

**LAND AT BEE COTTAGE,
UTTOXETER ROAD, ALTON,
STOKE ON TRENT**

**PRE-DEVELOPMENT
ARBORICULTURAL SURVEY**

A Report to: Hewitt & Carr Architects

Report No: RT-MME-120301-02

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REPORT VERIFICATION

This study has been undertaken in accordance with British Standard 5837:2012 "Trees in relation to design, demolition and construction - Recommendations".

Report Version	Date	Completed by:	Checked by:	Approved by:
Final	21/08/2015	Dean Moore (Arboricultural Project Officer)	Ed Lusk HND, PTI (Principal Arboricultural Consultant)	Dr Philip Fermor CEnv, MCIEEM (Managing Director)

DISCLAIMER

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client's brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

VALIDITY OF DATA

The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified and experienced arboriculturist to assess any changes to the trees, groups and hedgerows on site and to inform a review of the conclusions and recommendations made.

It should be noted that trees are dynamic living organisms that are subject to natural changes as they age or are influenced by changes in their environment. As such following any significant meteorological event or changes in the growing environment of the trees they should be re-assessed by a suitably qualified and experienced arboriculturist.

NON-TECHNICAL SUMMARY

Middlemarch Environmental Ltd was commissioned to undertake a pre-development arboricultural survey of a site in Alton in Staffordshire. It is understood that the site will be the subject of a planning application for residential development. To fulfil the project brief a desk study and a field survey of the trees present on site were undertaken in August 2015.

The desk study exercise identified that none of the trees present on site are protected by a Tree Preservation Order. Additionally this exercise established that the site is not situated within a Conservation Area.

Dean Moore (Arboricultural Project Officer) undertook the field survey in August 2015. The survey identified that the site contains a number of young, early-mature and mature trees which are predominately in a good condition.

The most significant trees recorded within the survey were the Ash (*Fraxinus excelsior*) and English oak (*Quercus robur*) trees located along the eastern and northern boundary. These trees were of a high quality and prominent specimens in the site.

A number of Sycamore (*Acer pseudoplatanus*) trees and a single Goat willow (*Salix caprea*) were also present within the site. These specimens were less significant in the local landscape, with many of these specimens having utility pruning to their crowns that has altered their form and structural viability. This has limited their likely future potential, and as such these specimens were typically considered to be of a low retention value.

A single Plum (*Prunus domestica*) was also present within the site, this tree had multiple branch failures within the crown and was in heavy decline with no long term contribution to the site.

To ensure the protection of trees selected for retention during the course of the proposed development it is recommended that the guidance set out in Section 5 of this report is considered and that, during development of the site, the retained trees are protected by the erection of tree protection barriers to the specification set out in BS5837:2012.

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1. INTRODUCTION

1.1 PROJECT BRIEF

In July 2015, Hewitt & Carr Architects commissioned Middlemarch Environmental Ltd to undertake an Arboricultural Survey of trees growing on land at Bee Cottage, Uttoxeter Road, Alton, Stoke on Trent.

It is understood that the proposed development of the site is the construction of new residential dwelling houses. However, at the time of writing full details of the proposed development were not known.

The purpose of this report is to:

- Record the current condition of the trees found on the site and categorise them using criteria outlined in BS5837:2012 "Trees in relation to design, demolition and construction - Recommendations".
- Provide a Tree Constraints Plan that identifies any constraints to development presented by the trees to include root protection areas for the retained trees as described in BS5837:2012.
- Provide guidance detailing arboricultural constraints to development and factors to be considered during the detailed design of the proposed development.

Middlemarch Environmental Ltd has previously carried out a Preliminary Ecological Assessment for Hewitt & Carr Architects at this site. The findings of this survey are detailed in Report RT-MME-120301-01.

1.2 SITE DESCRIPTION

The site under consideration, hereinafter referred to as the study area, is an irregular shaped parcel of land of approximately 1.4 ha in size which is located between Uttoxeter Road to the west and Saltersford Road to the south in the village of Alton at Ordnance Survey Grid Reference SK 075 419.

The study area is located within the village of Alton, which is located on the north eastern boundary of Staffordshire. To the north, east and south the surrounding area is dominated by pasture and arable fields whilst to the west residential housing dominates the wider landscape.

The study area comprised three pasture fields, which were generally equal in size and shape, each being bound by hedgerows. A 1.0 – 3.0 m high hedgerow that comprised of mixed species delineates the boundary of the study area. Within the eastern and northern hedgerows, a number of high quality trees were present, these trees were very prominent to the study area.

The study area is dominated by pasture grassland and all notable vegetative features are located adjacent to or beyond its boundaries. The topography of the study area is varied with a general slope down to its western boundary.

Sixteen trees, two groups and seven hedgerows have been surveyed. The location of the trees surveyed can be found on Middlemarch Environmental Ltd Drawing Number C120301-02-01, contained within Section 7 of this report.

2. METHODOLOGY

2.1 DESK STUDY

A desk study was undertaken to identify if any of the trees present within or in close proximity to the site are covered by Tree Preservation Orders (TPOs) or if the site is situated within a Conservation Area. This involved consultation with the Local Planning Authority.

2.2 CONDITION STATUS

To determine the status of the trees within the site a full arboricultural survey has been undertaken, assessing the species and status of all trees present. This survey has been carried out in accordance with British Standard 5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.

All trees have been assigned a unique reference number on site trees have been tagged with at 1.5 m above ground level. Individual trees above 75 mm in diameter (at 1.5 m above ground level) have had their position plotted to a survey drawing. The trees were visually assessed and a schedule prepared listing: tree number, species, trunk diameter at 1.5 m above ground level (or in accordance with Annex C of BS5837:2012), tree height, crown spread (cardinal points), crown clearance (cardinal points), height of first branch and growth direction, age class and estimated remaining life expectancy in years. Measurements for tree height, first branch height, crown clearance and crown spread were taken to an accuracy of 0.5 m. Stem diameter measurements were recorded to the nearest 10 mm. Any specific observations or recommendations with regard to management were also noted. All these observations and measurements are summarised in Section 3.3.

Each tree was assessed and assigned to one of the following categories:

- Category A: Those trees of high quality and value with an estimated remaining life expectancy of at least 40 years.
- Category B: Those trees of moderate quality and value with an estimated remaining life expectancy of at least 20 years.
- Category C: Those trees of low quality and value with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter below 150 mm.
- 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.

Categories A, B and C have further sub-categories with regards to the reasons for tree retention:

- 1: Mainly arboricultural qualities.
- 2: Mainly landscape qualities.
- 3: Mainly cultural values, including conservation.

2.3 ROOT PROTECTION AREA (RPA)

In order to avoid damage to the roots or rooting environment of retained trees, the RPA has been calculated for each of the Category A, B and C trees. This is a minimum area around a tree which is deemed to contain sufficient roots and rooting volume to maintain the tree's viability. Protection of the roots and soil structure in this area should be treated as a priority.

These figures have been calculated utilising the formulas within Section 4.6 and Annex D of British Standard 5837:2012.

3. RESULTS

3.1 DESK STUDY

James Burnett (Staffordshire Moorlands District Council, 2015, *Pers. Comm.*) confirmed by email on the 17th August 2015 that there are no Tree Preservation Orders within or closely surrounding the site. Burnett J, also confirmed that the site is not situated within a Conservation Area.

3.2 WEATHER CONDITIONS AND PERSONNEL

Dean Moore (Arboricultural Project Officer) completed the survey on 7th August 2015. The weather conditions at the time of the survey are shown in Table 3.1.

Conditions	Result
Temperature (°C)	11
Cloud Cover (%)	40
Precipitation	Nil
Wind Speed (Beaufort)	F 1

Table 3.1: Weather Conditions at Time of Survey

3.3 SURVEY RESULTS

Tree species recorded during the survey are listed in Table 3.2.

Common Name	Scientific Name
Apple	<i>Malus</i> sp.
Ash	<i>Fraxinus excelsior</i>
Beech	<i>Fagus sylvatica</i>
Buddleja	<i>Buddleja</i> sp.
Elder	<i>Sambucus nigra</i>
Elm	<i>Ulmus</i> sp.
English oak	<i>Quercus robur</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus avellana</i>
Holly	<i>Ilex aquifolium</i>
Leyland cypress	<i>X Cupressocyparis leylandii</i>
Lilac	<i>Syringa vulgaris</i>
Plum	<i>Prunus domestica</i>
Sycamore	<i>Acer pseudoplatanus</i>

Table 3.2: Tree Species Recorded During Survey

The full results of the Arboricultural Assessment are detailed in Table 3.3.

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	H't 1st Branch (m)	Branch Spread (m)				Crown Clearance (m)				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
						N	E	S	W	N	E	S	W							
1	Lilac	3	130	4.0	0.5 S	2.0	3.5	2.0	1.0	0.5	0.5	0.5	0.5	Y	G	P	<10	U	<ul style="list-style-type: none"> Multi-stemmed at ground level. Shrub has failed and is leaning towards the road. 	Remove shrub.
2	Goat willow	3	<u>540</u>	<u>12.0</u>	2.5 W	<u>6.5</u>	<u>6.5</u>	<u>6.5</u>	<u>6.5</u>	<u>3.0</u>	<u>3.0</u>	<u>2.0</u>	<u>2.0</u>	EM	G	G	20+	B1	<ul style="list-style-type: none"> Tree is located off-site but overhangs the study area. Trifurcate at 1.0 m above ground level. Ivy present on the main stem. 	-
3	Apple	2	<u>300</u>	<u>9.0</u>	2.0 N	<u>2.0</u>	<u>2.0</u>	<u>4.0</u>	<u>4.0</u>	<u>1.5</u>	<u>1.5</u>	<u>1.5</u>	<u>1.5</u>	EM	F	F	10+	C3	<ul style="list-style-type: none"> Tree is located off-site but does overhang to the study area. Minor deadwood present. Tree is in decline. Bird box present on the main stem and in the crown. 	-
4	Apple	1	<u>220</u>	<u>7.0</u>	2.5 NW	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>	<u>3.0</u>	<u>3.0</u>	<u>3.0</u>	<u>3.0</u>	EM	F	F	10+	C3	<ul style="list-style-type: none"> Tree is located off-site but does overhang to the study area. Minor deadwood present. Tree is in decline. Bird box present on the main stem and in the crown. 	-
2753	English oak	1	980	16.5	2.5 W	7.0	7.0	9.5	9.0	2.5	2.5	2.5	2.5	M	G	G	40+	A1	<ul style="list-style-type: none"> Epicormic growth present on the main stem. Burrs present on the main stem. Dieback present on apical and lateral branches. Minor deadwood present. 	-

Table 3.3: Results of Arboricultural Survey (continues)

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	H't 1st Branch (m)	Branch Spread (m)				Crown Clearance (m)				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
						N	E	S	W	N	E	S	W							
2755	English oak	1	620	10.0	3.0 W	5.0	3.0	3.5	5.0	2.5	2.5	2.5	2.5	M	F	F	20+	C1	<ul style="list-style-type: none"> Storm damage has occurred and removed the main stem, decay is evident at the point of failure. Unknown fungi present in the crown. Dieback present on lateral branches. Tree is showing signs of decline. 	-
2756	Sycamore	3	440	13.0	2.5 NW	8.0	8.0	8.0	7.5	2.5	2.5	2.5	2.0	EM	G	G	20+	B1 Int	<ul style="list-style-type: none"> Ivy (<i>Hedera helix</i>) present on the main stem. Limited inspection due to ivy. Branch stubs present on the main stem. 	Sever ivy.
2757	Sycamore	1	500	14.0	3.0 N	4.0	7.0	8.0	2.0	2.0	2.0	2.0	2.0	EM	F	F	20+	C1	<ul style="list-style-type: none"> Trifurcate at ground level. Epicormic growth present on the main stem and in the crown. Previous work – crown has been cutback from the power line. 	-
2758	Sycamore	1	260	9.0	2.5 E	5.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	EM	F	F	10+	C1	<ul style="list-style-type: none"> Tree is a poor specimen. Minor damage on the main stem at multiple locations, wounds are occluding. Previous work – crown has been cutback from power line. 	-

Table 3.3 (cont'd): Results of Arboricultural Survey (continues)

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	H't 1st Branch (m)	Branch Spread (m)				Crown Clearance (m)				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
						N	E	S	W	N	E	S	W							
2759	Ash	1	970	20.0	3.5 E	8.0	6.5	9.0	8.0	1.5	2.0	3.0	3.0	M	G	G	40+	A1 Int	<ul style="list-style-type: none"> Ivy (<i>Hedera helix</i>) present on the main stem. Minor cavities present in the crown. Minor deadwood present. Limited inspection due to ivy. 	Sever ivy.
2760	Ash	1	910	22.5	3.0 S	10.0	10.0	9.0	6.5	2.0	3.0	3.0	4.0	M	G	G	40+	A1	<ul style="list-style-type: none"> Minor deadwood present. Dieback present on lateral branches. Small branches hanging in the crown. 	-
2761	Ash	1	750	21.0	6.0 NW	9.0	4.0	6.0	8.0	2.5	2.5	2.5	2.5	M	G	G	40+	A1 Int	<ul style="list-style-type: none"> Cavity present on south side of the tree approx. 5.0 m above ground level. Minor deadwood present. Minor cavities present in the crown. Storm damage present in the crown. Small branches hanging in the crown. 	Aerial inspection of the cavity and storm damage wounds.
2762	Ash	1	440	14.5	3.5 NE	8.0	7.5	7.5	6.5	2.5	2.5	2.5	2.5	EM	G	G	40+	A1	<ul style="list-style-type: none"> Small branches hanging in the crown. Exposed roots. Bifurcate at 3.0 m above ground level. 	-
2763	Ash	1	600	16.0	2.5 W	8.0	9.0	9.0	9.0	2.0	2.0	2.0	2.0	EM	G	G	40+	A1	<ul style="list-style-type: none"> Minor deadwood present. 	-
2764	Plum	1	280	6.0	2.0 E	2.0	4.0	2.0	1.0	3.0	1.5	2.0	3.0	EM	P	F	<10	U	<ul style="list-style-type: none"> Tree has failed at multiple locations. Tree is in heavy decline. 	Remove tree.

Table 3.3 (cont'd): Results of Arboricultural Survey (continues)

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	H't 1st Branch (m)	Branch Spread (m)				Crown Clearance (m)				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
						N	E	S	W	N	E	S	W							
2765	Goat willow	4	270	6.0	1.5 W	2.5	3.5	3.5	3.5	2.0	2.0	2.0	2.0	Y	F	F	10+	C1	<ul style="list-style-type: none"> Tree is a poor specimen. Crossing branches present in the crown. Multi-stemmed at 1.0 m above ground level. 	-
G1	Holly, Sycamore	1	110 - 410	5.0 - 14.0	2.0 S	7.0	7.0	7.0	7.0	2.5	2.5	2.5	2.5	Y/ EM	G	G	20+	B2	<ul style="list-style-type: none"> Group offers screening. Dead and dying trees present. Group is generally in good health. 	-
G2	Ash, Hawthorn, Holly, Elder	1	40 - 110	3.0 - 6.0	0.0 E	2.5	2.5	2.5	2.5	0.0	0.0	0.0	0.0	Y	F	F	10+	C2	<ul style="list-style-type: none"> Dead and dying trees present. Group is in decline. 	-
H1	Hawthorn, Hazel, Elder	1	40 - 100	1.0 - 1.5	0.0 N	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	Y/ EM	G	G	20+	C 2,3	<ul style="list-style-type: none"> Hedgerow is well managed. Hedgerow is sparse in areas. 	-
H2	Hawthorn, Hazel, Elder	1	40 - 100	1.5 - 2.0	0.0 W	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	Y/ EM	G	G	20+	C 2,3	<ul style="list-style-type: none"> Hedgerow is well managed. Hedgerow is sparse in areas. 	-
H3	Elm, Hawthorn, Hazel, Holly, Elder, Buddleia	1	40 - 190	1.5 - 2.0	0.0 S	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	Y/ EM	G	G	20+	C2	<ul style="list-style-type: none"> Hedgerow is well managed. Hedgerow is sparse in areas. 	-
H4	Beech, Elder, Holly	1	40 - 140	1.0 - 5.0	0.0 E	1.5	1.0	1.0	1.0	0.0	0.0	0.0	0.0	Y	G	G	20+	C2	<ul style="list-style-type: none"> Dead and dying trees present. Clematis (<i>Clematis</i> sp.) is suppressing the hedgerow in areas. 	-
H5	Hawthorn, Leyland cypress	1	140	1.5 - 5.0	0.0 N	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	Y	G	G	20+	C2	<ul style="list-style-type: none"> Hedgerow is well managed. 	-
H6	Beech	1	60	1.5 - 2.0	0.0 W	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	Y	G	G	20+	C2	<ul style="list-style-type: none"> Hedgerow is well managed. 	-

Table 3.3 (cont'd): Results of Arboricultural Survey (continues)

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	H't 1st Branch (m)	Branch Spread (m)				Crown Clearance (m)				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
						N	E	S	W	N	E	S	W							
H7	Hawthorn, Leyland cypress	1	40 - 90	1.0 - 3.0	0.0 E	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	Y	G	G	20+	C2	<ul style="list-style-type: none"> Hedgerow is well managed. Hedgerow is off-site. 	-
<p>Key</p> <p><u>Age Class</u> Y: Young = tree within first third of average life expectancy EM: Early mature = tree within second third of average life expectancy M: Mature = tree within final third of average life expectancy OM: Over mature = tree beyond average life expectancy</p> <p><u>Physiological Condition</u> G: Good = no health problems F: Fair = symptoms of ill health that may be remedied P: Poor = poor health</p> <p><u>Structural Condition</u> G: Good = no structural defects F: Fair = remedial structural defects P: Poor = significant structural defects</p> <p><u>000</u>: Estimated dimension due to access restrictions</p>																				

Table 3.3 (cont'd): Results of Arboricultural Survey

3.4 ROOT PROTECTION AREA (RPA)

Table 3.4 provides details of the Root Protection Area (RPA) of all trees, groups or hedgerows surveyed which were classified as Category A, B or C specimens. This table also gives an approximate root protection radius for these trees.

Tree No.	Species	Diameter (mm)	Approximate Root Protection Radius (m)	Root Protection Area (m ²)
2	Goat willow	<u>540</u>	6.6	137
3	Apple	<u>300</u>	3.6	41
4	Apple	<u>220</u>	2.7	23
2753	English oak	980	12	452
2755	English oak	620	7.5	177
2756	Sycamore	440	5.4	92
2757	Sycamore	500	6.0	113
2758	Sycamore	260	3.3	34
2759	Ash	970	11.7	430
2760	Ash	910	11.1	387
2761	Ash	750	9.0	255
2762	Ash	440	5.4	92
2763	Ash	600	7.2	163
2765	Goat willow	270	3.3	34
G1	Holly, Sycamore	110 - 410	5.1*	81*
G2	Ash, Hawthorn, Holly, Elder	40 - 110	1.5*	7*
H1	Hawthorn, Hazel, Elder	40 - 100	1.2*	5*
H2	Hawthorn, Hazel, Elder	40 - 100	1.2*	5*
H3	Elm, Hawthorn, Hazel, Holly, Elder, Buddleja	40 - 190	2.4*	18*
H4	Beech, Elder, Holly	40 - 140	1.8*	10*
H5	Hawthorn, Leyland cypress	140	1.8*	10*
H6	Beech	60	0.9*	3*
H7	Hawthorn, Leyland cypress	40 - 90	1.2*	5*
Key:				
*: Around centre of each tree within group.				
<u>000</u> : Estimated dimension.				

Table 3.4: RPA and Approximate Root Protection Radius of Category A, B and C Trees, Groups and Hedgerows Surveyed

4. DISCUSSION

4.1 DESK STUDY

The desk study identified that no trees within the study area are subject to Tree Preservation Orders (TPO) and that the study area is not situated within a Conservation Area.

4.2 TREE QUALITY

Retention Value

The initial stage of a tree survey in accordance to BS5837:2012 looks at the trees on the site in terms of life expectancy and condition. Trees are then categorised according to their retention value.

Category A trees are those that have been assessed as being of a high quality and value; significant amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in **Green** on the Tree Constraints Plan.

Category B trees are those that have been assessed as being of a moderate quality and value; amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in **Blue** on the Tree Constraints Plan.

Category C trees are those that have been assessed as being of a low quality and value; the loss of these specimens should not necessarily be considered as a constraint to development. These trees are shown in **Grey** on the Tree Constraints Plan

Category U trees are those that have been assessed as having no retention value; these trees should not be a material consideration in the planning process. These trees are shown in **Red** on the Tree Constraints Plan.

Category A, B or C trees are those that should be a material consideration in the planning process whilst Category U trees are those which would be lost in the short term for reasons connected to their physiological or structural condition and hence they should not be a consideration in the planning process.

Overall sixteen trees, two groups and seven hedgerows have been inspected in accordance with BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.

A summary of the trees and groups in each of the four categories is given in Table 4.1.

BS5837:2012 Category	Tree Number
A	2753, 2759, 2760, 2761, 2762, 2763.
B	2, 2756, G1.
C	3, 4, 2755, 2757, 2758, 2765, G2, H1, H2, H3, H4, H5, H6, H7.
U	1, 2764.

Table 4.1: Summary of Trees, Groups and Hedgerows in BS5837:2012 Categories

Physiological Condition

Trees considered to be in a good physiological condition are those with crown density and shoot extension growth levels within the expected ranges for their age and species. Generally these trees, subject to being of a suitable structural condition, can be expected to make a lasting contribution to the site. Additionally trees within the good condition class are likely to tolerate changes within their growing environment that occur as a result of development; as such their successful retention will be easier to achieve.

Trees considered to be in a fair physiological condition are those specimens exhibiting lower shoot extension growth and reduced crown density than would typically be expected. These specimens have a lower life

expectancy than those within the good condition class and will not tolerate significant changes as a result of development as well as those in the good condition class.

Trees considered to be in a poor physiological condition are those exhibiting crown and shoot dieback and significantly reduced crown density. Trees of a poor physiological condition are not likely to make a lasting contribution to the site and whilst their retention in the short term may be beneficial such retention will only be achievable if the trees are fully protected throughout development as they will not tolerate changes in their growing environment.

Chart 4.1 summarises the distribution of tree physiological condition across the study area.

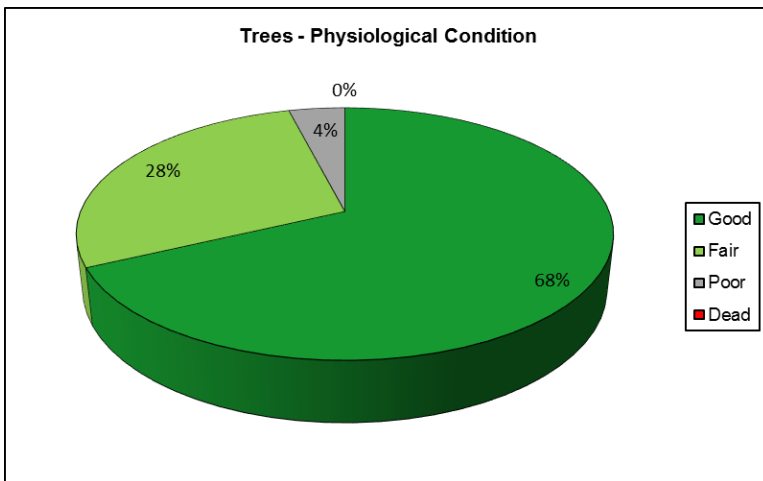


Chart 4.1: Tree Physiological Condition

Age Distribution

Those trees assessed as being young (Y) in age can generally be considered to have significant growth potential. Whilst these specimens are not likely to make a substantial contribution to the landscape character of the site at present they will, if retained, provide succession for the eventual removal of mature or over-mature trees as a result of declining physiological or structural condition.

Early mature trees (EM) will generally make a significant contribution to the landscape character and appearance of the site and their retention will provide more immediate succession. These trees will also have significant growth potential.

Mature trees (M) are not considered to have significant future growth potential and have generally reached their maximum expected size for the location. These trees will generally make the highest contribution to the landscape contribution of the site however a tree stock over dominated by mature trees will require careful management to ensure that continuation of canopy cover can be achieved.

Over-mature trees (OM) do not have the potential to increase in size and may in fact reduce in size as their crowns begin to break up. These trees will often make a significant contribution to the landscape character of the site and are likely to have ecological value. However the retention of these trees within new development must be carefully planned as they are approaching the end of their useful life expectancy and they will often have structural defects. Where over-mature trees are to be retained in new development it is essential that access is available for their eventual removal.

Veteran trees (V) are those that show features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species. These trees have negligible potential to increase in size. Veteran trees are usually of a high ecological value and they will require sensitive management where they are to be retained in new development. As such it is again essential that they are located in areas where access is available to undertake management operations and where there is a reduced risk of harm occurring from failure of the trees.

Chart 4.2 shows the distribution of the age class of trees within the study area.

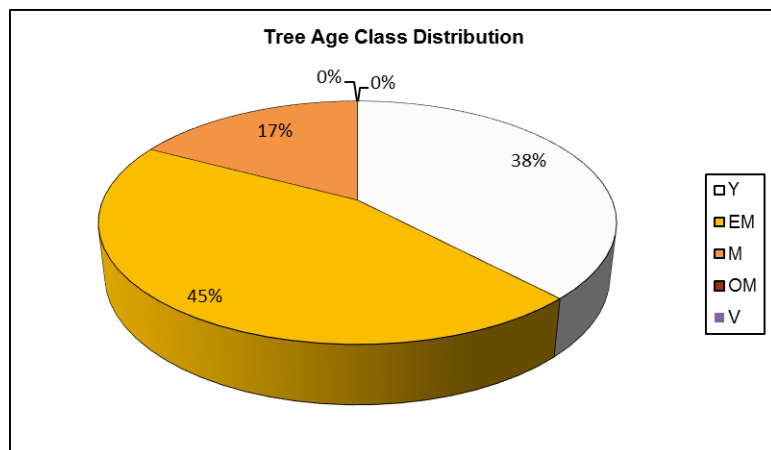


Chart 4.2: Tree Age Class Distribution

Visual Amenity

The trees located along the northern and eastern boundary of the site are a prominent feature of the local landscape and are considered to have a high visual amenity value.

Ecological Value

Generally speaking it is known that trees are of ecological value and that they fulfil an important role in the urban landscape. In particular it should be noted that trees may provide habitat for protected species, notably for birds and bats.

5. ARBORICULTURAL DESIGN GUIDANCE

5.1 THE TREE CONSTRAINTS PLAN

The Tree Constraints Plan (Drawing Number C120301-02-01, contained within Section 7 of this report) is designed to show the influence that the trees have upon the site by virtue of their size and position. The plan seeks to act as a design tool that shows both the above and below ground constraints presented by the trees.

The information provided within this section of the report is to assist in the interpretation of the Tree Constraints Plan and aims to ensure that those trees selected for retention can be successfully integrated within the proposed development.

5.2 TREE RETENTION / REMOVAL

The prioritisation for tree retention should be based upon the guidance contained within BS5837:2012. Category A trees should be seen as the highest priority for retention and Category C the lowest.

Category U trees have no retention value and in most circumstances such specimens will not be considered for retention within new development.

When considering which Category C trees to retain in the new development priority should be given to those trees that have been included within this category solely due to their having stem diameters of less than 150 mm at 1.5 m above ground level. These specimens are normally relatively young trees with future potential.

5.3 BELOW GROUND CONSTRAINTS

Root Protection Areas

Root Protection Areas for each tree and group of trees surveyed have been determined in accordance with BS5837:2012 and a schedule of Root Protection Areas is detailed within this Report as Table 3.4.

Initial Root Protection Areas (RPA's) for the trees have been plotted onto the Tree Constraints Plan as circles, with the tree located centrally, extending to encompass the area of ground, and thus the rootable soil volume, required for protection.

Where possible all development, including new hard landscaping, shall be situated outside of the retained trees designated Root Protection Areas.

Removal of Existing Hard Surfaces and Buildings

In addition to the effects that such construction may have upon the shape and location of the Root Protection area of the tree the presence of existing construction within the trees initial RPA's is also of note. Removal of such construction, should it be required, has a greater potential to cause harm to the trees due to the need for works in close proximity to them.

Where existing hard surfaces are located within the Root Protection Areas of retained trees care should be taken in their removal and such works should be completed by hand and supervised by an Arboricultural Consultant.

Where existing buildings are located within the Root Protection Areas of retained trees, care shall be taken in their demolition and works should be completed from outside the RPA with buildings being pulled back away from the trees. Again it is recommended that such works are supervised by an Arboricultural Consultant.

New Hard Surfaces and Buildings within Root Protection Areas

The construction of new hard surfaces and buildings around trees has the potential to cause soil compaction, to cause root damage and to reduce nutrient and moisture availability to tree roots to the detriment of tree health and vitality.

To minimise harm occurring as a result of such works, where installation of new hard surfacing is proposed within the Root Protection Areas of retained trees, it must be installed in accordance with no-dig principles.

Should new buildings be proposed within the RPA of an existing tree it will be necessary to take steps to minimise the potential impact to the tree to allow construction. In this respect the guidance contained within BS5837:2012 at clause 7.5 should be considered. This states: "*The use of traditional strip footings can result in extensive root loss and should be avoided. The insertion of specially engineered structures within RPAs may be justified if this enables the retention of a good quality tree that would otherwise be lost (usually Categories A or B). Designs for foundations that would minimize adverse impact on trees should include particular attention to existing levels, proposed finished levels and cross-sectional details. In order to arrive at a suitable solution, site-specific and specialist advice regarding foundation design should be sought from the project arboriculturist and an engineer. In shrinkable soils, the foundation design should take account of the risk of indirect damage.*"

Building Foundations

Any structures built on the site should comply with the foundation depths for buildings near or adjacent to trees and allow for the potential size of the trees at maturity. The soil types throughout the site will need investigating and appropriate measures taken.

If trees are removed across the site the potential for soil heave should be assessed and foundations designed accordingly (see NHBC Chapter 4.2, 2014).

Service Runs

All service runs, utilities and similar infrastructure should take note of trees and allow for working methods that will minimise damage to trees by referring to documents such as NJUG Volume 4 - Guidelines for the planning, installation and maintenance of utility services in proximity to trees (National Joint Utilities Group 2007).

5.4 ABOVE GROUND CONSTRAINTS

Existing Canopy Spreads

The existing canopy spreads of the trees on site are shown on the Tree Constraints Plan (Drawing Number C120301-02-01, contained within Section 7 of this report).

The current spread of a tree is a constraint due to its dominance, size and movement in strong winds. It will typically be unacceptable to design any built development within the current spread of a tree.

Where built development is proposed in close proximity to existing trees consideration should be given to the amount of working space required to allow its construction.

Additionally where development is proposed in close proximity to the existing canopy spread of a tree the likelihood of leaf or fruit fall or an accumulation of honeydew causing nuisance must be given.

It should also be noted that where the Root Protection Areas for retained trees do not extend to the edge of existing canopy spreads it is possible that those parts of the trees extending beyond the RPA may sustain damage during construction.

Where this occurs there are two primary options available to manage and minimise the potential for damage to tree canopies during development and these may be used singularly or in combination.

The first option is to create a Construction Exclusion Zone (CEZ), by the erection of protective fencing, around the full extent of the tree's canopy. The second is to undertake pre-development pruning works to the trees to reduce the potential for branch damage to occur.

Future Tree Growth

Some of the trees surveyed are not yet mature and they have the potential for future growth. Where these are to be retained consideration of their ultimate crown spread should be given as future branch growth may

result in interference with the proposed development, damage to branches and the need for a tree pruning regime.

Within the area of maximum branch spread, construction activities should be restricted for the long-term health and vigour of the trees. It is considered that within the area of maximum branch spread single storey buildings and the installation of hard surfaces would be an appropriate form of construction, however should car parking be proposed beneath the ultimate spread of trees the likelihood of fruit fall, leaf litter or sap exudation causing a nuisance must be considered.

In addition it is important to consider the likelihood of damage to trees or structures that may be caused by continuous whipping of branches in windy conditions. In such circumstances branches may have to be repeatedly cut back which will introduce wounds in the tree and may spoil its form or shape. In general terms trees should not be retained upon the basis that their ultimate branch spread can be significantly controlled by periodic pruning.

6. RECOMMENDATIONS

The following site-specific recommendations are made:

- The retention of the Category A and B trees across the site should be considered as a priority as these specimens are likely to make a substantial contribution to the continued landscape character of the site.
- The retention of the Category C trees should be considered where possible though it must be noted that these specimens have a low retention value and are likely to only offer a temporary contribution to the landscape character of the site.
- A number of trees have been given an interim grading, trees 2756 and 2759 require the ivy to be severed from 0.0 – 1.5 m above ground level and once the ivy has died off the trees are to be re inspected. Tree 2761 requires an aerial inspection of the storm damage and cavity located on the main stem, this is to investigate the extent of decay.
- It is recommended that all Category U trees are to be removed as these specimens offer a limited contribution to the study area.
- In general all new development shall be located outside of the RPA or canopy spread of any retained tree.
- Where any new development is proposed within the RPA or canopy spread of a retained tree it must be constructed in such a way that damage of the trees root system or crown can be avoided.
- Should new development require works within the RPA of any retained tree an Arboricultural Method Statement should be prepared to set out what steps are to be taken to protect the trees during the course of development.
- Any proposed new planting should consist of native and wildlife attracting species with a robust five year management plan to assist with the development proposal and to offer mitigation for any tree loss.
- This Arboricultural Survey is valid for a period of 12 months. If works are not commenced within this time period then it is advised that the trees are re-inspected to ensure no significant defects have developed since the original survey.

The following generic guidance should also be taken into account during the construction phase of any development, or significant engineering:

- Any trees, groups and hedgerows that are to be retained should be adequately protected by Heras fencing, in line with BS5837:2012, extending at least to the Root Protection Radius, to prevent accidental damage by vehicles or contractors (see Table 3.4, page 12, for RPA data for each tree).
- All tree works are to be carried out by a competent and qualified arborist to BS3998:2010 standards.
- Tree protection should be included in the induction and/or briefing sessions by the contractors to site personnel.
- Soil compaction, from the storage of large quantities of materials and plant tracking, may result in changes to soil permeability and local drainage. This may lead to waterlogging or loss of soil crumb structure. These effects may in turn lead to root asphyxiation and root death, a cause of instability and or mortality in trees. For this reason, heavy machinery and the storage of materials should be excluded from the crown and Root Protection Radius of all trees.
- The recommendations of BS5837:2012 and National Joint Utilities Group Volume 4 (Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees) (as appropriate to operations) should be followed when working close to trees.
- If works take place during the bird breeding season, usually from March to September inclusive, trees and hedgerows should be checked for nesting birds. If any trees are to be removed this should be done outside the breeding season or in the presence of a suitably qualified ecologist.
- Mature trees often contain cavities, hollows, peeling bark or woodpecker holes which provide potential roosting locations for bats. Bats and the places they use for shelter or protection (i.e. roosts) receive European protection under The Conservation of Habitats and Species Regulations 2010, as amended (Habitats Regulations 2010, as amended). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. Consequently causing damage to a bat roost constitutes an offence. As such prior to undertaking works to trees a check to see if they are being used for bat roosting should be undertaken by a suitably qualified and experienced ecologist.

7. DRAWINGS

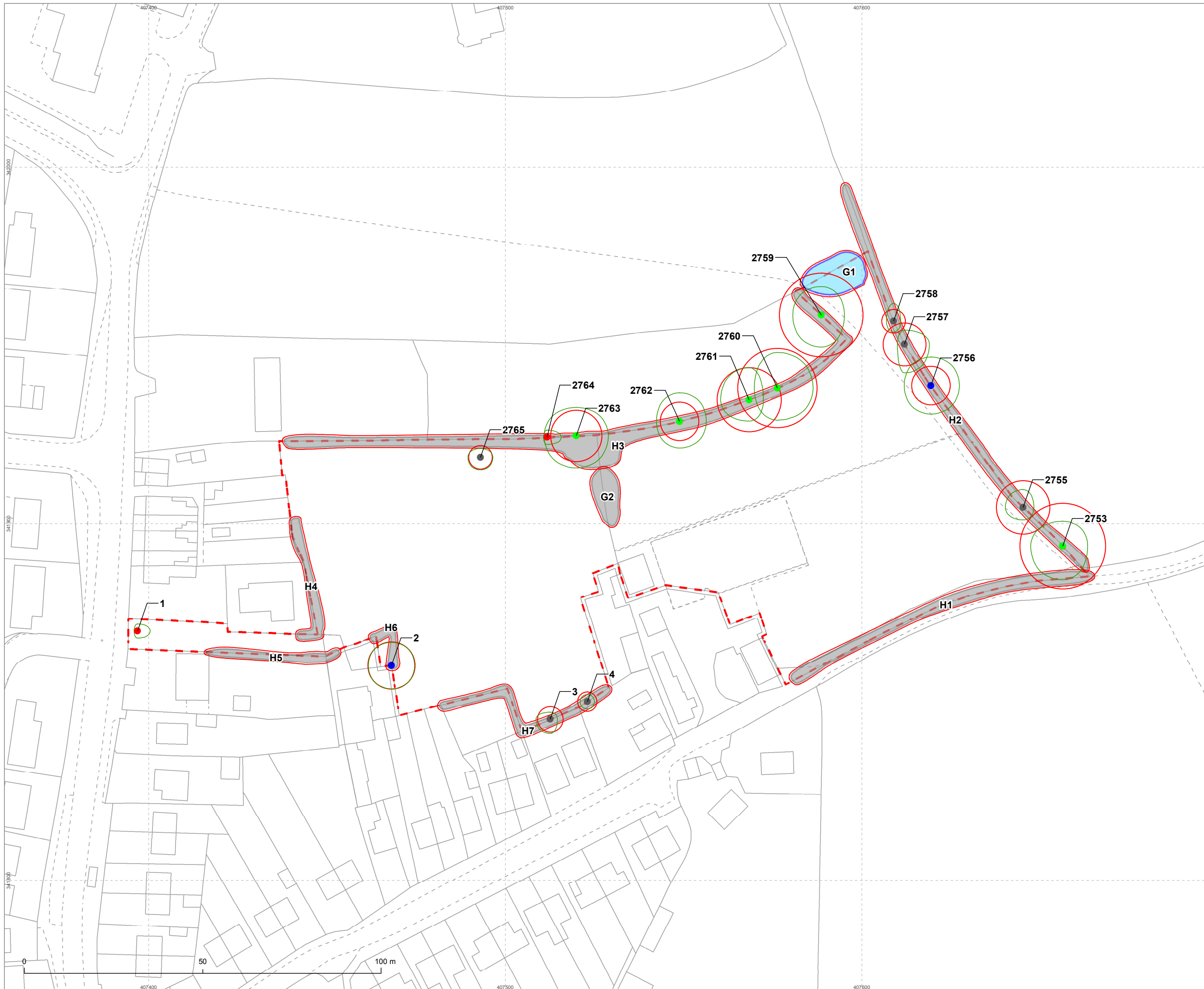
Drawing Number C120301-02-01– Tree Constraints Plan

Legend

- Category A tree
- Category B tree
- Category C tree
- Category U tree
- Category B group
- Category C group/hedgerow
- Current canopy extent
- Root Protection Area
- Site boundary

Note: on-site trees have been tagged at 1.5 m above ground level.

The original of this drawing was produced in colour - a monochrome copy should not be relied upon



Project
Land at Bee Cottage, Alton, Stoke-on-Trent

Drawing
Tree Constraints Plan

Client
Hewitt & Carr Architects

Drawing Number C120301-02-01	Revision 00
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Scale @ A3 1:1,000	Date August 2015
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Approved By DM	Drawn By RP
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