

 Tel: 01676 525880

Report Verification

Report Version	Date	Completed by:	Checked & Approved by:
Final	17/03/2023	Dean Moore Dip Arb TechArborA Senior Arboricultural Consultant	Duncan Smith BSc (Hons) MArborA Arboricultural Manager
Revision A	24/03/2023	Dean Moore Dip Arb TechArborA Senior Arboricultural Consultant	Duncan Smith BSc (Hons) MArborA Arboricultural Manager

Declaration of Compliance

This study has been undertaken in accordance with British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations*'.

Disclaimer

The contents of this report are the responsibility of Middlemarch. 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 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.

This Arboricultural Method Statement has been produced following a review of a fixed approved development layout for the site based on data provided by the client. The methods of work described herein will be a requirement of all relevant contractors associated with the development proposals.

On Site Monitoring Regime & Contact Details

All operations detailed within this AMS will be monitored by the Principal Contractor. The Principal Contractor will ensure that specifications within this document are followed (this will be built into the contract specification) and that the Project Arboriculturist will be contacted for advice in relation to works near to retained trees, as required by Condition 6 The Project Arboriculturist for the site is:

Name: Dean Moore

Position: Senior Arboriculturist

Mobile: 07715 707 397

Email: dean.moore@middlemarch.eco

Action	Project Arboriculturist Attendance Required
	✓ ✕
Pre-commencement site meeting / toolbox talk / induction	✓
Audit timetable	✓
RIBA Stage 5 - Enabling Works (Demolition)	
Tree Surgery	✓
Site set up and logistics	✓
Establishment of Demolition Exclusion Zone	✕
Topsoil Stripping / Subsoil Regrading	✓
Demolition of Structures and Removal of Hard Surfaces	✕
RIBA Stage 5 - Main Works (Construction)	
Establishment of Construction Exclusion Zone	✓
Permanent Ground Protection Measures	✓
Construction of Structures within the RPA / CEZ	✕
Working space to construct new buildings within RPAs	✕
Installation of utilities within RPAs	✓
RIBA Stage 6 – Handover and Close Out	
Removal of tree protection measures	✓
Tree Safety Assessment for handover	✓

Responsibilities

It is the responsibility of the Principal Contractor to ensure that the planning conditions attached to the planning consent are always adhered to and that a monitoring regime regarding tree protection is adopted on site.

The Principal Contractor will be responsible for contacting the Local Planning Authority should any issues are raised related to the trees on site.

If pruning works to trees beyond the agreed scope within this Method Statement are required at any time, then permission must be sought from the Local Planning Authority prior to commencement. All tree surgery works must be carried out in accordance with BS3998.

The Principal Contractor will ensure the build sequence is appropriate to ensure that no damage occurs to retained trees during the construction processes. Protective measures will remain in position until completion of the construction phase of development and will only be removed to allow the commencement of soft landscaping works.

The protection measures and signs will always be maintained in position and checked daily by a designated person on site under the responsibility of the Principal Contractor.

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1. Introduction

1.1 Project Background

This Arboricultural Method Statement was commissioned by Vistry Homes Ltd Southern to accompany a planning application following planning consent for residential and commercial development at Boorley Gateway in Hampshire. A survey of the trees on site and within influencing distance of the boundaries was undertaken on the November 2018 as part of a Preliminary Arboricultural Assessment (PAA) to aid design and avoid unnecessary tree removal.

An Arboricultural Impact Assessment (AIA) was subsequently undertaken to identify the potential impact of the development on the existing trees surveyed during the PAA in accordance with British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction - Recommendations' (hereafter referred to as BS5837).

Planning Consent for development (application reference 12/71514) was granted, subject to Condition 6 which states:

"No excavation, demolition or development related works shall take place on site until a arboricultural monitoring and supervision statement has been submitted to and approved in writing by the Local Planning Authority. The approved statement must be adhered to in full, and may only be modified subject to written agreement from the Local Planning Authority. This condition may only be fully discharged upon completion of the proposed development, subject to submission of monitoring reports as set out in the statement."

This Arboricultural Method Statement has been compiled to provide the information necessary to discharge Condition 6 and RIBA Stage 5 including:

- Audit schedule
- Specific tree protection measures
- Specific tree-friendly construction operations
- Tree pruning specification
- Arboricultural Clerk of Works (ACoW) supervision

1.2 Site Description, Drawings and Appendices

Attribute	Description
National Grid Reference	SU 5047 1506
Topography	Undulating ground, sand bunkers and a mix of hard and soft landscaping.
Tree Cover	Scattered trees, hedgerows, groups of trees and several woodlands are present across the site forming significant landscape and cultural features that can be viewed from afar.

Attribute	Description
Drawings attached	Tree Survey Plan – C129668-01-01 Tree Retention Plan – C129668-02-01 Tree Protection Plan – C159905-01-01
Appendices	Appendix A – Tree Schedule

Table 1.1: Summary of Site and Surroundings

1.3 Approved Development

The approved development to a mixed use and assisted living elements of the masterplan, comprising 933 sqm of employment floorspace (B1), a 378 sqm convenience foodstore (A1 Use Class), 389 sqm of flexible retail floorspace (A1/A2/A3) and 67 residential units for older persons (C3 Use Class) with associated parking, landscaping, drainage, road infrastructure and pedestrian and cycle links.

The application under consideration is for the development of mixed-uses under the extant outline planning permission for Boorley Green granted November 2013 (ref: O/12/71514). The proposals comprise:

- 933 sqm of light industrial units.
- 767 sqm of retail floorspace.
- 68 units (C3) of assisted living accommodation.
- Associated parking.
- Associated cycle parking.
- Associated refuse storage.
- Associated landscaping.

The proposed development has been designed so that safe and healthy existing trees are retained wherever possible and that those trees to be retained are not significantly impacted upon by the development.

1.4 Documentation Provided

This statement is based upon the information provided by the client, in addition to information collected by Middlemarch during the Preliminary Arboricultural Assessment, as detailed below.

Author	Document	Drawing Number	Date
Survey Solutions	Topographical Survey (14 sheets)	10633cv-01 to 10633cv-14 inclusive	Dec 2011
MJA Consulting	Engineering Layout Sheet 1	6663-MJA-SW-XX-DR-C-001 C3	11/02/2022

Table 1.2: Documentation Provided

2. Statutory Designation

2.1 Tree Preservation Order and Conservation Area Protection

A desk-based study was undertaken to identify if any of the trees present within or near the site are affected by statutory constraints as detailed below.

Statutory Constraint	Present ✓ ✗	Source	Details
TPO	✗	Eastleigh Borough Council via email 2 nd November 2018	None present.
Conservation Area	✗	Eastleigh Borough Council website	None present.
Ancient Woodland	✗	Multi Agency Geographical Information for the Countryside (MAGIC)	None present.

Table 2.1: Summary of Statutory Constraints that Affect the Site

Where a tree preservation order, conservation area or ancient woodland applies to trees within the assessment area, statutory constraints will apply to the development in respect of trees.

No works must be undertaken on the protected trees without prior permission from the Local Authority unless authorised as part of an approved planning application. Works include pruning, topping, lopping, uprooting or wilful damage or wilful destruction of these trees. Any proposed pruning works not currently approved will need to be fully specified and agreed within a future planning application.

2.2 Protected Species

Bats

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 2017 (Habitats Regulations 2017)¹. They receive further legal protection under the

¹ HM Government – The National Archives (2017) [online] The Conservation of Habitats and Species Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/1012/contents/made>

Wildlife and Countryside Act (WCA) 1981², as amended. Consequently, causing damage to a bat roost constitutes an offence.

Generally, should the presence of a bat roost be suspected whilst completing works on any trees on site then an appropriately licensed bat worker should be consulted for advice.

Birds

Trees offer potential habitat for nesting birds which are protected under the Wildlife and Countryside Act (WCA) 1981, as amended. Some species (listed in Schedule 1 of the WCA) are protected by special penalties. This legislation makes it an offence to intentionally or recklessly damage or destroy an active bird nest or part thereof.

As the trees on, and adjacent, to the site provide potential habitat for nesting birds all tree work should ideally be completed outside the nesting bird season (Generally March to September).

If this is not possible then the vegetation should be subject to a nesting bird inspection by a suitably experienced ecologist prior to commencement of works. If any active nests are identified then the vegetation, and a defined buffer zone, will need to remain in place until the young have naturally fledged.

² HM Government – The National Archives 2017. *Wildlife and Countryside Act 1981*. [online] Available at: <http://www.legislation.gov.uk/ukpga/1981/69/contents>

3. Arboricultural Method Statement

3.1 Introduction

The following sections of this report detail the specific protection measures, working methodologies and pruning requirements to be adopted as part of the demolition and construction phases of the project.

The principal contractor must ensure that they read and understand all of the following sections prior to commencement of site occupation.

Pre-commencement site meeting and site inductions

A pre-commencement site meeting involving the Project Arboriculturist and Principal Contractor will be undertaken at the beginning of the Enabling Works Phase, Main Construction Phase, Post Construction Phase.

Details of tree protection and methods of working around trees will be included within site inductions to new members of site staff. A copy of this document and the related Tree Protection Plan will be kept on site and referred to by operatives working near retained trees.

Monitoring/Audits

An inspection audit will be implemented by the Project Arboriculturist once the protective measures have been installed and prior to site occupation to ensure they provide the level of protection required for retained trees. Feedback will be provided to the Local Planning Authority Arboricultural Officer on completion of this visit and monthly audits of the tree protection measures will be undertaken by the Project Arboriculturist to ensure they remain in position and fit for purpose. Appendix D is a table of audits and monitoring undertaken for this project, this will be updated as and when audits are either requested by the client or the Local Planning.

Use of Subcontractors

The Principal Contractor will be responsible for ensuring sub-contractors do not carry out any process or operation that is likely to adversely impact upon any retained tree. If any issues arise in relation to the retained trees the Project Arboriculturist will be contacted for advice.

3.2 Enabling Works

Tree Work

All tree work should conform to BS3998:2010 and be completed prior to the installation of the tree protection measures and site occupation by demolition or construction contractors.

Tree/ Group Reference	Species	BS5837 Category	Retained	
			✓	✗
T171	Hornbeam	C		✗
T172	Hornbeam	C		✗
G181	Mixed Species	C		✗

Tree/ Group Reference	Species	BS5837 Category	Retained	
			✓	✗
G173*	Lombardy Poplar	C		✗
Key: *: Partial removal of trees within group.				

Table 3.2: Trees to be Removed or Pruned

In addition to the proposed tree removal, there are areas on site where it may be necessary to undertake access facilitation pruning works to retained trees to minimise the potential for accidental branch damage to occur during construction. As the phases of construction evolve, there will be a requirement to prune vegetation where it overhangs proposed highways and footways to provide adequate clearance for construction works and later pedestrian and vehicular use. Until these have been constructed, it would be difficult to predict the nature of these works.

As such, a tree works schedule should be compiled once the project commencement date has been announced and the methodology of works submitted by the Contracts Manager. Additionally, the Consortium must consider the long-term facilitation pruning requirements throughout the phased build program which is predicted to be a five to seven-year plan.

Site Setup, Compound, Materials Storage and Vehicle Parking

The site compound is to be located outside of the RPAs of retained trees and its establishment is unlikely to result in harm to retained trees. The location of the site compound is shown on the Construction Environment Management Plan produced by Vistry Southern.

Topsoil Stripping / Subsoil Regrading

Topsoil stripping and regrading of subsoils will not occur within the CEZ of any retained tree. Stored soil created from topsoil stripping will not be stored within any Construction Exclusion Zone.

Where regrading works are to be carried out within the RPAs of retained trees, these must be supervised by the Project Arboriculturist. No machinery must be located or stored within the RPAs of retained trees and all work must be carried out from the perimeter of RPA, working towards the trees where necessary in a precautionary manner. The spoil created from these works will not be stored within the RPA. Uncovered roots need to be assessed by the Project Arboriculturist. If deemed necessary, minor roots (<25 mm in diameter) uncovered by the works shall be pruned using clean, sterilised pruning saw or secateurs, leaving as small a pruning wound as possible. If a major root (>25 mm in diameter) is found, then works will be redesigned to accommodate any large roots found.

3.3 Main Works (Construction)

Construction Exclusion Zone

Protective barriers will be positioned to define the Construction Exclusion Zone (CEZ). Signs will be installed on the barriers to inform site contractors of the importance of the tree protection measures and no works that cause physical damage to retained trees, compaction of the soil or

severance of tree roots will occur within any exclusion zone. The extent of the CEZ encompasses the Root Protection Area (RPA) and / or tree canopy, whichever is the greatest.

No works, including storage of construction materials shall take place within the Construction Exclusion Zone as defined by the protective barriers.

The proposed location of the protective barriers surrounding the CEZ is identified on the Tree Protection Plan attached. The barriers will remain in place until completion of the demolition phase and will be adjusted as required to form the Construction Exclusion Zone (CEZ) prior to the next phase.

Permanent and Temporary Ground Protection Measures

Permanent ground protection (no-dig cellular confinement system) will be utilised to construct the proposed footpath diversion route which passes through the Construction Exclusion Zones of retained trees. All temporary ground protection shall support the expected loads in accordance with Structural Engineers recommendations to avoid permanent compaction and soil.

New areas of hardstanding are to be installed within the Root Protection Area (RPA) are illustrated on the Tree Protection Plan this is for the provision of new foot paths. All new hardstanding within the RPA of retained trees will be installed according to a no-dig construction methodology, as detailed below:

1. Prior to works commencing, the areas of 'no-dig' hardstanding will be marked out.
2. The existing ground cover and vegetation present within the area will be carefully stripped / trimmed.
3. The exposed soil will be covered with a permeable geotextile membrane. The geotextile layer shall be laid in accordance with manufacturer's recommendations and temporarily retained with pins, stakes, or weights.
4. A cellular confinement system will then be installed and fixed in position in accordance with the manufacturer's recommendations. The cellular confinement system used should be specified by the manufacturer or engineer, appropriate for weight capacity required.
5. The cellular confinement system will then be filled with the manufacturer's specified aggregate.
6. All plant movements involved in filling the cellular confinement system with aggregate shall be undertaken while supported by the filled system.
7. The infill aggregate will then be lightly rolled or whacked to ensure cohesion with the cellular confinement system.
8. The desired permeable and gas porous finished surface shall then be installed.

All works to install new hardstanding according to no-dig methodology shall be carried out under supervision of the Project Arboriculturist. Appendix E is a table that shows dates that supervision has been undertaken, supervision must be undertaken for all works within the RPA of retained trees.

Installation of utilities within RPAs

The installation of new subterranean utilities will require works within the Root Protection Areas of retained trees. The proposed excavation works will be completed using an Airspade and soil vacuum excavator to prevent damage to root systems of retained trees and will be supervised by the Project Arboriculturist. The following methodology must be adhered to:

1. The route of the proposed trench shall be determined in discussion with the Project Arboriculturist and marked out on site.
2. Pruning of lower branches to provide clearance for the vacuum excavator will be undertaken by a suitably qualified and experienced tree surgeon under supervision of the Project Arboriculturist prior to commencement of the works. **Permission may be required for trees covered by Statutory Protection.**
3. Upon commencement of the works, the aim will be to excavate the soil along the route of the proposed service trench to a suitable depth to permit the installation of new pipes beneath the network of retained roots (typically 750 mm below ground level) whilst retaining as many tree roots as feasible.
4. Whilst roots smaller than 25 mm in diameter may be pruned back to permit access for the vacuum excavator nozzle / utilities, roots larger than 25mm in diameter will be retained.
5. All exposed roots must be wrapped or covered with damp hessian or similar material, as soon as possible, to prevent desiccation and to protect them from rapid temperature changes.
6. Once the trench is complete the proposed service can be inserted into the trench through or below the network of retained tree roots.
7. Prior to backfilling all root coverings shall be removed and retained roots shall, where possible, be surrounded with topsoil and lightly compacted sharp sand, or other loose inert granular fill, before soil or other suitable material is replaced into the excavated area. The fill material shall be free of contaminants and other foreign objects potentially injurious to tree roots.

Works will not occur where the ambient air temperature is less than +4 °C. Roots shall be temporarily recovered with soil where the ambient temperature exceeds 14 °C or completion of the works is not foreseen within 24 hours of the finished excavation. Appendix F states the dates of the supervision for the installation of the utilities, supervision must be undertaken for all works within the RPA of retained trees.

3.4 Post Construction Works

Removal of Protective Barriers

Protective barriers will be removed once all external main construction works have been completed to allow the completion of hard and soft landscaping. Barriers shall be removed carefully to ensure no damage to retained trees occurs.

Hard Landscaping

Hard landscaping works that have the potential to cause physical damage to retained trees, compaction of the soil or severance of tree roots shall not occur within the precautionary zones (RPA / canopy) unless under supervision of the Project Arboriculturist. Any hard landscaping works taking place within the precautionary zones surrounding retained trees should be completed in accordance with this AMS following advice from the Project Arboriculturist.

No unsupervised works or storage of hard landscaping construction materials shall occur within the Precautionary Zones (former CEZ).

Soft Landscaping

All soft landscaping within the exclusion zone will be undertaken by hand and in accordance with BS8545³.

A 500 mm radius from any tree stem will remain uncovered by turf or other planting to allow penetration of water and air into the soil. A propriety mulch will be applied to a depth of 100mm to inhibit weed and growth, reduce groundwater evaporation, resist and mitigate soil compaction, reduce maintenance requirements and act as a slow-release fertilizer.

3.5 Handover and Close Out

Tree Safety Assessment

A tree safety assessment will be required prior to handing over the site to the client for final site use to ensure all retained trees are in good condition and any potential hazards are mitigated sufficiently. All retained trees should positively contribute to the new development and should be included as part of a management plan to ensure the long-term safety of site users.

This BS5837:2012 survey is not a full or thorough assessment of the health and safety of the trees on or adjacent to the site; and therefore, it is recommended that detailed tree inspections are undertaken on a regular basis with the express purpose of complying with the landowner's duty of care to satisfy health and safety requirements.

³ British Standards Institution. (2014). *British Standard 8545:2014, Trees: from nursery to independence in the landscape – Recommendations*. British Standards Institution, London.

4. Drawings & Appendices

Drawing Number C129668-01-01 Tree Constraints Plan

Drawing Number C159905-01-01 Tree Protection Plan

Appendix A: Tree Schedule

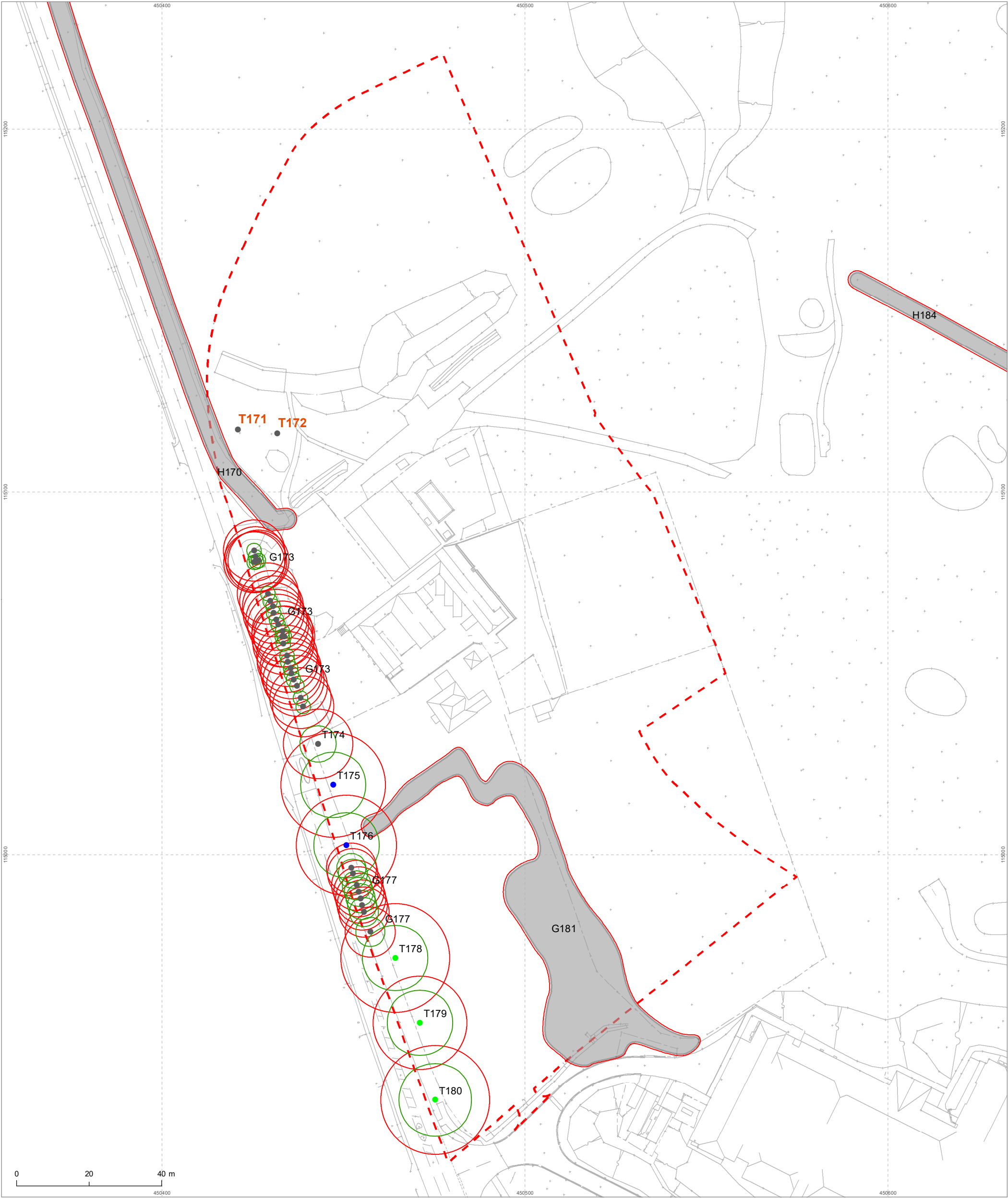
Appendix B: Tree Protection Fencing Sign

Appendix C: Updated Pre-Development Arboricultural Survey RT-MME-129668-01

Appendix D: Audit of Tree Protection Barriers

Appendix E: Supervision of the permanent ground protection measures

Appendix F Supervision of Utilities



Legend

Layer

Category A tree

Category B tree

Category C tree

Current canopy extent

Root protection area

Category C group

Site boundary

T00

Previously removed tree

Project

Non-Residential Phase,
Land at Boorley Green, Boorley

Drawing

Tree Constraints Plan

Client

Boorley Green Development Consortium

Drawing Number

C129668-01-01

Scale @ A3

1:1000

Approved By

MK

Revision

00

Date

December 2018

Drawn By

RP/CD

MIDDLEMARCH ENVIRONMENTAL

Triumph House, Birmingham Road, Allesley, Coventry CV5 9AZ
T:01676 525880 F:01676 521400
E:admin@middlemarch-environmental.com

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Drawing based on proposed CAD "CONS 160608 SL01_GC RevA.dwg" and "X SMA Roundabout - final.dwg" supplied by the client.

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

C129668-01-01



- Legend**
- Tree location and stem diameter
 - Root protection area
 - Current canopy - tree to be retained
 - Category A tree
 - Category B tree
 - Category C tree
 - 'No dig' methodology
 - Ground protection
 - Tree Protection Barrier (BS5837: 2012)
 - Site access
 - Site boundary

NOTES

All dimensions to be verified on site. Do not scale this drawing, use figured dimensions only. All discrepancies to be clarified with Project Arboriculturist. Drawing to be read in conjunction with Preliminary Arboricultural Assessment and Tree Schedule.

The positions of trees and their current crown spread, root protection area and shade pattern (where appropriate) have been shown on the Tree Survey Plan.

All survey data is based on a topographical survey where possible, supplied by the client.

Where topographical information has not identified tree positions or Ordnance Survey mapping has been utilised, trees have been positioned using GPS and aerial photography to provide approximate locations in relation to existing surrounding features. Further confirmation of tree and hedgerow locations through a topographical survey of the site is recommended to ensure future design accuracy.

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

The exact position of individual trees or species included as part of a tree group, woodland or hedgerow should be checked and verified on site prior to any decisions for foundation design, tree operations or construction activity being undertaken.

Further survey work would be required for calculating foundation depths in accordance with current Building Regulations requirements.

Trees are living organisms that change over time, the condition of all trees illustrated herein, are to be checked by the Project Arboriculturist should works commence 12 months after the date of this survey.

TREES INCLUDED DURING THE ASSESSMENT MAY BE SUBJECT TO STATUTORY CONSTRAINTS. IT IS THEREFORE ADVISED THAT NO WORKS SHOULD BE UNDERTAKEN TO ANY TREES ILLUSTRATED HEREIN WITHOUT FIRST OBTAINING THE RELEVANT AUTHORISATION TO DO SO UNLESS AGREED AS PER THE APPROVED PLANS THROUGH PLANNING CONSENT.

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Project	Boorley Gateway, Hampshire	
Drawing	Tree Retention Plan	
Client	Vistry Homes Ltd Southern	
Drawing Number	C159905-01-01	Revision 00
Scale @ A3	1:1,000	Date March 2023
Approved By	DM	Drawn By JR
MIDDLEMARCH		
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C159905-01-01

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	Branch Spread (m)				Min Crown Clearance (m)	Age	Vigour	Struc Cond	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W							
H170	Hawthorn	-	<u>200</u>	<u>2</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.0</u>	M	F	F	C	- Roadside hedgerow. - Ivy on stem. - No access.	-
T171	Hornbeam	-	-	-	-	-	-	-	-	-	-	-	-	Tree removed.	-
T172	Hornbeam	-	-	-	-	-	-	-	-	-	-	-	-	Tree removed.	-
G173	Lombardy poplar	1	700	22	2.0	2.0	2.0	2.0	1.5	M	F	F	C	- Soil tacked on golf course side of trees. - Ivy present. - Poor pruning wounds.	-
T174	Oak	1	<u>800</u>	<u>8</u>	<u>5.0</u>	<u>5.0</u>	<u>5.0</u>	<u>5.0</u>	<u>2.0</u>	M	F	F	C	- Pollarded stump. - Ivy present. - No access.	-
T175	Oak	1	<u>1200</u>	<u>16</u>	<u>9.0</u>	<u>9.0</u>	<u>9.0</u>	<u>9.0</u>	<u>1.5</u>	M	F	G	B	- Dieback. - Ivy present. - Located off site. - No access. - In decline.	-
T176	Oak	1	1150	16	9.0	9.0	9.0	9.0	0.5	M	F	G	B	- Ivy present. - Roadside tree. - Old pruning wound. - Telephone wires running through.	-
G177	Lombardy poplar	-	570	19	4.0	4.0	4.0	4.0	0.0	M	F	F	C	- Ivy present. - Roadside tree. - Deadwood. - Telephone wires running through.	-
T178	Oak	1	1360	20	9.0	9.0	9.0	9.0	0.5	M	G	G	A	- Veteran potential. - Hanging deadwood. - Telephone wires running through.	-
T179	Oak	1	1070	11.4	9.0	9.0	9.0	9.0	0.5	M	G	G	A	- Tear on lower limb on eastern side - Hollow cavity	-
T180	Oak	1	1350	15	10.0	10.0	10.0	10.0	0.5	M	G	G	A	- Street lamp and pavement at base. - Deadwood.	-

Table 3.3 : Results of Arboricultural Survey (continues)

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	Branch Spread (m)				Min Crown Clearance (m)	Age	Vigour	Struc Cond	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W							
G181	Monterey cypress, Oak, Eucalyptus, Poplar	-	700	16	6.0	6.0	6.0	6.0	0.0	M	F	F	C	• Restricted inspection due to access	-
Key <u>Age Class</u> Y: Young = juvenile tree recently planted EM: Early mature = tree within first third of average life expectancy SM: Semi 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 <u>Structural Condition</u> G: G = no structural defects F: Fair = remedial structural defects P: Poor = significant structural defects RPA: Root Protection Area															

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



**PROTECTIVE FENCING. THIS
FENCING MUST BE
MAINTAINED IN ACCORDANCE
WITH THE APPROVED PLANS
AND DRAWINGS FOR THIS
DEVELOPMENT.**



**TREE PROTECTION AREA
KEEP OUT !**

**(TOWN & COUNTRY PLANNING ACT 1990)
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY
PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A
TREE PRESERVATION ORDER.
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY
LEAD TO CRIMINAL PROSECUTION**

**ANY INCURSION INTO THE PROTECTED AREA MUST BE
WITH THE WRITTEN PERMISSION OF THE LOCAL
PLANNING AUTHORITY**

**BOORLEY GREEN DEVELOPMENT
PHASE 2 (NON-RESIDENTIAL),
BOORLEY GREEN, HAMPSHIRE**

**UPDATED PRE-DEVELOPMENT
ARBORICULTURAL SURVEY**

A Report to: Luken Beck MDP Ltd

Report No: RT-MME-129668-01

Date: January 2019



Triumph House, Birmingham Road, Allesley, Coventry CV5 9AZ

Tel: 01676 525880 Fax: 01676 521400

E-mail: admin@middlemarch-environmental.com Web: www.middlemarch-environmental.com

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	15/01/2019	Fiona Shuttle BSc (Arboricultural Project Officer)	Dr Katy Read CEnv, CEcol, MCIEEM, MCIWEM, C.WEM DipSM (Executive Director)	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 an updated Pre-development Arboricultural Survey of a site at Boorley Green in Botley, Hampshire. It is understood that the site will be the subject of a planning application for the construction of the Boorley Green Gateway Centre. To fulfil the project brief, a desk study and a field survey of the trees present on site were undertaken in November 2018.

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.

Mark Kirk FdSc Arboriculture (Arboricultural Consultant) undertook the field survey in November 2018. The survey identified that the site contains a number of mature trees adjacent to Winchester Road which are predominantly in a good or fair condition.

The most significant trees recorded within the survey included three mature Oaks within a larger row of trees adjacent to Winchester Road on the western boundary of the site. These specimens were considered to be high retention value due to their age, good condition and prominence. A number of additional Oaks within the row were also identified as being moderate retention value however, these trees showed signs of dieback or old pruning wounds that reduced their overall value and condition.

The remaining trees identified within the survey were considered to be of a lower retention value as they were less significant in the local landscape and offer limited likely future potential, typically due to poor pruning in the past and presence of deadwood.

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

Luken Beck MDP Ltd commissioned Middlemarch Environmental Ltd to undertake a Pre-development Arboricultural Survey of trees growing on land at, and adjacent to, Boorley Green in Botley, Hampshire. It is understood that the proposed development of the site includes the construction of the Boorley Green Gateway Centre.

A previous arboricultural survey of the wider Boorley Green site was undertaken in January 2012 by Barrell Tree Consultancy. The primary aim of this survey was to identify the trees that had not been previously identified and update the condition status of all trees present.

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.

1.2 SITE DESCRIPTION

The wider Boorley Green development site consists of a former golf course, covering an area of 71 hectares that includes retained water features, undulating ground, sand bunkers and a mix of hard and soft landscaping, rest areas, footpaths and routes for motorised golf carts.

The topography of the site is undulating with small lakes and water features interspersed amongst vegetative features. There is a significant high-point towards the southern section of the site that overlooks the remainder of the former golf course. Scattered trees, hedgerows, groups of trees and a number of woodlands are present across the site forming significant landscape features.

The section of the site under consideration within this report, the Boorley Green Gateway Centre site, is an irregularly shaped parcel of land of approximately 2.6 ha in size which is located in the north-eastern section of the wider Boorley Green development site at Ordnance Survey Grid Reference SU 5047 1506.

The Boorley Green Gateway Centre site has boundaries with Winchester Road to the west, the Botley Park Hotel to the south and with the wider Boorley Green development site to the north and east.

The location of the trees surveyed can be found on Middlemarch Environmental Ltd Drawing Number C129668-01-01, 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.

Additionally, an online search using the Multi Agency Geographical Information for the Countryside (MAGIC) website for statutory conservation sites was undertaken to determine the presence of any ancient woodlands that have been recorded within a 15m radius of the site.

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. 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

Eastleigh Borough Council confirmed by email on 2nd November 2018 that there are no trees with Tree Preservation Orders (TPOs) within the site. However, a woodland and three individual trees located in proximity to the site, within the wider Boorley Green site to the south of the area under consideration are subject to TPOs.

An internet search using the online mapping provided by Eastleigh Borough Council (<https://www.eastleigh.gov.uk/council/interactive-maps-of-the-borough>) also confirms that the study area is not situated within a Conservation Area.

Reference to the Multi Agency Geographical Information for the Countryside (MAGIC) website indicates that no ancient woodland sites have been recorded within a 15m radius of the survey area.

3.2 WEATHER CONDITIONS AND PERSONNEL

The survey was completed on the 8th November 2018 by Mark Kirk, Arboricultural Consultant. The weather conditions at the time of the survey are shown in Table 3.1.

Conditions	Result
Temperature (°C)	9
Cloud Cover (%)	70
Precipitation	Nil
Wind Speed (Beaufort)	F1

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
Eucalyptus	<i>Eucalyptus gunnii</i>
Hornbeam	<i>Carpinus betulus v Fastigiata</i>
Lombardy poplar	<i>Populus nigra Italica</i>
Monterey cypress	<i>Cupressus macrocarpa</i>
Oak	<i>Quercus robur</i>
Poplar	<i>Populus sp.</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)	Branch Spread (m)				Min Crown Clearance (m)	Age	Vigour	Struc Cond	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W							
H170	Hawthorn	-	<u>200</u>	<u>2</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.0</u>	M	F	F	C	- Roadside hedgerow. - Ivy on stem. - No access.	-
T171	Hornbeam	-	-	-	-	-	-	-	-	-	-	-	-	Tree removed.	-
T172	Hornbeam	-	-	-	-	-	-	-	-	-	-	-	-	Tree removed.	-
G173	Lombardy poplar	1	700	22	2.0	2.0	2.0	2.0	1.5	M	F	F	C	- Soil tacked on golf course side of trees. - Ivy present. - Poor pruning wounds.	-
T174	Oak	1	<u>800</u>	<u>8</u>	<u>5.0</u>	<u>5.0</u>	<u>5.0</u>	<u>5.0</u>	<u>2.0</u>	M	F	F	C	- Pollarded stump. - Ivy present. - No access.	-
T175	Oak	1	<u>1200</u>	<u>16</u>	<u>9.0</u>	<u>9.0</u>	<u>9.0</u>	<u>9.0</u>	<u>1.5</u>	M	F	G	B	- Dieback. - Ivy present. - Located off site. - No access. - In decline.	-
T176	Oak	1	1150	16	9.0	9.0	9.0	9.0	0.5	M	F	G	B	- Ivy present. - Roadside tree. - Old pruning wound. - Telephone wires running through.	-
G177	Lombardy poplar	-	570	19	4.0	4.0	4.0	4.0	0.0	M	F	F	C	- Ivy present. - Roadside tree. - Deadwood. - Telephone wires running through.	-
T178	Oak	1	1360	20	9.0	9.0	9.0	9.0	0.5	M	G	G	A	- Veteran potential. - Hanging deadwood. - Telephone wires running through.	-
T179	Oak	1	1070	11.4	9.0	9.0	9.0	9.0	0.5	M	G	G	A	- Tear on lower limb on eastern side - Hollow cavity	-
T180	Oak	1	1350	15	10.0	10.0	10.0	10.0	0.5	M	G	G	A	- Street lamp and pavement at base. - Deadwood.	-

Table 3.3 : Results of Arboricultural Survey (continues)

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	Branch Spread (m)				Min Crown Clearance (m)	Age	Vigour	Struc Cond	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W							
G181	Monterey cypress, Oak, Eucalyptus, Poplar	-	700	16	6.0	6.0	6.0	6.0	0.0	M	F	F	C	• Restricted inspection due to access	-
Key <u>Age Class</u> Y: Young = juvenile tree recently planted EM: Early mature = tree within first third of average life expectancy SM: Semi 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 <u>Structural Condition</u> G: G = no structural defects F: Fair = remedial structural defects P: Poor = significant structural defects RPA: Root Protection Area															

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)
H170	Hawthorn	<u>200</u> *	2.4*	18*
G173	Lombardy poplar	700*	8.4*	222*
T174	Oak	<u>800</u>	9.6	290
T175	Oak	<u>1200</u>	14.4	652
T176	Oak	1150	13.8	598
G177	Lombardy poplar	570*	6.9*	150*
T178	Oak	1360	15.0	707
T179	Oak	1070	12.9	519
T180	Oak	1350	15.0	707
G181	Monterey cypress, Oak, Eucalyptus, Poplar	<u>700</u> *	8.4*	222*
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 eight trees, one hedgerow and three groups of trees have been inspected in accordance with BS5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations*'.

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

BS5837:2012 Category	Tree Number
A	T178, T179, T180.
B	T175, T176.
C	H170, T171, T172, G173, T174, G177, G181.
U	Nil.

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.

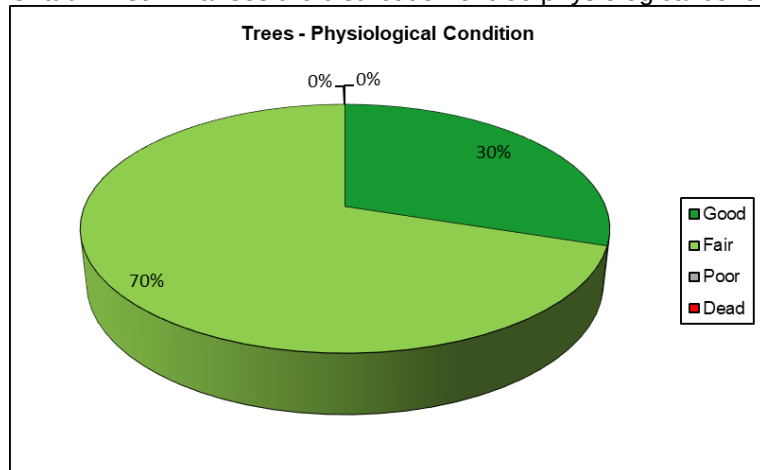


Chart 4.1: Tree Physiological Condition

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.

Visual Amenity

The trees and groups of trees located adjacent to the western boundary of the site are, as a group, 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 C129668-01-01, 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 (RPAs) 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 RPAs 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 C129668-01-01, 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 circumstance's 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:

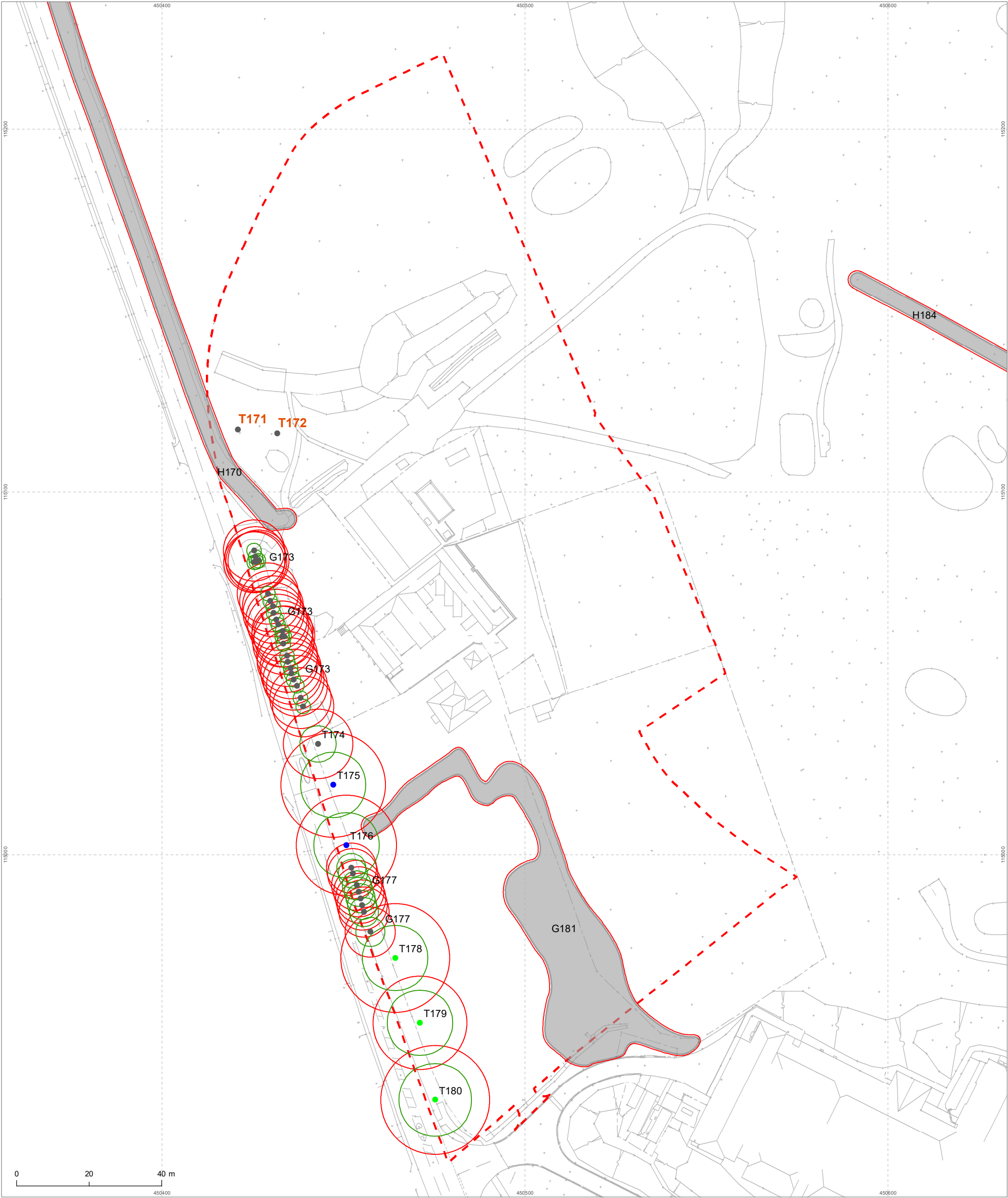
- The retention of the Category A and B trees across the site should be considered as a priority as these specimens are likely to make a substantial contribution to the continued landscape character of the site.
- The retention of the Category C trees should be considered where possible though it must 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.
- 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 considered during the construction phase of any development, or significant engineering:

- Any trees, groups or 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 9, 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 C129668-01-01– Tree Constraints Plan



Legend

Layer

Category A tree

Category B tree

Category C tree

Current canopy extent

Root protection area

Category C group

Site boundary

T00

Previously removed tree

Project

Non-Residential Phase,
Land at Boorley Green, Boorley

Drawing

Tree Constraints Plan

Client

Boorley Green Development Consortium

Drawing Number

C129668-01-01

Scale @ A3

1:1000

Approved By

MK

Revision

00

Date

December 2018

Drawn By

RP/CD

MIDDLEMARCH ENVIRONMENTAL

Triumph House, Birmingham Road, Allesley, Coventry CV5 9AZ
T:01676 525880 F:01676 521400
E:admin@middlemarch-environmental.com

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Drawing based on proposed CAD "CONS 160608 SL01_GC RevA.dwg" and "X SMA Roundabout - final.dwg" supplied by the client.

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

C129668-01-01

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Appendix D: Audit of Tree Protection Barriers

[illegible][illegible]

Appendix E: Supervision of the permanent ground protection measures

[illegible][illegible]

Appendix F: Supervision of Utilities

[illegible][illegible]