



Land behind Innovation Centre, Havant

Arboricultural Survey

For

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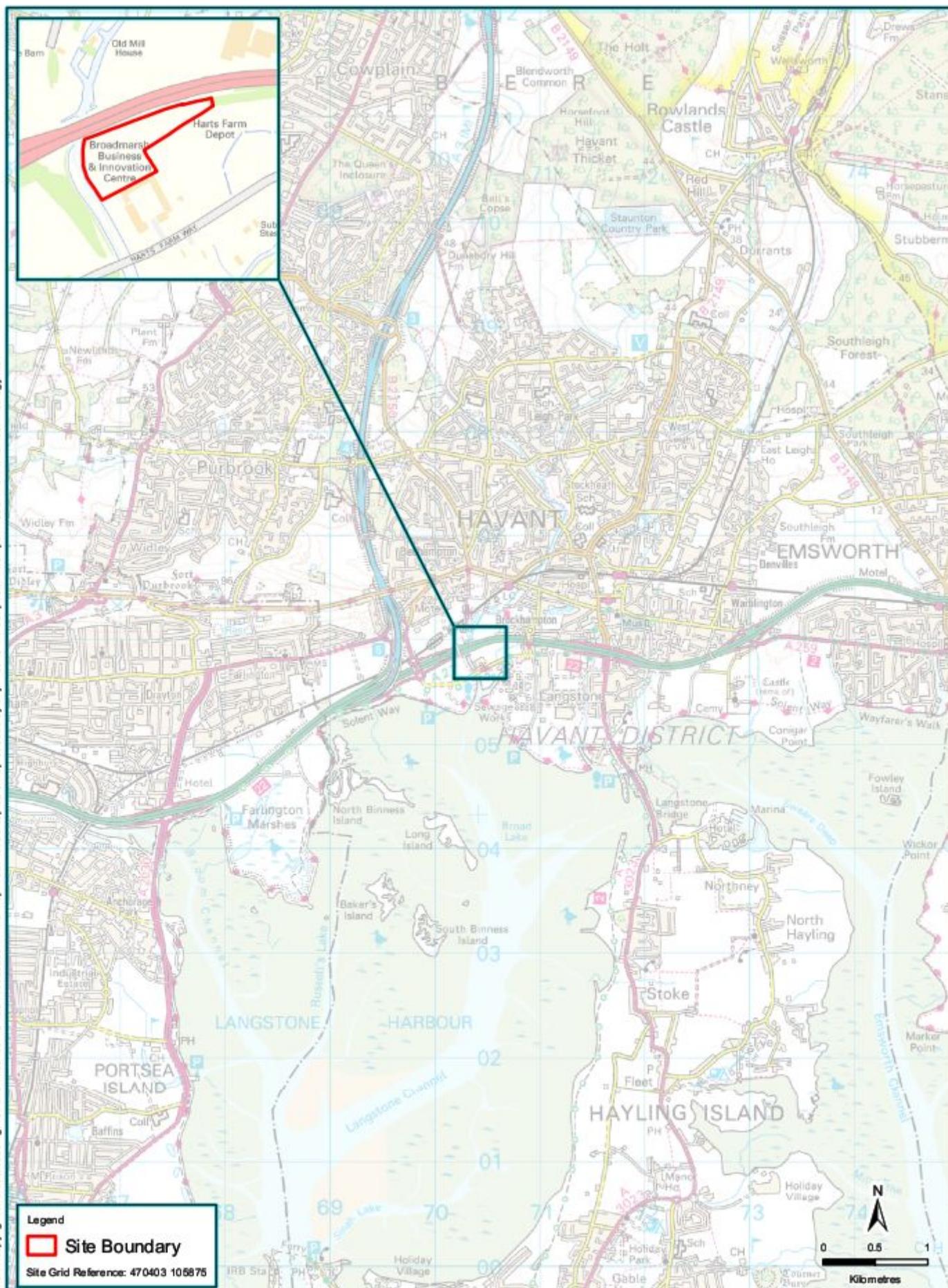
FIGURE 1: SITE LOCATION

FIGURE 2: TREE CONSTRAINTS PLAN (TCP01)

1. Summary

- 1.1.1 The Homes and Communities Agency (HCA) is proposing the development of a plot of land in Havant, Hampshire (see Figure 1). There are no proposals available at present but various surveys are being undertaken to inform the marketing and potential sale of the site.
- 1.1.2 Campbell Reith Hill LLP commissioned Thomson Ecology on behalf of the HCA to undertake an arboricultural survey of up to 70 trees within and adjacent to the site. This document details the survey methodology and results of the arboricultural survey. The arboricultural survey was carried out in accordance with BS5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (BSI, 2012).
- 1.1.3 All trees were categorised in accordance with the cascade chart in BS5837:2012. Trees were given a ranking of A, B or C in descending order of value and assigned one or more subcategories qualifying the basis of that value as either arboricultural, landscape or cultural. Trees with only short-term remaining value or that require immediate removal for safety or management reasons are given a U rating.
- 1.1.4 A total of seven individual trees, three groups and two woodlands were recorded during the survey and listed in the Tree Schedule (see Appendix 1). The survey recorded six Category B trees, three Category B groups, two Category B woodlands and one Category C tree located within or adjacent to the site.
- 1.1.5 Category B and C trees represent a material consideration to development. Strong effort should be made to retain Category B trees within the development. Whilst Category C trees should be retained where possible, they should not be retained where they would present a serious constraint to development.
- 1.1.6 It is recommended that an Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) are produced once detailed plans of the proposed layout are available.

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Client	Campbell Reith Hill LLP	Drawing Ref	ACAM192/12495/1	
Figure Number	1	Scale at A4	1:50,000	
Figure Title	Site Location	Drawn	NS	Checked
		Date	01/07/2013	TD
		Date	01/07/2013	



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Legend

- Root Protection Area of Category 'B' Tree
- Root Protection Area of Category 'C' Tree
- Tree Stem Location
- Tree Canopy Extents
- Site Boundary

Site Grid Reference: 470403 105875

Base mapping supplied by the client Campbell Reith Hill LLP.

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Drawing Ref
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Figure Number
2

Figure Title
Tree Constraints Plan
(TCP01)

2. Introduction

2.1 Development Background

2.1.1 The Homes and Communities Agency (HCA) is proposing the development of a site located at Harts Farm Way, Havant, Hampshire. There are no formal proposals for the site as of yet, but the site is likely to be marketed and sold for development. These proposals are hereafter referred to as 'the development'."

2.1.2 The development is located on an 1.94 hectares (ha) area of land (grid reference TQ245864), shown on Figure 1. The area affected by the development is hereafter referred to as 'the site'.

2.1.3 There are a number of trees within the site and adjacent to the site boundary that may be affected by development by any future development.

2.2 Site Description

2.2.1 The site is located to the rear of the Broadmarsh Business and Innovation Centre on Harts Farm Way and comprises a area of grass land and scrub with trees along its boundaries, particularly along the northern boundary and north-east corner of the site. It is bordered by the A27 to the north and Hermitage Stream to the west.

2.3 Brief and Objectives

2.3.1 Campbell Reith Hill LLP commissioned Thomson Ecology on behalf of the HCA on 5th June 2013 to undertake an arboricultural survey of the site, including a Tree Schedule (see Appendix 1) and a Tree Constraints Plan (TCP).

2.3.2 The objective of the survey and report was to assess the condition of the existing trees on site and any off site trees that might be affected by the development, providing sufficient information to enable decisions to be made on potential design layout and tree retention for the proposed development. The brief was to:

- Conduct an arboricultural survey of up to 70 trees (grouped where deemed appropriate) within or immediately adjacent to the site (as defined by the red line boundary on drawing ref: 2071-001-FIG2), in accordance with standards set out in BS5837:2012 *Trees in Relation to Design, Demolition and Construction - Recommendations* (BSI, 2012);
- Produce a report of the results, including the Tree Schedule; and
- Produce a TCP.

2.4 Limitations

2.4.1 The information provided within this report and in the accompanying Tree Schedule covers only those trees that were inspected and their condition at the time of survey.

- 2.4.2** Whilst this report makes general observations on the long term potential of the trees surveyed, trees are dynamic organisms and subject to continual change, thus this report should not be relied upon for the purposes of development for more than 12 months from the date of survey.
- 2.4.3** A full hazard assessment has not been made and therefore no guarantee is given as to the structural integrity of any of the trees on site.

3. Methodology

3.1 Desk Study

- 3.1.1 Records of Tree Preservation Orders (TPOs) existing at the site and Conservation Areas within or adjacent to the site were sought from Havant Borough Council.

3.2 Tree Survey

- 3.2.1 All significant trees at the site were assessed for their potential to be affected by the development proposals. Significant trees are defined as those with a trunk diameter of greater than 75mm at 1.5m above ground level according to the survey methodology outlined in BS5837:2012. Off-site or third party trees have been included where it is likely they would influence the development.
- 3.2.2 The trees surveyed were inspected from ground level only, were not climbed and no internal investigations were undertaken.
- 3.2.3 Trees were categorised as single trees or those that formed part of a distinct group such as a woodland or hedgerow. Groups can be defined as cohesive arboricultural features, either aerodynamically, visually or culturally (BS5837:2012).
- 3.2.4 The trees were assessed using a qualitative assessment categorising the quality and value of the trees based on arboricultural, landscape and cultural (including conservation) features. Each tree was then placed into one of four categories based on quality and value. Definitions for these categories can be found in Appendix 2. The information recorded for each tree is shown in Table 1.

Table 1: Information recorded for each tree during survey

Attribute	Description
Tree No.	Numerical reference given in sequential order starting at number '1', corresponding with the numbers as set out in Figure 2; trees are given the prefix 'T', groups 'G', woodlands 'W' and hedgerows 'H'.
Species	The common names are based upon on site identification and expressed according to " <i>Tree Guide</i> " (Johnson & More, 2004).
Height	Measured approximately from ground level with the aid of a clinometer and shown in metres (m).

Attribute	Description
Stem Diameter	Diameter measured at approximately 1.5m above ground level. In the case of multi-stemmed trees, measurement is taken of each stem at 1.5m, where there are two to five stems; or a mean stem diameter at 1.5m, where there are more than five stems. Given in millimetres (mm).
Canopy Spread	Maximum branch spread measured in metres from the centre of the trunk in the direction of the four cardinal points of the compass (or an average can be given if branches demonstrate an even spread).
Crown Clearance	Height above ground level of the first significant branch and direction of growth, and the height above ground level of the overall canopy.
Age Class	• Young - less than one-third natural life span spent; • Middle-aged - between one-third and two-thirds natural life span spent; • Mature - greater than two-thirds life span completed; • Over-mature - mature, and in an overall state of decline; • Veteran - surviving beyond the typical age range for the species with a high value in terms of conservation and amenity.
Physiological Condition	Overall health, condition and function of the tree in comparison to a 'normal' example of the species of a similar age; e.g. 'good', 'fair', 'poor' or 'dead'. If deemed necessary, these gradings may be elaborated upon in the 'Comments' section.

Attribute	Description
Structural Condition	The overall structural condition of the tree including the roots, butt, trunk, limbs and their unions, and the presence of any structural defects, decay or pathological defects. • Good - no significant visible structural defects with a form typical for the species; • Fair - a specimen with only minor defects that are easily remedied or of no long term significance; • Poor - significant and irremediable physiological or structural defects that may lead to early or premature decline; • Hazardous - significant structural defects of such a degree that there is a risk of imminent collapse or failure. If deemed necessary, these gradings may be elaborated upon in the 'Comments' section.
Comments	Comments have been made, where appropriate, relating to location, health and condition, structure and form, estimated life expectancy, conservation value and amenity value within the local landscape.
Preliminary Management Recommendations	Tree work that should be undertaken for good arboricultural management, regardless of the requirements of the development.
Estimated Remaining Contribution	The estimated time, in years, that the tree will provide a safe contribution to the site (i.e. <10, 10-20, 20-40 and >40).

Quality Assessment

3.2.5 On the basis of this assessment each tree was then placed into one of the four categories based on its quality and value. The four categories can be seen in Table 2.

Table 2: Quality assessment categories

Category	Description
Category U	Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

Category	Description
Category A	Trees of high quality with an estimated life expectancy of at least 40 years.
Category B	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
Category C	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

3.2.6 Trees categorised as either A, B or C, were also allocated up to three subcategories. The subcategories chosen for each tree are dependent on the main reasons for selection of the particular category grading. The three subcategories are as follows:

1. Category grading based on mainly arboricultural qualities;
2. Category grading based on mainly landscape qualities; and
3. Category grading based on mainly cultural values, including conservation.

Root Protection Areas (RPAs)

3.2.7 Trees that are selected for retention on the site could be at risk of damage during construction, such as root damage during excavations for foundations or services, or any ground-working for landscaping. Further impacts on the trees may potentially result from vehicle movements and materials storage, including root severance, compaction of the soil and exclusion of air and water to the soil. The risk of tree damage is minimised if construction activities are planned to avoid the roots of trees.

3.2.8 The area of ground adjacent to each tree or group of trees that contains the majority of the roots can be calculated using the equation provided in the BS5837:2012. This Root Protection Area (RPA) is a radius around the tree of 12 times the stem diameter for a single stem. For multi-stemmed trees of two to five stems and greater than five stems, the cumulative stem diameters to be multiplied by 12, are calculated as per the equations in Table 3.

Table 3: Equations for the calculation of the RPA of multi-stemmed trees.

Number of stems	Equation
Two to five	$\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 \dots + (\text{stem diameter } 5)^2}$
More than five	$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$

3.2.9 The RPA for each tree in the Tree Schedule has been calculated and, where relevant, has been adjusted to take into account site conditions. For example, when a tree is growing in a confined

root space adjacent to an existing building or other solid structure that would restrict root growth in that direction, the RPA has been adjusted accordingly (see Figure 2).

3.2.10 The RPA for tree groups is calculated using the stem diameter of the largest tree within the group. The RPA radius is calculated as per Section 3.3.2 and then used to define the RPA by following the outline of the group's extent.

3.2.11 Where the calculated RPA exceeds 707m², it has been capped at this figure, as per BS5837:2012. This is equivalent to a circle with a radius of 15m or a square with approximately 26m sides.

Date of Survey

3.2.12 The site was visited and the survey undertaken on 27th June 2013 by Sam Lowe BSc (Hons) MSc TechCert(ArborA) MArborA.

Weather Conditions

3.2.13 The weather conditions at the time of survey were bright and sunny. Deciduous trees were in full leaf.

4. Results

4.1 Desk Study

- 4.1.1 It was confirmed by Lara of Havant Borough Council via telephone on 1st July 2013, that no trees within the site or immediately adjacent to the site boundaries are covered by Tree Preservation Orders or located within a Conservation Area.

4.2 Tree Survey

- 4.2.1 A total of seven significant individual trees, three groups of trees and two woodland blocks located within or immediately adjacent to the site boundary were recorded during the survey. A breakdown of categories can be found in Table 4. The locations of all trees, RPAs, retention categories and reference numbers are shown on Figure 2. A detailed description of each tree is given in the Tree Schedule in Appendix 1.

Table 4: Number of significant trees allocated to each retention category.

	Category 'A' Trees	Category 'B' Trees	Category 'C' Trees	Category 'U' Trees
Number of Trees in Category	0	11	1	0
Tree Numbers	-	T1, T2, T4, T5, T6, T7, G1, G2, G3, W1, W2	T3	-

- 4.2.2 The subcategories assigned to each tree surveyed can be seen in the Tree Schedule in Appendix 1. A list of the criteria used to determine the category and subcategories of the trees can be found in Appendix 2 - Table of Quality Assessment.

Root Protection Areas (RPAs)

- 4.2.3 The RPAs for the trees and groups surveyed can be seen in Figure 2. The actual RPAs, in m², for the individual trees surveyed are shown in Appendix 1.

5. Recommendations

5.1 Site Specific Guidance

- 5.1.1** All trees, groups and woodlands on site should be considered for retention where possible, with the greatest consideration given to Category B features and finally the Category C trees. However, the retention of the Category C trees should not be at the expense of an efficient design.
- 5.1.2** Effort should be made to retain both of the areas of woodland on the site (W1 and W2) as the form an effective barrier from the A27 to the north of the site. There is also a large area of grass and scrub towards the centre of the site that could be used development without affecting any trees.
- 5.1.3** Should any tree removal be considered prior to the submission of a planning application, it should be noted that the felling of over 5m³ of timber in any one calendar quarter requires permission from the Forestry Commission under the Forestry Act (1967). If tree removal of this scale is to be undertaken a Felling License application will need to be made, unless full planning permission has been granted.

5.2 Tree Protection

- 5.2.1** For those trees selected to be retained as part of the redevelopment, it will be necessary to maintain Construction Exclusion Zones (CEZs) during the construction phase. The purpose of CEZs is to prevent damage to the tree roots from severance, compaction of the soil, or exclusion of air and water to the soil.
- 5.2.2** The CEZ should cover the area around the RPAs of all trees at the site that are not directly affected by the works. The CEZ should be maintained by suitable stout fencing (identified by marking as a 'Construction Exclusion Zone' or 'Tree Protection Zone' with notices) or adequate ground protection suitable to withstand any likely loading. The fencing should be fit for the purpose of excluding construction activity and remain rigid and complete throughout the duration of the works. If the ground protection is intended for pedestrian movements, a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile may be acceptable; however if intended for wheeled or tracked construction traffic, the ground protection should be designed by an engineer.
- 5.2.3** Where CEZs overlap with existing areas of tarmac, restricted working may be allowed and may not require protection by fencing. Such areas should, however, be clearly identified as restricted working areas within the CEZ by markings on the ground and notices. Within restricted working areas in CEZs, construction activities should be limited to surfacing works only. Strictly no digging should be allowed within these areas, except in cases where root-sensitive excavation techniques have been recommended in an Arboricultural Method Statement.
- 5.2.4** An adequate water and air supply to roots should be provided for all trees both during and after construction. This should include preventing impermeable surfacing from being allowed to cover more than 20% of the RPA.

5.3 General Recommendations

5.3.1 The following points are made as general recommendations:

- Building lines should be at least 2m outside the RPA. Limited use may be made for parking, drives or hard surfaces within the RPA, subject to advice from a qualified arboriculturist;
- Wherever possible, service runs should be routed outside the RPAs. If this is not possible, they should be kept together and trenchless techniques should be used. At all times where services pass within an RPA, detailed plans showing the proposed routing should be drawn up in conjunction with an arboriculturist;
- On residential developments consideration must be given to future tree growth and orientation (BS5837:2012), i.e. adverse shading and blocked views from windows, which may lead to pressure to fell or remove trees in the future. Wherever possible, the windows of primary rooms should be orientated to avoid any potential conflict with tree canopies; and
- An Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) should be produced once detailed plans for the development are available.

6. References

- 6.1.1 British Standards Institution (2012) BS5837:2012 Trees in Relation to Design, Demolition and Construction - Recommendations. BSI, London.
- 6.1.2 British Standards Institution (2010) BS 3998:2010 *Recommendations for Tree Work*. BSI, London.
- 6.1.3 HM Government. The Town and Country Planning (Tree Preservation) (England) Regulations 2012. London: Office of Public Sector Information (OPSI).
- 6.1.4 Johnson, O. & More, D. (2004) *Tree Guide*. London: HarperCollins.
- 6.1.5 Lonsdale, D. (1990) *Principles of Tree Hazard Assessment and Management*. The Stationery Office, London.
- 6.1.6 Matheny, N. & Clark, J.R. (1998) *Trees and Development*. ISA, Champaign, IL.
- 6.1.7 Mattheck, C. & Breloer, H. (1994) *The Body Language of Trees*. The Stationery Office, London.
- 6.1.8 National Joint Utilities Group (NJUG) (2007) NJUG Volume 4: Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees. NJUG, London.
- 6.1.9 Office of the Deputy Prime Minister (ODPM) (2006) *Tree Preservation Orders, A Guide to the Law and Good Practice*. Office of Public Sector Information (OPSI).
- 6.1.10 Patch, D. & Holding, B. (2007) Arboricultural Practice Note 12: Through the Trees to Development. London: AAIS.
- 6.1.11 Robertson, J, Jackson, N & Smith, M (2006) *Tree Roots in the Built Environment*. The Stationery Office, London.

7. Appendix 1 - Tree Schedule

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition		Comments	Preliminary Management Recommendations	BS Category	RPA (m ²)
				N	E	S	W					Physiology	Structure				
T1	<i>Prunus domestica</i> ; domestic plum	8	210, 190, 190, 240	3	3	3	3	1S	1	Mature	20-40	Good	Fair	Four stems from 1m with tight forks and minor bark inclusions	-	B1;3	79
T2	<i>Salix alba</i> ; white willow	19	370, 400, 390	6	6	6	6	1NW	1	Mature	20-40	Good	Fair	Triple stem; failed branch in crown	Remove failed branch from crown	B1;2	203
T3	<i>Salix alba</i> ; white willow	17	460, 460	6	6	6	6	3NE	5	Mature	10-20	Good	Poor	Twin stem with included bark; two additional large stems failed in past without leaving large wounds on remaining stems	Remove failed stems and pollard remaining stems	C2;1	191
T4	<i>Salix alba</i> ; white willow	19	380, 480	6	6	6	6	0NW	2	Mature	20-40	Good	Fair	Twin stem; deadwood and hanging branches in crown; exudates from limb crown	Remove deadwood and hanging branches from crown	B1;2	170
T5	<i>Salix alba</i> ; white willow	18	450, 470	7	5	5	7	1SW	1	Mature	20-40	Good	Fair	Twin stem with tight fork	-	B2;1	192
T6	<i>Salix alba</i> ; white willow	17	400, 470	6	6	6	5	1NE	2	Mature	20-40	Good	Fair	Twin stem; deadwood in crown	-	B1;2	148

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition		Comments	Preliminary Management Recommendations	BS Category	RPA (m ²)
				N	E	S	W					Physiology	Structure				
T7	<i>Populus x canadensis</i> , hybrid black poplar	22	750	7	7	7	7	1.5W	1	Mature	20-40	Good	Good	-	-	B1;2	254
G1	<i>Prunus cerasifera</i> ; Myrobalan cherry; <i>Fraxinus excelsior</i> ; ash; <i>Populus tremula</i> ; aspen; <i>Salix alba</i> ; white willow; <i>Sambucus nigra</i> ; elder; <i>Ulmus minor var vulgaris</i> ; English elm	17	500	5	5	5	5	-	0	Middle- aged	>40	Good	Fair	Group of mixed broadleaves growing on slope; large dead tree (4m stick) and dead elm	Retain large dead tree as habitat and fell dead elm	B2;3	-
G2	<i>Populus alba</i> ; white poplar; <i>Salix alba</i> ; white willow; <i>Alnus glutinosa</i> ; common alder; <i>Salix caprea</i> ; goat willow; <i>Prunus spinosa</i> ; blackthorn; <i>Crataegus monogyna</i> ; common hawthorn	14	280	4	4	4	4	-	0	Middle- aged	20-40	Good	Fair	Group of mixed broadleaved species growing on slope; dominated by central white poplar and white willow	-	B1;2;3	-

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition		Comments	Preliminary Management Recommendations	BS Category	RPA (m ²)
				N	E	S	W					Physiology	Structure				
G3	<i>Salix alba</i> ; white willow	14	340, 290	4	4	4	4	-	1	Middle- aged	>40	Good	Fair	Group of two twin white willow; one with included fork	Pollard	B1;2	-
W1	<i>Tilia cordata</i> ; small-leaved lime; <i>Acer platanooides</i> ; Norway maple; <i>Crataegus monogyna</i> ; common hawthorn; <i>Fraxinus excelsior</i> ; ash; <i>Acer pseudo-platanus</i> ; sycamore	16	310	4	4	4	4	-	1	Middle- aged	>40	Good	Fair	Plantation mixed broadleaved woodland dominated lime and Norway maple	-	B1;2;3	-

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition		Comments	Preliminary Management Recommendations	BS Category	RPA (m ²)
				N	E	S	W					Physiology	Structure				
W2	<i>Populus tremula</i> ; aspen; <i>Acer pseudo-platanus</i> ; sycamore; <i>Acer platanoides</i> ; Norway maple; <i>Alnus incana</i> ; grey alder; <i>Prunus cerasifera</i> ; Myrobalan cherry; <i>Salix alba</i> ; white willow; <i>Sorbus aria</i> ; whitebeam; <i>Crataegus monogyna</i> ; common hawthorn; <i>Tilia cordata</i> ; small-leaved lime	13	180	3	3	3	3	-	0	Middle-aged	>40	Good	Fair	Plantation mixed broadleaved woodland	-	B1;2;3	-

8. Appendix 2 - Table of Quality Assessment

Category and definition		Criteria (including subcategories where appropriate)		Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot be retained as living trees in the context of the current land use for longer than 10 years	- Trees that have serious, irremediable, structural defects, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have existing or potential conservation value which might be desirable to preserve			DARK RED
	1 Mainly arboricultural values	2 Mainly landscape values	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or of formal or semi-formal arboricultural features (e.g. the dominant and/or principle trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical commemorative or other value (e.g. veteran trees or wood-pasture)	LIGHT GREEN
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	MID BLUE
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	GREY