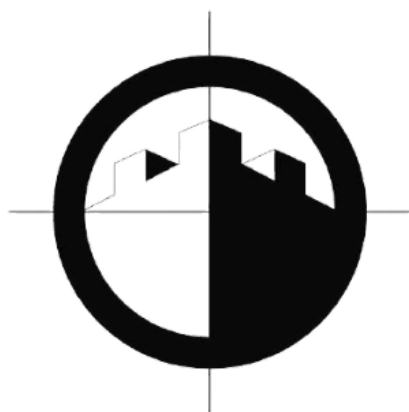




CASTLE SURVEYS LTD

ARBORICULTURAL IMPACT ASSESSMENT

SITE LOCATION

5 Hornsey Rise, Wellesborough

ISSUE DATE

22nd August 2023

SEED REF

1584-AIA-V1-A

CLIENT

Mr & Mrs Cartwright



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LONDON 020 3728 2884



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DOCUMENT CONTROL

Date	Author	Checked	Revision
22.08.2023	Ryan Kearney FdSc	GP	Rev A

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LIMITATIONS

The contents of this report are valid at the time of writing. Castle Surveys Ltd shall not be liable for any use of this report other than for the purposes for which it was produced. Owing to the dynamic nature of trees, this report is valid for a period of 12 months.

Any alteration to the application site or development proposals could change the current circumstances and may invalidate this report and any recommendations made.

The tree survey was a preliminary assessment from ground level and observations were made solely from visual inspection for the purposes of an assessment relevant to planning and development. This report is not a tree risk assessment and should not be construed as such. While every attempt has been made to provide a realistic and accurate assessment of the trees' condition at the time of inspection, it may have not been appropriate, or possible, to view all parts or all sides of every tree to fulfil the assessment criteria of a tree risk assessment.

This is not an ecological report. The Wildlife and Countryside Act 1981 (as amended) and the Conservation of Species and Habitat Regulations 2017 make it an offence to disturb nesting birds or recklessly endanger a bat or its roost. Where the presence of birds or bats is suspected, a qualified ecologist or Natural England should be contacted for advice.

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Appendix 4	Temporary Ground Protection
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Plans

Tree Constraints Plans

Ref: 1584-TCP-001-A Revision: A

Arboricultural Impact Plans

Ref: 1584-AIP-002-A Revision: A

Tree Protection Plans

Ref: 1584-TPP-003-A Revision: A

1. Introduction

Background & Instruction

- 1.1.1. This report has been prepared by Ryan Kearney FdSc.
- 1.1.2. This Arboricultural Impact Assessment (AIA) has been prepared by Castle Surveys Ltd on behalf of Mr & Mrs Cartwright in support of a planning application for a *“single storey rear extension to the existing double garage”* at 5 Hornsey Rise, Wellesborough (hereafter referred to as the ‘site’).
- 1.1.3. The report has been submitted to satisfy the response received during the Pre-application response (Ref: 23/10035/PREHMO)
- 1.1.4. The planning application is to be submitted to Hinckley and Bosworth Borough Council (HBBC).

Purpose

- 1.1.5. The tree survey and AIA has been carried out in accordance with the recommendations outlined within British Standard BS5837:2012 ‘Trees in relation to design, demolition and construction – Recommendations’.
- 1.1.6. This AIA report:
 - Provides the baseline survey data of existing trees, including a Tree Schedule and Tree Constraints Plan (TCP).
 - Evaluates the direct and indirect impacts of the Proposed Development upon the existing trees.
 - Where necessary, provides details of mitigation and tree protection, including a Draft Tree Protection Plan

Site Description

- 1.1.7. The site is centred at UK National Grid Reference (SK 36079 02352) and comprises an area to the rear of the residential garden of 5 Hornsey Rise, Wellesborough. The site is bordered on all sides by other developments and parking areas.
- 1.1.8. The application boundary is illustrated on the Site Location Plan (**Appendix 1**)

2. Reference Documents

2.1.1. **Table 1** provides a summary of documents which provide the basis for this tree survey and AIA.

Table 1 - Reference Documents

Document	Reference Number	Prepared By	Date
Existing Site Plan	-	-	June 2023
Proposed Plans	Design 4A-27.07.23	Rosenthal Architectural Services	July 2023

3. Planning Policy and Legislation

National Planning Policy Framework (NPPF)

3.1.1. The following paragraphs within the NPPF set out policies which guide the planning policy and decision-making process of Local Planning Authorities in relation to trees. These are:

3.1.2. **Paragraph 131**

Trees make an important contribution to the character and quality of urban environments and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly-planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users.

3.1.3. **Paragraph 174 (b & d)**

Planning policies and decisions should contribute to and enhance the natural and local environment by:

Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

3.1.4. **Paragraph 180**

When determining planning applications, Local Planning Authority's (LPA) should apply the following principles:

If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternate site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused unless there are wholly exceptional reasons and a suitable compensation strategy exists.

Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be

integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Statutory Tree Protection & Designations

- 3.1.5. An interactive TPO map from HBBC has been used to confirm there are no Tree Preservation Orders (TPO) are present on site.
- 3.1.6. The site is not located within a Conservation Area.
- 3.1.7. No Ancient Woodland¹ designations are present upon or adjacent to the Site.

Felling Licence

- 3.1.8. Tree felling is restricted under the Forestry Act 1967. Under this act, there is an exemption from the need for a felling licence for “Felling trees immediately required for the purpose of carrying out development authorised by planning permission (granted under the Town and Country Planning Act 1990)”
- 3.1.9. If full planning permission is granted, then any trees which require felling to implement the approved plans are exempt from this statutory protection. Outline planning permission does not provide an exemption to the regulations that control tree felling in the Forestry Act 1967.

¹ Ancient woods are areas of woodland that have persisted since 1600 in England and Wales, and 1750 in Scotland. The Magic Maps website (<https://magic.defra.gov.uk/MagicMap.aspx>) has been used to search for ancient woodland on or adjacent to a site.

4. Baseline Tree Survey

- 4.1.1. The tree survey was undertaken in on 30th May 2023, by George Pickering *BSc (Hons), TechArborA*.
- 4.1.2. The tree survey was undertaken in accordance with the methodology outlined within BS5837:2012.
- 4.1.3. The locations of the trees surveyed are illustrated on the Tree Constraints Plan (TCP) (**Appendix 3**) together with details of the constraints to new development in accordance with BS5837, including:
- Tree Retention Category
 - Root Protection Areas (RPAs)
 - Tree Canopy Spreads
- 4.1.4. Details for each of the trees surveyed are provided in the Tree Schedule (**Appendix 2**), including; reference numbers, species, tree dimensions, life stage, physiological and structural condition, and retention category.

Tree Survey Summary

Trees

- 4.1.5. The survey recorded 12no. individual trees consisting of 1no. category A, 5no. category B, 5no. category C and 1no. category U retention value.

Groups

- 4.1.6. The survey recorded 1no. group of trees of category B retention value.

5. Impact Assessment

- 5.1.1. The impact of the proposed development upon existing trees is illustrated on the Arboricultural Impact Plans (**Appendix 3**).

Tree Removal

- 5.1.2. There are no trees to be removed as a result of the Proposed Development.

Root Protection Areas (RPAs)

- 5.1.3. The RPA is an area equivalent to a circle with a radius 12 times the diameter of the trees measured at 1.5 metres for single stemmed trees. For trees with more than one stem, one of two calculation methods should be used. In all cases, the stem diameter(s) should be measured in accordance with Annex C, and the RPA should be guided from Annex D of BS5837:2012.
- 5.1.4. The RPA is an area in which no ground works should be undertaken without due care in relation to the retained tree(s), to avoid soil compaction, changes in levels or soil contamination which could alter the trees condition and/or stability. The shape of the RPA and its exact location will depend upon arboricultural considerations and ground conditions.
- 5.1.5. The RPA for the trees has been calculated as prescribed by BS5837:2012 and are shown in relation to the Proposed Development on the Arboricultural Impact Plan at **Appendix 3**.

New RPA Incursions

- 5.1.6. The Proposed Development will result in 3 new RPA incursions.
- **T3 (Yew)** – New incursion of 9.4m² out of a total RPA of 81m² = New RPA incursion of 12% for proposed building.
Mitigation – Pile foundations to be used with above ground slab.
 - **T4 (English holly)** – New incursion of 26m² out of a total RPA of 113m² = New RPA incursion of 32% for proposed building.
Mitigation – Pile foundations to be used with above ground slab.
 - **T6 (Yew)** – New incursion of 7.6m² out of a total RPA of 64m² = New RPA incursion of 12% for proposed building.
Mitigation – Pile foundations to be used with above ground slab.

Screw pile foundations

- 5.1.7. The proposed development will be required to use pile foundations to avoid impacting the RPAs of retained trees.
- 5.1.8. The design should allow for the beam and floor slab to be constructed above-ground. The exact specification should be confirmed as part of the technical design following planning approval.

- 5.1.9. The exact locations of piles should be determined following on site investigation and placed to avoid any significant roots. Full details can be provided as part of an Arboricultural Method Statement following planning approval.
- 5.1.10. For more information on the installation of pile foundations see **Appendix 5**.

Tree Canopies & Shade

- 5.1.11. The distribution of tree canopy cover on and within influencing distance of the site is illustrated on the TCP (**Appendix 3**). The Tree Schedule lists the vertical clearance from site ground level to significant tree branching of individual trees. This measurement informs the impacts of accessibility and development beneath tree canopies.
- 5.1.12. If considered appropriate the principal tree shadow constraints can be shown on the TCP and are plotted in accordance with BS5837 using the current height of surveyed trees.
- 5.1.13. Where shading is unavoidable, the potential adverse impact of shadowing should also be reviewed on balance with the positive aspects of retaining a degree of canopy shade. BS5837:2012 (para. 5.3.4, a) NOTE 1) states that “shading can be desirable to reduce glare or excessive solar heating, or to provide comfort during hot weather. The combination of shading, wind speed/turbulence reduction and evapotranspiration effects of trees can be utilised in conjunction with the design of buildings and spaces to provide local microclimatic benefits”.
- 5.1.14. As the development comprised minor amendments to an existing developed area, the impact of shade upon the Proposed Development is not considered to be significant or negative.

Future growth

- 5.1.15. Due to the location of retained trees, future growth of trees is not considered to be an issue to the Proposed Development.
- 5.1.16. Minor pruning of lateral branches will address any issues where the canopy of trees encroaches towards the proposed buildings.

6. Tree Protection

Tree Protection Fencing

- 6.1.1. The existing boundary fence will be used as the tree protection fencing during construction. There is room for storage of building supplies outside the RPAs of the retained trees.

Temporary Ground Protection

- 6.1.2. To reduce the likelihood of ground compaction through development there will be a requirement to install temporary ground protection in the locations illustrated on the Tree Protection Plan at Appendix 3.
- 6.1.3. BS5837:2012 - Paragraph 6.2.3.3 recommends that new temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.
- 6.1.4. The ground protection might comprise one of the following:
- a) For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;
- 6.1.5. For pedestrian-operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane.
- 6.1.6. An example specification has been included at **Appendix 4**, the final specification will be agreed with the appointed contractor and details submitted to the LPA prior to installation.

7. References

- 7.1.1. British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction - Recommendation'
- 7.1.2. British Standard 3998:2010 'Tree work – Recommendations'
- 7.1.3. BS8545:2014 Trees: from nursery to independence in the landscape – Recommendations
- 7.1.4. National Planning Policy Framework (NPPF) 2021
- 7.1.5. The Forestry Act 1967
- 7.1.6. The Town and Country Planning Act 1990
- 7.1.7. The Town and Country Planning (Tree Preservation) (England) Regulations 2012.

Appendix 1 – Site Location Plan



Appendix 2 – Tree Schedule



CASTLE SURVEYS LTD

BS5837:2012 TREE SCHEDULE

DATE	CLIENT	SITE	REFERENCE
02/06/2023	Mr & Mrs Cartwright	5 Hornsey Rise, Wellesborough	1584-TS-001-A

Tree No.	Common Name	Botanical Name	Height (m)	Stem Dia (mm)	Crown Spread (m)				Height of Crown Clearance (m)	Age Class	Phys Con	Struc Con	Additional notes	Preliminary recommendations	BS5837 Retention Category	RPA (m ²)	RPA Radius (m)
					N	E	S	W									
T1	Common beech	<i>Fagus sylvatica</i>	21	910	7	7	8	8	8	Mat	Good	Good	Located within residential garden. Tree is twin stemmed from base.	No work required at the time of assessment.	A1	366	10.80
T2	Silver birch	<i>Betula pendula</i>	17	450	4	6	5	3	6	E/Mat	Declining	Poor	Located on edge of residential garden. Tree has large previous wounds on main stem with decay associated. Canopy heavily declining with moderate deadwood associated. Sparse canopy. Very limited future contribution.	No work required at the time of assessment.	U	92	5.40
T3	Yew	<i>Taxus baccata</i>	13	434	5	3	6	4	2.5	E/Mat	Good	Fair	Located offsite next to footpath. Twin stemmed from base. Canopy comes onto site by approx. 3m. Good future value.	No work required at the time of assessment.	B1, 2	82	5.10
T4	English holly	<i>Ilex aquifolium</i>	13	490	4	4	5	4	4	E/Mat	Fair	Fair	Located offsite next to footpath. Multistemmed from base. Canopy comes onto site by approx. 2.5m. Minor deadwood associated with canopy. Good future value.	No work required at the time of assessment.	C1, 2	113	6.00
T5	Yew	<i>Taxus baccata</i>	15	364	3	3	5	4	3	E/Mat	Good	Fair	Located offsite next to footpath. Twin stemmed from base, stems starting to graft together. Minor deadwood associated with canopy. Good future value.	No work required at the time of assessment.	C1, 2	64	4.50
T6	English holly	<i>Ilex aquifolium</i>	13	432	5	5	3	4	2.5	E/Mat	Good	Fair	Tree located offsite next to main road. Footpath is present to South East directly at base. Roots unlikely to be within site boundary.	No work required at the time of assessment.	C1, 2	82	5.10
T7	Yew	<i>Taxus baccata</i>	14	490	4	4	3	3	2	E/Mat	Good	Fair	Tree located offsite next to main road. Footpath is present to South East directly at base. Roots unlikely to be within site boundary.	No work required at the time of assessment.	C1, 2	113	6.00
T8	English holly	<i>Ilex aquifolium</i>	12	230	3	3	2	2	2	E/Mat	Good	Fair	Tree located offsite next to main road. Footpath is present to South East directly at base. Roots unlikely to be within site boundary.	No work required at the time of assessment.	C1, 2	23	2.70
T9	Common beech	<i>Fagus sylvatica</i>	18	260	5	5	4	4	3.5	E/Mat	Good	Good	Tree located offsite next to main road. Footpath is present to South East directly at base. Roots unlikely to be within site boundary.	No work required at the time of assessment.	B1, 2	28	3.00
T10	Pedunculate oak	<i>Quercus robur</i>	19	300	6	5	4	5	4	E/Mat	Good	Good	Tree located offsite next to main road. Footpath is present to South East directly at base. Roots unlikely to be within site boundary.	No work required at the time of assessment.	B1, 2	41	3.60
T11	Common lime	<i>Tilia x europaea</i>	20	420	6	5	5	5	1.5	E/Mat	Good	Good	Tree located offsite next to main road. Footpath is present to South East directly at base. Roots unlikely to be within site boundary.	No work required at the time of assessment.	B1, 2	82	5.10



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BS5837:2012 TREE SCHEDULE

DATE	CLIENT	SITE	REFERENCE
02/06/2023	Mr & Mrs Cartwright	5 Hornsey Rise, Wellesborough	1584-TS-001-A

Tree No.	Common Name	Botanical Name	Height (m)	Stem Dia (mm)	Crown Spread (m)				Height of Crown Clearance (m)	Age Class	Phys Con	Struc Con	Additional notes	Preliminary recommendations	BS5837 Retention Category	RPA (m ²)	RPA Radius (m)
					N	E	S	W									
T12	Common lime	<i>Tilia x europaea</i>	19	370	4	3	3	3	3	E/Mat	Good	Good	Tree located offsite next to main road. Footpath is present to South East directly at base. Roots unlikely to be within site boundary.	No work required at the time of assessment.	B1, 2	64	4.50
G1	Silver birch, Common beech, English holly, Scots pine, Cherry laurel, Yew, Common lime		Ave 15	Ave 280	See associated plans				3	Mat	Good	Good	Group located directly offsite behind garden wooden fence. Trees are grown close together. Minor deadwood. Good future value.	No work required at the time of assessment.	B2	See associated plans	

Appendix 3 – Plans



KEY:

Trees / Groups

- Canopy Spread
- Tree Stem
- Root Protection Area

A Category Tree
(High quality / retention value)

B Category Tree
(Moderate quality / retention value)

C Category Tree
(Low quality / retention value)

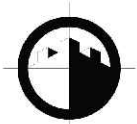
U Category Tree
(No remaining retention value)

Hedgerows
(Not assigned BS5837:2012 category)

NOTES:
Tree locations are estimated from measurements on-site. No
topographical survey available at the time of tree survey.



Rev A	Issue to client	02.06.2023
Rev	Description	Date



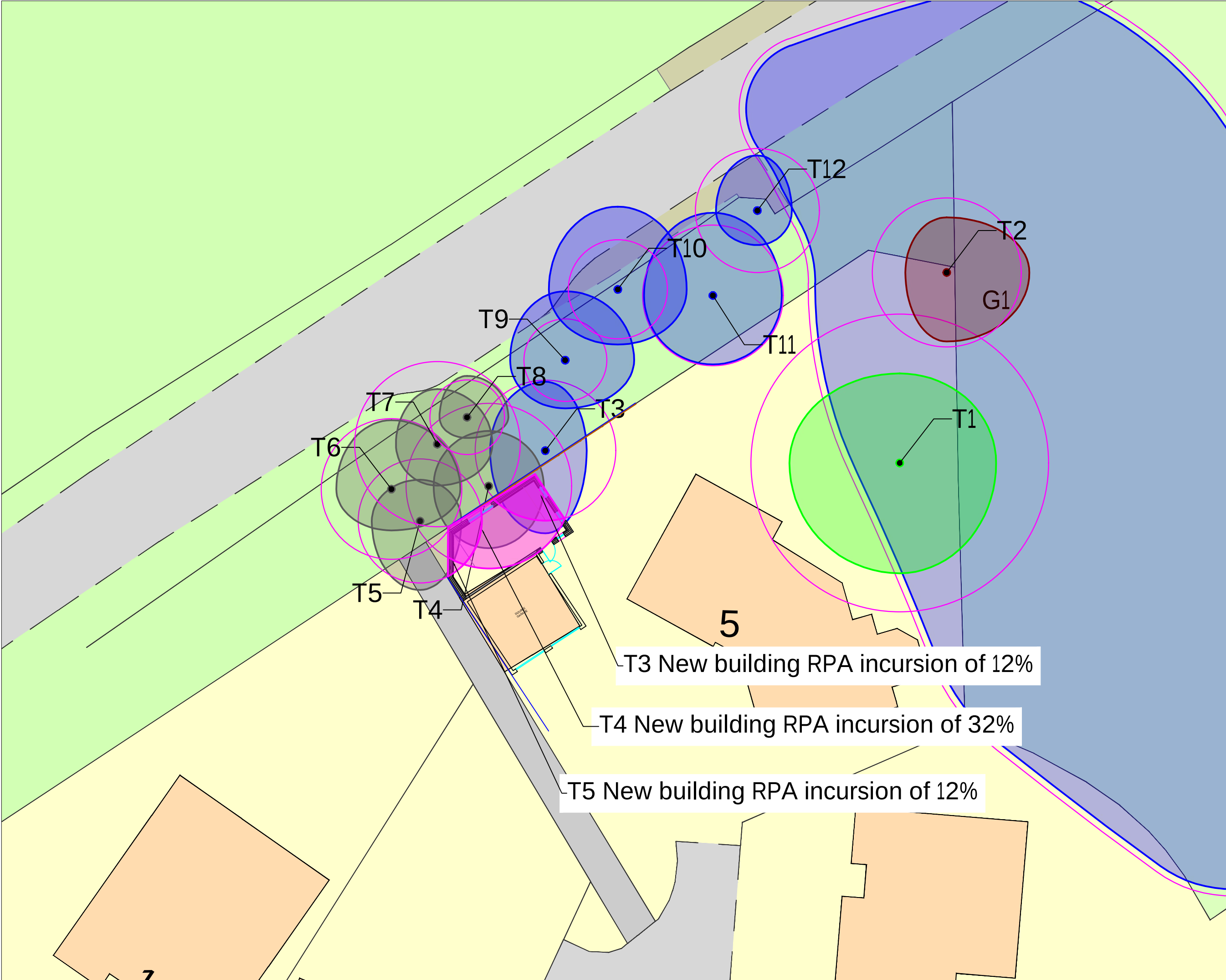
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PROJECT
5 Hornsey Rise, Wellesborough

TITLE
Tree Constraints Plan

DRAWING REF 1584-TCP-001-A	DRAWING NO 001
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SCALE 1:250 @ A3	REVISION Rev A
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KEY:

Trees / Groups

- Canopy Spread
- Tree Stem
- Root Protection Area

A Category Tree
(High quality / retention value)

B Category Tree
(Moderate quality / retention value)

C Category Tree
(Low quality / retention value)

U Category Tree
(No remaining retention value)

Hedgerows
(Not assigned BS5837:2012 category)

ARBORICULTURAL IMPACT

New RPA Incursion

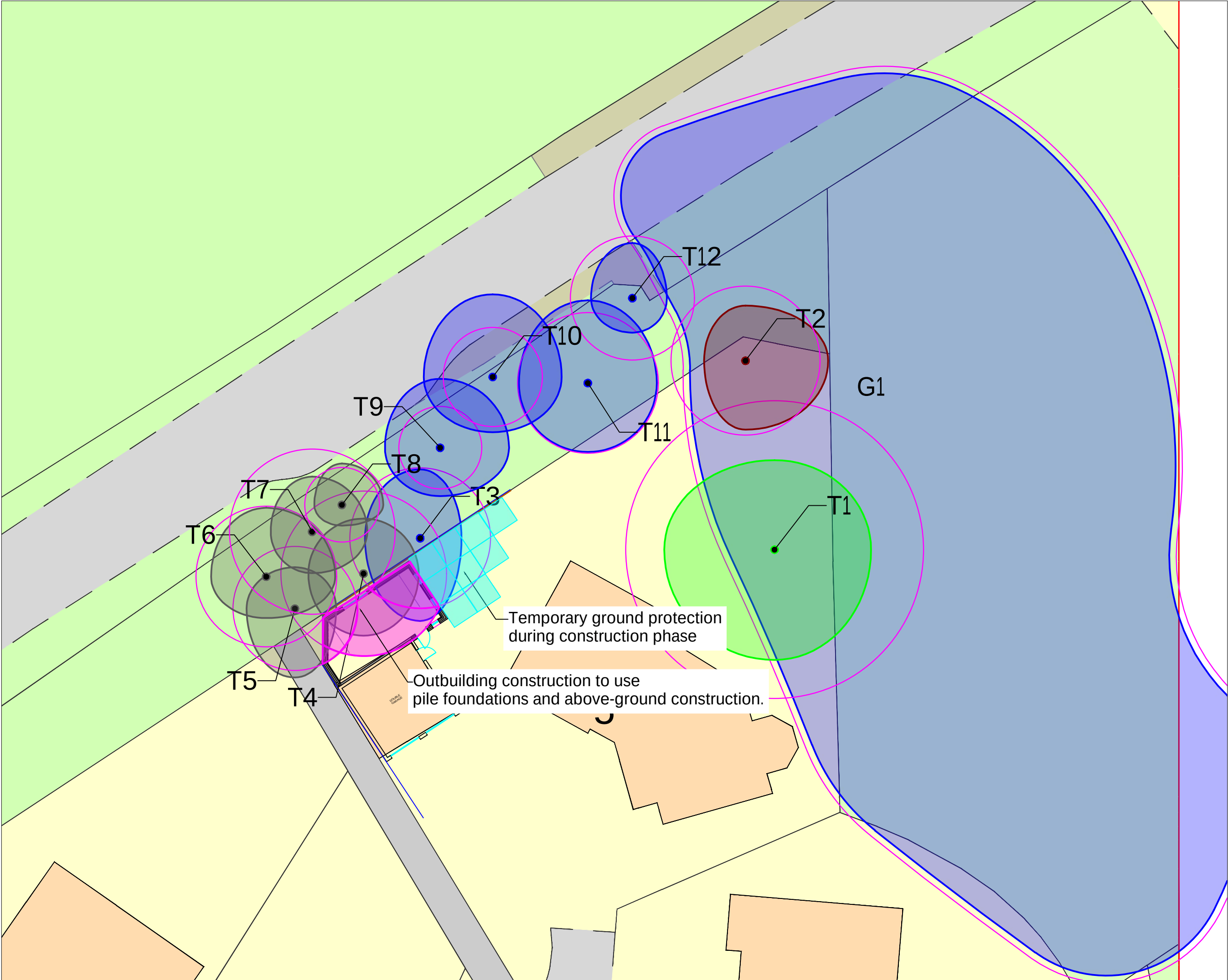
NOTES:
Tree locations are estimated from measurements on-site. No topographical survey available at the time of tree survey.



Rev A	Issue to client	22.08.2023
Rev	Description	Date



CASTLE SURVEYS LTD	
PROJECT 5 Hornsey Rise, Wellesborough	
TITLE Arboricultural Impact Plan	
DRAWING REF 1584-AIP-002-A	DRAWING NO 002
SCALE 1:250 @ A3	REVISION Rev A



KEY:

Trees / Groups

- Canopy Spread
- Tree Stem
- Root Protection Area

A Category Tree
(High quality / retention value)

B Category Tree
(Moderate quality / retention value)

C Category Tree
(Low quality / retention value)

U Category Tree
(No remaining retention value)

Hedgerows
(Not assigned BS5837:2012 category)

TREE PROTECTION

Temporary Ground Protection

Area to use pile foundations and above ground construction

NOTES:
Tree locations are estimated from measurements on-site. No topographical survey available at the time of tree survey.

Rev A
Rev

Issue to client
Description

22.08.2023
Date

N

CASTLE SURVEYS LTD

PROJECT
5 Hornsey Rise, Wellesborough

TITLE
Tree Protection Plan

DRAWING REF
1584-TPP-003-A

DRAWING NO
003

SCALE
1:250 @ A3

REVISION
Rev A

Appendix 4 – Temporary Ground Protection

Recommended specification

BS5837:2012 - Paragraph 6.2.3.3 - *For pedestrian-operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane.*

Membrane - TERRAM T1000 Geotextile

Compression later – woodchip (provided on-site by tree work contractors) 150mm depth

Ground Protection Boards – Ground-Guards MultiTrack 39kg mats

Edging – Timber or other similar.

Image 1 – Ground-Guards temporary tree root protection - example



Appendix 5 – Screw Piling Near Protected Trees



Screw Piling Near Protected Trees

Technical Bulletin 17-12/01:

The Protection of Trees by Law

Trees form an integral part of our natural and built environment – providing a multitude of visual, environmental & societal benefits. Local Planning Authorities have the power to protect trees which bring significant amenity &/or benefit to the local area. This protection is particularly important where trees are under threat.

Any number of trees, of any type or combination of types can be protected under a legal notice known as a Tree Preservation Order (TPO) although hedges, bushes or shrubs are not usually protected. Generally a TPO is issued by an LPA in response to the submission of a planning application for a new house, building or structure.

A TPO has the power to halt any amendments or works planned on or near a tree. Trees can also be protected through specific conditions within a planning application response without a TPO being issued.

Impact on Developers

Being issued with a TPO typically means that a Developer or Home Owner will need to show they have met specific conditions put in place to protect the trees on their land from being damaged, altered or removed. Planning permission will not be granted before these and any other conditions have been proven to be met.

Root Protection Areas/Zones

Often the term 'Root Protection Area' or 'Root Protection Zone' is used. The definition of an RPA or RPZ is as follows:

"[A] Root Protection Area is defined as a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority"

Woodland Trust (2017)¹

Specifying an RPA/RPZ helps planning authorities demarcate an area around a protected tree in which any construction work must meet certain conditions and stipulations.

The Role of a Project Arboriculturalist

An Arboriculturalist is an amenity tree specialist knowledgeable in all aspects of the growing, maintaining and removing of woody plants for any reason other than as a timber crop.

¹ <https://www.woodlandtrust.org.uk/blog/2017/09/root-protection-order/>



Commissioning an assessment of the trees on your development site should be considered as early as possible in the project programme. This will help identify any trees of interest (pre-empting possible TPOs and influencing the design early on) and provide an idea of potential RPA sizes. Often an Arboriculture report will be requested by the LPA to support your planning application at some stage regardless so it helps to have this early on.

Structural Foundations in Root Protection Areas

“Much of the damage that can be done to trees by construction occurs below the ground, and so if you are planning to build within an RPA foundation design is critical. One of the most significant issues of building around trees is severing roots. In extreme cases this can cause the tree to fall over (the issues this might create for a new building are clear), but will more likely cause the tree to die slowly as its nutrient supply is cut off. Essentially this means that traditional trench foundations in RPAs are out, unless they will only clip a small area.”

Archio (2017)²

The preferred alternative to traditional foundations when building in RPAs is to use small diameter piles. Piled foundations limit potential damage to roots during installation, and ensure no part of the tree bears the loads from the structure.

Micro Piling vs Screw Piling

Local Planning Authorities will often allow buildings or structures to be built within an RPA if they are supported by Micro Piles or Screw Piles.

There are many different forms of Micro Piles in use in the UK, mainly manufactured from steel or concrete or a combination of the two. They are typically pre-fabricated and driven in (using a percussion rig or vibratory action), or preaugured and cast in situ. Micro piles provide an excellent foundation system in the correct situation.

Installing virtually any type of micro pile will create a hole up to 300mm diameter to the required depth which involves fully displacing or removing soil or tree roots in the intended pile location. This creates a suitable hole to allow a pile to be driven in or cast into place but at the expense of root damage.

Screw piles are a far less invasive foundation system. A screw pile consists of a slender, hollow steel shaft with a small number of steel helices (or screw threads) welded to it. As an indication, the largest screw pile in the ABC Anchors range – the 89R - has a pile shaft outer diameter of 89mm, a maximum helix diameter of 350mm, a maximum helix thickness of 20mm but can support 25 tonnes as standard.

Installing screw piles is a smooth and steady process whereby screw piles are rotated into the ground using a handheld or excavator mounted torque head. Installation occurs at a constant speed, inducing no vibration and requiring no pre-auguring.

² <http://archio.co.uk/blog/2015/09/03/how-close-can-you-build-trees-part-3/>



A screw pile displaces a comparatively small amount of soil & tree roots compared to a traditional micro pile. The helices attached to the screw pile shaft are deliberately made from thin steel plate, with a blunt protruding edge to ensure that where possible, roots are moved out of the way during installation rather than severing them. The pile shaft is considerably smaller than that of a micro pile so again, displacement of soil and tree roots is minimised.

Screw Piles: Keeping Root Damage to a Minimum

Clearly there is no way that a pile can be installed through an existing root system without causing some damage, however it is key to the health of the tree to minimise this effect as much as possible. As previously discussed, micro piling requires the removal of all material in the position of the pile, including any tree roots encountered.

Based on experience, screw piling has been found to leave a good proportion of the tree roots intact following installation. It has been argued that screw pile installation acts to aerate the soil in which it penetrates, which has the added benefit of increasing oxygen supply to the root system.

Compression of soil containing tree roots by traditional foundations has been shown to have a detrimental effect on the continued health of the tree. Compaction of soil reduces the passage of oxygen to roots during wet weather, and can cause the soil to become so dense that roots are no longer able to penetrate through it. Screw piles overcome this by supporting load directly on their constituent helices. These are placed well below the tree roots to ensure the root ball does not experience any loading influence or disturbance as a result of development.

Additional benefits of using screw piles

When installed as a deep foundation (4m+), screw piles are resistant to water movement in the soil (heave/shrinkage) experienced as a result of water uptake from the soil by the tree and therefore are ideally situated for use in high volume potential clays. Installing screw piles as an alternative to deep footings in such soils is often considerably cheaper.

Screw Piles are installed to a predetermined torque during the installation process. A well-established relationship exists between installation torque achieved and the final load capacity of the pile, so the final capacity of the pile can be calculated quickly on site. As no further pile testing is required once the pile is in the ground, there is no need to place the tree at further risk of damage through the use of testing equipment.

No heavy plant is needed to install a screw pile. The ABC Anchors handheld anchor driver weighs less than 100kg and is capable of installing a pile with a safe working load capacity of 73kN (factored). Our excavator mounted torque head (capable of installing piles with a SWL of 250kN (factored)) can be operated from a long reach excavator, which ensures that the root ball experiences no loading as a result of pile installation.

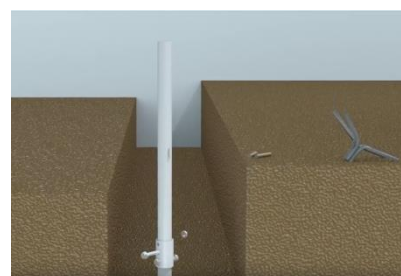
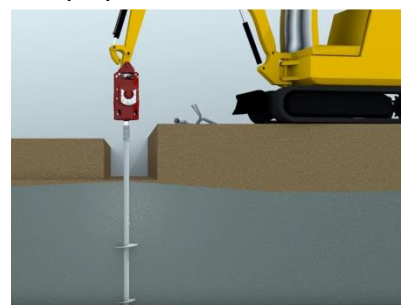
Typically screw piles are used in combination with a cast concrete ground beam system. This system is generally flexible enough to allow pile to be adjusted on site if any large tree roots are encountered and need to be avoided.



Screw Pile Installation Method

The typical screw pile installation method is described briefly below for reference.

1. Clear away vegetation in the area to be piled and check for underground cables, drains, pipes using appropriate equipment. Identify any major tree roots to be avoided in the intended pile locations.
2. Mount the powerhead to the excavator, remembering to connect the auxiliary hydraulics to the powerhead as per the detailed instructions supplied. Check for correct operation
3. Insert the upper end of the screw pile lead section into the anchor driver & secure with the drive pins supplied.
4. Position the anchor at the desired location and at a near vertical position screw the first helix into the ground.
5. When the first helix is buried, begin to make the angular adjustment to maintain verticality. Remember that final angular adjustments should be made before the second helix penetrates the ground.
6. When the installing tool becomes 300mm-500mm from the ground disconnect it from the section in the ground and reconnect it to the next extension.
7. Align the extension with the section in the ground and bolt them together. (Make certain that the bolt and nut are securely tightened)
8. Continue to drive the anchor and add extensions until the desired torque is reached and maintained; and the pile is installed to the correct depth and required height. It may be necessary to cut the pile to the desired length if it cannot be driven to a suitable depth in the ground.
9. Attach the terminations.



Industry Support

“Having specified and witnessed the installation of screw piles I consider they must be one of the most tree friendly foundation systems around. Easy to install from low ground pressure machines working on ground protection they can be installed without material impact to roots.”

Jago Keen – Keen Consultants Ltd

