

Preliminary Arboricultural Assessment for Utilities

Dumbleton Copse, Thornhill, Southampton

A Report To: The Clancy Group
Report Number: RT-MME-160199-01
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Report Verification

Report Version	Date	Completed by:	Checked & Approved by:
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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.

The document is designed to identify the existing trees on the site to aid design and avoid unnecessary tree removal. An Arboricultural Impact Assessment which identifies the relationship between the existing, retained trees and future proposed development will be required to accompany the planning application.

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1. Introduction

1.1 Project Background

This Preliminary Arboricultural Assessment for Utilities was commissioned by The Clancy Group as part of proposed sewer water installation works required to serve a new housing development at Dumbleton Copse, Southampton in Hampshire. A survey of the trees along the route and within influencing distance of the route was undertaken on the 17th October 2023 to aid design and avoid unnecessary tree removal.

This survey has been carried out in accordance with *NJUG - Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4)*¹ and *British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations'*². The purpose of this report is to:

- Record the current condition of the trees found during the survey and categorise them using criteria outlined in BS5837.
- Provide a Tree Survey Plan that identifies the constraints to utilities including Root Protection Areas (RPA) and crown spreads.
- Provide general guidance detailing the approved methods of utilities installation and repair and factors to be considered during the utility design process in relation to the findings on site.

1.2 Site Description, Context, Drawings & Appendices

Attribute	Description
National Grid Reference	SU 47529 12060 Centred
Topography	Varied with ditches and slopes present within the wooded section of the site.
Drawings attached	Tree Survey Plan – C160199-01-01
Appendices	Appendix A – Tree Schedule

Table 1.1: Summary of Site and Surroundings

¹ National Joint Utilities Group (NJUG) - *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4)*

² British Standard 5837:2012 *'Trees in Relation to Design, Demolition and Construction – Recommendations'*.

2. Survey Methodology

2.1 Survey Scope

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 NJUG - *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4)* and British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations'.

All individual trees with a stem diameter greater than 75 mm are shown on the Tree Survey Plan and have been assigned a unique reference number. Trees were visually assessed and a schedule prepared listing:

- Tree number
- Species
- Tree height
- Minimum crown clearance
- Stem diameter
- Crown spread
- Age class
- Vigour
- Structural condition

Measurements for tree height, minimum 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 were also noted. All observations and measurements are included in Appendix A Tree Schedule.

Trees were assessed and assigned one of the following categories:

Category U:

Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

Category A:

Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B:

Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C:

Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

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

- Mainly arboricultural qualities.
- Mainly landscape qualities.
- Mainly cultural values, including conservation.

N.B. Certain trees considered unsuitable to retain in their current context (Retention Category U) may possess existing or potential conservation value which make them desirable to preserve in the context of wildlife habitat (e.g. areas with limited public access).

2.2 Root Protection Area (RPA) / Precautionary Zone (PZ)

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 in accordance with section 4.6 of BS5837. BS5837 recommends this as the minimum area around a tree that contains sufficient roots and rooting volume to maintain viable tree vigour and structure. NJUG Volume 4 identifies three Tree Protection Zones as below:

- **Prohibited Zone** – 1m from the stem – No excavation.
- **Precautionary Zone** – 4 x tree circumference (NJUG) or 12 x stem diameter (BS5837) – manual, vacuum excavation or supervised mechanical excavation only.
- **Permitted Zone**– Outside of the Precautionary Zone / RPA – limited use of mechanical plant.

Where groups of trees have been assessed, the PZ / RPA has been shown based on the maximum sized tree stem in each group and so may exceed the PZ / RPA required for some of the individual specimens within the group. Further detailed inspection of the individual trees forming a group may be required where proposed works could potentially impact upon individual trees forming the combined group.

Protection of the roots and soil structure within the PZ / RPA should be treated as a priority.

2.3 Tree Schedule

Appendix A provides a schedule of the survey findings and includes the relevant observations made at the time of inspection.

2.4 Assessment Limitations

This survey has been undertaken in accordance with NJUG Volume 4 and BS5837 and trees under 75mm in diameter and the specific location of species within a hedgerow have not been identified in accordance with the guidance. It may therefore be necessary during detailed apparatus design to undertake further assessment and accurate positioning of juvenile trees or woody species within hedgerows and tree groups to assist structural calculations for foundation design of structures in accordance with current building regulations and NHBC Chapter 4.2 *Building near Trees*¹.

For the purposes of this assessment, a hedgerow is described as a line of trees or shrubs with canopies less than 5m wide which is regularly managed through pruning. Where trees are present within a hedgerow that are significantly different in character from the remainder, these have been identified and recorded separately. A tree survey in accordance with BS5837 does

¹ National House Building Council. (2022). *NHBC Standards 2022: Chapter 4.2 - Building Near Trees*. NHBC, Milton Keynes.

not assess hedgerows against the Hedgerow Regulations 1997² or from an ecological perspective.

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

2.5 Conditions of Tree Survey

The survey was completed by a suitably qualified and experienced Arboriculturist from ground level and from within the boundary of the site. Aerial tree inspections or the internal condition of the stem/s or branches was not undertaken at this stage. Evaluation of tree condition given within this assessment applies to the date of survey and cannot be assumed to remain unchanged. It may be necessary to review these within 12 months, in accordance with sound arboricultural practice.

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 and hedgerows 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.

2.6 Tree Survey Plan

The Tree Survey Plan identifies the existing trees including above and below ground constraints which should be considered during the design process.

² Department of the Environment, Transport, and the Regions: London. (1997). *The Hedgerows Regulations 1997: A Guide to the Law and Good Practice*.

3. Statutory Designation

3.1 Tree Preservation Order and Conservation Area Protection

A desk-based study was undertaken to identify if any of the trees in proximity to the proposed works are affected by statutory constraints as detailed in Table 3.1 below.

Statutory Constraint	Present		Source	Details
	✓	✗		
TPO		✗	Online via Eastleigh Borough Council Local Authority website	None present
Conservation Area		✗	Online via Eastleigh Borough Council Local Authority website	Not present
Ancient Woodland		✗	MAGIC (Multi Agency Geographical Information for the Countryside)	Not present

Table 3.1: 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 proposed works in respect of trees.

Statutory Undertakers

A Statutory Undertaker is defined as the holder of a licence under section 6 of the Electricity Act 1989 (licences authorising supply, etc), a gas transporter or a water or sewerage undertaker.

No works must be undertaken on the protected trees without prior permission from the Local Authority unless the works have been approved as part of recent detailed planning application or the works are exempt under Regulation 14 (Exemptions) of The Town and Country Planning (Tree Preservation) (England) Regulations 2012 (hereafter referred to as The Act). This states:

Nothing in Regulation 13 of The Act shall prevent the cutting down, topping, lopping or uprooting of a tree by or at the request of a statutory undertaker, where the land on which the tree is situated is operational land of the statutory undertaker and the work is necessary:-

- In the interests of the safe operation of the undertaking;
- In connection with the inspection, repair or renewal of any sewers, mains, pipes, cables or other apparatus of the statutory undertaker;
- To enable the statutory undertaker to carry out development permitted by or under the Town and Country Planning (General Permitted Development) Order 1995;

Section 263 Definition of Operational Land under the Town and Country Planning Act 1990

Operational land for statutory undertakers refers to the areas of land that are owned or controlled by organizations or entities that have been granted specific legal powers and responsibilities by statute or legislation. Statutory undertakers include public or utility companies that provide essential services to the public, such as electricity, gas, water, telecommunications, transportation, or waste management.

Operational land for statutory undertakers is used for the purpose of carrying out their statutory duties and functions. It may include various types of infrastructure, facilities, or networks required for the provision of their services. For example, an electricity company may have operational land that includes power stations, substations, transmission lines, and distribution networks. A water company may have operational land that includes reservoirs, treatment plants, pumping stations, and pipelines.

The Town and Country Planning Act 1990 Section 263 identifies the meaning of “operational land” as:

(1) Subject to the following provisions of this section and to section 264, in this Act “operational land” means, in relation to statutory undertakers—

(a) land which is used for the purpose of carrying on their undertaking; and

(b) land in which an interest is held for that purpose.

The ownership and control of operational land for statutory undertakers can vary. Some statutory undertakers may own the land outright, while others may have specific rights and permissions granted to them by the government or regulatory authorities to use the land for their operations. In some cases, statutory undertakers may also have access to privately owned land through legal agreements or easements.

The use of operational land for statutory undertakers is typically governed by specific regulations, licenses, or permits that outline the conditions and requirements for its use. These regulations may include environmental considerations, safety standards, land use planning, and public consultation processes to ensure that the operations of the statutory undertakers are carried out in the best interests of the public and the environment.

Overall, operational land for statutory undertakers plays a crucial role in enabling these organizations to fulfil their statutory obligations and provide essential services to the public. It serves as the foundation for the infrastructure and networks necessary for the delivery of services, and its use is regulated to ensure that it is done responsibly and in accordance with relevant laws and regulations.

3.2 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)³. They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981⁴, 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.

³ 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>

⁴ HM Government – The National Archives 2017. *Wildlife and Countryside Act 1981*. [online] Available at: <http://www.legislation.gov.uk/ukpga/1981/69/contents>

4. Results Summary

4.1 Preliminary Arboricultural Assessment

The assessment identified six individual trees, eight groups of trees and a woodland as detailed in Appendix A Tree Schedule and Table 4.1 below.

BS5837:2012 Category	Tree/ Group/ Woodland Reference
U	-
A	T4.
B	T1, T2, T3, T6, G1, G2, G5, G7, G8, W1.
C	T5, G3, G4, G6.

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

The highest value specimen recorded during the survey was an English oak tree (T4) which was considered to be of high retention value (Retention Category A). T4 was in good condition and exhibited healthy crown vigour due to its location at the periphery of the copse. It should be noted that boggy ground and dense vegetation restricted access to various areas of the site which combined with a lack of topographical survey information inhibited the accurate positioning of individual trees during the survey and also lead to the estimation of dimensions in some instances.

Four individual trees (T1, T2, T3 & T6), five groups of trees (G1, G2, G5, G7 & G8) and a woodland (W1) recorded during the survey were all considered to be of moderate retention value (Retention Category B). The individual specimens comprised English oak, sycamore, silver birch and cherry. The groups of trees included the following species: English oak, silver birch, sweet chestnut, cherry laurel, sycamore, rowan, beech, goat willow, plum and holly. The individual specimens and the groups of trees were typically in good condition and exhibited healthy crown vigour, however, dead and dying specimens were observed within G5 and G8. The woodland contained specimens primarily in good condition, however, it lacked management with dead and dying specimens present a lack of lower canopy trees and sections which were dying back.

The remaining one individual tree and three groups of trees recorded during the survey were all considered to be of low retention value (Retention Category C). The majority of these specimens were relatively juvenile and had stem diameters below the require 150mm to be considered of higher retention value. The larger specimens present within G4 were in fair to poor condition and were prevented from being considered higher value by the presence of defects such as tear wounds, crown dieback and included unions.

5. Arboricultural Design Guidance

5.1 Opportunities and Constraints

The information provided within this section of the report aims to inform designers and engineers of the constraints posed by the trees to ensure that trees selected for retention can be successfully retained, long term. The objective is to achieve a harmonious and sustainable relationship between trees and utilities for the future. All retained trees must be protected, and sufficient offsets provided between the trees and the proposed works to ensure they are not negatively impacted upon.

The removal of trees to facilitate the proposed works should be minimised and new tree planting should be provided to adequately mitigate any essential tree loss allowing sufficient space for the required easements.

5.2 Above Ground Constraints

Existing Canopy Spreads

The existing canopy spreads are shown on the Tree Survey Plan to assist in facilitation planning of works to trees to avoid overhead utilities or works beneath tree canopies or during loading and unloading of materials. The future crown spreads and root growth of younger trees will need to be fully considered when designing nearby infrastructure.

Where temporary built structures such as scaffolding or assisted access machinery such as the telehandlers or MEWPs are proposed near to existing trees, consideration should be given to the amount of working space required to allow access.

5.3 Below Ground Constraints

Root Protection Areas / Precautionary Zones (RPAs)

Root Protection Areas / Precautionary Zones for each tree and group of trees have been determined in accordance with BS5837 and NJUG Volume 4 respectively and is detailed within Appendix A Tree Schedule.

Initial RPAs / PZs have been plotted onto the Tree Survey Plan as circles, with the main tree stem/s located centrally, extending to encompass the area of ground, and thus the root-able soil volume, required for protection.

There are areas on site where, due to the presence of existing structures and hard surfaces, tree root development may have been restricted because of reduced nutrient or moisture availability and a lack of provision for gaseous exchange. In such areas it may be appropriate to modify the shape of the RPAs / PZs, whilst not reducing their area, to consider the likely root morphology and distribution of the affected trees.

Determining the extent of a tree's root system, however, is not a simple process and whilst roots can generally be considered absent beneath substantial buildings, they may be present beneath lighter structures and areas of hard surfacing. Where possible, all utility installation should be situated outside of the designated Root Protection Areas of retained trees.

5.4 Tree Categorisation

All trees within influencing distance of the proposed work zone should be a consideration in all utilities planning. The existing trees and hedgerows provide visual amenity, wildlife and sequestered carbon benefits to the local area and the prioritisation for tree retention should be based upon the guidance contained within NJUG Section 3.12 *New / Renewal of Apparatus – Existing Trees* and BS5837 as detailed below.

Retention Category U

Trees found unsuitable to retain have limited, transient retention value due to their current condition and, in most circumstances, such specimens will not be considered for retention unless they offer wildlife habitat potential and are situated in areas with limited pedestrian access, where they are unlikely to impact the proposed utilities.

Retention Category A

Trees of high quality should be given the highest priority when deciding which trees should be retained. These trees contribute to the local area in arboricultural and landscape terms and their loss should be avoided.

Retention Category B

Moderate quality trees should be retained as they offer the potential to provide medium to long term benefits to the local area. These trees are typically found to have remediable defects that may improve over time. The removal of Retention Category B trees should generally be avoided.

Retention Category C

When considering which low quality trees to retain, priority should be given to those trees that have been included within this category solely due to their young age and limited proportions (stem diameters of less than 150 mm at 1.5 m above ground level). These young specimens offer future potential as established tree cover but could be removed and replaced or translocated to areas away from the proposed utility works to avoid their loss. The remaining trees in this category provide only temporary or transient landscape benefits and therefore, should not constrain the proposed works.

5.5 Works within Root Protection Areas

Utility works near to trees has the potential to cause soil compaction, root damage and a reduction in nutrient and moisture availability to roots and should therefore be avoided. To minimise harm, specialist construction methods may be required to ensure any potential impact is fully considered.

The excavation of a continuous hand-dug or mechanically excavated trench can result in extensive root loss and should be avoided. The use of specialist trenchless technology techniques should be used to enable the retention of good quality trees that would otherwise be lost (usually Categories A or B).

Designs for foundations of proposed structures that minimize adverse impact on trees should include particular attention to existing levels, proposed finished levels and cross-sectional details. To arrive at a suitable solution, site-specific and specialist advice regarding foundation design should be sought from the Project Arboriculturist and Structural Engineer. In shrinkable soils, foundation design should consider the risk of indirect damage through subsidence and heave.

5 National Joint Utilities Group (NJUG) - *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees* (Volume 4)

5.6 Building Foundations

Any newly built structures should comply with the current building regulations and *NHBC Chapter 4.2 building near trees (2022)*. Foundation depths for buildings near or adjacent to tree/s should consider the potential size of the tree/s at maturity and their subsequent water demand. The soil types throughout the site should be fully investigated and appropriate mitigation measures taken. If trees are removed across the site, the potential for soil heave should be assessed and foundations designed accordingly.

This survey has been undertaken in accordance with BS5837- Recommendations and therefore, further assessment in accordance with current building regulations will be required to inform foundation design.

5.7 Subterranean Utilities and Services Easements

All new below-ground service runs, utilities and similar infrastructure should consider tree roots. RPAs should be avoided to ensure potential impacts are minimised and trees remain safe and healthy into the future.

Where works are proposed within the RPAs of retained trees the protection of tree roots is imperative and as such traditional trenching should not be considered a feasible option. The proposed utility installation could be completed using specialist installation methods such as directional drilling, thrust boring, micro-tunnelling positioned at a minimum depth of 1500 mm below existing ground level. Entry and retrieval pits must be sited outside the root protection area of any retained tree to prevent damage to root systems.

Where pipeline routes are to be located beneath tree groups or woodlands, deviations in the route and joins in the pipework should be minimised to reduce the potential in the future for the need to undertake repair works within the woodland.

The access and egress route to the site should be fully considered in the same way as the site itself and any modifications to the design should be made to avoid tree canopies and rooting areas. Low ground pressure vehicles should be used wherever possible to reduce the need for specialist ground protection. Tracked plant machinery exerting a ground pressure of less than 0.48kg/cm² should only be used. Continuous tracking of vehicles through the RPAs of retained trees should not occur and if predicted, pre-emptive measures should be planned.

Service easements should also be considered when designing new infrastructure to ensure retained trees are not adversely impacted upon.

5.8 Future Tree Growth

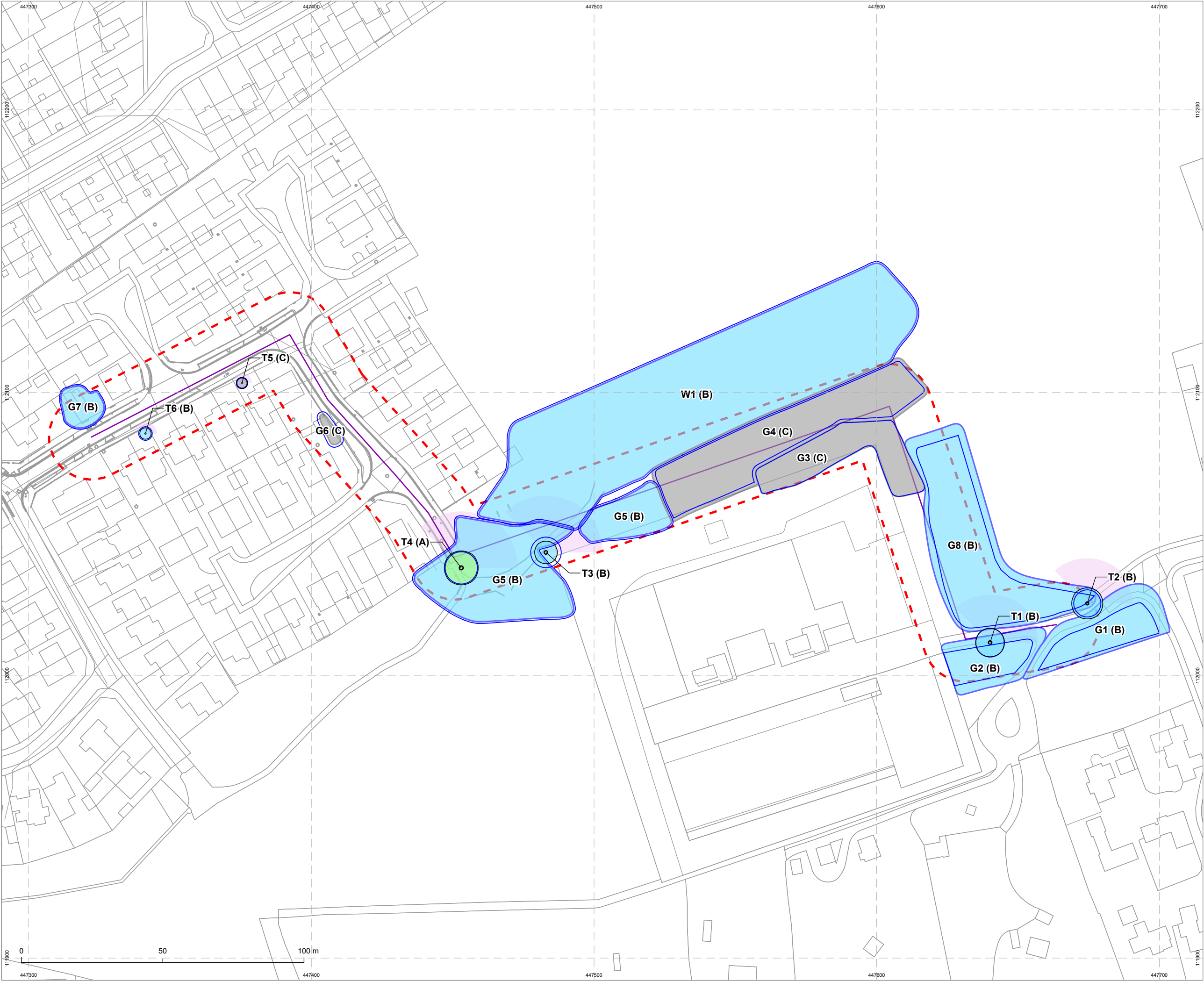
Where trees are to be retained alongside new utilities, their ultimate proportions including crown and root growth, should be fully considered as future branch and root growth may result in conflict with the proposed service. It may be necessary to install a subterranean root barrier between the service and adjacent trees to prevent future conflict.

As trees grow, they absorb carbon dioxide from the atmosphere and store it in the form of roots, stems and branches and loss of the woody parts of trees should therefore be avoided if possible.

6. Recommendations

The following standard recommendations are made:

- The retention of Category A and B trees along the route should be considered a priority.
- The retention of Category C trees along the route should be retained where possible.
- All new utilities should be located outside of the RPA or canopy spread of any retained tree.
- Any proposed new planting should consist of a mix of ornamental, native and wildlife attracting species.
- Tree planting should be avoided where they may obstruct overhead power lines or cables or incur within the easement required for each service. Any underground apparatus should be ducted or protected using a suitable root barrier at the time of construction.
- This Arboricultural Survey is valid for a period of 12 months.
- If works take place during the bird breeding season, usually from March to September inclusive, trees affected by the proposed works should be checked for nesting birds.



C160199-01-01

Legend

Tree location and stem diameter

Category A

Category B

Category C

Current canopy extent

Root Protection Area

Indicative tree shadow

Approximate pipeline route

Survey area

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

Dumbleton Copse, Thornhill, Southampton

Drawing

Tree Survey Plan

Client

The Clancy Group

Drawing Number

C160199-01-01

Revision

00

Scale @ A3

1:1,250

Date

November 2023

Approved By

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Appendix A - Tree Schedule

Measurements	Age Class	Overall Condition	Root Protection Area (RPA)
Height - measured from ground level at base of stem/s (m).	YNG: Juvenile trees that have been recently planted.	G - Good: Trees with only a few minor defects and in good overall health needing little, if any attention.	• The RPA column gives the required area (m²). • The RPA Radius column gives the radius (m) of an equivalent circle. • The RPA is calculated using the formulae described in paragraph 4.6.1 of British Standard 5837: 2012 and is indicative of the required rooting area in order for a tree to be retained.
Stem Dia. - Diameter measured (mm) in accordance with Annex C of the BS5837.	SM: Semi-mature, trees upto 1/3 life expectancy.	F - Fair: Trees with minor, but rectifiable, defects or in the early stages of stress from which it may recover.	
Crown - crown spread estimated radially from the main stem (m).	EM: Early mature, trees 1/3 – 2/3 life expectancy.	P - Poor: Trees with major structural and/or physiological defects such that it is unlikely the tree will recover in the long term.	
Abbreviations Est - Estimated stem diameter Avg - Average stem diameter Max - Maximum stem diameter	M: Mature trees, upto 2/3 life expectancy.	D - Dead: Trees no longer alive. This could also apply to trees that are dying and unlikely to recover.	
	OM: Over mature, declining or moribund trees of low vigour.	In the assessment, of the BS category, particular consideration has been given to the following • The health, vigour and condition of each tree • The presence of any structural defects in each tree and its future life expectancy • The size and form of each tree and its suitability within the context of a proposed development • The location of each tree relative to existing site features e.g. its screening value or landscape features	
	V: Veteran, tree possessing certain attributes relating to veteran trees.	• Age class • Life expectancy	

Structural Condition

The following has been considered when inspecting structural condition:

- The presence of fungal fruiting bodies around the base of the tree or on the stem, as they could possibly indicate the presence of possible internal decay.
- Soil cracks and any heaving of the soil around the base.
- Any abrupt bends in branches and limbs resulting from past pruning.
- Tight or weak 'V' shaped forks and co-dominant stems.
- Hazard beam formations and other such biomechanical related defects (as described by Claus Mattheck, Body Language of Trees HMSO Research for Amenity Trees No. 4 1994).
- Cavities as a result of limb losses or past pruning.
- Broken branches or storm damage.
- Canker formations.
- Loose or flaking bark.
- Damage to roots.
- Basal, stem or branch / limb cavities.
- Crown die-back or abnormal foliage size and colour.
- Any changes to the timing of normal leaf flush and leaf fall patterns.

Quality Assessment of Retention Category

Category U - Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

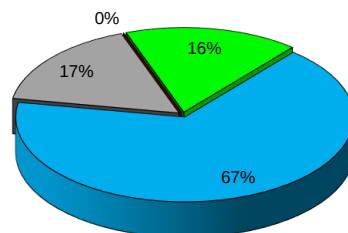
Category A - Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B - Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C - Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

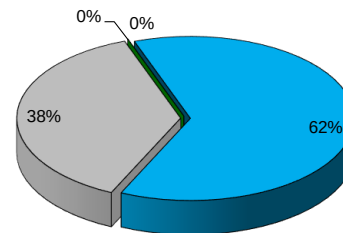
Sub-categories: (i) - Mainly arboricultural value
(ii) - Mainly landscape value
(iii) - Mainly cultural or conservation value

BS5837 category: Individuals



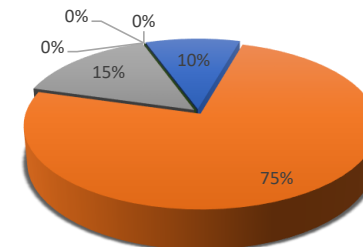
■ Category U
 ■ Category A
■ Category B
 ■ Category C

BS5837 category: Groups of trees



■ Category U
 ■ Category A
■ Category B
 ■ Category C

Age distribution of tree stock



■ Young
 ■ Semi Mature
 ■ Early Mature
■ Mature
 ■ Over Mature
 ■ Veteran

Appendix A - Summary

	Individual Trees	Totals	Tree Groups	Totals
Category U		0		0
Category A	T4	1		0
Category B	T1, T2, T3, T6	4	G1, G2, G5, G7, G8	5
Category C	T5	1	G3, G4, G6	3
	Total	6	Total	8

	Hedgerows	Totals	Woodlands	Totals
Category U		0		0
Category A		0		0
Category B		0	W1	1
Category C		0		0
	Total	0	Total	1

Tree No	Species	Height (m)	Crown Clearance (m)	No. of Stems	Stem Dia. (mm)	Crown Radius				Age Class	Structure	Vigour	RPA (m)	RPA Radius (m)	Cat	Comments
						N	E	S	W							
T1	Silver birch	17.0	4.0	2	320 260	5.0	5.0	5.0	5.0	SM	F	G	81	5.1	B 1	Branch stubs observed Included unions observed Minor deadwood in the crown Typical crown form
T2	Sycamore	16.0	2.0	1	390	5.5	5.5	5.5	5.5	SM	F	G	72	4.8	B 1	Branch stubs observed Included unions observed Minor deadwood in the crown Limited inspection due to dense vegetation Typical crown form
T3	English oak	20.0	13.0	1	450	4.0	4.0	4.0	4.0	SM	F	G	92	5.4	B 1	Branch stubs observed Epicormic growth observed in the crown Epicormic growth on the main stem Minor deadwood in the crown Etioled form
T4	English oak	20.0	2.0	1	460	6.0	6.0	6.0	6.0	SM	G	G	102	5.7	A 1	Branch stubs observed Hard surfaces within the rooting area Minor deadwood in the crown Typical crown form
T5	Cherry	3.5	2.0	1	150	2.0	2.0	2.0	2.0	SM	F	F	10	1.8	C 1	Branch stubs observed Pruning wounds observed Typical crown form Estimated dimensions Limited inspection due to access
T6	Cherry	4.0	1.0	1	190	2.0	2.0	2.0	2.0	SM	F	F	18	2.4	B 1	Branch stubs observed Limited inspection due to access Estimated dimensions Hard surfaces within the rooting area Typical crown form Pruning wounds observed

Tree No	Species	Height (m)	Crown Clearance (m)	No. of Stems	Stem Dia. (mm)	Crown Radius				Age Class	Structure	Vigour	RPA (m)	RPA Radius (m)	Cat	Comments
						N	E	S	W							
G1	English oak Silver birch Sweet chestnut Cherry laurel Sycamore	16.0	0.0	-	350	5.0	5.0	5.0	5.0	SM	F	G	55	4.2	B 2	Conjoined canopy Branch stubs observed Included unions observed Limited inspection due to dense vegetation Self seeded trees present Typical crown forms
G2	English oak Silver birch Rowan Sycamore Sweet chestnut	18.0	0.0	-	320	4.0	4.0	4.0	4.0	SM	F	G	48	3.9	B 2	Conjoined canopy Branch stubs observed Included unions observed Minor deadwood in the crowns Typical crown forms Self seeded trees present
G3	Goat willow Crack willow	5.0	0.0	-	160	2.0	2.0	2.0	2.0	SM	F	F	14	2.1	C 2	Conjoined canopy Branch stubs observed Limited inspection due to safety concerns Limited inspection due to dense vegetation Limited inspection due to access Self seeded trees present Typical crown forms Estimated dimensions
G4	Sycamore Silver birch Holly Goat willow Sweet chestnut	17.0	0.0	-	320	5.0	5.0	5.0	5.0	SM Y	F,P,D	F,P,D	48	3.9	C 2	Conjoined canopy Branch stubs observed Dead and dying trees present Limited inspection due to dense vegetation Limited inspection due to safety concerns Minor deadwood in the crowns Self seeded trees present Typical crown forms Tear wounds observed Included unions observed
G5	English oak Sweet chestnut Beech Sycamore	18.0	3.0	-	550	6.0	6.0	6.0	6.0	SM EM	F	G	137	6.6	B 2	Conjoined canopy Branch stubs observed Included unions observed Minor deadwood in the crowns Typical crown forms Self seeded trees present
G6	Lawson cypress Magnolia	4.0	2.0	-	160	1.0	1.0	1.0	1.0	SM	F	F	14	2.1	C 2	Limited inspection due to access Typical crown forms Conjoined canopy Hard surfaces within the rooting area Lawsons has been topped. Estimated dimensions

Tree No	Species	Height (m)	Crown Clearance (m)	No. of Stems	Stem Dia. (mm)	Crown Radius				Age Class	Structure	Vigour	RPA (m)	RPA Radius (m)	Cat	Comments
						N	E	S	W							
G7	English oak Goat willow Plum	14.0	1.0	-	540	6.0	6.0	6.0	6.0	SM EM	F	G	137	6.6	B 2	Conjoined canopy Branch stubs observed Limited inspection due to access Minor deadwood in the crowns Typical crown forms Hard surfaces within the rooting area Estimated dimensions
G8	English oak Sweet chestnut Silver birch Sycamore Goat willow Holly	14.0	0.0	-	320	4.0	4.0	4.0	4.0	SM Y	F	G	48	3.9	B 2	Dead and dying trees present Conjoined canopy Branch stubs observed Limited inspection due to dense vegetation Minor deadwood in the crowns Self seeded trees present Typical crown forms Tear wounds observed Included unions observed Dense ivy on the stems Dense ivy in the crowns Limited inspection due to ivy