

Arboricultural report for Harlands, Highcross Road,
Southfleet, DA13 9PH

Reference GRS.89.23

Client: Mr Lee Clark

Local Planning Authority: Dartford Borough Council



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1. PURPOSE OF REPORT

- 1.1 To follow the core objectives to prepare a concept design including outline proposals for structural design following the guidance set out in BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS).
- 1.2 By following the principles set out in the BS will ensure there is a sustainable relationship between the built form and the tree stock, and therefore allowing the retained trees to continue to grow and contribute to the character of the local landscape.
- 1.3 Feasibility stage - tree survey (**appendix B**). This provides a sequential reference number; species; height; stem diameter branch spread; crown clearance; age of tree, general observations, and estimated remaining contribution to the landscape. Each tree/group of trees will be allocated a grading based on Table 11 – Cascade chart for tree quality assessment forming a tree location plan (TLP-01).
- 1.4 Identification of primary and secondary constraints the existing trees will pose to the development of the site by producing a tree constraints plan (TCP).
- 1.5 Examples of primary constraints include:
 - Below ground - extent of the root protection area (RPA)²
 - Tree Preservation Orders/ Conservation Areas
 - Above ground - branch framework and space for the canopy to grow without affecting any structures and may have an impact on the future welfare of the retained trees also referred as post development³.
 - Shading arcs assessing areas of the site which will be affected by shading.
- 1.6 Also identified are secondary constraints such as areas of existing hard standing within the RPA that can be removed if the soil is not disturbed. This information will help to identify any above and below ground constraints which will provide guidance for the design layout of the proposed development. At this stage, it may be necessary to remove existing trees to accommodate the proposed design layout.
- 1.7 **Arboricultural Impact Assessment (AIA)** is based on the findings from the tree survey and the TCP and evaluates any direct or indirect effects the existing trees may have on the proposed design and assesses what impact the proposed removal of the trees would have on the local landscape.
- 1.8 **Tree protection plan (TPP)** identifies any issues which must be addressed during the demolition and construction phase. In addition, any pruning works that are necessary to facilitate plant machinery are also identified.

¹ Refer to Appendix A for more information.

² Root protection area (RPA) is defined as minimum area around a tree required to contain sufficient roots and rooting volume to ensure the successful integration of the tree into the new layout. This is calculated using the formulae set out in section 4.6 of BS5837:2012 Trees in relation to design, demolition and construction – Recommendation.

³ As described in section 5.2 of the B.S Example includes current and ultimate height and spread of the tree, species characteristics, density of foliage, susceptibility to honey dew and branch drop.

2. BASE LINE DATA

- 2.1 The survey was carried out in accordance with section 4.4 – 4.5 of the BS 5837:2012 'Trees in relation to design, demolition, and construction – Recommendation', hereafter to be identified as 'BS' Where it was not possible to gain access to record the relevant data, certain fields such as crown spread and diameter at breast height (dbh) were estimated.
- 2.2 If defects were noted and required further inspection the following inspection aids were used: laser distometer was used to measure the crown spread, binoculars to inspect the upper crown, magnifying glass for inspection of pest and diseases, steel probe to test strength of wood/depth of cavities and a mallet to give an audible indication of the extent of cavities.
- 2.3 Trees within the report were inspected from ground level only and any external faults and features were recorded. The following inspections were not carried out: aerial inspection, detailed excavation of the rooting system or the use of internal decay detection equipment. The use of such equipment would require an additional report.
- 2.4 Detailed ecological considerations are beyond the scope of this report. UK and European wildlife legislation may affect the timing and even prohibit the enhancement of works and operations described in this report. Most of the information regarding wildlife can be found in the Wildlife and Countryside Act 1981 (as amended). It is recommended that consideration is given to the requirement for ecological surveys. Bats in particular are afforded particular protection and a specialist may be required to determine if bats are present or could be affected when carrying out tree works.
- 2.5 Trees are living organisms whose health and condition can change rapidly. Trees should be checked on a regular basis. The conclusions and recommendations of this report are valid for one year. It is recommended that the trees within the site be inspected after adverse weather conditions such as high winds.
- 2.6 Stem diameters are used to calculate Root Protection Areas (RPA) (see appendix C); where ivy or dense undergrowth has been noted in the comments section of the tree survey a precise stem diameter measurement may not have been possible. The stem diameter and RPA given in this instance is therefore provisional until such time that the ivy has been removed and the stem recalculated

3. DRAFT ARBORICULTURAL METHOD STATEMENT

THIS PART OF THE REPORT MUST BE READ IN CONJUNCTION WITH THE TREE PROTECTION PLAN ATTACHED WITH THIS REPORT. FAILURE TO ADHERE TO THE RECOMMENDATIONS OUTLINED IN THIS SECTION MAY RESULT IN A TEMPORARY STOP NOTICE BEING SERVED.

3.1 To ensure an effective tree protection regime is implemented the following logical sequence of events and arboricultural inspection/supervision must be always adhered to. These stages and the arboricultural input are listed below.

- Pre-commencement meeting
- Tree removal and access facilitation pruning
- Protective fencing installed.
- Temporary ground protection installed.
- Excavating within the RPA
- Removal of protective fencing

3.2 A pre-commencement meeting will be held on site before any site clearance or construction work begins and the following parties should be in attendance.

<i>Name of person</i>	<i>Title</i>	<i>Telephone number</i>	<i>Email address</i>
Mr P Hegley	Tree Officer	TBC	TBC
TBC	Project architect	TBC	TBC
TBC	Site manager	TBC	TBC
Mr Guy Stephens	Arboricultural	07970675828	guy@grstrees.co.uk

Table 1- List of contacts

3.3 The pre-commencement meeting will be used to clarify and make understood all aspects of the implementation of tree protection and sequencing to all relevant parties. The specific works or events during which the arboricultural consultant will need to visit the site to undertake supervision or inspection will be confirmed, and a suitable length of time between monitoring visits will be agreed. When the project arboriculturist is not on site, a person will be appointed to undertake a daily inspection of the approved tree protection measures are in place. The inspections will be recorded and sent to the project arboriculturist. The LPA tree officer will receive monitoring reports on a regular basis, as agreed during the pre-commencement meeting.

3.4 A copy of the AMS and TPP will be kept on site at all times and be made available to all those who are to undertake works directly adjacent to the trees that are to be retained. It is the developer's responsibility to ensure that details of this AMS and any agreed amendments are known and understood by all site personnel.

3.5 If there is a change in site manager then the arboricultural consultant must be informed and a meeting must take place within 5 days of such a change, so that the important aspects of the AMS and TPP can be discussed and made clear to the site manager.

3.6 The table below identifies the phases of the project arboriculturist will be on site to oversee works which have the potential to harm the retained trees. A monitoring form will be sent to the LPA confirming they have been completed satisfactorily.

Phase	Works to take place	Tree Protection measures to be installed	Project arboriculturist attend	Site monitoring report to be sent to LPA
Pre-start meeting	Sequence of monitoring regime to be agreed.	N	Y	Y
Demolition phase	Demolition of existing buildings	Erection of tree protective fencing	N	Y
Construction phase	Erection of approved works	Tree protection fencing to be retained.	Y – Oversee excavation along the rear elevation.	Y

Table 2 - Site monitoring phases

3.7 In the event of bats being found the tree should only be felled if deemed unsafe. If a potential bat roosting site is found during tree works every effort must be taken to preserve the area, for example cuts must be made above the crack or hole.

3.8 Stages of the erection and removal tree protective fencing and signs.

3.9 The location of the tree protective fencing (TPF) is shown as a light blue line on the TPP for both the demolition and construction phase and must be kept in those locations throughout the course of the development which include the following stages.

- Delivery of all plant machinery
- Soft landscaping including the removal of soil.
- Installation of underground services
- Construction of the approved development
- Hard and soft landscaping

3.10 Installing and maintaining the TPF.

1. Existing vegetation that prevents the TPF from being installed in its entirety is to be removed using hand tools only.
2. Mark out the fencing points
3. Fencing contractors erect the fencing and attach tree protection signs.
4. Site meeting with the project arboriculturist and site foreman to inspect and sign it off.

3.11 Approved works to start. As soon as the construction works start the fencing must remain in place, in the event of it having to be removed or relocated the project arboriculturist must be contacted immediately who will inform the local planning authority. Any alternative fencing to be used must be approved by the project arboriculturist and a revised TPP will be issued and sent to the local planning authority for approval.

3.12 Examples of protective fencing

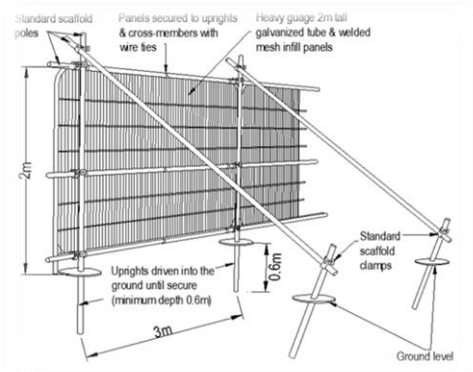


Figure 1 Default specification for protective fencing (Figure 2)

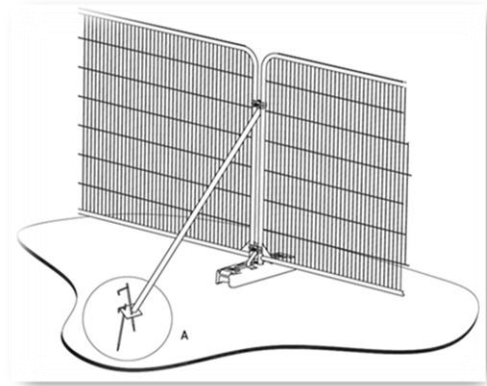


Figure 2 Example of above ground stabilizing system (Figure 3 a)

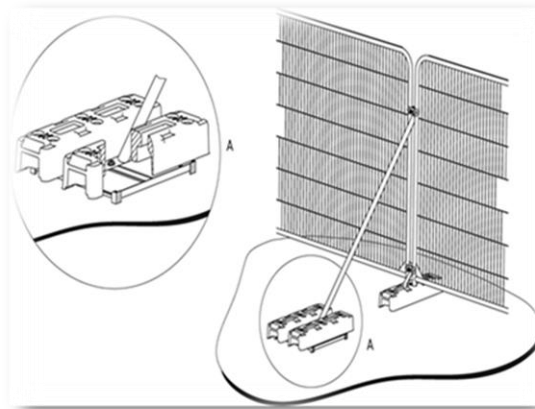


Figure 3 Example of stabilizer strut on block tray (Figure 3b)

3.13 In the first instance the tree protective fencing will be the default specification as shown as figure 2 of BS5837:2012 Trees in relation to design, demolition and construction and will comprise the following elements; standard scaffold poles, heavy gauge 2 m tall galvanized tube and welded mesh infill panels, panels secured to uprights and cross members with wire ties, ground level, Upright driven into the ground until secure (minimum depth 0.6 m) and standard scaffold clamps.

-
- 3.14 An assessment will be made by the project arboriculturist whether the default protective fencing can be implemented and be a robust form of protection during the demolition and construction phase, the fencing can be changed to either figures 3a or 3b depending on the site. The project arboriculturist will inform the tree officer of any changes in the type of fencing. To avoid potential enforcement action, it may require issuing a new tree protection plan to the LPA which will need to be formally discharged.
- 3.15 Prior to carrying out any tree work. Birds: Please note that it is an offence under the Wildlife and Countryside Act of 1981, amended by the Countryside and Rights of Way Act 2000, to kill, injure or take any wild birds, damage or destroy nests that are in use or are being built and take or destroy eggs.
- 3.16 Bats: Prior to the commencement of any tree works, a visual inspection carried out by a qualified ecologist must be carried out to see whether there are any signs of bat. In the event of bats being found the tree should only be felled if deemed unsafe. Such features have the potential to provide roosting spaces for bats but are not in themselves indicators of presence.
- Woodpecker holes.
 - Rot holes.
 - Loose bark.
 - Cankers.
 - Tension cracks and splits.
 - Shattered 'snag' ends.
 - Signs of internal decay (e.g. fungal fruits, hyphae, exudation).
 - Inclusions.
 - Elongated tight forks,
 - 'Unusual' growth forms
 - Bat boxes on or near the tree.
 - Evidence of past pruning/coppicing/pollarding/storm damage.
- 3.17 In the event of bats being found the tree should only be felled if deemed unsafe. If a potential bat roosting site is found during tree works every effort must be taken to preserve the area, for example cuts must be made above the crack or hole.

3.18 Examples of tree protection warning signs

3.19 Notices stating, "Tree Protection Zone, Keep Out!" will be attached with cable ties to every third panel.



Figure 4 Example of warning signs

3.20 Examples of ground protection

3.21 Temporary ground protection shall be designed to an engineer's specification; to accommodate and support the likely loading from any traffic entering or using the site without being distorted or causing compaction of underlying soil.

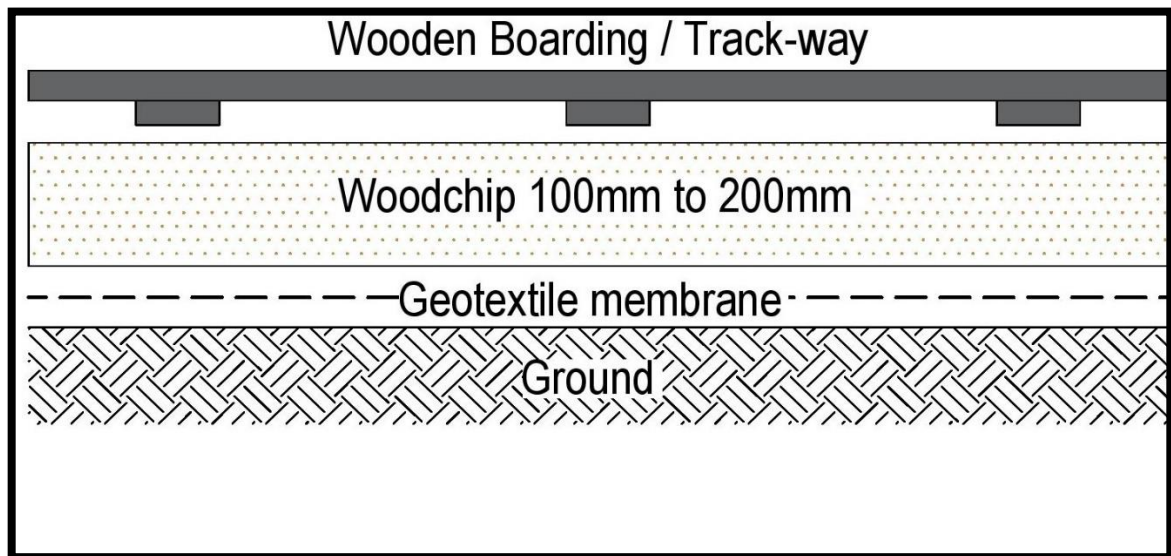


Figure 5 Temporary ground protection

Examples of temporary ground protection include.

- Pedestrian- single thickness of scaffold boards placed either on top of a driven scaffold frame thus forming a suspended walkway, or on top of a compression – resistant layer e.g. 100 mm depth of woodchip.
- Pedestrian operated plant up to a gross weight of 2 t – comprising inter-linked ground protection boards, placed on top of 150 mm wood chip laid onto a geotextile membrane.
- Wheeled or tracked construction traffic exceeding 2 t gross weight - an engineering specification in consultation with the project arboriculturist is recommended see www.ground-guards.co.uk.

3.22 Demolition of buildings

3.23 Before any demolition starts all the relevant protective measures as shown on the TPP must be in place. The stages of this phase of works are as follows.

- Pre-commencement meeting with the retained arboricultural consultant/ site manager to discuss the critical stages during the demolition phase.
- All plant machinery must be located outside the RPA.
- Disassemble the tree protective fencing to allow basic access to work area.
- Floor and slabs are to be removed using handheld machinery e.g., hand breaker and pieces removed by hand ensuring the rooting environment is not disturbed or the levels altered.
- 100 mm of topsoil either from within the site or imported ⁴ is to be spread over exposed areas.
- In the event of contamination of the soil from fuel and oil leakage the retained arboricultural consultant must be contacted immediately to assess the impact.

3.24 Excavating within the RPA shown as orange line.

3.25 Roots encountered of less than 25mm diameter may be cut cleanly by the arboricultural consultant with secateurs or a sharp pruning saw (except where they occur in clumps of 25mm diameter or larger). If roots (or clumps of roots) of 25mm in diameter or larger are encountered they shall be retained and protected, and the pile relocated.

3.26 Exposed roots shall be covered with sand or hessian sacking and be kept moist at all times; they shall not be left exposed to frost, wind or direct sunlight.

3.27 A mini piling rig shall be used to install the piles within RPAs; the rig shall be of a size and working height which, in operation, can be accommodated without damaging tree trunks or branches. It shall remain standing on the ground protection (or outside of RPAs) at all times. In this way the soil within the RPAs shall be protected from compaction damage.

3.28 There shall be no changes in existing soil levels within the RPAs of trees to be retained.

⁴ BS 3882: 2007 – Specification for topsoil and requirements for use

3.29 No activity shall occur within the CEZ's; this means:

- No storage of equipment or materials.
- No access to people, plant or vehicles.
- The actions to be carried out within or directly adjacent to the CEZ's shall only be carried out in accordance with this method statement. Where specified these works shall only be carried out under the direct supervision of the arboricultural consultant.
- Provision shall be made to avoid the spillage of chemicals that are toxic to roots into the RPA. It is now standard practice to have emergency spillage kits made available. Liquid chemicals such as oil, bitumen, diesel, and cement shall not be stored, mixed or discharged onto the ground within 10 m of the trees.
- No notice boards, or above ground services, shall be attached to any of the trees. No fires shall be lit within the RPAs of the trees or near enough to the extent of the canopy that branches might be damaged.
- Planning of site operations shall take sufficient account of wide loads, tall loads and plant with booms, jibs and counterweights (including drilling rigs), in order that they can operate without coming into contact with retained trees. Such contact can result in serious damage to the trees and might make their safe retention impossible. Consequently, any transit or traverse of plant in proximity to trees shall be conducted under the supervision of a banksman, to ensure that adequate clearance from trees is maintained at all times.
- Unwanted vegetation shall be removed by hand or by using chemicals that do not damage the roots of the trees that are to be retained.

4. GLOSSARY OF TERMS

Arboricultural method statement ('AMS')	Methodology for the implementation of any aspect of development that is within the root protection area (RPA), or has the potential to result in loss of or damage to a tree to be retained.
Arboricultural consultant	Appointed person to oversee all tree related matters and who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction.
Tree protection plan ('TPP')	Scale drawing, informed by descriptive text where necessary, based upon the finalized proposals, showing trees for retention and illustrating the tree and landscape protection measures
Root Protection Area ('RPA')	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.
Construction Exclusion Zone ('CEZ')	Area based on the RPA from which access is prohibited for the duration of a project
Protective fencing	Temporary fencing that excludes potentially harmful demolition or construction activity adjacent to trees to be retained.
Ground protection	Ground protection within RPAs capable of supporting traffic entering or using the site without being distorted or causing compaction of underlying soil or damage to surface roots.
Arboricultural monitoring & supervision	Throughout the demolition and construction process the arboricultural consultant shall undertake regular site monitoring visits and supervise specific works adjacent to trees. All supervisory and monitoring visits will be formally confirmed in writing and circulated to all relevant parties.

Table 3 Glossary of terms

5. GENERAL ADVICE

Extent and form of the root system	Within a short distance of the stem, the roots are highly branched, so as to form a network of small-diameter woody roots, which can extend radially for a distance much greater than the height of the tree, except where impeded by unfavourable conditions. All parts of this system bear a mass of fine, non-woody absorptive roots, typically concentrated within the uppermost 600 mm of the soil.
Damage to roots	All parts of the root system, but especially the fine roots, are vulnerable to damage. Once roots are damaged, water and nutrient uptake is restricted until new ones have grown. Mature trees recover slowly, if at all, from damage to their woody roots.
Soil compaction	Soil that has been compacted will not provide suitable conditions for the survival and growth of vegetation, whether existing or new, and is a common cause of post-construction tree loss on development sites. Compacted soil will adversely affect drainage, gas exchange, nutrient uptake and organic content, and will seriously impede or restrict root growth.

Table 4 General advice

6. REFERENCES

AL Shigo (1991) 'Modern Arboriculture', Shigo and Trees Associates

BS 3998:2010 'Recommendations for Tree Work', British Standards Institution, London.

BS5837: 2012 'Trees in relation to design, demolition and construction – Recommendation', British Standards Institution, London.

D. Lonsdale (1999) 'Principles of Tree Assessment and Management' HMSO

Mattheck and Broeler (1994) 'The Body Language of Trees' HMSO

Strouts and Winter (1994) 'Diagnosis of Ill Health in Trees' HMSO

National Joint Utilities Group. Volume 4, GUIDELINES FOR THE PLANNING, INSTALLATION AND MAINTENANCE OF UTILITY APPARATUS IN PROXIMITY TO TREES", Issue 2: 16th November 2007

**Appendix A –Tree survey information - undertaken in accordance with section 4,
BS5837:2012 ‘Trees in relation to design, demolition and construction – Recommendations**

Tree no:	Sequential reference number of trees or groups of trees commencing at "1". Prefixed with a letter indicating type: T: Tree. G: Group. H: Hedge. W: Woodland. A: Area
Tree Preservation Order/ (TPO) conservation area (CA)	Served on individual, groups, woodland or as an area when the local planning authorities (LPA) consider it necessary to protect the visual amenity of the local area. Consent from the LPA must be sought prior to undertaking any works, failure to do so may lead to unlimited fines. Conservation area is an area designated under 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990. Works to trees located within a CA require six weeks notification (S211 notice) to be submitted to the LPA. If the works are considered excessive and will have an impact on the visual amenity of the CA a TPO can be served.
Name	Species listed by common name/ latin name
Height	Estimated height of tree shown in metres.
Trunk Dbh:	Diameter at breast height measured at approximately 1.5 m above ground level given in millimetres and to the nearest 100 mm. Where there are more than 1 stem the average diameter is provided.
Radial crown spread (M)	Given as a radial measurement in metres from the centre of the stem to the furthest point of the canopy at the four main compass points N, E, S, W
Crown clearance (M)	First branch above ground level
Height to first branch	Height and orientation of first significant branch.
Age Class	<p>Y: Young: Age less than 1/4 life expectancy SM: Semi Mature: 1/4 to 1/2 life expectancy EM: Early Mature: 1/2 to 3/4 life expectancy M: Mature: Over 3/4 life expectancy OV: Over-mature: Mature, and in a state of decline V: Veteran: tree that, by recognized criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.</p>
Physiology At the time of inspection the general health of the tree based upon its general appearance, vigour and the presence or absence of symptoms associated with poor health and physiological stress	<ul style="list-style-type: none"> • Good: Typical for species and age • Fair: Signs of physiological stress or dysfunction; but not significant enough that the tree may not recover. • Poor: Signs of physiological stress or dysfunction; significant enough that the tree might not recover. • Dead: Dead specimen.

<p>Structure Structural condition of the tree based on the structure of its roots, trunk and major stems and branches in relation to the presence of any physiological, pathological or mechanical defects.</p>	<ul style="list-style-type: none"> • Good: No significant structural defects. • Fair: Significant structural defects; but these are either remediable or do not put the tree at immediate or early risk of collapse. • Poor: Significant and irremediable structural defects, such that there may be a risk of early or premature collapse. • Hazardous: Significant and irremediable structural defects, such that there is a risk of imminent collapse.
<p>Landscape value</p>	<ul style="list-style-type: none"> • High: Individuals specimens considered to be of visual importance • Moderate: trees growing in a group no individual tree/s of significance: • Low; located within woodland, or provide little landscape value
<p>Estimated Years</p>	<p>Estimated life expectancy based on current condition.</p> <ul style="list-style-type: none"> • 0 Dead trees. • <10 Less than ten years. • 10+ more than ten years. • 20+ more than twenty years. • 40+ more than forty years
<p>Comments:</p>	<p>General comments relating to identified structural defects or hazards, vitality, pathogens or observational notes.</p>
<p>Recommendation of work</p>	<p>Arboricultural – Remedial tree works that involves pruning to a specification in accordance with the arboricultural best practice BS3998: 2010 Tree work – Recommendations. Examples include crown reduction, crown thinning, reducing specific branches and crown lifting.</p> <p>Safety works- nature of the works is to ensure the trees are kept in a safe manner.</p> <p>Facilitative – one off pruning works associated with development works whereby branches are removed to allow the movement of plant machinery within the grounds of the site without harming the trees visual appearance.</p>
<p>Category</p>	<p>A-Trees of high quality; B- Trees of moderate quality; C- Trees of low quality; U – Those 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</p> <p>1- Mainly arboricultural qualities 2- Mainly landscape qualities 3 – Mainly cultural values , including conservation values</p>
<p>Root Protection Area: (RPA)</p>	<ul style="list-style-type: none"> • The RPA represents the minimum area of soil that the tree requires supporting a healthy and effective root system. The amount shown is based on the calculations set out in section 4.6 of the BS see attached appendices for the method of calculation.
<p>Root Protection Area m2</p>	<ul style="list-style-type: none"> • Root Protection Area (RPA) as radius (m) from the centre of the trunk

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clearance	Height to 1st Branch	Life Stage	Physiology	Structure	Landscape Value	Est. Years	Comments	Recommendation	Category	RPA Radius	RPA m ²
T1	Turkey oak	10m	320mm	N7m E5m S3m W8m	N4m E4.5m S5m W1.5m	2m S	Y	Good	Good	Low	20+	Not plotted on the topographical survey.		B (1)	3.8m	46.3m ²
T2	Silver birch	13m	300mm est	N4.5m E5m S6m W5m	N3.5m E4m S3m W3m	1.5m W	SM	Fair	Fair	Low	20+	Off site tree. No access. Remote inspection only; boundary tree.		C (12)	3.6m	40.7m ²
T3	Sweet chestnut	10m	300mm	N4m E6m S4m W5m	N1.5m E2.5m S3m W1.5m	2m E	Y	Fair	Good	Low	10+	Boundary tree; shared ownership; dieback at branch ends.		C (1)	3.6m	40.7m ²
T4	Ash	12m	400mm est	N4m E4m S4m W4m	N2.5m E2.5m S2.5m W3m	1.5m N	Y	Good	Good	Low	10+	Off site tree. No access. Remote inspection only; crown has been previously heavily reduced.		C (1)	4.8m	72.4m ²
T5	Cider gum	12m	500mm est	N5m E4m S4m W5.5m	N4.5m E3.5m S4m W3.5m	4m N	SM	Good	Good	Low	20+	Boundary tree; reduced in height and spread.		C (12)	6.0m	113.1m ²
T6	Hawthorn	5m	300mm est	N2m E2m S2m W2m	0m	0m N	SM	Good	Good	Low	10+	Part of group.		C (12)	3.6m	40.7m ²
T7	Hawthorn	3m	100mm	N1.5m E1m S0.5m W1.5m	0.5m	0.5m N	Y	Good	Good	Low	10+	Small suppressed tree.		C (1)	1.2m	4.5m ²
T8	Hawthorn	3m	130mm	N2m E2m S2m W2m	N1.5m E1.5m S1.5m W1.5m	0.5m N	Y	Good	Good	Low	10+	Small tree.		C (1)	1.6m	7.6m ²
T9	Sycamore	12m	2 stems @ 400mm	N5m E5.5m S6m W5.5m	N1.5m E2m S2m W1.5m	1.5m E	SM	Good	Good	Low	20+	Off site tree. No access. Remote inspection only; twin stemmed from base.		C (1)	6.8m	144.8m ²

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clearance	Height to 1st Branch	Life Stage	Physiology	Structure	Landscape Value	Est. Years	Comments	Recommendation	Category	RPA Radius	RPA m ²
H9	Mixed hedge comprising Hawthorn	12m	Multi stemmed	N1.5m E1.5m S1.5m W1.5m	N1.5m E1.5m S2m W1.5m	1.5m E	SM	Good	Good	Low	20+	Mixed boundary hedge, good screening value but does overhanging into the site	Cut overhanging branches back to the boundary line.	C (1)	6.8m	144.8m ²

APPENDIX C - Calculation of the Root Protection Area (RPA)

The RPA for single stem trees is an area equivalent to a circle with a radius 12 times the stem diameter.

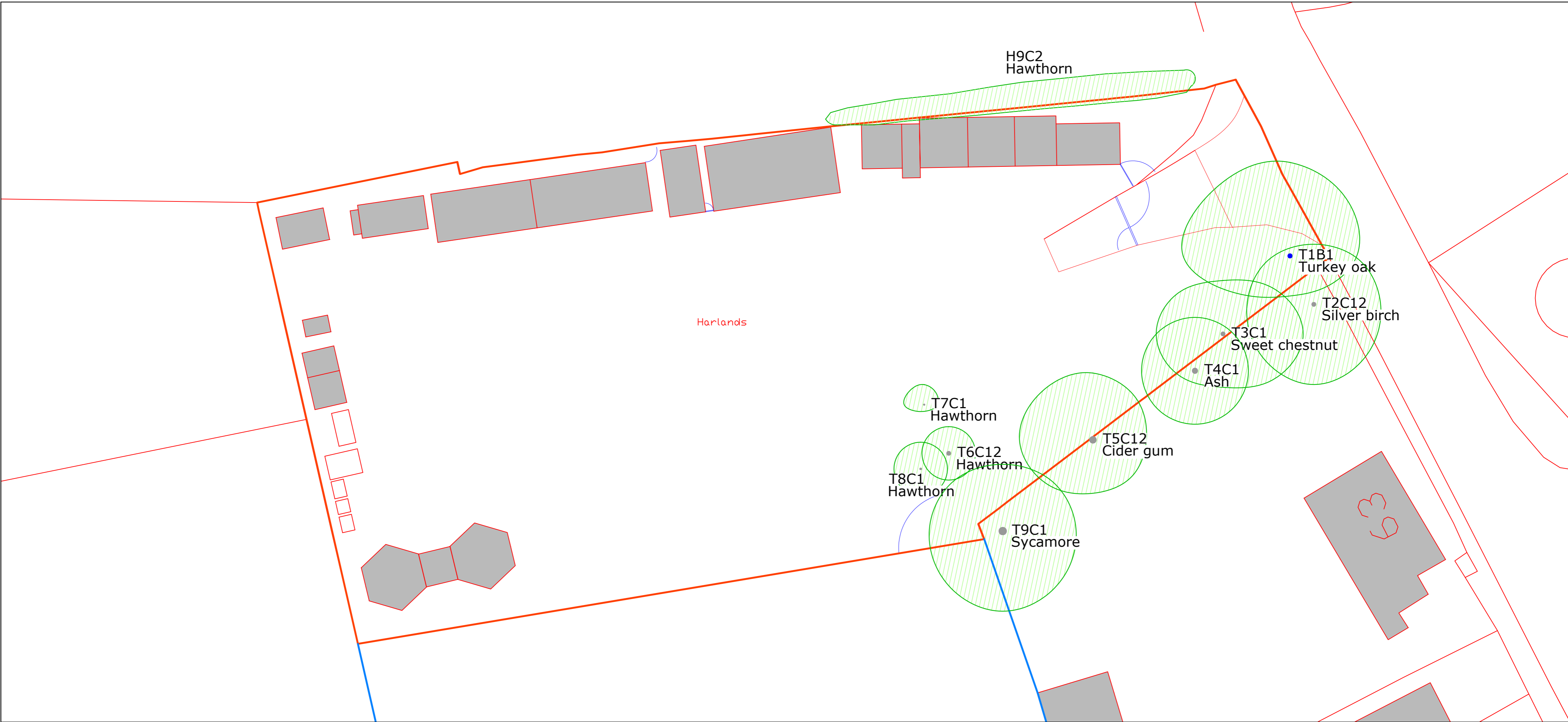
For trees with more than one stem the following calculation methods should be used. Guidance is provided within the BS (Annex C) which provides details on how to measure the stem diameters. The calculated RPA for each tree should be capped to 707m²

- a) Trees with two to five stems, the combined stem diameter should be calculated as follows:

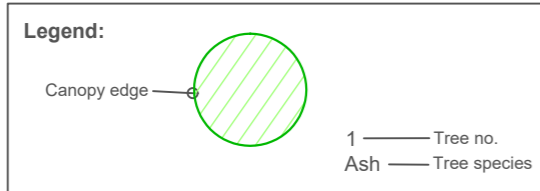
$$\sqrt{(\text{stem diameter}1)^2 + (\text{stem diameter}2)^2 \dots + (\text{stem diameter } 5)^2}$$

- b) Trees with more than five stems (not shown in Annex C), the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$



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Please ensure all dimensions on site and any if there are any discrepancies please notify us.
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Client	Mr Lee Clarke
Title	Tree Location Plan - TLP-01
Site	Land at Harlands, Highcross Road, Southfleet, DA13 9PH
Date	28/08/2023
Drawn	GRS
Job ref	GRS.89.23
Scale	1:200
Paper size	A2
Notes	T1, T2, T4, T9, T7, T8, T9 and H9 positions are approximate
Drawing reference	Site location plan

Tree categorization:
 In accordance with the cascade chart in Table 1 of British Standard 5837 (2012) *Trees in relation to design, demolition and construction - Recommendations*

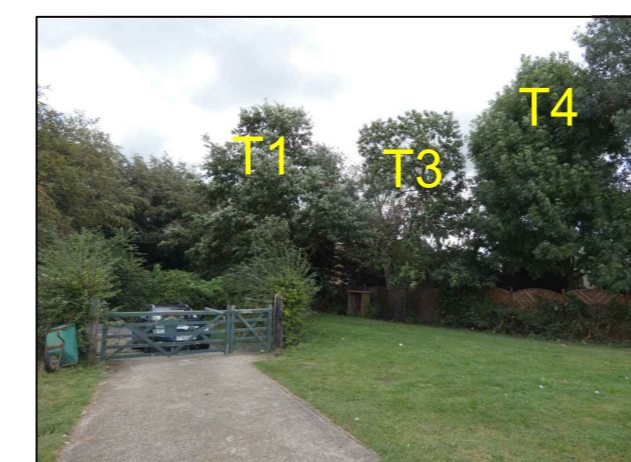
Canopy of a category U tree ●
 Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

Canopy of a category A tree ●
 Trees of high quality with an estimated remaining life expectancy of at least 40 years

Canopy of a category B tree ●
 Trees of moderate quality with an estimated remaining life expectancy of at least 20 years

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

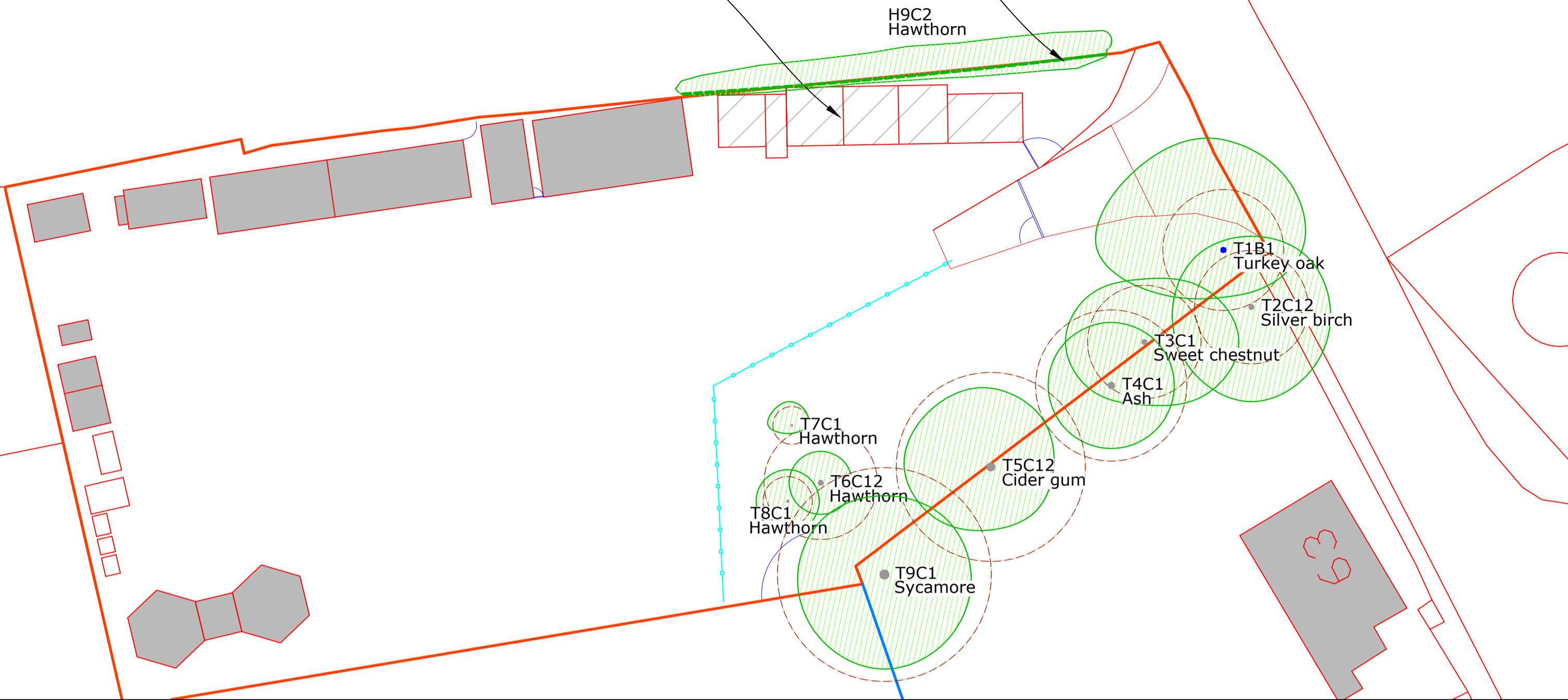
- 1. Tree survey**
 - 1.1. In total three individual trees, two areas and 1 no. hedgerow were surveyed in accordance with section 4. BS 5837:2012 - Trees in relation to design, demolition and construction - Recommendations (BS).
 - 1.2. The tree schedule forms appendix B of this report.
 - 1.3. The weather was clear throughout the site visit.
 - 1.4. **Status of trees.** At the time of preparing this report none of the trees are subject to a Tree Preservation Order, nor is the site located in a Conservation Area.
 - 1.5. According to DEFRA Magic there are no woodlands of historical significance i.e. Ancient Woodland.
 - 1.6. Appraisal of tree stock. The only trees shown on the topographical survey are T3, T5 and T6, the position of the remaining trees is approximate. The dimensions of the off-site trees were estimated.
 - 1.7. None of the trees are particularly remarkable specimens, but in the case of the off-site trees, T2 - T9 they provide an established screen between the application site and neighbouring site.
 - 1.8. H9 is an off-site hedge which has not been maintained which has resulted in part of the crown overhanging into the site.



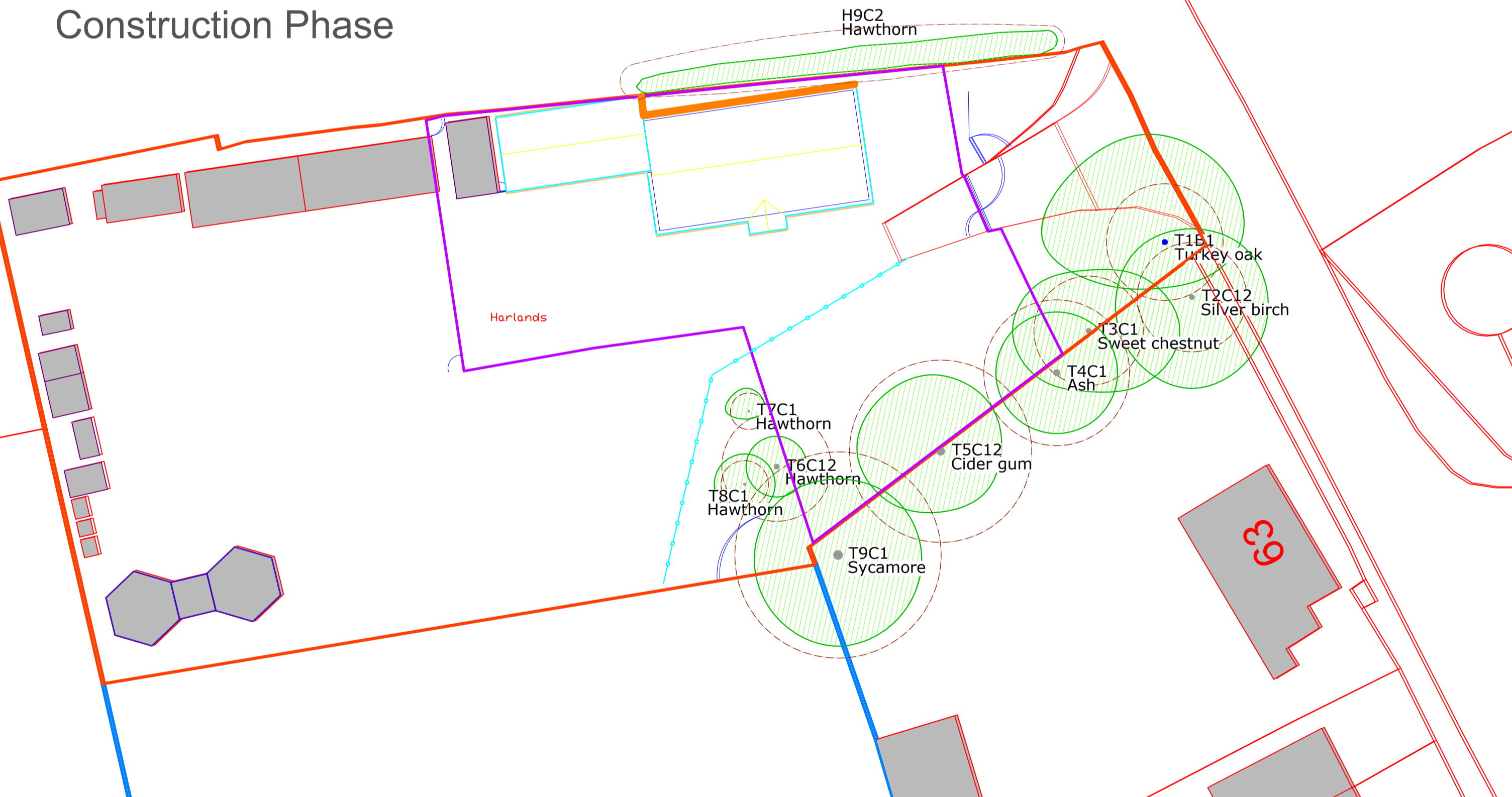
Demolition Phase

Existing buildings to be demolished

Overhanging branches to be cut back to the boundary



Construction Phase



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Legend:

1 — Tree no.
Ash — Tree species

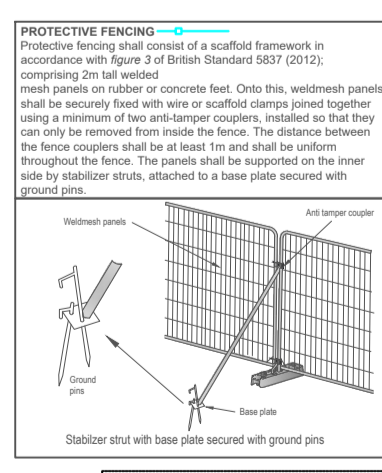
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- Arboricultural Impact Assessment**
 - This report provides an analysis and evaluation for demolition of the existing buildings and the erection of a single storey dwelling and provision of utility room in part of existing retained barn.
- Direct Impact - assessing the incursion into the root protection area (RPA).**
 - H9 is the nearest vegetation that is likely to be affected by the erection of the single storey dwelling. The orange line shown on the rear elevation is the area which must be overseen by the project arboriculturist to ensure any roots that may be found are treated correctly.
- Trees to be removed to facilitate this development.**
 - It will not be necessary to remove any trees to facilitate this scheme.
- Long term relationship between the dwelling and existing trees.**
 - It will be necessary to cut H9 to the boundary line, as there is a gap between the rear elevation hedge these works can be carried out to best practice.
 - The remaining trees are far enough away from the dwelling allowing them to continue to grow and reach their full species potential. With regards to the off-site trees they will continue to provide screening for the neighbours.

- Tree Protection Measures**
 - See the accompanying Arboricultural Method Statement for full details of the order of events and specifications for tree protection.



TREE PROTECTION AREA

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

THE FOLLOWING MUST BE OBSERVED BY ALL PERSONS:-

- THE PROTECTIVE FENCING MUST NOT BE REMOVED
- NO PERSON SHALL ENTER THE PROTECTED AREA
- NO MACHINE OR PLANT SHALL ENTER THE PROTECTED AREA
- NO MATERIALS SHALL BE DEPOSITED IN THE PROTECTED AREA
- NO SPILL SHALL BE DEPOSITED IN THE PROTECTED AREA
- NO EXCAVATION SHALL OCCUR IN THE PROTECTED AREA

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

KEEP OUT!

EXCAVATION WITHIN RPAS

Excavation within root protection areas (RPAs) shall be carried out carefully by hand, under direct supervision of the arboricultural consultant. When excavating within the RPA the soil shall be moved using shovels, trowels and brushes. **Roots smaller than 25mm diameter**; shall be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. **Roots occurring in clumps or of 25mm diameter and over**; shall only be severed by the arboricultural consultant if he is satisfied that this action will not lead to significant detriment to the trees' health or safety. Roots, whilst exposed, shall immediately be wrapped or covered by hessian to prevent desiccation and to protect them from rapid temperature changes. Any wrapping shall be removed prior to backfilling, which will take place as soon as possible. Prior to backfilling, retained roots shall be surrounded with topsoil or un-compacted sharp sand (builders' sand will not be used because its high salt content is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material shall be free of contaminants and other foreign objects potentially injurious to tree roots.

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Drawing reference	Site location plan/ Proposed block plan

