

**ARBORICULTURAL SURVEY**  
at  
**Bannisters Barn**  
**Markbeece**  
**Edenbridge**  
**Kent**  
**TN8 5NS**

**Client:**

360 Globalnet  
on behalf of Privilege

**Client Address:**

Regus House  
Herald Way  
Pegasus Business Park  
Castle Donnington  
DE74 2TZ

**Client Telephone:**

0116 478 1258

**Insured:**

Dr Brian Milner

**Claim Number:**

DLG-SN-20-002198

**JCA Ref:**

17531/LW

**Client Ref:**

29595893

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## 1. Introduction

### 1.1 Purpose of the Report

- 1.1.1 This arboricultural report is required by our client as part of an investigation into suspected clay shrinkage subsidence damage at: **Bannisters Barn, Markbeech, Edenbridge, Kent, TN8 5NS.**

### 1.2 Terms of Reference

- 1.2.1 We are instructed by **360 Globalnet** to visit the site and carry out an arboricultural survey covering all vegetation within likely influencing distance of the subject property. It has been requested that we only consider vegetation management options for the purpose of this report.
- 1.2.2 We have been supplied with details of the site investigation, which was carried out by **Drainage Repair Company**, and have included the salient points in this report. We have applied this information to our knowledge of trees and the arboricultural data we gathered on site and prescribed recommendations for current, or future action, if required.
- 1.2.3 We are to prepare our findings in a detailed report, making specific recommendations as to any arboricultural management which may be required to prevent further damage.

### 1.3 Scope of the Report

- 1.3.1 The subject property is a two-storey, detached house with extensions to the left-hand and right-hand sides of the property.
- 1.3.2 Damage has occurred to the house and left-hand side extension. Please see the **360 Globalnet Engineer's Report** for full details of the current damage at the subject property.
- 1.3.3 The distance between the vegetation surveyed and the building is measured from the closest part of the property.

## 2. Survey Conditions and Methods

### 2.1 Date of Inspection and name of Inspector

2.1.1 The site was surveyed during September 2021 by **Richard Daubeny** *Level 3 Arboriculture*.

### 2.2 Data Collection Methods

2.2.1 The inspection was carried out at ground level using visual assessment of the tree canopy, stem and rooting area. No digging or drilling was carried out on this occasion.

2.2.2 The measurements were made using instruments including clinometers for tree *HEIGHT*, diameter tapes for *STEM DIAMETER* (measured at 1.5m above ground level) and tape measures or electronic distometers for *CROWN SPREAD* and *DISTANCE TO PROPERTY*.

2.2.3 *AGE CLASS* and *LIFE EXPECTANCY* values are estimated based upon our knowledge of trees and the way they grow. No core sampling was carried out on this occasion.

2.2.4 The term *INFLUENCING DISTANCE* as used in this report is not derived from the NHBC's 'zones of influence' formula. It is merely an estimation of the potential of a tree or shrub to cause damage to the subject property after due consideration of many factors including soil characteristics, specimen size, vigour, species, likely water uptake and distance from the property.

2.2.5 '*NHBC WATER DEMAND*' (low, moderate or high) are categories originated by the National House Building Council. The concept was designed to be used as an aid for determining the correct foundation depths for new build situations where there are existing trees present.

## 3. Ground Investigation, Soil & Root Analysis

### 3.1 Introduction

- 3.1.1 Trees influence soil conditions, and in some soil types root activity can create a soil moisture deficit (S.M.D.), which means that the amount of water being used by the tree and by natural evaporation has exceeded the amount of water entering the ground through precipitation or other means. This deficit can lead to soil shrinkage which in turn can cause a building to move, particularly if its foundations are shallow. The result is *SUBSIDENCE*.
- 3.1.2 The soil's *PLASTICITY INDEX*, *PLASTIC LIMIT*, *MOISTURE CONTENT* and the likely water uptake of the tree/trees in question are key factors in determining whether shrinkage has occurred.
- 3.1.3 On shrinkable soils, damage to buildings can also occur as a result of tree removal. In such cases, re-hydration of the soil beyond that which would ordinarily occur prior to the removal of vegetation can cause an upwards movement of the ground which is known as *HEAVE*. Trees should not, therefore, be removed without due consideration of likely effects.
- 3.1.4 The ground investigation and root analysis at this site have been carried out by others. Results of these investigations are briefly summarised below.

### 3.2 Foundations Types and Depths

- 3.2.1 Please refer to the site plan at **Appendix 2** for an indication of the trial pit/borehole locations.
- 3.2.2 **Trial pit/borehole 1** revealed a concrete foundation at a maximum depth of 200mm below ground level.
- 3.2.3 **Trial pit/borehole 2** revealed a concrete foundation at a maximum depth of 900mm below ground level.

### 3.3 Soil Types

#### 3.3.1 Trial Pit/Borehole 1:

- The soils *plasticity index* ranged from 31% to 41%.
- *Moisture contents* within the soil samples ranged from 27% to 35%.
- The *plastic limit* of the soils ranged from 25% to 27%.
- The *liquid limit* of the soils ranged from 56% to 68%.

These results indicate that the clay soil found within **Trial Pit/Borehole 1** is of medium to high shrinkability and that the soil is **not** desiccated.

#### 3.3.2 Trial Pit/Borehole 2:

- The soils *plasticity index* ranged from 30% to 42%.
- *Moisture contents* within the soil samples ranged from 30% to 35%.
- The *plastic limit* of the soils ranged from 25% to 29%.
- The *liquid limit* of the soils ranged from 55% to 71%.

These results indicate that the clay soil found within **Trial Pit/Borehole 2** is of medium to high shrinkability and that there is an onset of desiccation between 1.5 and 2m.

### 3.4 Root Analysis

- 3.4.1 Microscopic examination of tree root anatomy generally enables the GENUS of roots recovered during the ground investigation to be established. However, it rarely identifies individuals to SPECIES level.
- 3.4.2 Certain species, for instance Willows and Poplars, are indistinguishable by these methods and identification can only be made at FAMILY level.
- 3.4.3 The diameter and the depth of the root can be an indication of its significance.
- 3.4.4 To establish whether the root is alive, iodine is used to test for starch which is stored in some cells of living tree roots but is broken down by micro-organisms upon the death of a root in the soil.
- 3.4.5 Live root samples are normally a prerequisite for establishing, on a balance of probability, which vegetation is the most likely cause of any damage noted.
- 3.4.6 Results of the analysis of root material recovered during the ground investigation are summarised in the table below.

Trial Pit/B/hole	Sample Depth (m)	Family	Genus	Diam. (mm)	Starch Test
1	0.2-2.2	<i>Oleaceae</i>	-	-	-
1	0.2-2.2	Monocotyledon group	-	-	-
2	0.9-2.5	<i>Fagaceae</i>	<i>Quercus</i>	-	-

- 3.4.7 The root identification is a family match to the vegetation identified as **T1** and **S3** in this report.

## 4. Status of the Trees

- 4.1 A Tree Preservation Order (TPO) and Conservation Area check was made on **12<sup>th</sup> August 2021** with **Sevenoaks District Council**.
- 4.2 We are informed that the site is within **Markbeech Conservation Area**.
- 4.3 Before any work is organised for trees with a stem diameter of above 75mm, a 'notice of intent' must be submitted to the Local Authority, outlining all the proposed works along with a suitable justification. A waiting period of six weeks is then required, during which time the Local Authority may or may not decide to afford the trees with further protective status. If, after the required timescale has lapsed and/or the authority does not wish to allocate a Tree Preservation Order (TPO), the works may commence as planned.
- 4.4 *No work must be done to trees with a stem diameter of above 75mm until the above process has been completed and the trees have not been allocated with a TPO.*

## 5. Tree Descriptions & Recommendations

- 5.1 Descriptions of the surveyed vegetation and all recommended work are detailed in the tables at **Appendix 1**.
- 5.2 Please refer to the site plan at **Appendix 2** for the locations of the vegetation surveyed and all the relevant site features.



## 6. Discussion

- 6.1 We have been informed by our client that the damage observed at the property is due to clay shrinkage caused by vegetation.
- 6.2 Based on this information, having made a detailed survey of the site and having given due consideration to the other information supplied, it is likely that in this case some subsidence damage has occurred as a result of drying shrinkage caused by vegetation within influencing distance of the property.
- 6.3 We consider the vegetation identified as **T1** and **C17** to be the primary cause of the damage observed at the subject property. We have therefore recommended that these be removed and that the stump be treated to prevent regrowth.
- 6.4 We consider the vegetation identified as **S2** to **S16** to be of possible future concern to the subject property, if left unmanaged. We have therefore recommended that these be maintained at or below their current size. These works are only recommended as a precaution and are not considered a priority to resolve the damage observed at the subject property.
- 6.5 We have summarised all our tree specific recommendations in **Section 7** and made general recommendations in **Section 8**. The effect of these recommendations should be to prevent further damage by reducing the moisture uptake close to the problem areas.

## 7. Summary of Tree Specific Recommendations

Item	Species	Recommended Action	Location	Planning Restriction
T1	English Oak	Remove and treat stump to prevent re-growth.	Subject Property	Markbeech Conservation Area
S2	Mixed species	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
S3	Mixed species	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
S4	Mixed species	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
C5	Mixed species	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
H6	Beech	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
C7	Bianca Hop	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
S8	Rose	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
C9	Mixed species	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
T10	Sycamore	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
T11	Boxelder Maple	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
C12	Grape	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
T13	Beech	Maintain at current height and spread.	Third Party – Barn Plat	Markbeech Conservation Area
T14	Pear	Maintain at current height and spread.	Third Party – Barn Plat	Markbeech Conservation Area
H15	Beech	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
S16	Rhododendron	Maintain at current height and spread.	Subject Property	Markbeech Conservation Area
C17	Honeysuckle	Remove and treat stump to prevent re-growth.	Subject Property	Markbeech Conservation Area

## 8. General Recommendations and Observations

- 8.1 This report is based upon a visual inspection. JCA Limited shall not be responsible for events which happen after this time due to factors which were not apparent at the time, and the acceptance of this report constitutes an agreement with the guidelines and the terms listed in this report.
- 8.2 All tree work must be carried out to BS 3998: 2010 - '*Recommendations for Tree Work*'.
- 8.3 Any tree work should be carried out by qualified, experienced and skilled arboricultural contractors covered by adequate *public liability and employers liability insurance*. Any defects seen by a contractor or the employer that were not apparent to the consultant must be brought to the consultant's attention immediately.
- 8.4 The influence of trees on the soil and on buildings may change as they grow, as climate varies or as other changes occur in the local environment. It is therefore advisable to have trees inspected by JCA Limited annually.
- 8.5 That the project engineer considers all possible solutions which may not involve vegetation works, if there is a wider public or ecological interest in retaining the trees influencing the property.
- 8.6 The property and the damage should be monitored by the project engineer on a regular basis after the recommended tree works are complete.
- 8.7 If, after the works have been carried out, there is little improvement, this may mean that the situation cannot be rectified by arboricultural means alone. If this point is reached the situation must be reassessed in conjunction with other experts.
- 8.8 No liability can be accepted by the consultant in respect of the trees unless the recommendations of this report are carried out under their supervision and within their timescale.
- 8.9 That the project engineer considers the possibility of heave.

# Appendices

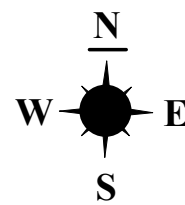
## Appendix 1: Tree Descriptions and Recommendations

Tree Ref.	Age Common Name <i>Botanical Name</i>	Height (m)	Stem Diameter (cm)	Canopy Spread (m)	Owner / Occupier  Observations	Condition	Distance to Property (m)	NHBC Water Demand	Life Expectancy (yrs)	Within Potential Influencing Distance	Root Identification Match	Contributing to Damage	Recommendations
T 1	Mature English Oak <i>Quercus robur</i>	17	117	18	Policy Holder  No recent tree management. Circa 300 years old.	GOOD	10	HIGH	40+	Yes	Yes	Yes	Remove and treat stump to prevent re-growth.
S 2	Mature Mixed Species <i>Details in observations.</i>	1.3	4	1.5	Policy Holder  Shrub bed consisting of Hazel, Rose, Viburnum and Wisteria. Circa 10-20 years old.	GOOD	5.5	LOW	20+	No	No	No	Maintain at current height and spread. Future risk.
S 3	Mature Mixed Species <i>Details in observations.</i>	2.5	5	2	Policy Holder  Shrub bed consisting of Lilac, Japanese Laurel, Mock Orange, Rose and Berberis. Maintained top and sides. Circa 10-20 years old.	GOOD	7.5	NO DATA	20+	NO DATA	Yes	Unlikely	Maintain at current height and spread. Future risk.
S 4	Mature Mixed Species <i>Details in observations.</i>	1.5	6	1.3	Policy Holder  Shrub bed consisting of Camelia, Rose and Azalea. Circa 10-20 years old.	GOOD	2.5	NO DATA	20+	NO DATA	No	Unlikely	Maintain at current height and spread. Future risk.
C 5	Semi-mature Mixed Species <i>Details in observations.</i>	2	3	1.2	Policy Holder  Vine and Purpurea growing alongside the wall of the subject property. Circa 10-20 years old.	GOOD	0.2	NO DATA	20+	NO DATA	No	No	Maintain at current height and spread. Future risk.
H 6	Mature Beech <i>Fagus sylvatica</i>	2.2	10	1.3	Policy Holder  Maintained top and sides. Circa 10-20 years old.	GOOD	1.5	MOD	40+	Yes	No	No	Maintain at current height and spread.
C 7	Mature Bianca Hop <i>Humulus lupulus</i>	2	4	1.3	Policy Holder  No recent pruning management. Circa 10-20 years old.	GOOD	2.8	NO DATA	20+	NO DATA	No	No	Maintain at current height and spread. Future risk.
S 8	Mature Rose <i>Rosaceae sp.</i>	2	4	1.2	Policy Holder  Maintained top and sides. Circa 10-20 years old.	GOOD	0.1	NO DATA	20+	NO DATA	No	No	Maintain at current height and spread. Future risk.
C 9	Semi-mature Mixed Species <i>Details in observations.</i>	1.8	3	1	Policy Holder  Rose and Honeysuckle climbers alongside the wall of the subject property. Circa 10-20 years old.	GOOD	0.1	NO DATA	20+	NO DATA	No	No	Maintain at current height and spread. Future risk.
T 10	Early-mature Sycamore <i>Acer pseudoplatanus</i>	3	11	3	Policy Holder  No significant recent tree management. Circa 10-20 years old.	GOOD	10.9	MOD	40+	Yes	No	No	Maintain at current height and spread. Future issue.

Tree Ref.	Age	Height (m)	Stem Diameter (cm)	Canopy Spread (m)	Owner / Occupier	Condition	Distance to Property (m)	NHBC Water Demand	Life Expectancy (yrs)	Within Potential Influencing Distance	Root Identification Match	Contributing to Damage	Recommendations
	Common Name Botanical Name				Observations								
T 11	Semi-mature Boxelder Maple <i>Acer negundo</i>	5	20	9	Policy Holder  No recent tree management. Circa 30-40 years old.	GOOD	5.67	MOD	40+	Yes	No	No	Maintain at current height and spread. Future risk.
C 12	Semi-mature Grape <i>Vitis sp.</i>	2	3	1.2	Policy Holder  No recent pruning management. Circa 10-20 years old.	GOOD	0.1	NO DATA	20+	NO DATA	No	No	Maintain at current height and spread. Future risk.
T 13	Mature Beech <i>Fagus sylvatica</i>	18	80	17	Policy Holder  No recent significant tree management. Circa 140-160 years old.	GOOD	10.8	MOD	40+	Yes	No	No	Maintain at current height and spread. Future risk.
T 14	Semi-mature Pear <i>Pyrus communis</i>	5	15	3	Third Party - Barn Plat  Situated alongside <b>H6</b> . Circa 20-30 years old.	FAIR	7.5	MOD	10+	Yes	No	No	Maintain at current height and spread.
H 15	Mature Beech <i>Fagus sylvatica</i>	2	10	1	Policy Holder  Maintained top and sides. Circa 10-20 years old.	GOOD	1.5	MOD	20+	Yes	No	No	Maintain at current height and spread.
S 16	Mature Rhododendron <i>Rhododendron sp.</i>	1.6	8	1.4	Policy Holder  No recent pruning management. Circa 10-20 years old.	GOOD	2.44	NO DATA	20+	NO DATA	No	No	Maintain at current height and spread.
C 17	Semi-mature Honeysuckle <i>Lonicera sp.</i>	1.5	2	1	Policy Holder  Growing along the wall of the subject property. Circa 10-20 years old.	GOOD	0.5	NO DATA	20+	NO DATA	No	Likely	Remove and treat stump to prevent re-growth.

## **Appendix 2: Site Plan**





To Markbeech

Barn Plat

H6

T14

T13

H6

Bannisters Barn

T/H2

T/H1

T1

T10

S2

C9

S16

T11

H15

C12

C17

S8

C5

S4

C7

S3

Appendix 2: Site Plan			
ADDRESS: Bannisters Barn, Markbeech, Edenbridge, Kent, TN8 5NS. JCA REF: 17531/LW			CANOPY OF TREE/SHRUB-GROUP TO BE RETAINED; NO ACTION REQUIRED
NOT TO SCALE PAPER SIZE: A3			CANOPY OF TREE/SHRUB-GROUP TO BE RETAINED; CURRENT OR FUTURE MANAGEMENT REQUIRED
SURVEYED BY: RD DRAWN BY: LW APPROVED BY: XX			CANOPY OF TREE/SHRUB-GROUP TO BE REMOVED
 JCA Limited Arboricultural & Forestry Consultants			STEM OF TREE/SHRUB TO BE RETAINED
			STEM OF TREE/SHRUB TO BE REMOVED
			OUTLINE OF SUBJECT PROPERTY
			APPROXIMATE LOCATION OF THE DAMAGE
			BOREHOLE/TRIAL PIT LOCATION

## Appendix 3: Author Qualifications

### Principal Consultant and Managing Director

**Jonathan Cocking** *F.R.E.S., Tech. Cert. (Arbor.A), PDipArb (RFS) FArborA CBiol MSB. MICFor.* Jonathan is a Registered Consultant and Fellow of the Arboricultural Association and sits on its Professional Committee. He has 31 years' experience in the Arboricultural profession and served for eight years as Senior Arboriculturist with a large local authority before establishing JCA in 1997. Jonathan has since developed JCA's portfolio of services and its extensive client base. He is a Chartered Biologist, a Chartered Arboriculturist and an Expert Witness with much experience of litigation work.

### Technical Director

**Toby Thwaites** *BSc (Hons), HND (Arboriculture), MArborA.* Toby joined JCA in 1998 after graduating in Ecology at the University of Huddersfield and has since graduated in Arboriculture at the University of Central Lancashire. A former JCA team leader and Consulting Arboriculturist, Toby is now Technical Director and oversees all office and on-site activities at JCA and is on hand to offer technical support and advice.

### Consulting Staff: Arboriculture

**Andrew Bussey.** Andrew started working in consultancy at JCA in 2006 having spent 12 years working as an arborist for various private companies before joining a Local Authority forestry team. He has various NPTC qualifications, is QTRA qualified and is a LANTRA Accredited Professional Tree Inspector.

**Emily Wilde** *FdSc (Arboriculture).* Emily joined JCA having previously worked for various private tree surgery and consultancy companies over the past 8 years. She initially obtained a ND in Forestry & Arboriculture, followed by a FdSc in Arboriculture at Askham Bryan College, York. Emily has various NPTC certificates and is QTRA qualified.

**Mick Eltringham** *ND (Forestry).* Mick joined JCA after spending 12 years working in the industry for various private companies in the north and south of England. He has also spent the last five years working as a consultant for two canopy research projects in the Amazon Rainforest, working with Oxford University and the University of Arizona. He has various NPTC Qualifications.

**Charles Cocking** *FdSc (Arboriculture), MArborA.* Charles joined JCA in January 2014 as an Apprentice having previously worked for the company on a part time basis during 2013. Charles obtained his Foundation Degree in Arboriculture at Askham Bryan College, York.

**Dan Kemp** *FdSc (Arboriculture).* Dan joined JCA with nearly 30 years' experience in arboriculture. He worked as a London Tree Officer for 12 years and in several arboricultural and horticultural management posts, specialising particularly in tree risk assessments and tree related subsidence.

**Ryan Bateman** *BSc (Hons), FdSc (Arboriculture), TechArborA.* Ryan joined JCA in 2020 after working as a Lecturer on the Foundation Degree in Arboriculture at Askham Bryan College in York. Ryan has both practical skills, NPTC qualifications and theoretical knowledge and owned his own contracting business prior to, and whilst working as a lecturer.

**Robert Armitage** *BSc (Hons) Arboriculture, MArborA.* Rob joined JCA in 2021 with over six years' experience within arboricultural consultancy, predominantly within the context of the UK planning system. Rob has recently attained professional membership of the Arboricultural Association.

**Luke Wickham** *FdSc (Arboriculture and Urban Forestry).* Luke joined JCA in 2021 after obtaining his Foundation Degree in Arboriculture and Urban Forestry at Askham Bryan College. Having previously worked within the industry for the past 4 years, running his own small business and sub-contracting for local firms, Luke brings a sound knowledge and understanding of the practical and academic sides of the industry.

**Matt Large** *DipArb L4 (ABC) TechArborA.* Matt is based in Northampton and assists JCA by undertaking surveys in the south of the country. He has been involved in the arboricultural sector since 1996 and obtained a Level 4 Diploma in Arboriculture in 2011. Matt is a LANTRA Accredited Professional Tree Inspector.

**Jonnie Setterfield** *BSc (Hons) MArborA.* / **Richard Daubeny** *Level 3 Arboriculture* / **Peter Wilkins** *BA (Hons) MArborA MIEnvSc.* Jonnie, Richard and Peter are based in the south-east of the UK and assist JCA by undertaking surveys in the south of the country.

### Administrative Staff

**Lorraine Spink** Administrative Assistant.  
**Lisa Beedham** Marketing Manager.

**Catherine Cocking** Accounts Manager.  
**Kelly Saunders** Accounts Assistant.

## Appendix 4: Photos



Image 1: **T1** (Oak) to be removed.

We hope that this report provides all the necessary information, but should any further advice be needed please do not hesitate to contact the author.

The contents of this report are true to the best of our knowledge and belief.

Signed



.....  
**Luke Wickham** *FdSc (Arboriculture and Urban Forestry).*

15<sup>th</sup> September 2021

For and on behalf of **JCA Ltd**

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# JCA Ltd. Arboricultural and Ecological Consultants

## Professional Tree and Ecology Advice nationwide

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### ARBORICULTURAL SERVICES

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#### Guidance for Architects and Developers

- British Standard 5837 Tree Surveys
- Arboricultural Implication Assessments (AIA)
- Arboricultural Method Statements (AMS)

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#### Advice for Engineers, Loss Adjusters and Insurers

- Tree Surveys for Subsidence
- Heave Assessment
- Tree Root Identification

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#### Advice for Local Authorities and Social Housing

- Tree Safety Surveys
- Specialist Decay Detection
- Landscape and Orchard Design

---

#### Tree Advice for the Legal Profession

- Subsidence Litigation
- Personal Injury and Accident Investigation
- Expert Witness, Planning Inquiries and Appeals

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#### Veteran Tree Management

- Ancient Woodland Management
- Veteran Tree Management

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#### Tree Health and Pest and Disease Management

- Pest and Disease Surveys
- Tree Health Checks
- Disease Mitigation and Control

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### ECOLOGICAL SERVICES

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#### Ecological Pre-Planning Services

- Phase 1 Habitat Surveys
- Great Crested Newt eDNA Sampling
- Protected Species: Bat, Wintering and Nesting Bird, Badger, Amphibian, Otter, Water Vole, White-Clawed Crayfish, Dormice and Reptile Surveys.
- Preparation for Environmental Impact Assessment (EIA)
- Invasive Species Surveys
- Code for Sustainable Homes

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#### Ecological Post-Planning Services

- Biodiversity Enhancement Plans
- Protected Species Mitigation
- Ecological Management (Bat and Bird box installation and inspection)

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#### HEAD QUARTERS:

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