	6	3	5	20	Good	Retention, remove epicormic	Part of Avenue	5.4	40	A	2	450	92	30	7.02
42	Lime (<i>Tilia cordata</i>)	Mature	600	4	4	4	6	20	Good	Retention, remove epicormic	Part of Avenue	7.2	40	A	2	600	163	30	9.36
43	Lime (<i>Tilia cordata</i>)	Mature	600	2	4	7	6	20	Good	Retention, remove epicormic	Part of Avenue	7.2	40	A	2	600	163	30	9.36
44	Lime (<i>Tilia cordata</i>)	Mature	650	2	4	7	7	20	Good	Retention, remove epicormic	Part of Avenue	7.8	40	A	2	650	191	30	10.14
45	Lime (<i>Tilia cordata</i>)	Mature	600	3	5	3	5	20	Good	Retention, remove epicormic, remove deadwood	Part of Avenue	7.2	40	A	2	600	163	30	9.36

Appendix C. Tree Schedule

Tree number	Basic information				BSS837 data					Basic			BSS837 data					Amend ed RPA	
	Tree species	Age	DBH mm	Gr 3 M	Gr 4 S	Gr 5 S	Gr 6 W	Height	Condition	Management recommendations	Comments	RPA m's	Life span	Category	Sub cat	RPA DBH	RPA m2		Constr aims as %
46	Lime (Tilia cordata)	Mature	375	3	8	3	6	20	Good	Retention, remove epicormic	Part of Avenue	4.5	40	A	2	375	64	30	5.85
47	Lime (Tilia cordata)	Mature	525	7	4	2	74	20	Good	Retention, remove epicormic	Part of Avenue	6.3	40	A	2	525	124	30	8.19
48	Wych Elm (Ulmus glabra)	Mature	350	3	1	0	1	3	Average	Feature tree with large cavity	Great feature tree	4.2	40	C	2	350	55		4.2
49	Lime (Tilia cordata)	Mature	950	5	5	7	6	20	Good	Retention, crown raise over road,, remove ivy	Part of Avenue growing over road	11.4	40	A	2	950	408	50	15
50	Lime (Tilia cordata)	Mature	500	7	4	2	7	20	Good	Retention, remove epicormic	Part of Avenue, large limb remove val	6	40	A	2	500	113	50	9
51	Lime (Tilia cordata)	Mature	500	5	4	7	4	20	Good	Retention	Part of Avenue	6	40	A	2	500	113	50	9
52	Lime (Tilia cordata)	Mature	750	7	7	6	3	20	Good	Retention, crown raise over road	Part of Avenue	9	40	A	2	750	255	60	14.4
H53	Privet hedge (Ligustrum ovifolium)	M	100	0.5	0.5	0.5	1	1	Good	Maintain as hedge	None	1.2	20	C	2	100	5		1.2
54	Laburnham (Laburnham anagroides)	M	250	1	3	3	2	4	Good	None	Possible feature tree	3	20	B	1	250	28		3
55	Purple leaved plum	M	150	2	2	3	1	4	Good	Possible retention	None	1.8	20	B	2	150	10		1.8
56	Beech (Fagus sylvatica)	Mature	1200	6	12	12	8	26	Average	Possible decay sounding with canopy still not in leaf when others are	Reassess late summer 2017 for canopy inspection	14.4	20	A	2	1200	652	5	15
57	Beech (Fagus sylvatica)	Mature	510	8	5	7	6	13	Good	Crown raise	Low crown over road	6.12	20	B	2	510	113	45	8.874
58	Beech (Fagus sylvatica)	Mature	440	9	5	8	2	17	Average	Crown raise	Suppressed	5.28	20	B	2	440	92	45	7.656
59	Beech (Fagus sylvatica)	Mature	790	5	5	6	3	20	Average	Crown raise	None	9.48	20	B	2	790	280		9.48

Appendix C Tree Schedule

Tree number	Basic information				BSS837 data				Basic				BSS837 data						
	Tree species	Age	DBH mm	Em N	Em C	Em S	Seed W	Height	Condition	Management recommendations	Comments	RPA m's	Life span	Category	Sub cat	RPA DBH	RPA m2	Constr limits as %	Amend RPA
60	Ash (<i>Fraxinus excelsior</i>)	Early maturity	550	4	7	2	6	20	Poor	Remove	No leaf on crown and hollow sounding near road.	6.6	5	U	2	550	137		6.6
61	Ash (<i>Fraxinus excelsior</i>)	Early maturity	480	3	3	2	3	22	Poor	Remove	No leaf on crown and hollow sounding near road.	5.88	5	U	2	490	113		5.88
62	Beech (<i>Fagus sylvatica</i>)	Early maturity	510	7	5	3	1	22	Average	Low retention	Suppressed	6.12	10	C	2	510	113		6.12
63	Beech (<i>Fagus sylvatica</i>)	Mature	660	3	7	4	9	22	Good	None	None	7.92	20	B	2	660	191		7.92
64	Beech (<i>Fagus sylvatica</i>)	Early maturity	600	4	3	1	9	17	Good	None	None	7.2	20	B	2	600	163		7.2
65	Ash (<i>Fraxinus excelsior</i>)	Early maturity	600	5	4	4	4	20	Poor	Remove	History of failure, poor crown canopy	7.2	10	U	2	600	163		7.2
66	Ash (<i>Fraxinus excelsior</i>)	Early maturity	360	1	2	2	1	13	Poor	Remove	History of failure, poor crown canopy	4.32	10	U	2	360	55		4.32
67	Ash (<i>Fraxinus excelsior</i>)	Early maturity	500	0	0	0	0	0	Poor	Remove	Stem failure	7.2	10	U	2	500	113		7.2
68	Beech (<i>Fagus sylvatica</i>)	Mature	600	3	4	3	4	22	Average	None	Below average crown canopy	7.2	20	B	2	600	163		7.2
69	Beech (<i>Fagus sylvatica</i>)	Mature	1050	4	7	7	10	25	Average	None	Below average crown canopy	12.6	20	B	2	1050	489		12.6
70	Beech (<i>Fagus sylvatica</i>)	Mature	650	4	9	5	3	25	Average	None	Below average crown canopy	7.8	20	B	2	650	191		7.8
71	Beech (<i>Fagus sylvatica</i>)	Mature	1000	6	16	6	3	25	Average	None	Below average crown canopy	12	20	B	2	1000	452		12

Appendix D - Glossary

Abbreviation	Term	Explanation
DBH	Diameter at Breast Height	The diameter of the tree trunk in question, 'breast height' is taken to be 1.3 metres above ground level. Multi-stem trees have their stems measured separately and indicated as so in the tree schedule. Trees with abnormal growths, branch unions or other obstructions at 1.3 m will have their measurements taken immediately below said obstructions.
NSVD	No Significant Visual Defects	n/a
AGL	Above Ground Level	n/a
RPA	Root Protection Area	Circular area surrounding tree with a radius based on the DBH of the tree, as calculated in BS 5837:2012. RPA Radius = 12 x DBH
-	Scaffold Branches	Significant (relative to the canopy in question) 1st & 2nd order branches which support the tree's canopy.
VTA	Visual Tree Assessment	A system of tree inspection devised by Claus Mattheck using visual signs to read the body language of trees & aid with the diagnosis of potential defects.
-	Binomial name shorthand	First two letters of genus name & first two letters of species name as combined to give a shorthand species code. E.g. Sycamore - <i>Acer pseudoplatanus</i> would be written as ACPS. Where cultivar or conflicting names are used, a six digit form will be used rather than four digit. E.g. Copper Beech - <i>Fagus sylvatica</i> 'Purpurea' would be written as FASYPUR.
CB	Crown Break	The point at which the main stem divides into tree's canopy.
I#	Inspection Period	Shorthand term denoting the regularity of the recommended re-inspection regime. E.g. I1 = reinspect on annual basis, I2 = reinspect once every two years, I0.5 = reinspect once every six months
-	Basal/Stem Opening	Section of tree which has lost its bark coating & may or may not feature wood degradation, decay or an open cavity.
Y	Young	Tree which has not yet established a significant rooting structure in the ground & has not developed a significant branching structure - its form is largely 'whip' like in nature & it could normally be easily transplanted or replaced.
SM	Semi Mature	Tree which has established a significant rooting structure & could not easily be transplanted. The trees structure will have begun to develop an internal scaffold structure but its structural form does not yet match that of a mature version of its specimen. Trees in this age class will still be developing significantly in height & spread.
EM	Early Mature	Tree which has established a significant rooting structure & has developed a noticeable internal scaffold structure, it differs from a mature version of its species only in size but not in relative proportions of its structure. Trees in this age class will still be developing significantly in height & spread.
M	Mature	Tree which has established a significant root-plate & which is over 50% of the way through its usual life expectancy. Trees in this age class will still be developing significantly in spread but less significantly in height.
OM	Over Mature	Tree which has fully established & will no longer be able to continue increasing in size due to its age, it may be showing signs of decline such as localised dieback but does not need to do so by definition. However it should be expected that signs of structural deterioration will soon become apparent.
V	Veteran	Tree which is showing veteran tree characteristics such as very significant crown retrenchment, extensive internal cavitation & possess significant cultural, ecological &/or historical value. Size is a common indicator of these characteristics but is not an essential requirement, for example, ancient coppices may possess veteran tree characteristics but may have a stunted form. Age is a stronger indicator but again not essential as veteran characteristics can be encouraged in younger trees.
-	Minor Deadwood	Deadwood under 50 mm in diameter
-	Major Deadwood	Deadwood which is equal to or greater than 50 mm in diameter
-	Deadwood Stub	Section of deadwood which may be over 50mm in diameter but is less than 500mm in length and therefore not immediately considered to be possessing a significant potential for failure.

Appendix F - General Tree Protection Considerations

Any tree retained within the design will require protection in accordance with BS 5837, regardless of its initial retention category. This protection will require tree to be fenced off in areas equal to the RPAs plotted on the attached Tree Constraints Plan, located in **Appendix A**.

A protective fence will be erected prior to the commencement of any site works e.g. before any materials are brought on site. The fence will have signs attached to it stating:

'CONSTRUCTION EXCLUSION ZONE – NO ACCESS'

The protected fence may only be removed following completion of all construction works.

The fence is required to be sited in accordance with the Tree Constraints Plan enclosed with this method statement as **Appendix A**. They must ideally be constructed as per figure 2 in BS 5837 and be fit for the purpose of excluding any construction activity (see diagram below). Any other fence/barrier used must be fit for the purpose (as decided by the project arborist).

Once erected all protective fencing will be regarded as sacrosanct, and will not be removed or altered without prior recommendation by the project arborist and approval by the local planning authority.

The diagram below demonstrates the required fence specifications of BS 5837 figure 2.

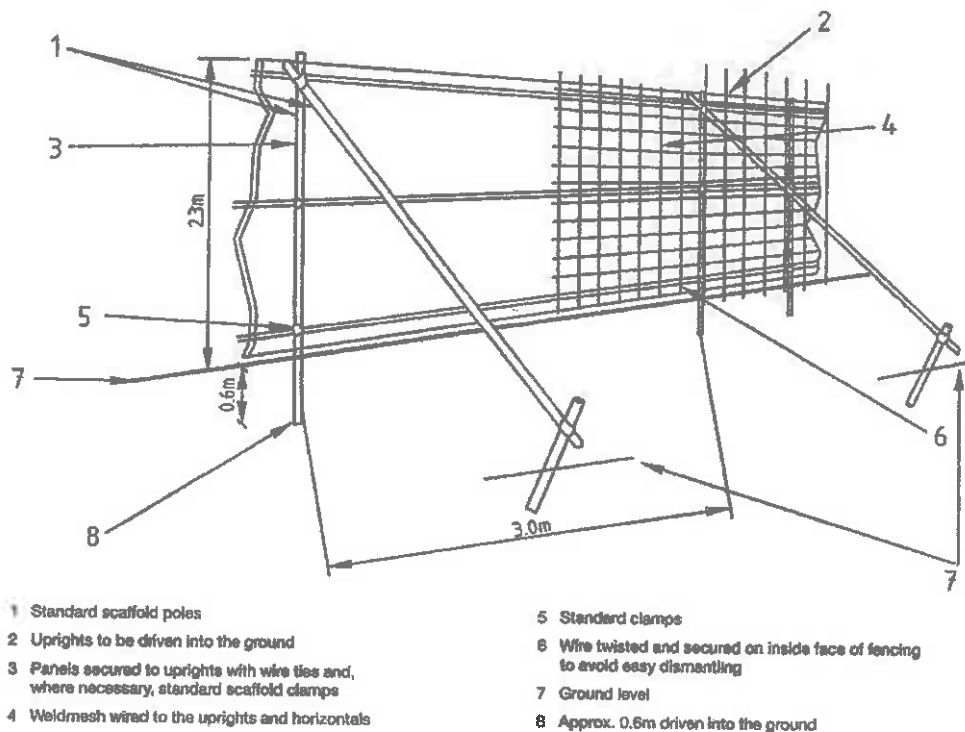


Figure 2. – Protective fencing for RPA

Appendix F - General Tree Protection Considerations (Cont.)

Should scaffolding be required to be erected within the RPA of any retained trees (so that building works may be carried out outside the extent of the RPA), this should be carried out to the following specifications:

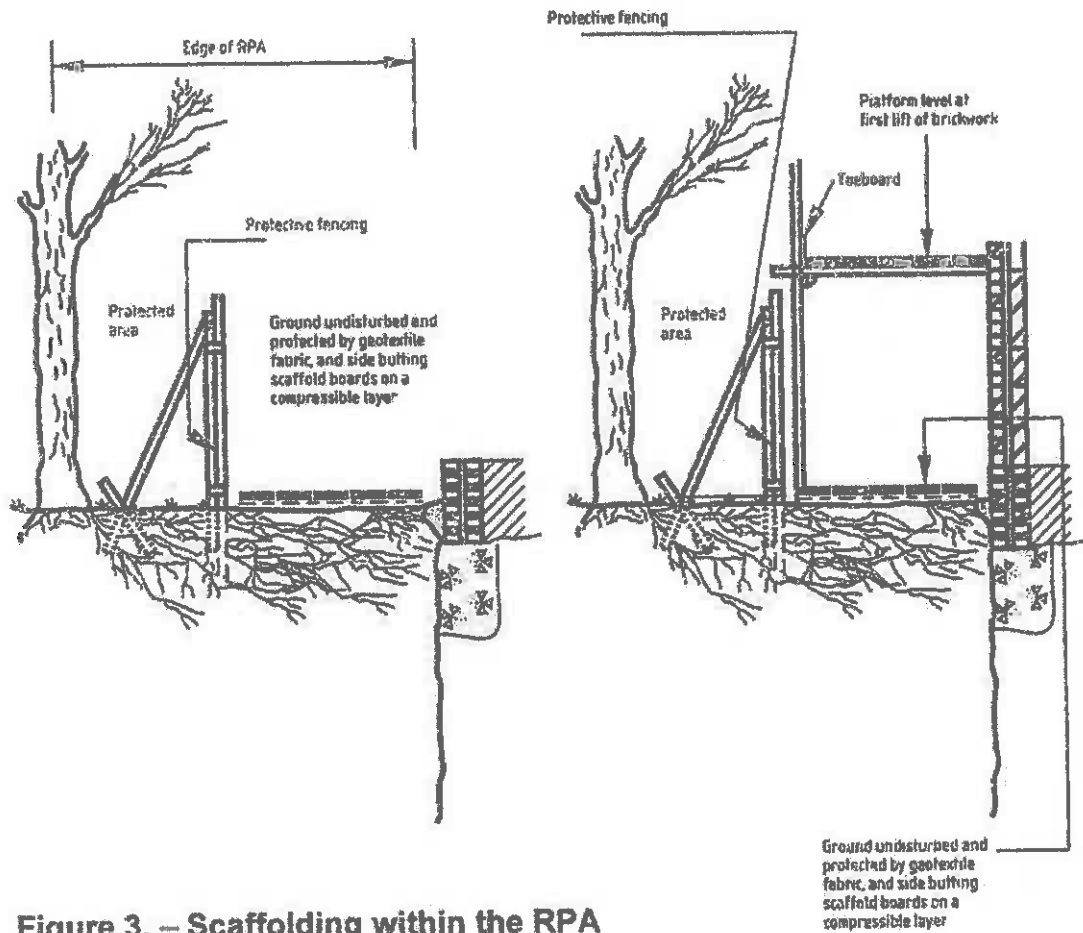


Figure 3. – Scaffolding within the RPA

CONSTRUCTION EXCLUSION ZONE

KEEP OUT

RESTRICTED ACCESS
NO VEHICLES
NO STORAGE OF MATERIALS

REPORT ANY TREE DAMAGE TO
TREESTYLE CONSULTANCY
ON

07872 064 313

Appendix G - Author's Signature and Declaration

It is trusted that this report provides the necessary information for the client to make an informed decision regarding tree management on the site, but should any further advice be required please do not hesitate to contact the author.

This report is valid for one year after the date of this report's publication.

Signed 15th May 2017.



Andrew McLoughlin

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BS 5837:2012 Pre-Development Report

Site

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**Instructed By
Helmrig Ltd**

Contents

Contents

Executive Summary

1.0 Introduction

2.0 Tree Works

3.0 Tree Protection Barriers

4.0 Pre-Construction Phase

5.0 Construction Phase

6.0 Post-Construction Phase

7.0 Work Timescale

Appendix A - Tree Protection Plan

Appendix B - Tree Categorisation and the Proposal

Appendix C Tree Schedule

Appendix D - Glossary

Appendix E - BS 5837:2012 Cascade Chart for Tree Quality Assessment

Appendix F - General Tree Protection Considerations

Appendix G - Author's Signature and Declaration

Executive Summary

McDermott Developments Ltd were commissioned to complete a survey to specifications set out in British Standard 5837:2012 *Trees in relation to design, demolition & construction - Recommendations*. The site consisted of the old hospital and its surrounding land owned by the NHS Property Services Ltd. To the rear of the grounds are predominately buildings and hard standing surfaces. To the front is a large grassed area with many large mature trees with high amenity value. To the west is a neglected area of very large trees. The survey included 75 trees being mostly mature and of category A (high quality), these range from being individual trees to avenues and rows. There are also several hedges and groups of trees.

Most of the proposed development is to the rear of the grounds where there are still a few category A trees and a couple of orchards and hedges. The majority of the existing trees to the front of the grounds are to be retained. The entire front area will need to be fenced off with access being made via the current road surface. The proposal would see the installation of a new road over the rooting areas of these trees. Trees to be retained affected by the construction of highways will be protected by cellular confinement system, prior to any construction, this will then allow plant machinery access and the new road surface can be installed. The protection of all these trees during the construction procedure will be required in order to prevent root damage to some of the conflicting tree Root Protection Areas. This will require monitoring from council and the Arboricultural Consultant. This can be achievable through the implementation of a 'No-Dig' methodology and expert arboricultural supervision during works in these highly sensitive areas. Details of this approach can be provided via an Arboricultural Method Statement. Japanese Knotweed has been identified within the RPA of a few mature trees, the excavation will see the removal of large areas of their root mass. However the development will benefit from the retention of a significant number of trees, 53 in total, 5 trees are to be removed due to their condition and 13 trees are to be removed due to the development proposal / effects of knotweed removal. Replacement tree planting within plot curtilage and POS areas will be considered to enhance the development with native species lost due to development. It should be noted that there is capacity within the site for remedial planting of any trees removed, but this could be outside of the area of proposed development.

1.0 Introductions

1.1 Terms of Reference

- 1.1.1 Under instruction from McDermott Developments Ltd, an arboricultural report has been prepared to accompany a planning application for a proposed development of the hospital for the creation of residential housing estate.
- 1.1.2 The report will include a tree survey, undertaken in accordance with British Standard 5837:2012 *Trees in relation to design, demolition & construction – Recommendations*, and an appraisal of the trees located within the site boundaries and their possible constraint to development.

1.2 Method of Inspection

- 1.2.1 The inspection of the trees was undertaken at ground level using visual assessment (VTA) of the trees canopy, stem and basal area, based on methodology devised by Mattheck (1998). No diagnosis tools were used in the survey. Further investigation, including decay detection or climbing inspections, will be recommended where suitable. The survey is compiled in accordance with BS 5837. Root Protection Areas (RPAs) are based upon equations taken from section 4.6 of this document.

1.3 Qualifications & Experience

Andrew McLoughlin

- 1.3.1 I have a National Certificate in Arboriculture and a Higher National Diploma in Arboriculture. I am also a qualified teacher and a LANTRA instructor and assessor. Founder and Managing Director of Treestyle Consultancy since 2001. ISA Tree Risk Assessment Qualification, Quantified Tree Risk Assessor.

Up to date Curriculum Vitae (which include records of up to date Continued Professional Development - CPD) can be provided upon request.

2.0 Caveats and Limitations

- 2.1 This report is concerned only with trees in relation to construction. This report makes no attempt to provide a full health & safety inspection of the trees surveyed. It should not be seen as an alternative for a tree hazard assessment which is specific to minimising the risk & liability associated with trees. Potentially hazardous trees have been highlighted and appropriate recommendations made only where urgent action is required in the interests of public safety.
- 2.2 Any observations made with regards to the condition of built structures are from a layperson's view. No assessment of the potential influence of trees, upon buildings or other structures resulting from the effects of trees upon shrinkable load-bearing soils has been made.
- 2.3 The content of this report may become invalidated if a change of circumstance affecting the trees arises as a result of unusual weather conditions, particularly storms & high winds.
- 2.4 Structural or chemical soil disruption around the trees may invalidate the findings in this report, especially where there is significant damage to the rooting area of the tree.

- 2.5 The trees in question were surveyed using non-invasive methods (the trees were not exposed to any physical disruption such as drilling necessary for fractometer measurements). Recommendations regarding internal cavities and/or internal decay cannot be made from this report without further inspection. Chemical analysis of the soil was not undertaken. Comments made upon the structure of the tree are based upon inspection from ground level.
- 2.6 The content of this report may become invalidated by any 'Force Majeure' such as significant natural or man made disasters out of the control of any specific party.
- 2.7 The report is issued for the purposes of the instructing client in the form it is given and therefore no liability is accepted to any other party where reproduction, manipulation or reliance upon any incorrect representation of this report has been undertaken.

3.0 Survey Details

- 3.1 The survey took place on 10th May 2017.
- 3.2 The weather was clear and sunny with several NHS staff being on site. There were several constraints due to the trees being located in dense under growth or having a mass of epicormic growth around the base or Ivy covering stems and crowns.
- 3.3 No diagnosis tools were used in the survey. All measurements were calculated using the necessary instruments or estimated where access could not be gained.
- 3.4 All trees with a stem diameter greater than 150 mm located within the boundaries of the proposed site have been included in the survey.
- 3.5 The survey should be read in conjunction with the Tree Constraints Plan located in **Appendix A**.
- 3.6 Trees were visually assessed and all relevant information recorded on site. Trees were graded in accordance with BS 5837. Data collected on all trees surveyed can be found in **Appendix C**. An explanation of the tree schedule format can be found in **Appendix D**.

4.0 Site Overview

- 4.1 The site could be split into three areas. The first is the northern front area and having high amenity value because of the road and hospital, this area has an abundance of high quality trees with 40 years plus contribution. The southern part of the grounds is proposed to be developed and has a few high quality trees and hedges and with a couple of orchards. A disused and unmanaged area of land to the west houses some of the largest mature trees on site, here several trees require removing and others attention.
- 4.2 The trees on site provide significant amenity value to any future and current development.
- 4.3 The survey included 75 trees ranging from semi mature to mature and 2 hedges and 3 groups of trees. The breakdown of quantities for each retention category is as shown below in **Figure 1**. A cascade chart explaining the process used to reach these categorisations can be found in **Appendix E** Effort and resources to accommodate the trees into the design proposal should be allocated proportionately based on their retention category.

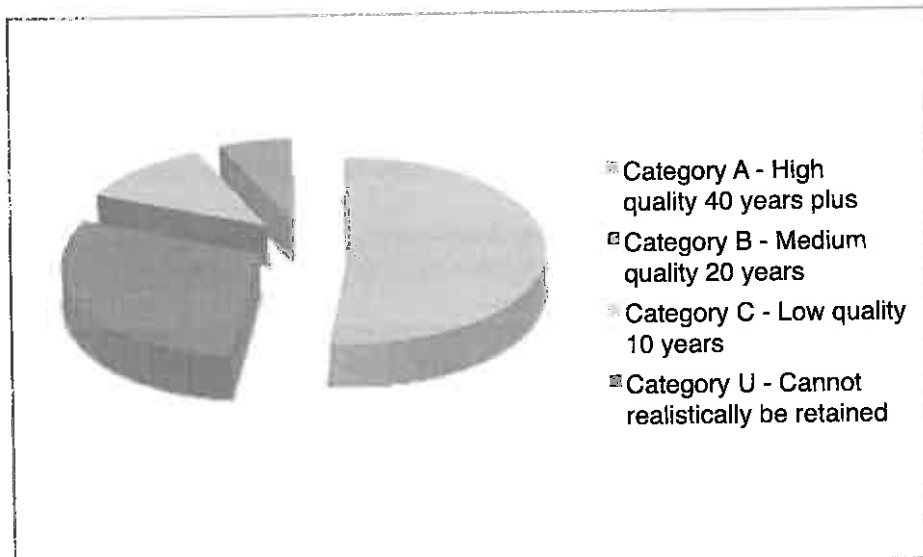


Figure 1. Breakdown of BS 5837 categorisation of all trees surveyed.

- 4.4 Generally speaking, the local planning authority is likely to accept the removal of trees in a poor condition or those with minimal safe useful life expectancy. This would normally include category 'U' & some category 'C' trees. Please note that the surrounding area's capacity for remedial planting of replacement trees should be considered when proposing tree removal.
- 4.5 No trees which have been identified as category 'U' have been given this categorisation due to their poor structural & physiological condition. It is estimated that trees with this categorisation have a limited life expectancy as their condition will deteriorate with time. However there are several small trees and shrubs within the hedges that will require thinning out.

5.0 Tree Retention Considerations

- 5.1 A summary of the trees in each of the four categories is given below in Table 1, for ease of reference.

Table 1. Summary of trees according to BS 5837 retention categorisation.

Tree Category	Tree Number
A	T1 T2 T3 T4 T10 H14 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T29 T30 T31 T32 T33 T34 T35 T36 T37 T38 T40 T41 T42 T43 T44 T45 T46 T47 T49 T50 T51 T52 T56
B	T6 T7 T8 T9 T11 G12 G13 G15 T17 T54 T55 T57 T58 T59 T63 T64 T68 T69 T70 T71 T73 T74
C	T5 T16 T18 T39 T48 H53 T62 T72 T75
U	T60 T61 T65 T66 T67

- 5.2 Should excavation work or the installation of utilities be required, work should be completed in a sympathetic manner as advocated in section 7.6 of BS 5837 & NJUG 'Guidelines for the Planning, Installation & Maintenance of Utility Apparatus in Proximity to Trees' in order to minimise any root damage/severance. Please see attached file - [njug_v4_trees_issue2.pdf](#) for details.
- 5.3 Under ideal circumstances, no hard surfaces should be positioned within the RPAs of any trees to be retained. These areas should be positioned outside of the required RPAs, or slightly reduced in size; this will also reduce pressure on the existing trees. If this cannot be undertaken, it is recommended that a sympathetic engineering solution be found in order to protect & retain existing tree roots. An example of an acceptable solution would be the use of a 'no dig' cellular confinement system & porous infill.
- 5.4 Any trees scheduled for retention will require protection in accordance with BS 5837, regardless of their initial retention category. This protection will require the trees being fenced-off in areas equal to the RPAs as shown within the Tree Constraints Plan. Fencing should be constructed in accordance with specifications set out in **Appendix F** (taken from figure 2 of BS 5837). This must be undertaken prior to any work commencing on site & maintained throughout the development process.
- 5.5 These construction exclusion zones (areas with the RPAs of retained trees) will be considered sacrosanct from any ground disturbance throughout the entire development process. Where access or construction is required within the RPA of any tree scheduled for retention, this should be completed in a sympathetic manner as not to cause detrimental effect on the tree's health. Such issues should be discussed in an Arboricultural Implications Assessment (AIA) & the required techniques included within an Arboricultural Method Statement (AMS) & Tree Protection Plan (TPP).

6.0 Conclusions

- 6.1 The retention and protection of the trees located to the north and front area is essential, due to there being some very high quality individual trees, groups of trees and avenues of trees. It is imperative that these areas protected and that the site is monitored throughout the duration of the construction. The proposed installation of a new road over the rooting areas of these trees can be constructed, again their protection during the construction and post construction is critical and this will require a cellular confinement system to be installed prior to work commencing. This cellular confinement system may also be used on the rooting areas of the trees to the west and in areas to the south if any of these trees and hedges are to remain.
- 6.2 Hedges and orchards located in the southern rear area have seen little maintenance, these if retained would benefit some maintenance. This also applies the G13, an area of trees and shrubs to the far south that would create an instant nature screening.
- 6.3 The area of trees to the west are large, mature to over mature and are in desperate need of attention. This area is dangerous with trees or parts of trees mechanically falling or has already failed. The removal of some of the trees is critical and are listed in the Tree Schedule in Appendix B, however their removal will open up areas within this stand of trees leaving the remaining with the increased potential of wind blown potential. This area will require a further tree assessment with a level three investigation, after the current advised works has been carried out.
- 6.4 Japanese Knotweed has been identified in the rooting areas of three trees, T19, T20 and T21. These three trees were listed as category A, in accordance to BS5837 (2012). Due to the constraints of the current road the Knotweed shares a large proportion of these category A trees rooting areas. Conversation with the Knotweed specialist revealed that the entire area and more would have to be excavated down 2.5m. Two issues arise, firstly the trees will not survive such excavation of their roots resulting in severe crown decline, fungal infection and a decrease in the tree stability. The delicate shallow rooting system of T21 Beech will definitely not survive such root disturbance.
- 6.25 All tree work carried out should be carried out in accordance with BS 3998:2010 *Recommendations for tree work* by a competent, qualified arborist. They must also hold sufficient public/employees liability insurance.