

Arboricultural Report, Impact Assessment & Planting Scheme

For Development Purposes (BS 5837: 2005)

at

**Land between
73 & 75 Park Street
Wombwell
Barnsley**

On Behalf of

Firth Partnership

Produced by

Crown Consultants Ltd



*Arboricultural
Consultants*

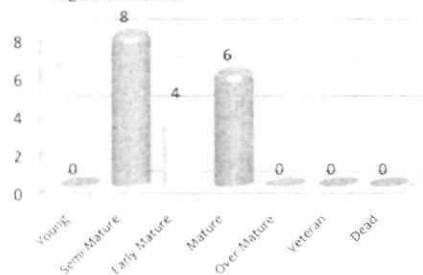
Dashboard

Welcome to the Dashboard. This section offers an overview of the report.

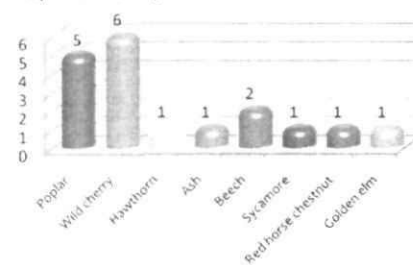
The pie charts to the right present key statistics found within our survey. The bar charts below indicate the age distribution, species distribution and the works we have recommended. Other sections within the dashboard are self explanatory.

Please read the introductory notes within Section 1 which explain how to navigate through the report and locate all the required information.

Age Distribution



Species Diversity



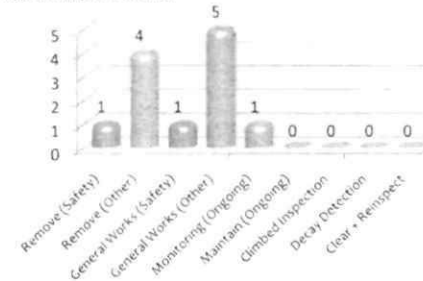
Tree Protection Status

We are informed that:

- There are no Tree Preservation Orders affecting trees within the site
- The site is not within a Conservation Area

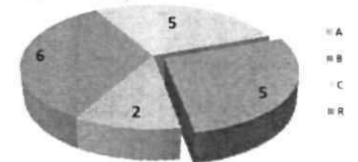
See Section 4 for further details.

Recommended Works

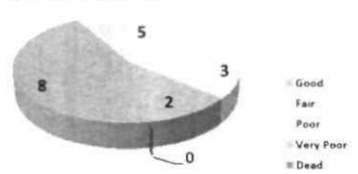


Trees surveyed as individual specimens: 15
groups: 3
hedges: 0
shrubs: 0
woodlands: 0

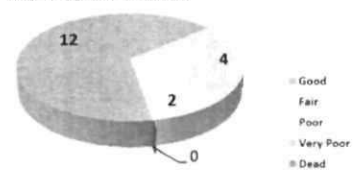
Retention Categories



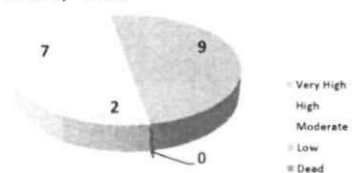
Structural Condition



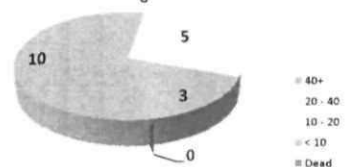
Physiological Condition



Amenity Values



Life Expectancy



Summary.

- It is proposed to construct four detached residential dwellings on land that is currently unused.
- A survey was conducted to BS5837. The condition of all trees on site was assessed and a Retention Category was allocated. Tree positions and Root Protection Areas are plotted on a Tree Constraints Plan.
- An Arboricultural Impact Assessment and Planting Scheme are also included within this report.
- The majority of trees within the site are self sown wild cherry trees, in poor condition, being leaning, multiple-stemmed and damaged. It is proposed to remove these trees since they are unsuitable for retention.
- It is also proposed to remove one hawthorn located centrally to the site.
- Towards the rear of the site are some poplar trees. It is proposed to retain these except for two hazardous specimens.
- The proposals have been designed around the constraints posed by the retained trees such that there shall be no impact on retained trees due to the design layout.
- It is proposed to plant eleven new trees as part of a post development landscaping scheme. The overall impact of the development shall be an improvement in the amenity levels afforded to the locality by trees.
- So long as tree protection fencing is installed as indicated on the Tree Protection Plan, there is no reason to expect any significant arboricultural impact since the retained trees are situated away from the proposed development.

These points are further discussed in sections 4 and 5.

Contact Details.

Local Authority: Barnsley MBC
Tree Officer: Ed Jowett
Arboricultural Consultant: Ivan Button (Crown Consultants Ltd).

Tel. 01226 772559
Tel. 01422 316660

Site Location: Land between 73 & 75 Park Street, Wombwell



Extent of the survey

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Appendix 2:	<i>Survey Methodology</i>
Appendix 3:	<i>Authors Qualifications</i>
Appendix 4:	<i>Explanation of Terms, Glossary</i>
Appendix 5:	<i>Further Information</i>
Appendix 6:	<i>Site Plans</i>

1. Introduction

1.1. Instructions and References

- 1.1.1. I am instructed by Richard Lawton of Firth Partnership to conduct an Arboricultural Survey to BS 5837: 2005 at Land between 73 & 75 Park Street, Wombwell and produce my findings in a report. I have also been instructed to produce an Impact Assessment and a Planting Scheme which are to be found at Sections 5 and 6.
- 1.1.2. I have been supplied with a topographical survey of the site with tree positions already plotted.
- 1.1.3. I have studied a plan depicting the development proposals and have transposed the relevant details on to drawing number Co8230/1 within Appendix 6.
- 1.1.4. I have liaised with Mr Lawton throughout the writing of this report in order to attain an adequate understanding of the project to enable me to carry out an accurate assessment.
- 1.1.5. I have indicated the location of Tree Protection Fencing on the plan within Appendix 6,
- 1.1.6. A résumé of my qualifications and experience are included within Appendix 3.

1.2. Scope and Purpose of the Report

- 1.2.1. This report is designed to accompany a planning application for development proposals at the above site. Its purpose is to assist and inform the planning process according to guidelines laid out in BS 5837 (2005).
- 1.2.2. *This report is based on a survey carried out from ground level. No climbed inspections or specialist decay detection was undertaken. Only trees with a stem diameter over 75mm are included which lie within the site boundary or close enough to be affected by development.*
- 1.2.3. Where appropriate, potentially hazardous trees are highlighted and appropriate recommendations are made. However, this report should not be seen as a substitute for a full *Safety Survey* or *Management Plan* which are specifically designed to minimise risk and liability associated with responsibility for trees.

1.3. Navigating Through the Report

- 1.3.1. Following this introduction is a general description of the site, followed by a record of all the tree data gathered during the survey. Section 4 deals with any safety issues and general tree maintenance and Section 5 discusses the impact of the development proposals. A planting scheme is at section 6. Photographs of the site are at Section 7.
- 1.3.2. People unfamiliar with BS 5837 surveys and reports shall find detailed guidance within the Appendices:
 - Appendix 1 describes our interpretation of the British Standard.
 - Appendix 2 explains how the survey is carried out.
 - Appendix 4 explains the terms used within the Tree Data Schedule and incorporates a glossary of all technical terms used throughout the report.
- 1.3.3. All persons should refer to the plans within Appendix 6.

2. Site Overview

2.1. Location

2.1.1. The site lies within a moderately populated residential area. The coordinates are 53°31'6.67"N, 1°23'21.01"W, the OS reference is: SE 4059902601 and the altitude is 41m above sea level.

2.1.2. My survey was limited to the area shown in Figure 1. I understand that this is sufficient to consider the impact of the proposed development.



Figure 1 Extent of the survey.

2.2. Site Use

2.2.1. The site is currently unused. It is bounded by Park Street to the front, a disused canal to the rear and residential properties to either side.

2.3. Topography

2.3.1. The site slopes gradually down from the road to the disused canal.

2.4. Amenity Value Overview

2.4.1. None of the trees within the site are considered to have a high amenity value. Towards the centre of the site are a group of very poor quality self seeded wild cherries. To the rear of the site are a row of 4 mature poplars, two of which are in a state of collapse. Adjacent these are a group of relatively young poplars. Three mature cherries exist close

to the north-west boundary, which offer a degree of visual amenity due to their screening properties.

- 2.4.2. The site would benefit from the planting of some ornamental garden species, especially close to Park Street and the boundaries with the adjacent residential properties.

3. Tree Data Table

The following pages contain information gathered for each tree during the survey conducted on 26th November 2009.

The reader should refer to Appendix 4 in order to correctly interpret the tree data.

All images within the Tree Data Table are diagrammatical only. Their purpose is to indicate, at a glance, the relative dimensions of each tree. The images are computer generated based on measurements recorded for stem diameter, crown spread, crown height and overall height. Often the image will reflect the individual species type. However, the specific form of the tree is not represented.

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)			Scaled Tree Diagram (m)	Notes	Recommendations				
					W	N	E			Priority	Inspect Freq (yrs)	Vigour	Physiological Condition	Life Expectancy (yrs)
					S								Structural Condition	Retention Category
T1	Mature Poplar	16	4	72	4	0	4		Position: Adjacent canal. Form: Single stemmed with a major lean and an unbalanced crown. History: No evidence of significant pruning. Defects: Very poor specimen.	Remove.		Moderate	Fair	10-20
	Populus sp					10				Moderate	n/a		Poor	R
T2	Mature Poplar	20	11	75	6	2	8		Position: Adjacent canal. Form: Single stemmed and leaning with an unbalanced crown. History: No evidence of significant pruning. Defects: Major limb failure has left a major tear wound at 6m.	Remove.		Moderate	Poor	10-20
	Populus sp					7				Moderate	n/a		Very Poor	R
T3	Mature Poplar	22	10	70	10	5	10		Position: Adjacent canal. Form: Multi-stemmed at 6m with a balanced crown. History: No evidence of significant pruning. Defects: Significant deadwood and broken branch to lower crown.	Crown clean.		Moderate	Good	40+
	Populus sp					5				Moderate	1		Fair	B
T4	Mature Poplar	22	6	82	8	10	8		Position: Adjacent canal. Form: Single stemmed and leaning with an unbalanced crown. History: No evidence of significant pruning. Defects: Major cavity at base (acceptable condition at present).	Crown clean.		Moderate	Good	40+
	Populus sp					0				Moderate	1		Fair	B
T5	Mature Wild Cherry	10	6	45	3	5	1		Position: Adjacent boundary with no 73. Form: Twin-stemmed at 4m with a sparse crown. History: Half of crown is dead. Defects: Major bark wound at ground level to 1.5m, x40% of girth.	Remove limb overhanging boundary at main fork. Monitor.	1	Low	Fair	<10
	Prunus avium					5				High			Very Poor	C
T6	Mature Wild Cherry	17	4	97 @ Base	6	8	6		Position: Adjacent boundary with no 73. Form: Twin-stemmed at ground level with a balanced crown. History: No evidence of significant pruning. Defects: Minor deadwood to lower crown.	Deadwood.		High	Good	40+
	Prunus avium					10				Low	3		Fair	B
T7	Early-Mature Wild Cherry	17	6	58 @ Base	5	4	1		Position: Adjacent boundary with no 73. Form: Twin-stemmed at 0.5m with a full crown. History: No evidence of significant pruning. Defects: Minor deadwood to lower crown.	Deadwood.		Moderate	Good	40+
	Prunus avium					6				Low	3		Good	B

Reference
G = Group
H = Hedge

Reference	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)			Scaled Tree Diagram (m)	Notes
					W	N	E		
					S				
G15	Semi-Mature					av			
	Poplar	av	av	av	2	2			Position: East corner of site. Form: Single stemmed and vertical with well-formed crowns. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Close growing group.
	Populus sp	14	4	20	2		2		
T16	Semi-Mature					2			
	Sycamore	10	5	25	2		2		Position: Situated on third party land. Form: Multi-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: Ivy prevented detailed inspection.
	Acer pseudoplatanus				2				
T17	Semi-Mature					4			
	Red Horse Chestnut	9	3	34	4		4		Position: Situated on third party land. Form: Twin-stemmed at 3m with a full crown. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Limited inspection.
	Aesculus carnea				4				
T18	Semi-Mature					4			
	Golden Elm	14	2	35	4		4		Position: Situated on third party land. Form: Single stemmed and vertical with a well-formed crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Attractive specimen.
	Ulmus 'Louis Van Houtte'				4				

Recommendations		Vigour		Amenity Value	
		Physiological Condition	Structural Condition	Life Expectancy (yrs)	Retention Category
Priority	Inspect Freq (yrs)				
No action required, some thinning would be advantageous.		High	Good	Moderate	40+
n/a	3		Good		C
No action required.		High	Good	Low	10-20
n/a	1.5		Fair		C
No action required.		High	Good	Moderate	40+
n/a	3		Good		B
No action required.		High	Good	High	40+
n/a	3		Good		

4. Tree Condition and Recommendations

This section gives an overview of the trees surveyed and highlights any safety concerns. Recommendations are made for management purposes and are independent of development proposals. The tree data schedule within the previous section should also be consulted as this gives a detailed description of individual specimens.

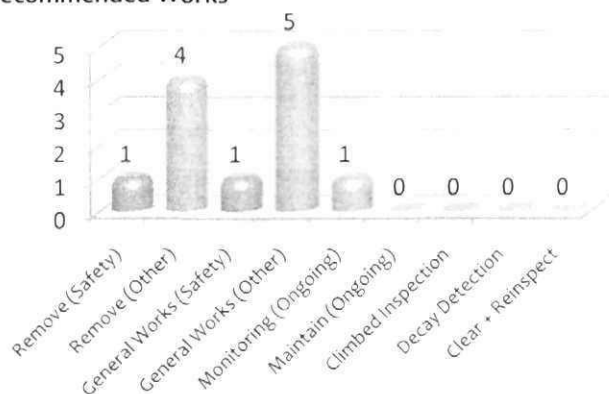
4.1. Summary of our findings:

- 4.1.1. T2 is potentially hazardous mature poplar with a very large tear wound to its stem where it has lost a major limb. This tree will require removal due to its hazardous condition (see photo 16 in Section 7). The adjacent mature poplar (T1) is also recommended for removal due to its extremely poor form (see photo 17).
- 4.1.2. The cherry, T8, has a severe lean over the adjacent boundary and is recommended for removal (see photo 12). Groups of wild cherries, G9 and G10 are recommended for removal due to their general poor condition and low amenity value (see photos 7 to 11).
- 4.1.3. One half of the crown of the wild cherry, T5, has died. This tree is potentially hazardous and requires works in order to make it safe. This should be done as a matter of high priority (see photo 13). There is also a very large bark wound extending from ground level to 1.5m which extends approximately 40% around the girth of this tree. This exposed timber is decayed to a depth of 2-3cm, this should be monitored and it is likely that the tree will require removal within the next 5-10 years.
- 4.1.4. Trees which are in an acceptable condition at present but which require the removal of deadwood and general crown cleaning are T3, T4, T6, and T7. Such work is of a relatively low priority.
- 4.1.5. Crown lifting and the removal of ivy is recommended for the hawthorn, T11, in order to encourage this tree to grow into an attractive specimen (see photo 3).

4.2. Work priority and future management.

- 4.2.1. The Tree Data Schedule at Section 3 details what works are required to individual trees in order to ensure that they are in an acceptable condition. The chart below summarises these works.

Recommended Works



Key:

Bars coloured red indicate hazardous trees.

Bars coloured orange indicate trees which may be hazardous and require further investigation.

Bars coloured green indicate trees which are not hazardous and the work is therefore of a lower priority.

4.2.2. The recommended works should be prioritised according to the table below:

Work Priority	Definition	Tree Number:
Urgent	As soon as possible	None
Very High	Within 1 Month	None
High	Within 3 Months	T5
Moderate	Within 1 year	T1, T2, T3, T4, G9, G10
Low	Within 3 years	T6, T7, T8, T11

4.2.3. Upon completion of these works and any subsequent recommendations, the trees shall be in an acceptable condition from a safety perspective. However, they should be regularly inspected according to the following schedule:

Inspection Frequency (years)	Tree Number:
0.5	None
1	T3, T4, T5
1.5	T13, T16
3	T6, T7, T11, T12, T14, G15, T17, T18

4.3. Tree protection status

4.3.1. On 27th November 2009, we were informed, by Rachael Pell of Barnsley Metropolitan Borough Council that:

- The site is not within a conservation area.
- There are no Tree Preservation Orders affecting trees within the site.

4.3.2. Heavy fines exist for carrying out unauthorised works to protected trees so we advise that further checks are made in case new TPOs have been created since the time of writing this report or we have been misinformed.

5. Arboricultural Impact Assessment

5.1. Overview of the Development

5.1.1. It is proposed to construct 4 detached residential dwellings. These will be served by a new access road from Park Street. Services for the site shall be located beneath the access Road. The proposed locations of the dwellings are overlaid onto our Tree Constraints Plan within Appendix 6.

5.1.2. The proposals have been designed to take into account arboricultural advice in order to minimise the impact on trees within, and adjacent to, the site.

5.2. Impact of Tree Loss / Pruning

5.2.1. The impact of tree removal is assessed below:

Tree N°	Age + Species	Height + Diameter	Condition	Amenity Value	BS 5837 Category	Comments
T1, T2	Mature	16,20m	Poor	Low	R	Large trees but in a state of collapse. They require removal for safety reasons not to facilitate the development
	Poplars	75cm				
T8	Early-mature	av 15m	Poor	Low	R	Severe lean over boundary. Not worthy of retention.
	Wild Cherry	44cm				
G9, G10	Semi-mature	av 9m	Poor	Low	R	Very low quality specimens. Not worthy of retention.
	Wild Cherry	15-20cm				
T11	Semi-mature	8m	Good	Low	C	Relatively small specimen set back from the road. Removal shall have a negligible impact on local amenity.
	Hawthorn	35cm (base)				

5.2.2. The above table shows that no significant tree removal is proposed to facilitate the development.

5.2.3. No pruning works are required.

5.3. Mitigation Planting

5.3.1. It is proposed to plant 11 new trees. A selection of species has been suggested to provide interest throughout the seasons and to soften the impact of the development viewed from Park Street and from the adjacent properties. The new trees are appropriately located so that they are sustainable and are not likely to be perceived as nuisance trees as they mature. The overall impact of the development shall be an improvement in the visual amenity afforded to the area by trees.

5.4.1. Adequate tree protection fencing shall need to be established before any construction activity takes place. The proposed fencing specification and location are indicated on the Tree Protection Plan. So long as the areas behind the fencing are treated as a Construction Exclusion Zones, there shall be no impact on retained trees due to the development.

5.5. Impact of Demolition / Removal of Surfaces

5.5.2. Soil stripping outside of the Root Protection Areas may take place using mechanical excavators. Within Root Protection Areas, it will be necessary to undertake soil stripping and removal of surface vegetation by hand.

5.6.1. The existing ground levels shall need to be maintained within root protection areas in order to prevent damage to retained trees.

5.7.1. No significant changes are proposed to surfaces over tree roots. No additional paths or driveways are proposed over rooting zones.

5.8.1. There is ample opportunity for services and drainage provision without the need to pass through any Root Protection Areas. The exact position of services should be agreed and installation engineers should be made aware of the need to keep trenches outside of RPAs.

5.9.1. The installation of overground services shall have no arboricultural impact due to the lack of trees positioned to the front of the property.

5.10. Impact of Street Lighting

5.10.1. If lighting is to be installed adjacent to the new access road, it will be necessary to agree the exact position of lampposts and underground cables with the local authority. Installation engineers should be made aware of the need to keep trenches outside of RPAs.

5.11. Impact of Foundations

- 5.11.1. The proposed buildings are all situated outside of Root Protection Areas so foundation design shall not be of any arboricultural concern.

5.12. Hazardous Materials

- 5.12.1. All hazardous materials (including cement and petrochemical products) will need to be controlled according to COSHH regulations in order to ensure there is no detrimental impact on tree health. Provision shall need to be made to ensure that cement and cement run-off are contained outside of all Root Protection Areas.

5.13. Boundary Treatments

- 5.13.1. I am not aware of any changes that are proposed to the existing boundary features close to trees.
- 5.13.2. If fences or hedges are to be installed within the RPAs of retained trees as part of a post development landscaping scheme, this must be done in a manner that involves minimal excavation. Post hole should be kept narrow, excavated by hand and relocated in exploratory holes reveal roots in excess of 25mm.
- 5.13.3. Boundary walls will not be acceptable over the RPA of retained trees.

5.14. Effect of Retained Trees on the Development

- 5.14.1. The retained trees are all situated at sufficient distances from the proposed development that they shall have minimal impact on the development.
- 5.14.2. Occasional maintenance of the beech tree, T13 will be required to maintain adequate clearance distances. Given the unbalanced canopy of this tree, such maintenance will serve to balance the tree.

5.15. Summary

- 5.15.1. The proposal has been well designed around the existing tree constraints. The only trees that require removal are Retention Category R trees which are not worthy of retention and one Category C tree.
- 5.15.2. The retained trees will not significantly impact on the dwellings and lighting levels shall be adequate.
- 5.15.3. Tree protection fencing will need to be installed prior to commencement in order to ensure that trees are not harmed during the construction phase. Proposed fence locations are indicated on the plan within Appendix 6.

5.16. Long Term Management

- 5.16.1. The poplars within G15 would benefit from some thinning (see photograph 18).
- 5.16.2. The beeches T13 and T14 may require occasional maintenance works (see photograph 6).

6. Planting Scheme

6.1. Tree Planting Schedule

6.1.1. In total it is proposed to plant 7 standard sized trees and 4 heavy standards as specified below:

Ref No	Species	N	Size	Root Spec
N1	Small Ash (Fraxinus excelsior)	1	Standard	100cm dbh
N2	Small Ash (Fraxinus excelsior)	1	Standard	100cm dbh
N3	Persian Ironwood (Parrotia persica)	1	Standard	100cm dbh
N4	Small Ash (Fraxinus excelsior)	1	Standard	100cm dbh
N5	Yellow Ash (Fraxinus excelsior)	1	Standard	100cm dbh
N6	Small Ash (Fraxinus excelsior)	1	Standard	100cm dbh
N7	Small Ash (Fraxinus excelsior)	1	Standard	100cm dbh
N8	Small Ash (Fraxinus excelsior)	1	Standard	100cm dbh

6.2. Tree Planting Specification

- 6.2.1. All stock shall be healthy and conform to BS 3936: 1992. Nursery Stock. Part 1: Specification for Trees and Shrubs. All stock to be materially undamaged, sturdy, vigorous, of balanced shape and without elongated shoots. Trees to be selected with a single, straight, stout stem and good graft union.
- 6.2.2. All species are to be true to type, no substitutes are to be made without the written consent of the Local Planning Authority.
- 6.2.3. Any approved planting operations within the RPAs of retained trees are to be undertaken using hand tools only. No tracked / wheeled machinery to be used. No chemicals of any description to be used. No topsoil stripping, lowering or raising of ground levels (including the spreading of topsoil prior to seeding or turfing).

- 6.2.4. Ground which has been lightly compacted during construction is to be cultivated to a depth of 300mm. A minimum area of 1m x 1m for each tree.
- 6.2.5. Where chemical contamination or heavy compaction has occurred, an appropriate amount of soil is to be removed and replaced with quality topsoil compliant with BS 3882. A minimum area 2m x 2m x 0.5m deep is to be replaced for each tree. Prior to backfilling with topsoil bases and sides of all excavation to be de-compacted/loosened with a garden fork or spade.
- 6.2.6. A planting hole slightly larger than the root ball/ root spread shall be excavated by hand. The edge of the planting hole shall be roughened with a spade and the base dug over to a depth of 150mm to improve drainage.
- 6.2.7. The planting hole shall be backfilled with the original soil material and lightly firmed to prevent air pockets. No soil improvers or fertiliser shall be added as this may inhibit successful establishment.
- 6.2.8. Trees shall be planted with stem base at ground level, *Standard* trees (or smaller) shall be single staked at 30 - 50cm above ground level and attached with adjustable and flexible tree ties. *Heavy Standards* (or larger) shall be double staked at 80 - 1200cm above ground level and attached with adjustable and flexible tree ties. Stakes shall be driven into the ground such that they avoid the root ball. Stakes to be of tanalised timber with a minimum diameter of 75mm for *Standard* trees and 100mm for *Heavy Standards*.
- 6.2.9. Spiral rabbit guards (60cm x 50mm, clear recycled PVC) to be affixed around the base of each tree.
- 6.2.10. Minimum area of 1.5m diameter around each tree to remain vegetation free. Seasoned woodchip or medium grade bark mulch to be installed to a depth of 100mm within this area to deter weed competition.
- 6.2.11. Trees to be planted late October to late March and well watered straight after planting.

6.3. Aftercare

- 6.3.1. Trees to be regularly watered during the first growing season and during prolonged dry spells for at least two seasons.
- 6.3.2. Following is a guide to watering requirements though in practice these are heavily dependent upon climatic conditions:
- All trees watered 3 times per month April through to September inclusive. During the October, November and March the frequency may be reduced to 2 times per month. During December, January and February the frequency may be reduced to once per month.
 - At each watering session heavy standards should receive 20 gallons, standards should receive 15 gallons. This equates to approximately 10 minutes and 7.5 minutes from a domestic hose at moderate pressure.
 - The entire area beneath the canopy should be watered.
 - After 2 years the trees should only require watering during periods of extended dry weather.
- 6.3.3. Tree ties to be checked annually and repaired / adjusted as required.
- 6.3.4. Stakes to be removed after 2 - 3 growing seasons.
- 6.3.5. Any trees which fail to become established are to be removed and replaced with a new tree of the same species and specification as the original.

7. Photographs

Photo 1. See the plan in Appendix 6 for photo locations



Photo 2.



Photo 3.



Photo 4.



Photo 5.



Photo 6.



Photo 7.



Photo 8.



Photo 9.



Photo 10.



Photo 11.



Photo 12.



Photo 13.



Photo 14.



Photo 15.



Photo 16.



Photo 17.



Photo 18.

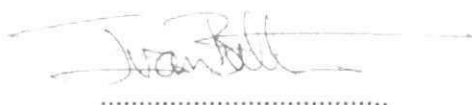


8. Signature

This report represents a true and factual account of the trees at

Land between 73 & 75 Park Street
Wombwell
Barnsley

Signed



Ivan Button N.C.H. (Arb), FDSO (Arb), BSc (Hons), P.G.C.E., M. Arbor. A.

on behalf of

Crown Consultants Ltd

Dated

8th December 2009



*Arboricultural
Consultants*

Appendix 1: Understanding BS 5837: 2005

Aimed predominantly at arboriculturalists, architects, developers and planners, this Standard offers a balanced approach to harmonising development with existing trees. It acknowledges the positive contribution trees may offer to a site, as well as the negative aspects of retaining inappropriate trees. The stresses that development may place on existing trees are recognised, and guidance is offered regarding solutions. The Standard suggests a three stage approach:

A1.1 Stage 1: Initial Survey and Report

This identifies the existing trees and allocates to each a **Retention Category** which takes into account amenity value, condition and realistic life expectancy. The categories are allocated independently of development proposals. Our interpretation of the retention categories is explained below:

A1.1.1 Retention Categories

A Category: Trees of high quality and amenity. Usually, mature trees with a significant life expectancy which would enhance any development. Retention of these trees is strongly encouraged.

B Category: Trees of moderate quality and amenity. Usually mature trees, or younger trees with exceptional form. Retention of these trees is desirable though the removal of occasional specimens may be acceptable.

C Category: Trees of low quality and amenity. The removal of these trees should generally be seen as acceptable in order to facilitate development.

R Category: Trees whose structural condition is such that they should be removed if development is to proceed.

A1.1.2 Occasionally trees are borderline and do not fall neatly into one of the categories A, B or C. In such cases we apply a superscript (^{+/}) such that:

C⁺ Indicates borderline C/B, though Category C is deemed to be the most appropriate.

B⁺ Indicates borderline C/B, though Category B is deemed to be the most appropriate.

A1.1.3 The British Standard suggests that each of the A, B and C categories should be further subdivided (A1, A2, A3, B1, B2, B3 etc) such that subcategory 1 denotes mainly arboricultural values, subcategory 2 denotes mainly landscape values and subcategory 3 denotes mainly cultural values (including conservation). Multiple subcategories may be used.

Our experience suggests that these subdivisions lack clarity and often confuse the reader. Within this report subcategories are **not** denoted. It can be assumed that all retention categories are dictated by the individual qualities of each specimen. Where appropriate, the use of phrases such as 'Part of a formal group', or 'Has a high ecological value', or 'Offers good screening to the site' are incorporated into the observation section of the Tree Data Schedule at Appendix 5. We believe this conveys all relevant landscape and cultural information without unnecessary confusion. Any person wishing clarification regarding subcategories of any trees surveyed should contact the author.

Arboricultural Impact Assessment
Appendix 1

A1.1.4 Tree Constraints Plan (TCP). This indicates the position, crown spread, retention category and root protection area (RPA) of each tree and is used to inform where development may proceed without causing damage to trees.

The RPA marked on the TCP is the area within which the majority of roots are expected to lie. No significant detrimental effects are expected if the RPA can be completely avoided. The Standard suggests a simple formula whereby "radius of RPA" = "12 x stem diameter". This is modified (according to the Standard) to take into account specific factors which influence rooting activity, e.g. underground structures. In exceptional circumstances it may be acceptable to make incursions into the RPA, though this should be discussed with an arboriculturalist and may ultimately lead to the refusal of planning consent.

The British Standard suggests that shading should be indicated on the TCP, denoted as a circle-segment drawn northwest to due-east with a radius equal to the height of the tree. We deem this to be misleading since it does not reflect true shading patterns which vary dramatically according to tree form, time of year and time of day. For these reasons we do not generally illustrate shade constraints according to this formula, though if requested we will provide them.

A1.2 Stage 2: Arboricultural Impact Assessment

This type of report identifies and evaluates the impact that development may have on existing trees and vice versa.

A1.3 Stage 3: Arboricultural Method Statement

This type of report indicates the necessary methodology required to protect trees from potential damage during the development process. Typical issues addressed are direct damage to trunk and branches, by cranes or other equipment, damage to roots caused by installation of underground services or foundations, and the use of chemicals which are hazardous to tree health, e.g. cement.

One of the primary concerns of this type of report is soil compaction caused by traffic passing over tree rooting areas. This is easily overlooked by developers, though it prevents roots from accessing oxygen and may lead to a significant deterioration in tree health.

A *Method Statement* is often requested by local authorities during the latter stages in the planning process and may be enforceable as part of the planning conditions. It is essential that a realistic proposal is put forward which balances tree protection requirements with the practicalities of construction.

Appendix 2: Survey Methodology

- A2.1 A ground level visual survey was carried out using the *Visual Tree Assessment* technique described by Mattheck and Broeler (1994) and endorsed by the Arboricultural Association (LANTRA Professional Tree Inspection course, 2007).
- A2.2 Structural condition is assessed by inspecting the stem and scaffold branches from all angles looking for weak branch junctions or symptoms of decay. Particular attention is paid to the stem-base. Cavities are explored using a metal probe in order to assess the extent of any decay. If this is not possible further inspection is recommended in the form of a climbed inspection or using specialist decay detection equipment.
- A2.3 The physiological condition is assessed by inspecting the stem, branches and foliage for symptoms of disease. The overall vigour of the tree is also taken into account.
- A2.4 Where the condition of a tree is deemed to be unacceptable, recommendations are made according to a scale of priority in order to reduce the liability of the owner. The position of the tree and its potential targets are taken into account.
- A2.5 Measurements are obtained using a diameter tape, clinometer, distometer and loggers tape. Where this is not practical measurements are estimated.
- A2.6 Some trees are surveyed as groups, though this is avoided close to areas likely to be developed.
- A2.7 Finally, a *Retention Category* was allocated as described in Appendix 1.1.1.

Appendix 3: Author's Qualifications

Qualifications & Experience of Ivan Button N.C.H. (Arb), FDSc (Arb), BSc (Hons), P.G.C.E., M. Arbor. A.

Construction

Between 1983 and 1990 Ivan worked within the construction industry and received training in a broad range of practical building skills and general construction principles. In 1989 Ivan obtained a BSc (Hons) at Leeds University followed by a P.G.C.E at The University of Wales in 1990. Ivan returned to work within the construction industry and expanded his understanding of construction principals.

Arboriculture

In 1996 Ivan obtained a NCH (Arboriculture) at the University of Lincoln and became a member of the Arboricultural Association. He then trained as an Arboricultural Consultant before establishing a tree surgery and landscaping business in 1998. In 2005 Ivan commenced full time employment with a leading Arboricultural Association approved consultancy and soon adopted a senior role responsible for five consultants.

Ivan is now the Director and Principal Consultant of Crown Consultants Ltd.

Ivan has produced numerous Arboricultural Reports for the purposes of Development, Safety, Management, Mortgage, Subsidence, Mitigation and Litigation.

He is accredited as a LANTRA *Professional Tree Inspector*. A qualification produced in association with the Arboricultural Association and generally recognised as appropriate for all levels of tree inspection.

He obtained a foundation degree in arboriculture at the University of Lancashire, which he passed with distinction.

He is a member of the Consulting Arborist Society and is listed within their areas of professional expertise for QTRA and as an expert witness.

Ivan is a professional member of the Arboricultural Association and the International Society of Arboriculture.

He is a licensed Quantified Tree Risk Assessment user.

Ivan has undertaken professional expert witness training accredited by the University of Cardiff and is registered as a Sweet and Maxwell Checked Expert Witness 2008.

Ivan currently acts as Local Authority Tree Officer for Barnsley Metropolitan Borough Council.

Appendix 4: Explanation of Tree Data and Glossary

This section explains the terms used in the **Tree Data Schedule** within Section 3.

A4.1 General Observations

A4.1.1	Numbering System:	Each item of vegetation has its own unique number prefixed by a letter such that T1=Tree 1, G2=Group 2, H3=Hedge 3 and W4=Woodland 4, S5=Shrub 5.
A4.1.2	Age Categories:	Usually less than 10 years old.
	Young	Significant future growth to be expected, both in height and crown spread (typically below 30% of life expectancy).
	Semi-Mature	Full height almost attained. Significant growth may be expected in terms of crown spread (typically 30-60% of life expectancy).
	Early-Mature	Full height attained. Crown spread will increase but growth increments will be slight (typically 60% or more of life expectancy).
	Mature	A level of maturity whereby significant management may be required in order to keep the tree in a safe condition.
	Veteran	As for veteran except management is not considered worthwhile.
	Over Mature	
A4.1.3	Species:	Common names and Latin names are given.
A4.1.4	Height:	Measured from ground level to the top of the crown.
A4.1.5	Stem Diameter:	Taken at 1.5m above ground level where possible. On multi-stemmed trees this measurement may be taken at ground level, though usually an indication of the number of stems and average diameter is given, e.g. 3 x 30cm.
A4.1.6	Crown Height:	Measured from ground level to the height at which the main crown begins. Where the crown is unbalanced it is measured on the side deemed to be most relevant. This is usually the side facing the area of anticipated development.
A4.1.7	Tree Diagram:	This scaled drawing is computer generated based on measurements taken for stem diameter, crown height and spread, and overall height. It is designed to help the reader rapidly assess the data. It is not an accurate representation of the form of the tree.
A4.1.8	Crown Spread:	Measured N, E, S & W, taken from the centre of the stem and usually rounded up to the nearest metre.
A4.1.9	Observations:	If a tree's position is considered to be relevant it will be commented upon (e.g. overhanging a children's play area). Tree form and pruning history are also recorded along with an account of any significant defects. Defects and descriptive terms are dealt with in more detail at the end of this section.
A4.1.10	Recommendations:	Usually based on any defects observed and intended to ensure that the tree is in an acceptable condition.
A4.1.11	Priority Scale:	Depending upon the threat posed by the tree, and the likelihood of failure, recommendations should be carried out according to the following priority scale:
	Urgent	To be carried out as soon as possible.
	Very High	To be carried out within 1 month.
	High	To be carried out within 3 months.
	Moderate	To be carried out within 1 year.
	Low	To be carried out within 3 years.
A4.1.12	Inspection Frequency:	An interval of 6 months, 1 year, 1.5 years or 3 years is allocated before the next inspection is due. Wherever practical, consideration should be given to seasonal changes so that deciduous trees are not always surveyed in winter when they have no leaves, or in summer when leaves may obscure branches within the upper crown.
A4.1.13	Vigour:	An indication of growth rate and the tree's ability to cope with stresses:
	High	Having above average vigour.
	Moderate	Having average vigour.
	Low	Having below average vigour.
	Very Low	Tree is struggling to survive and may be dying.
A4.1.14	Physiological Condition:	
	Good	Healthy and with no symptoms of significant disease.
	Fair	Disease present or vigour is impaired.
	Poor	Significant disease present or vigour is extremely low.
	Very Poor	Tree is dying.
A4.1.15	Structural Condition:	
	Good	Having no significant structural defects.
	Fair	Some defects observed though no high priority works are required.
	Poor	Significant defects found. Tree requires monitoring or remedial works.
	Very Poor	Major defects which will usually require significant remedial works or tree removal.
A4.1.16	Amenity Value:	
	Very High	Exceptional specimen, observable by a large number of people.
	High	Attractive specimen, observable by a significant number of people.
	Moderate	One of the above factors is not applicable.
	Low	Unattractive specimen or largely hidden from view.
A4.1.17	Life Expectancy:	The estimated number of years before the tree may require removal. Classified as (<10), (10-20), (20-40), or (40+).
A4.1.18	Retention Category:	These are explained in detail in Appendix 1.

A4.2 Evaluation of Defects

Cavities, wounds, deadwood etc are all evaluated as follows:

Major	Such that structural integrity is, or will become, compromised and the tree is, or will inevitably become, hazardous.
Significant	A defect that may over time become a major defect, though not necessarily so. This will depend on the vigour of the tree and its ability to deal with decay etc.
Minor	A defect that is not likely to compromise the tree's structural integrity.

General Glossary

Adaptive growth	In tree biomechanics, the process whereby wood formation is influenced both in quantity and quality by the action of gravitational forces and mechanical stresses on the cambial zone.
Aerobic	Conditions in which oxygen is freely available, or to biomechanical processes that depend on the presence of oxygen.
Anaerobic	A condition marked by the absence of oxygen; Generally such areas are unsuitable for normal life and growth of plant tissues. These sites tend to be populated by bacteria capable of surviving low oxygen conditions often associated with Slime Flux.
Arboriculture	The culture and management of trees as groups and individuals primarily for amenity and other non-forestry purposes.
Arborist	A person possessing the technical competence through experience and related training to provide management of trees or other woody plants in a landscape setting. Generally involved with the development or management of trees for visual amenity or land management rather than the growth of trees for product or profit.
Barrier zone	A layer within an annual increment of wood which contains abnormal xylem cells, laid down by the cambium in response to wounding or other trauma.
Body language	In trees, the outward display of growth responses and or deformation in response to mechanical stress.
Bole	Or Trunk, the main stem of a tree below its first major branch.
Bracket	A type of fruiting body produced by various fungal species, plate like to hoof like in shape and often a one sided attachment to the wood or bark.
Branch bark ridge	A ridged area located at the union of a branch to a trunk or stem.
Branch Collar	Trunk tissue that forms around the base of a branch between the main stem and the branch, or between a main branch and a lateral branch. As a branch decreases in vigour or begins to die, the collar usually becomes more pronounced and completely encircles the branch.
Brown Rot	Form of decay where cellulose is degraded, while lignin is only modified.
Buttress Root	Roots that emerge from the base of the tree stem, normally large and well developed that rapidly reduce in diameter to create the Root Plate this offers structural support for the tree. Buttress roots divide rapidly forming the connection between the stem and the transport roots.
Cabling Bracing	Installing cables within the crown of a tree to prevent collapse.
Callus	Undifferentiated cells often formed at the edges of recent injuries. This tissue quickly becomes differentiated, forming cells of the type characteristic of that position on the tree (e.g. forming wood, bark, roots, etc.) see wound response tissue.
Cambium	A thin layer of actively growing and dividing cells, located between the xylem (sapwood) and bark of a plant; the part responsible for radial growth of a tree stem or branch.
Canopy	The topmost layer of twigs and foliage in a woodland, tree or group of trees.
Canker	A localised area of dead bark and cambium on a stem or branch, caused by fungal or bacterial organisms, characterised by woundwood development on the periphery. This may be annual or perennial.
Cavity	An open and exposed area of wood, where the bark is missing and internal wood has been decayed and dissolved.
Chlorotic	Also Chlorosis. A condition of the plant marked by yellowing of normally green foliage, often indicating nutrient deficiency or plant dysfunction.
Clinometer	Devices that measures vertical angles, and provides direct height measurements of objects by triangulation.
Co-dominant stems/trunk	Are forked branches or trunks of nearly the same size in diameter and lacking a normal branch union.
Compacted soils	Soils in which the air-space (oxygen space) has been reduced or eliminated, reducing water infiltration and percolation, reducing root presence and inhibiting new root development.
Compartmentalisation	The physiological process that creates the chemical and mechanical boundaries that act to limit the spread of disease and decay organisms.
Compression Failure	Localized buckling of fibres and other longitudinal elements produced by compression of wood along the grain; compression failures sometimes develop in standing trees.
Compression Strength	The ability of a material or structure to resist failure when subjected to compressive loading; measurable in trees using special drilling devices
Compression Wood	Abnormal wood formed on the lower side of branches and curved stems, with physical properties different from normal wood.
Conservation Area	In Great Britain, designated areas of architectural or historical interest, in which there are special procedures for planning applications. Additionally tree works cannot generally be undertaken without prior notification (Currently 6 weeks) to the relevant local planning authority. See also Tree Preservation Orders.
Core Sample	A sample of wood extracted from a trunk or branch, using an increment borer tool. The resulting core can be analysed for characteristics of growth, wood strength, structure, decay, and for species identification.
Crotch	The union of two or more branches; the auxiliary zone between branches.
Crown	The upper canopy of a tree, including upper trunk, scaffold branches, secondary branches, stems and leaves.
Crown lifting / raising	Crown Lift The removal of the lowest branches, usually to a given height. It allows more residual light and greater clearance underneath for vehicles etc.
Crown reduction	The reduction of a tree's height or spread while preserving its natural shape.
Crown thinning	The removal of some of the density of a tree's crown, usually 5-25% allowing more light through its canopy and reducing wind resistance.
Deadwood (noun)	Deadwood is often present within the crown or on the stems of trees. It may be an indication of ill health, however, it may also indicate natural growth processes. If a target is present beneath the tree, deadwood may fall and cause injury or damage and should be removed, otherwise deadwood can remain intact for conservation purposes (insects, fungi, birds etc.).
Deadwood (verb)	The removal of dead branches from a tree's canopy, usually of a specified size (in diameter).
Decay	Progressive deterioration of organic tissues, usually caused by fungal or bacterial organisms, resulting in loss of cell structure, strength, and function. In wood, the loss of structural strength.
Decay Detection	The assessment of decay within a tree has been traditionally difficult, but recent advances have made it possible to achieve accurate representations of the internal section of a tree in both 2D and 3D, removing doubt over the condition of the tree and allowing accurate management decisions.
Decurrent	In trees a, system of branching in which the crown is borne on a number of major widely spreading limbs of similar size. In fungi relates to toadstools whose gills run down the stem and leaves and other plant organs, which extend down the stem.
Defect	In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment.
Defoliation	The losing of plants foliage.

Dieback	Progressive death of buds, twigs and branch tissues, on individual limbs resulting in Deadwood, or throughout the canopy, extreme cases can result in Stag Heading.
Dripline	A projected line on the ground that corresponds to the spread of branches in the canopy; the farthest spread of branches.
Epicormic shoots	Fast growing, weakly attached shoots/branches that often grow as a response to stress factors upon a tree or branch removal.
Excurrent	In trees, a system of branching that a single leader remains dominant, through the control of lateral branches.
Failure	In connection with tree hazards, a partial or total fracture within the wood tissue or loss of cohesion between roots and soil. (In total failure affected parts will snap or tear away completely, Partial failure there is a crack or deformation, which results in an altered distribution of mechanical stress.
Feeder Roots	Fine fibrous Water and nutrient absorbing roots located in the outer root system.
Flush-Cut	In trees and shrubs, a pruning cut close to the parent stem, which removes the branch bark ridge.
Foliage	The live leaves or needles of the tree; the plant part primarily responsible for photosynthesis.
Formative pruning	The trimming of a tree to remove weaknesses and irregularities which may lead to problems. The formative pruning operation is aimed at reducing the potential for future weaknesses or problems within the tree's crown.
Gall	An abnormal, disorganized growth of plant tissues, caused by parasitic or infectious organisms such as insects, fungi, bacteria, or viruses.
Girdling	In woody plants, any form of damage that destroys the bark and / or the Cambium all the way around the stem, branch or root, normally resulting in death of the damaged section.
Girdling Root	In woody plants, a root that grows across the buttress, or across other roots, eventually causing constriction of the radial growth.
Growth Increment	The incremental growth added as new annual ring develops each season over existing wood. This is seen as (growth) rings in cross-sections of wood.
Hazard beam	An upwardly curved branch in which strong internal stresses may occur without the compensatory formation of extra wood (longitudinal splitting may occur in some cases).
Heartwood	Inner non functioning tissues that provide structural support to trunk.
Heave	In relation to shrinkable clay soils, expansion due to rewetting of a volume of soil previously subjected to the removal or water by plant / trees following felling or root severance. Also in relation to root growth, the lifting of pavements and other structures by radial expansion. Also in relation to tree stability, the lifting of one side of a wind rocked root plate.
Herbicide	A chemical compound that causes the death of a plant.
Included Bark	Bark that becomes embedded in a crotch between branch and trunk or between co-dominant stems, usually found in narrow or tight crotches, and causes a weak structure.
Increment Borer	A tool that cuts and extracts a narrow cylinder of wood from a tree for analysis of the wood tissue and growth increments.
Leader	The primary terminal shoot or trunk of a tree.
Limb	A large lateral branch growing from the main trunk or from another larger branch.
Lion Tailing	Often the result of poor pruning practices; the main leader or branches are largely devoid of side branches, growth is restricted to the end of branches and is likely to suffer damage through end loading.
Lopping	In trees, a general term that related to the removal of branches from a tree.
Monitoring	Due to the relative life span of trees in relation to our own, long-term monitoring provides a valuable insight to the health of trees, identifying decline and or stabilisation and or improvement.
Mulch	A material laid over the root system of a tree to help conserve moisture within the soil. Additionally it may help control the development of weeds close to the tree.
Mycelium	A mass of growing filaments (hyphae) formed by fungi.
Mycorrhizae	The symbiotic relationship between roots and certain beneficial fungi. Mycorrhizae are the combined root / fungal growth.
Natural Pruning	The shedding of a branch or twig that has died back naturally and has become decayed at or near its base.
Necrosis	The failure and subsequent death of a branch, leader or tree.
Negligence	A failure to take reasonable action to deal with a hazard to prevent damage to property or person.
Nutrient	Substances that are absorbed by living organisms for the maintenance of internal processes.
Occluding tissue	The general term of wood, cambium and bark that develop around the site of a wound on a woody plant
Pathogen	A microorganism that causes diseases within another organism.
Phloem	The principle conductive tissue that the products of Photosynthesis are transported around the plant
Photosynthesis	The process were light energy is used to create energy (Carbohydrate) for use within the plant.
Pollard	A term for a pollarded tree.
Pollard head	The swollen section of branch / stem that forms behind the pollarding cut.
Pollarding	The complete or partial removal of the crown of a young tree so as to encourage the development of numerous branches either for amenity or historically as fodder, repeated management is required cyclically to maintain the feature
Prune or Pruning	Selective removal of woody plant parts of any size, using saws, Loppers, Secateurs, or other pruning tools.
Reaction Wood	Wood with distinctive anatomical characteristics, formed in parts of leaning or crooked stems and in branches to provide additional strength / support. In hardwoods, tension wood usually forms. In conifers, compression wood is usually found.
Reaction Zone	A zone normally darker than surrounding wood that denoted the boundary often a defensive one between functional sapwood and dysfunctional or decaying wood.
Re-grading	The raising or lowering of a soil profile from its original grade.
Rejuvenation	Where historically or environmentally important trees are to be retained, their life spans can be significantly extended through the adoption of particular pruning regimes.
Rejuvenation root treatment	Management of the root zone can have a significant positive effect upon the health of trees. Physical, mechanical and biological approaches are available and can be prescribed in accordance within the constraints of individual sites.
Remedial pruning	The removal of old stubs, deadwood, epicormic growth, rubbing or crossing branches and other unwanted items from the tree's crown.
Resistograph	Invasive decay detection technique whereby the resistance offered by the timber to a spinning probe is measured and plotted.
Rib	In tree body language, a long narrow, axial protuberance which often over lays a crack.
Ring Barking	Artificial Girdling of the stem, to result in the death of a tree. May be used in habitat creation were the retention of dead standing trees is required.
Rod Bracing / Bolting	Traditionally, this has relied upon the Installation of steel rods or bolts through the stems or limbs, to reduce twisting or splitting of the wood. The installation of such features does require legal interpretation.
Root Barriers	Both Buildings and services can benefit from the installation of root barriers to protect a soil volume from the ingress of roots.

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Root Collar	The basal area of the tree; transition zone from trunk to root. Also sometimes called trunk flare.
Root Plate	The primary support area for the tree; an area of the root system close to the base that structurally anchors the tree to the soil.
Root Rot	Either a general term for decay within the wood of the lower stem / buttress roots, or a disease in which the fine roots are killed.
Root System	The portion of the tree containing the root organs, including buttress roots, transport roots, and fine absorbing roots; all underground parts of the tree.
Root Zone	The area and volume of soil around the tree in which roots are expected. May extend to three or more times the branch spread of the tree, or several times the height of the tree.
Sail Area	That area or the tree subjected to wind load.
Sanitation	In plant disease control, the removal of material that could a source of infection by a pathogen. Removal of diseased plant parts, such as fallen leaves and twigs, and pruning of dead and diseased branches. Diseased parts should be burned or buried under soil or active compost.
Sapwood	Xylem wood tissue, usually light in colour, representing the outer growth rings of the wood. Usually living, reactive wood tissue, in a healthy tree. See heartwood
Scaffold limbs / scaffold branches	The branches that from the main network framework of the crown of a tree.
Senescent	A decline in growth and vigour due to age or stress factors.
Shrub	A woody plant that branches at or close to the ground level and so does not have a single stem.
Slime Flux	Relating to a toxic condition from the spreading of bacteria or their products from a source of infection; characterized by malodorous gases, or salt deposits upon the bark. If these products enter the sap stream, localised vessel necrosis can result, usually associated with anaerobic conditions.
Soft Rot	A kind of wood decay, where a fungi degrades cellulose within the cell wall, without causing overall degradation.
Soil Compaction	The compression of soil, causing a reduction of pore space and an increase in the density of the soil. Air is squeezed out and nutrients become locked. Tree roots cannot grow in compacted soil.
Soil Profile	The characteristics of a soil as regards to relative depth; the changes in soil texture and composition that occur with depth.
Soil Texture	The classification of the constituent particles of soil; includes sand, silt and clay particles. Directly related to soil porosity, permeability, and aeration.
Sonic Decay Detection	Non invasive method whereby sound waves are passed through the tree and the speed is measured. Slow speeds indicate decay and a tomography picture representing the inner stem is produced.
Stag Heading	In a tree, a state of dieback where dead branches protrude beyond the current living crown.
Stress	In plant physiology, conditions where one or more physiological functions are not working within normal parameters.
Stump Grinding	The removal of a tree stump using a specialist grinding machine.
Subsidence	In relation to vegetation, the removal of water by plant growth resulting in localised shrinkage in the soil volume.
Sucker	Same as sprout.
Suppressed	Trees which are dominated by surrounding vegetation and whose crown development is restricted from above.
Systemic	Affecting the whole plant or organism. A systemic compound is carried throughout the entire plant to all parts through the vascular system.
Target	Any person or object within reach of a falling tree or part of a tree that may be injured or damaged.
Target Pruning	The pruning of a branch where the wound affects only branch material, often result in a target shaped wound.
Tension Wood	Reaction wood typically formed on the upper side of limbs or curved stems; characterized by lack of cell wall lignifications (higher ratios of cellulose to lignin).
Tight Union / Tight Crotch	Also, narrow crotch. A crotch with a narrow angle between branches, often having included bark.
Tomography	The comparison of sound or stress waves through the tree allows the creation of a 2D or 3D representation of the internal structure of a stem or branch section and highlights areas of damage. Virtually non-injurious.
Topography	The configuration of surface features, including the vertical and horizontal relationships of the ground and other features.
Topping	Cutting large limbs back severely, without regard to form or habit of the tree. Cuts are usually made between lateral branch nodes. This practice is extremely injurious to trees, and promotes decay and structural weakness within the crown.
Tree	A woody plant that typically has a single stem, at maturity has a height of at least 4 metres and a stem diameter at breast height of at least 75mm.
Tree Preservation Order	In Great Britain, an order made by the local planning authority, where consent must be gained before undertaking all but exempt works to a tree.
Trunk Flare	The basal area of the trunk that flares or widens, and merges with the main roots. See root collar
Veteran Tree	Veteran trees are often found in large parks or estates and commonly affected by extensive decay or have been subject to extensive works. These trees are retained for historical importance and often pose greater risk than normal, which is generally justified. They need careful management and often propping or bracing to support them, some require fencing to limit access.
Vigour	Active, healthy growth of plants: ability to respond to stress factors.
Visual Tree Assessment (VTA)	An assessment of the mechanical condition of trees based upon their 'body language'. Trees are dynamic and respond to faults / decay / environmental factors in various ways, these responses can be indicative of structural integrity.
Wetwood	An infection caused by bacteria living inside the plant tissues. The bacteria ferment the plant fluids, resulting in death of nearby cells, and often causing exudations of fluid from the bark, often referred to as a Slime Flux.
White Rot	A kind of wood decay where a fungi attacks the lignin within the wood matrix
Wind loading	Forces placed upon tree canopy, branches, trunk and roots of a tree under windy conditions.
Wind Throw	The failure of a tree due to wind loading.
Witches Broom	A deformed or unusual growth of twigs from adventitious buds, caused by insects, disease, or dieback of twigs and buds.
Wood	Secondary Xylem; the main structural support and water conducting tissue of trees and shrubs.
Wound Response Tissue	Also Occluding Tissue, Wound Wood or Callus. Differentiated wood tissue that grows around the margins of a wound or injury.
Wound Wood	Wood with atypical features, formed in the vicinity of a wound and a term to describe the occluding tissues around a wound
Xylem	Plant tissues with special function of translocation of water and dissolved nutrients.

Appendix 5: Further Information

Building Near Trees – General

National Joint Utilities Group publication # 10 (1995), *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees*. Downloadable at www.njug.demon.co.uk/pdf/NJUG%20Publication10.pdf

NHBC Standards Chapter 4.2., *Trees and Buildings*.

Horticulture LINK project 212. (University of Cambridge, 2004), *Controlling Water Use of Trees to Alleviate Subsidence Risk*.

Tree Planting and aftercare

See www.trees.org.uk/leaflets.php# for downloadable leaflets on selecting a garden tree, planting, aftercare and veteran tree management.

British Standards

BS 5837: 2005. *Trees in Relation to Construction – Recommendations*.

BS 3998: 1989. *Recommendations for Tree Work*.

BS 3936: 1992. *Nursery Stock. Part 1: Specification for Trees and Shrubs*.

BS 3936: 1992. *Nursery Stock. Part 10: Specification for Groundcover Plants*.

BS 4043: 1989. *Transplanting Root-balled Trees*.

BS 8004: 1986. *Foundations*.

BS 8103: 1995. *Structural design of Low-Rise Buildings*.

BS 8206: 1992. *Lighting for Buildings*.

BS 3882: 2007. *Topsoil*.

BS 4428: 1989. *General Landscaping Operations (excluding hard surfaces)*.

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P. J. Littlefair, *Measuring Daylight, BRE Information Paper 23/93 f3.50*. (Advises on measuring daylight under the real sky or an artificial sky, allowing for the changing nature of sky light).

High Hedges

Communities and Local Government website with numerous downloadable documents, from: <http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/>

Tree Specific Websites

www.crowntrees.co.uk

www.trees.org.uk

www.rfs.co.uk

www.treehelp.info

www.woodland-trust.org.uk

www.treecouncil.org.uk

Crown Consultants site containing useful information

Arboricultural Association

Royal Forestry Society of England, Wales and N. Ireland

The Tree Advice Trust

The Woodland Trust

The Tree Council

Appendix 6: Site Plan

The plan(s) referred to within the report follow this page.

Tree Constraints Plan

Tree Protection Plan & Planting Plan

Construction Exclusion Zone

[illegible]