



# Boverton, Vale of Glamorgan

Arboricultural Survey

For

Barratt Homes South Wales

Project No.: ABAW105 / 009 / 004 / 001

April 2015





#### London & South East

Compass House Surrey Research Park Guildford GU2 7AG . UK t +44 (0)1483 466 000

#### North & Borders

Calls Wharf 2 The Calls Leeds LS2 7JU . UK t: +44 (0)113 247 3780

#### Wales & South West

Williams House 11-15 Columbus Walk Cardiff CF10 4BY . UK **t**: +44 (0)2920 020 674

## Scotland

20-23 Woodside Place Glasgow G3 7QF . UK t: +44 (0)141 582 1333

#### Enquiries

e: enquiries@thomsonecology.com

w: www.thomsonecology.com







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Figure 2: Tree Constraints Plan (TCP01)

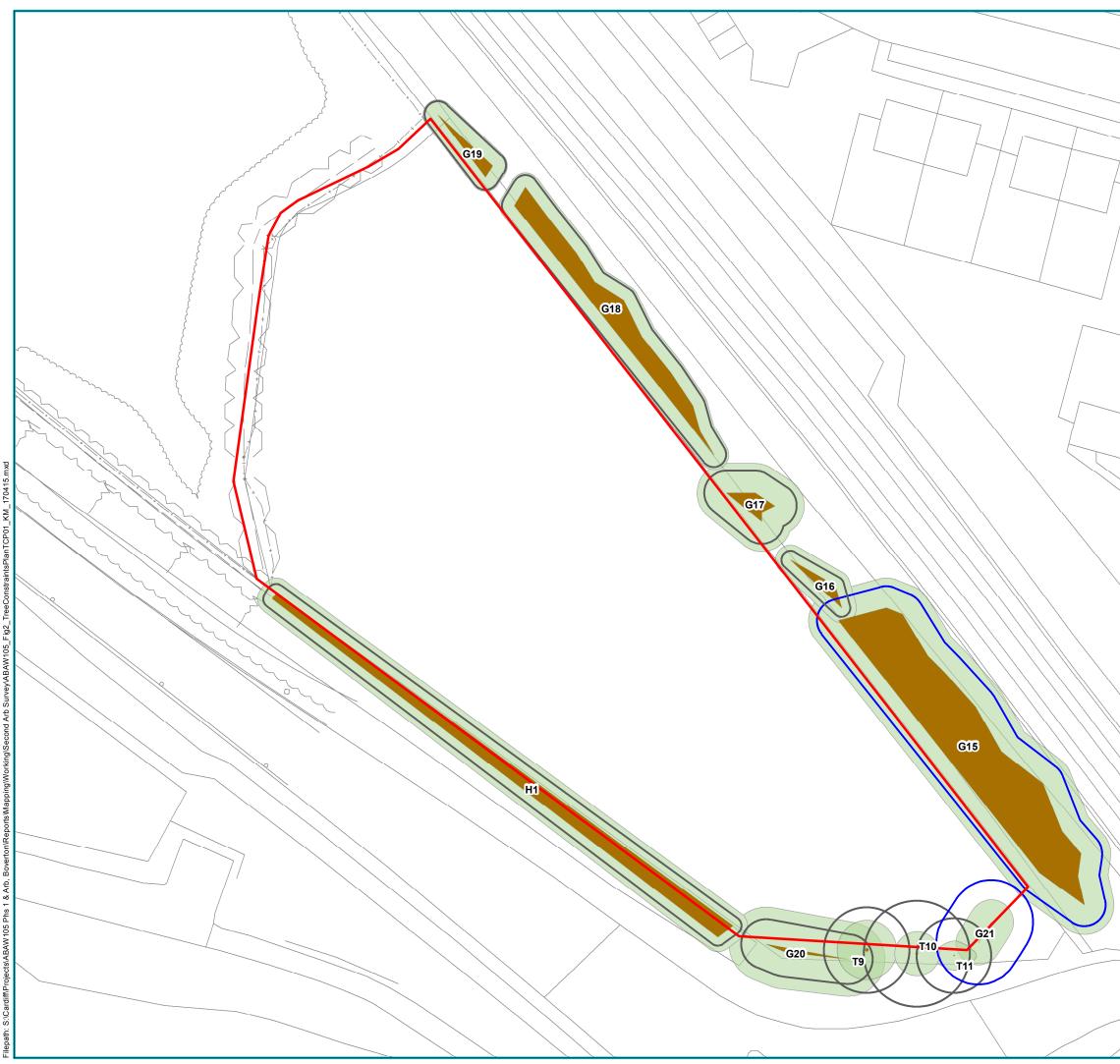


# 1. Summary

- 1.1.1 Barratt Homes South Wales is proposing the development of a plot of land in Boverton, Vale of Glamorgan (see Figure 1). Following an arboricultural survey at the site in 2014, the proposals have been amended to include an additional adjacent area within the development, which is the subject of this survey and report.
- 1.1.2 Barratt Homes South Wales commissioned Thomson Ecology to undertake an arboricultural survey of trees within and adjacent to the site. This document details the survey methodology and results of the arboricultural survey only. 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 three individual trees, seven groups and one hedgerow were recorded during the survey and listed in the Tree Schedule. The survey recorded two Category B groups, three Category C trees, five Category C groups and one Category C hedgerow located 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. While 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 undertaken once detailed plans of the proposed layout are available.



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# 2. Introduction

## 2.1 Development Background

- 2.1.1 Barratt Homes South Wales is proposing a residential development on a site located adjacent to the B4265, Boverton, Vale of Glamorgan. The original proposal involved the development of a 1.85ha area of land comprising two fields, however this has now been expanded to include an additional adjacent field within the development. These proposals are hereafter referred to as 'the development'.
- 2.1.2 The development is located on a 2.41ha area of land (grid reference SS98806844), shown on Figure 1. This area comprises an area of land, approximately 1.85ha which was the subject of an arboricultural survey in 2014, and an additional adjacent field, approximately 0.56ha which is the subject of this survey and report. This additional area, which is the subject of this report, 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. Detailed development plans are in the process of being drawn up and a planning application is to be submitted to Vale of Glamorgan Council later in 2015.

## 2.2 Arboricultural Background

- 2.2.1 An arboricultural survey was undertaken of the contiguous fields to the north-west of the site (see Figure 1) in August 2014, in line with BS5837:2012 '*Trees in relation to design, demolition and construction recommendations*'. The results of this survey can be seen in Thomson Ecology report reference: ABAW105/001/002.
- 2.2.2 This survey recorded a total of eight individual trees and 14 groups, including two Category B groups, six Category C trees, 10 Category C groups, two Category U trees and two Category U groups. To avoid confusion, the sequential numbering of trees, groups and hedgerows for this survey will follow on from that of the previous survey, starting at T9, G15 and H1.

## 2.3 Site Description

**2.3.1** The site is a small pasture field accessed via Llantwit Road. It is bordered on the north-east by a railway line and the south-west by the B4265. Trees are present along each boundary.

## 2.4 Brief and Objectives

- 2.4.1 Barratt Homes South Wales commissioned Thomson Ecology on 10<sup>th</sup> April 2015 to undertake an arboricultural survey of the site, including the production of a Tree Schedule and a Tree Constraints Plan (TCP).
- 2.4.2 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 40 trees (grouped where deemed appropriate), within or immediately adjacent to Phase 2 of the site (as shown on the site plan provided by email on 09/03/2015), in accordance with standards set out in BS5837:2012 *Trees in Relation to Design, Demolition and Construction Recommendations* (BSI, 2012). The survey will exclude the north-western boundary which was surveyed during Phase 1 in 2014 and described in the survey report reference: ABAW105/001/002 (issued 5<sup>th</sup> August 2014);
- Undertake a desk study to determine the presence of any Tree Preservation Order or Conservation Area restrictions at the site;
- Produce a report of our methods and the results, including the Tree Schedule; and
- Produce a TCP.

#### 2.5 Limitations

- 2.5.1 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.
- 2.5.2 While this report makes general observations on the long term potential of the trees surveyed, trees are dynamic organisms and subject to continual change. Therefore this report should not be relied upon for the purposes of development for more than 12 months from the date of survey.
- 2.5.3 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 the site.
- 2.5.4 Where trees were clad in ivy (*Hedera helix*), or where dense epicormic growth or dense underplanting obscured the main stem, this was recorded in the Tree Schedule. The inspection of such trees is impeded and as such a further inspection may be required following the removal of the obstruction. The retention categories of such trees should be considered as provisional only.
- 2.5.5 Measurements for off-site trees have been estimated and therefore may not fully represent the related constraints.

# 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 Vale of Glamorgan 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). The information recorded for each tree can be seen in Table 1.

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).
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).

Table 1: Information recorded for each tree during survey



Attribute	Description		
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	<ul> <li>Young - less than one-third natural life span spent;</li> <li>Middle-aged - between one-third and two-thirds natural life span spent;</li> <li>Mature - greater than two-thirds life span completed;</li> <li>Over-mature - mature, and in an overall state of decline;</li> <li>Veteran - surviving beyond the typical age range for the species with a high value in terms of conservation and amenity.</li> </ul>		
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.		
Structural Condition	<ul> <li>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.</li> <li>Good - no significant visible structural defects with a form typical for the species;</li> <li>Fair - a specimen with only minor defects that are easily remedied or of no long term significance;</li> <li>Poor - significant and irremediable physiological or structural defects that may lead to early or premature decline;</li> <li>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.</li> </ul>		



Attribute	Description
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

3.2.4 During the survey, the trees were assessed qualitatively, 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. The four categories can be seen in Table 2. Definitions for these categories can be found in Appendix 1.

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 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.

- **3.2.5** 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)

- **3.2.6** 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.
- 3.2.7 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.

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

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

- **3.2.8** 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).
- **3.2.9** 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 3.2.7 and then used to define the RPA by following the outline of the group's extent.
- 3.2.10 Where the calculated RPA exceeds 707m<sup>2</sup>, 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

3.2.11 The site was visited and the survey undertaken on 15<sup>th</sup> April 2015 by Sam Lowe BSc (Hons) MSc TechCert(ArborA) MArborA MICFor.

#### Weather Conditions

3.2.12 The weather conditions at the time of survey were cloudy with patches of sun. Deciduous trees were entering bud burst.

# 4. Results

## 4.1 Desk Study

**4.1.1** It was confirmed by Morgan Howell of Vale of Glamorgan Council via telephone on 23<sup>rd</sup> April 2015 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 three significant individual trees, seven groups and one hedgerow 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 2.

	Category A Trees, groups and hedgerows	Category B Trees, groups and hedgerows	Category C Trees, groups and hedgerows	Category U Trees, groups and hedgerows
Number of Trees, groups and hedgerows in Category	0	2	9	0
Tree, group and hedgerow Numbers	-	G15, G21	T9, T10, T11, G16, G17, G18, G19, G20, H1	-

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

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

Root Protection Areas (RPAs)

**4.2.3** The RPAs for the trees, groups and hedgerow surveyed can be seen in Figure 2. The actual RPAs, in m<sup>2</sup>, for the individual trees surveyed are shown in Appendix 1.



# 5. Recommendations

#### 5.1 Site Specific Guidance

- 5.1.1 All trees recorded were located off-site and should therefore be considered for retention where possible, with the greatest consideration given to Category B and then Category C trees. However, the retention of Category C trees should not be at the expense of an efficient design. If any trees require removal to facilitate the development, permission must be sought from the landowner before any works can be undertaken.
- **5.1.2** As all trees recorded are located off-site, it should be possible to effectively utilise the site for development without having a significant impact on the surrounding trees.

#### 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 kept clear of RPAs where possible. 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) *Collins 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 - Table of Quality Assessment

Category and definition	Criteria (including subca	ategories where appropriate)		Identification on plan		
Trees unsuitable for reten	ition (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	<ul> <li>Trees that have seric loss is expected due removal of other cate companion shelter cate irreversible overall de Trees infected with p trees nearby, or very quality</li> <li>NOTE Category U trees ca be desirable to preserve</li> </ul>	DARK RED				
	1 Mainly arboricultural values     2 Mainly landscape values     3 Mainly cultural values, including conservation					
Trees to be considered for	r 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		



# 8. Appendix 2 - Tree Schedule

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N E S W				Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology Structure		Comments	Preliminary Management Recommendations	BS Category	RPA (m <sup>2</sup> )
Т9	<i>Acer</i> <i>pseudoplatanus</i> ; sycamore	10	480	4	4	4	4	1.5N	3	Middle- aged	20-40	Fair	Fair	Off-site; codominant stems from 1.5m; ivy; pruning stubs; narrow main fork	-	C1;2	104
T10	<i>Acer</i> <i>pseudoplatanus</i> ; sycamore	10	380, 200, 410	3	3	3	3	2NE	3	Middle- aged	20-40	Fair	Fair	Off-site; triple stem; one stem with tight ivy covered fork; pruning stubs	Sever ivy to inspect tight fork	C1;2	159
T11	<i>Acer</i> <i>pseudoplatanus</i> ; sycamore	10	160, 140, 360	2	3	2	3	2.5NW	3	Middle- aged	20-40	Fair	Fair	Off-site; triple stem; ivy covered; crossing branches	-	C1;2	79
G15	Fraxinus excelsior, ash; Crataegus monogyna; hawthorn; Acer pseudoplatanus; sycamore	10	240	4	4	4	4	-	0.5	Middle- aged	>40	Good	Fair	Off-site group of predominantly ash and hawthorn	-	B2;3	-
G16	<i>Crataegus monogyna</i> ; hawthorn	4	100	2	2	2	2	-	1	Middle- aged	20-40	Good	Fair	Off-site group of hawthorn; ivy on stems	-	C2;3	-
G17	Fraxinus excelsior, ash; Crataegus monogyna; hawthorn	12	250	4	4	4	4	-	1	Middle- aged	>40	Good	Fair	Off-site group of ash and hawthorn; measurements estimated; portions of bases and stems obscured	-	C2;3	-
G18	<i>Crataegus</i> <i>monogyna</i> ; hawthorn; <i>Fraxinus</i> <i>excelsior</i> , ash	5	140	2	2	2	2	-	0.5	Middle- aged	20-40	Good	Fair	Off-site group of hawthorn with occasional young ash	-	C2;3	-
G19	<i>Crataegus monogyna</i> ; hawthorn	5	150	2	2	2	2	-	1.5	Mature	20-40	Good	Fair	Off-site group of hawthorn; ivy on stems; some multistem	-	C1;2;3	-

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Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N E S W				Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology Structure		Comments	Preliminary Management Recommendations	BS Category	RPA (m <sup>2</sup> )
G20	<i>Acer pseudoplatanus</i> ; sycamore	10	280	5	5	5	5	-	1	Middle- aged	>40	Good	Fair	Off-site group of sycamore; two twin stems; ivy	-	C1;2	-
G21	Acer pseudoplatanus; sycamore; Fraxinus excelsior, ash	11	470	3	3	3	3	-	2	Mature	20-40	Good	Fair	Off-site; small remnant section of laid ash and sycamore hedgerow; ivy covered; wire fence in stems; pruning stubs	-	B2;3	-
H1	Crataegus monogyna; hawthorn; Fraxinus excelsior, ash	5	100	2	2	2	2	-	0.5	Middle- aged	20-40	Good	Fair	Off-site hawthorn hedge with occasional young ash	-	C2;3	-