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Arboricultural Impact Assessment

Oaktrees, Clandon Road, Send, GU23 7LA

Reference: MW.2304.OCRS.AIA
Client: Darlingtons Residential
Date: 27 June 2023



Executive Summary

Trees are a consideration in this planning application for four dwellings. Therefore, this report has been drafted to provide the information required to enable the local planning authority to meet the duty placed upon them by section 197 of the Town and Country Planning Act (as amended, 2021).

Included are a BS5837:2012 compliant tree survey, arboricultural impact assessment, and tree protection strategy that includes a method statement and tree protection plan.

No trees are to be removed to facilitate the proposals

The new dwellings are sited such that impact on existing trees is minimised, whilst still maximising the site's capacity.

Aside from a small bin store in the RPA of a frontage oak, the main area of focus is the corner of unit 1. It passes within the circular RPA of pine tree #08. However, the new building occupies an area almost the same as the existing dwelling. Therefore the presence of roots is likely to be minimal and thus special foundations are not proposed. Supervised excavation is proposed though, and detailed in the enclosed method statement. Ground protection will be used along the side of unit 1 to protect the ground from compaction whilst allowing some construction access.

Tree protection commitments include erecting barriers and ground protection; a pre-start audit/meeting; and supervision of certain tasks.

Provided the protection strategy is implemented as outlined, I believe this application is of low arboricultural impact, and thus acceptable.

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1. Instructions and Terms of Reference

- 1.1. In April 2023, I was instructed by Darlington Residential to undertake a tree survey and subsequently, in June, to produce this report to accompany a planning application for four dwellings at Oaktrees, Clandon Road, Send, GU23 7LA.
- 1.2. Following the recommendations of the British Standard¹, this report includes the necessary information to enable the local planning authority to meet the duty placed upon them by section 197 of the Town and Country Planning Act (as amended, 2021).
- 1.3. It demonstrates that the impact, both direct and indirect, of the proposal, has been assessed and where appropriate, mitigation, compensation and tree protection proposed.
- 1.4. Correct implementation of the tree protection specified within this report is critical for ensuring the retained trees are successfully protected throughout the construction process.
- 1.5. The assessment considers the impact of the proposal on the constraint presented by trees retained within the site, and those on adjacent land. Such impact can be caused directly through construction damage and indirectly from post-development resentment and pressure to detrimentally prune or remove the trees. The latter is often due to a poor juxtaposition between the proposal and the trees.
- 1.6. The root protection area (RPA) for each tree represents a minimum area in m² that shall be left undisturbed around each retained tree. This is initially represented by a circle but is fundamentally an area of rooting volume. This is often adjusted to account for constraints to root growth within the site (primarily highways and buildings). Recommendations are provided in the British Standard as to the protection of existing trees during the construction process. This is achieved by ensuring a tree protection strategy is implemented before any demolition or construction on site.

Documents Supplied

- Proposed: Y3262_SK01_Oaktrees_issue090623.dwg
- Site survey: 2301013-Oak Trees Clandon-Topo-Preliminary.dwg

Statutory Legislation

- 1.7. According to Guildford Borough Council's online service², the frontage oak trees are protected by TPO 1985 No.1.
- 1.8. There are no tree preservation orders on trees within the site (checked at the time of writing), nor is the site within a conservation area.

¹BS5837:2012 Trees in relation to design, demolition and construction

² <https://maps.guildford.gov.uk/myrdgbc.aspx>

2. Tree Survey Scope & Methodology

- 2.1. Tree survey data can be found on the appended plan.
- 2.2. The tree survey has been carried out following the recommendations of The British Standard and the trees are assessed objectively and without reference to any site layout proposals. Categories are based on each tree's health and condition, together with an assessment of its life expectancy if its surroundings were to be unchanged.
- 2.3. The reference numbers of surveyed trees and groups of trees are shown on the tree reference plan, which is appended to this report and based on the supplied survey drawing. Stem locations within groups may be estimated, and indicative of canopy only.
- 2.4. The tree survey was carried out from ground level only, with the aid of binoculars as necessary, following the Visual Tree Assessment³ (VTA) method.
- 2.5. Where trees are located on neighbouring land, an estimated appraisal of their quality and dimensions has been made.
- 2.6. Where stems or branches are obscured by ivy or other materials a full assessment of those parts will not be possible.
- 2.7. Tree heights were measured with a clinometer or estimated in relation to those measured.
- 2.8. Trunk diameters are measured at 1.5m above ground level, where this is not possible, then Figure C.1 of the British Standard is followed.
- 2.9. Tree canopies were markedly asymmetrical, and were measured (or estimated by pacing) in four directions using a laser measure. Symmetrical canopies are measured in one direction only, with dimensions in the remaining directions assumed to be similar. For the canopies of groups of trees, the maximum radius for each compass point is measured (more complicated groups will have further notes taken and an accurate representation will be shown on the plan).
- 2.10. All estimated dimensions are noted in the data.

³ Mattheck, C. & Breloer, H., 1998. The Body Language of Trees: A Handbook for Failure Analysis. London: H.M.S.O.

3. Arboricultural Impact Assessment

Proposal

- 3.1. The plan is to replace the existing house with four new dwellings, as indicated on the attached plan.

Tree Removals

- 3.2. No trees need to be removed to facilitate this proposal.

Tree Surgery

- 3.3. There are no plans for any tree surgery work at this stage.

Construction Impact

- 3.4. A small bin store is proposed in the RPA of oak #14. To minimise impact on roots, this will be built above ground using 'no-dig' techniques. Essentially this can be basic patio slabs laid on the ground, or a slightly more complex (but stable) cellular confinement system (CCS).
- 3.5. The corner of unit 1 passes within the circular RPA of pine tree #08. However, the new building occupies an area almost the same as the existing dwelling. Therefore the presence of roots is likely to be minimal and thus special foundations are not proposed. Supervised excavation is proposed though, and detailed in the method statement section of this document. Ground protection will be used along the side of unit 1 to protect the ground from compaction whilst allowing some construction access.

Supervision & Monitoring

- 3.6. Some sites require more arboricultural involvement during the construction process than others. This is typically commensurate with the pressure on retained trees and the complexity of the tree protection strategy.
- 3.7. For this project, a pre-start meeting/tree protection audit before demolition starts is proposed. Supervision will also be required for two separate tasks.
- 3.8. It is my opinion that regular monitoring visits would not be necessary for this project.

Service & Utility Provisions

- 3.9. There is adequate space to service the site whilst avoiding all RPAs. New connections to the highway will need to be routed through the access point in front of units 1 & 2.
- 3.10. Rainwater gullies should be avoided to the side of unit 1, to avoid excavation in RPAs.

Future Pressure

- 3.11. It can be seen from the appended plan that there is sufficient offset from the trees to provide some open space around the dwelling and allow construction without impact.
- 3.12. I have worked with the design team to achieve the subject layout and am confident that the proposed dwelling locations maximise the available space whilst not resulting in situations where excessive shade might bring forth requests to heavily prune or remove the retained trees.

Summary

- 3.13. Provided the tree protection strategy is implemented as outlined in the following method statement, it is my opinion that this application is of **low** arboricultural impact, and thus acceptable.
- 3.14. Should the council wish to see more onerous tree protection methods, this can be ensured via an appropriately worded planning condition and should not be the basis for a reason for refusal.

4. Arboricultural Method Statement

- 4.1. The tree protection on this site is subject to implementation as detailed in the following sections.
- 4.2. The recommendations of the British Standard have been applied where viable. Where deviations from the preferred approach are required, the impact on any retained trees is minimised through a combination of supervision from an arboriculturist and adherence to the associated method statement.
- 4.3. The strategy must be followed to avoid not only impact upon the trees but to adhere to any planning conditions, once permission is granted.
- 4.4. The information within this section must be passed to the site foreman and cascaded to all relevant personnel involved in the project.
- 4.5. Any questions about the content or its implementation shall be directed to **Mark Welby Consulting Arborists at 01730 239492** before action is taken.
- 4.6. A tree protection plan showing the types of tree protection and their locations is appended. It includes the tree survey data, existing site features and the approved construction. The plan must be read in conjunction with this method statement.

Phasing

- 4.7. It is essential that the following phasing is followed if trees are to be effectively protected throughout construction.

1	Installation of protection barriers & ground protection
2	Pre-start tree protection audit/meeting
3	Confirmation that tree protection barriers are installed to be sent to LPA
4	Demolition phase
5	-Supervised removal of the western corner, near tree #08
6	Excavation for any groundworks & service trenches
7	Construction phase
8	-Excavation for new foundations for unit 1 where in RPA: under arboricultural supervision
9	-Installation of 'no-dig' style bin store in RPAs: under arboricultural supervision
10	Removal of tree protection barriers upon completion of work

Table 1: Timing of operations in relation to trees

- 4.9. Shall any of the protection measures prove incompatible with elements of the build program, contact the project arboriculturist to discuss options.

Pre-start Audit/Meeting

- 4.10. The most important step in the tree protection process: a meeting with the project arboriculturist and the site manager shall be undertaken to review the measures before any main construction work starts on site. Usually included as a specific item in any planning conditions.
- 4.11. It is an opportunity to discuss any conflicts with the approved AMS and to seek changes if necessary.
- 4.12. An auditable record is to be kept on file and forwarded to the LPA if required.

Construction Exclusion Zone (CEZ)

- 4.13. The CEZ is a root-sensitive area where construction activities are to be excluded. The default method of doing so is through the installation of tree protection barriers. If construction access is required in the CEZ then ground protection can be used to facilitate this.
- 4.14. It is the responsibility of everyone engaged in the construction process to respect the tree protection measures and observe the necessary precautions within and adjacent to them.
- 4.15. Inside the exclusion zone, the following shall apply:
- No mechanical excavation whatsoever;
 - No excavation by any other means without arboricultural site supervision;
 - No hand digging without a written method statement having first been approved by the project arboriculturist;
 - No lowering of levels for any purpose (except removal of grass sward using hand tools);
 - No storage of plant or materials;
 - No storage or handling of any chemical including cement washings;
 - No vehicular access (unless ground protection is installed);
 - No fire lighting.
- 4.16. In addition to the above, further precautions are necessary adjacent to trees:
- No substances injurious to tree health, including fuels, oil, bitumen, cement (including cement washings), builder's sand, concrete mixing and other chemicals shall be stored or used within or directly adjacent to the protection area of retained trees;
 - No fire shall be lit such that flames come within 5m of tree foliage.
- 4.17. Variations from the above may be specified in the following sections of this method statement. This is only acceptable where detailed and will typically be subject to supervision by the arboriculturist.

Protection Barriers

- 4.18. Barriers must be fit to exclude construction activity and appropriate to the degree and proximity of work around the retained tree(s). Barriers shall be maintained to ensure that they remain rigid and complete.
- 4.19. See [Appendix i](#) for barrier specifications.
- 4.20. The default specification comprises a vertical and horizontal scaffold framework, well-braced to resist impacts. The vertical tubes shall be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels shall be securely fixed. Care shall be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification shall be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.
- 4.21. On smaller projects or those where the level of construction is less intensive, alternative specifications may be acceptable (see [Appendix i](#)), subject to agreement with the project arboriculturist and written approval LPA (local planning authority).

Ground Protection

- 4.22. If required to facilitate access within the CEZ (or as shown on the appended tree protection plan), ground protection is to be installed. If not already included on the tree protection plan, it must be approved in writing by the local planning authority before implementation. The ground protection must be capable of supporting the expected loads and avoiding rutting, compaction and damage to the soil: as advised in section 6.2.3 of the British Standard.



GP1: Tree protection barriers and scaffold ground protection



GP2: Tree protection barriers & trackmat ground protection

4.23. Stages of ground protection installation:

1. If required, dismantle barriers and re-erect them to protect any newly exposed CEZ not to be covered by ground protection;
2. Any shrubs, saplings or trees to be removed, are to be cut or ground out to just below ground level rather than grubbed or winched out, which can damage the roots of retained trees;
3. Lay woven geotextile over the existing ground surface by hand;
4. Cover the area with a compressible layer (200mm of woodchip, for example), using hand tools only;
5. Cover compressible layer with side butting scaffold boards, plywood boards or proprietary trackway/trackmats;
6. Confirm surface is acceptable for use with the project arboriculturist;
7. Area ready for construction access;
8. Any scaffolding required within the area will be erected with the uprights placed on spreader boards;
9. The boarding will be left in place until the construction works are finished.

4.24. A single thickness of boarding laid on the soil surface will provide sufficient protection for pedestrian loads. However, for wheeled or tracked construction traffic movements within the RPA, ground protection will involve the use of temporary geocell/cellular confinement systems, reinforced concrete slabs or track-board systems details of which are to be specified by the project engineer and approved for use by the project arboriculturist and local authority before construction commences.

4.25. Track-boards can be sourced from Trakmats Europe Ltd, 0845 6435388, www.trakmatseurope.com, or groundguards.com

4.26. There is to be no excavation within the ground protection area whatsoever. This includes the installation of services and associated utilities, without prior approval.

Site Induction

4.27. All site staff are to be briefed on the tree protection strategy for the site as part of the general site induction procedure. This can be carried out by the site manager once he has been briefed by the project arboriculturist.

4.28. In general, this will include the following:

1. Explanation of the purpose of the tree protection barriers and any ground protection
2. Explanation of the demolition procedures near trees

3. Explanation of the sensitive/supervised excavation areas
4. What to do if access is needed within a protected area for any reason
5. What to do if damage occurs to any tree protection barriers and how to contact the project arboriculturist if necessary.

Tree Surgery

- 4.29. Should any pruning work be required, the following must be adhered to once any requisite permissions are obtained.
- 4.30. All work will be carried out under BS3998⁴ industry best practice and in line with any works already agreed upon with the council.
- 4.31. The statutory protection^{5 6} will be adhered to. If further advice is required, particularly if bats are discovered during tree work, it will be obtained from Natural England or other competent persons and recommendations adhered to.
- 4.32. The stumps of any trees removed from within the Construction Exclusion Zone or the RPAs of retained trees will be either cut flush to ground level and left in situ or ground out using a stump grinder. They will not be winched out.
- 4.33. All operations shall be carefully carried out to avoid damage to the trees being treated or neighbouring trees. No trees to be retained shall be used for anchorage or winching purposes.

Installation of Underground Services

- 4.34. Mechanical trenching for the installation of underground apparatus and drainage sewers any roots present and can change the local soil hydrology in a way that adversely affects the health of the tree. For this reason, particular care must be taken in the routeing and methods of installation of all underground apparatus. Wherever possible, apparatus must be routed outside RPAs. Where this is not possible, it is preferable to keep the apparatus together in common ducts. Inspection chambers shall be sited outside the RPA.
- 4.35. Where underground apparatus is to pass within the RPA, detailed plans showing the proposed routeing must be drawn up in conjunction with the project arboriculturist. In such cases, trenchless insertion methods shall be used: Microtunnelling, Surface-launched directional drilling, Pipe ramming or Impact moling (see BS5837:2012 Table 3), with entry and retrieval pits being sited outside the RPA. Provided that roots can be retained and protected, excavation using hand-held tools might be acceptable for shallow service runs. If this is the case, the following methodology must be followed:

⁴ BS3998:2010- *Recommendations for Tree Work*. London: British Standards Institute

⁵ *Wildlife and Countryside Act*. (1981) London: HMSO.

⁶ *Conservation of Habitats and Species Regulations (2017)* London: HMSO.

4.36. Stages for installing services:

1. Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
2. Remove just enough tree protection fencing to allow access to the area and facilitate trenching.
3. Remove any surface vegetation or existing hard surfaces using hand tools.
4. Using an air-pick excavate the trench, keeping to the minimum dimensions required.
5. Roots occurring in clumps of 25 mm diameter and over are encountered they will be retained and kept damp by covering with hessian (re-wetted as required). If required, these shall be severed only following consultation with an arboriculturist; as such roots might be essential to the tree's health and stability.
6. Feed in services.
7. Backfill the trench with 200-300mm depth of excavated soil, or a mixture of excavated and imported topsoil to BS3882: 2015, firming down with heels.
8. Repeat step 7 until the trench is filled.
9. Re-erect tree protection fencing as per the approved plan.

4.37. The method of excavation above, for trenching within RPAs, is using air excavation. This tool utilises compressed air to remove soil from around tree roots causing minimal damage and can be run off a typical site compressor. I can provide details of contractors supplying air excavation services if required.

4.38. Alternatively, trenchless technology, such as thrust boring can be used in some instances and is particularly effective as it can pass directly under the tree, at a depth which is likely to avoid almost all impact on the roots of the subject tree. As no access/thrust pits will be located within the RPAs of the subject trees, the need for arboricultural supervision is limited.

4.39. Reference can be made to NJUG Vol 47 for guidance, but any approach must be approved by the project arboriculturist and brought to the attention of the local authority tree officer.

Fencepost/Hoarding Installation in RPA

4.40. Stages for installing wooden posts:

No plant machinery is to be used in the area for whatever reason

1. Remove TPF to allow access to the area. If working inside the tree's RPA, ground protection boarding must be used to avoid compaction and contamination of the root zone.

7 National Joint Utilities Group. (2010). Volume 4: NJUG Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2) - Operatives Handbook. NJUG.

2. Dig postholes using hand tools, avoiding damage to the protective bark covering larger roots. Roots smaller than 25mm in diameter may be pruned back using either secateurs or a hand saw, leaving a clean cut.
3. Damage or severance of roots above 25mm diameter must be avoided. If roots of this size are discovered, the hole shall be relocated. If there are a large number of such roots it may be necessary to relocate the hole by half a fence panels length and adjust the fence panels accordingly.
4. Line holes with non-porous lining, for example, a durable polyethene bag.
5. Insert post and fill post-hole with concrete to just below ground level.
6. Trim polyethene to ground level and fill with clean topsoil.
7. Reinstall TPF as approved.

Hard Surface Removal

- 4.41. Hard surfaces close to trees come in many different forms and makeups. Until removal (or trial pits) have ascertained the presence/absence of roots in the area, the final treatment of the area cannot be determined. Therefore, the initial phase of this work is somewhat exploratory.
- 4.42. No surface removal within RPAs will occur without arboricultural supervision.
- 4.43. Stages for hard surface removal within tree protection areas:
1. Contact the project arboriculturist to hold a pre-start site meeting and ‘toolbox’ talk before starting work and oversee the process.
 2. Plant machinery to run only on existing hard surfaces with consent from an arboriculturist.
 3. The plant may be used to carefully peel up existing tarmac and concrete.
 4. Other surfaces are to be removed by hand (paving etc.)
 5. Where any sub-base is unlikely to contain roots and only on approval from the project arboriculturist, it may also be carefully removed.
 6. If the supervisor concludes that there are no significant⁸ roots in the area following the surface (and possible sub-base) removal then there is no longer a need to proceed cautiously. The supervising arboriculturist will note their conclusions within the record of the overall works. Proceed to step 9.
 7. If the supervisor concludes that significant roots are still present then the underlying ground levels are to be retained. No further excavation is to occur.

⁸ To be site and tree specific. Subject to the supervising arboriculturist’s judgement

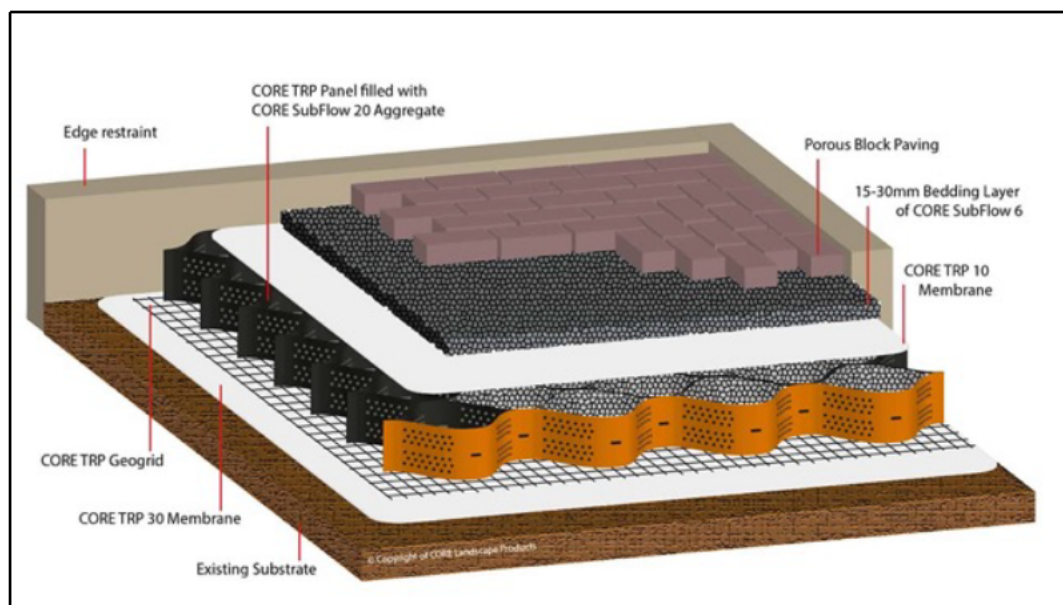
8. Any exposed roots and surrounding newly exposed areas are to be covered with up to 200mm of topsoil, from elsewhere on site, or imported topsoil to BS38829 Soil may be placed in the area by plant but must be spread by hand.
9. As deemed necessary by the supervising arborist, tree protection barriers are to be erected to protect tree stems and, if appropriate, the newly exposed soft ground. Reference the Tree Protection Plan for approved tree barrier alignments.
10. Work records are to be circulated by supervising arboriculturist and forwarded to the LPA as required.

Installation of 'No-Dig' Geocell Surface for Bin Store Base

4.44. To ensure that tree roots, within the ground under this proposed surface, continue to survive during and after construction, a geocell/cellular confinement system (CCS) is proposed. The following is a guide to installation, not an engineering specification. It is critical that an engineer design this surface to ensure long-term durability.

4.45. Stages for Installation of the cellular confinement surface:

1. Contact project arboriculturist to hold pre-start site meeting, a 'toolbox' talk before starting work and provide supervision throughout the process;
2. Remove existing grass sward to 50mm with hand tools or turf stripper only;



ND1: CORE Tree Root Protection © Porous block paving

3. Agreed removal of shrubs, saplings or trees, within the protected areas of retained trees are to be cut or ground out to just below ground level rather than grubbed or winched out, which can damage the roots of retained trees;

9 BS3882:2015- Specification for topsoil and requirements for use. London: British Standards Institute.

4. Retain all original ground levels after vegetation removal. No further excavation whatsoever within RPAs;
 5. Remove any existing hard surfaces (paving, tarmac etc.) Hand tools shall be used if possible. If machinery is required for this operation, it must be used only on existing surfaces or outside the protected areas and tree canopies (approval from the project arboriculturist must be sought before using machinery). The sub-base of existing surfaces or foundations shall be left in situ where possible to avoid unnecessary root disturbance and provide a base for the new surface;
 6. Install a non-woven geotextile (such as Root-tex 30) directly over soil grade level (levelled where necessary, by non-compacted washed sand) and fix in place;
 7. Lay the cellular system over the geotextile, which is secured open under tension during the infill process with steel staples or wooden pegs;
 8. Install kerbs and edgings directly on top of the existing soil grade level. For light structures, a treated peg and board may be acceptable. For more substantial structures, railway sleepers, haunched concrete with road pins, drilled kerbstones, gabions or cast in situ kerbs will be appropriate;
 9. Fill the cellular system ensuring any machinery works only on already filled areas. Typical infill consists of no fines angular granular material 20-40mm, which will remain uncompacted;
 10. If required, cover with a non-woven geotextile (Root-tex 30 or similar).
 11. Install porous wearing surface.
- 4.46. Any variation to the above specification must meet the following design criteria for low-invasive surfaces to provide the conditions for continued tree survival and growth:
- Maintain oxygen diffusion through the new surface to the rooting area (5-12% by volume)
 - Maintain sufficient passage of water to the rooting area (12-40% by volume)
 - Avoid compaction by maintaining a soil structure sufficient to sustain root growth (soil bulk density below 1.4g/cc).
- 4.47. Site analysis of the soil type and its structural characteristics will be required before determining the specific depth of products to be adopted, for example, footpaths normally require a depth of 75mm and, 100mm to 200mm depths are used for residential driveways, while greater depths may be required for the passage of heavier traffic such as for construction access and delivery vehicles.
- 4.48. If ground levels are to be raised more than 150mm this shall be achieved by the use of a granular material, which does not inhibit vertical gaseous diffusion. For example, no-fines gravel, washed aggregate, structural soil (min. 20% sand content) or cobbles.

4.49. See <https://www.corelp.co.uk/core-tree-root-protection/> and <https://www.geosyn.co.uk/product/cellweb-tree-root-protection> for more information.

Demolition

4.50. All barriers and/or ground protection are to be installed as per the approved Tree Protection Plan before commencement on site.

4.51. Sensitive demolition must only occur under supervision from the project arboriculturist

4.52. Stages of demolition within tree protection areas:

1. No plant machinery is to be sited on any exposed rooting area or soft ground;
2. Buildings to be folded in on themselves, or pulled away from trees;
3. Removal of debris by hand or with plant machinery not located on any exposed rooting area;
4. The floor is to be broken up with a hand-held breaker and pieces removed by hand. The slab floor can be lifted carefully by machinery if appropriate;
5. Underlying ground levels are to be retained. No excavation is to occur;
6. Any exposed roots and surrounding newly exposed areas are to be covered with up to 100mm of topsoil, from elsewhere on site, or imported topsoil to BS3882. Soil may be placed in an area by plant but must be spread by hand;
7. Tree protection barriers are to be erected in the final position to protect any newly exposed soft ground (as advised by supervising arborist).

Foundations in RPA

4.53. Excavation within the areas marked on the appended plan must be carried out as follows.

4.54. Stages of excavation:

1. Contact arboriculturist to supervise works;
2. Identify sensitive areas as shown on the appended plan;
3. Using hand tools, or a very sensitively applied small excavator start to excavate;
4. If roots are found, clear by hand around them;
5. Roots smaller than 50mm in diameter may be cleanly severed with bypass secateurs, loppers or pull cut saw at right angles to the root. Avoid tearing or ripping the root;
6. If roots found are greater than 50mm in diameter, then wrap with damp hessian to provide at least a 50% diameter increase and keep moist.
7. Keep hessian moist until the foundation is ready to be cast.
8. Remove the hessian covering and sleeve with a poly pipe of a diameter sufficient to cover the hessian (cut longitudinally along it and work it over the root taking care not to damage

the bark). Pipe plastic to be impermeable with a slit facing down to protect the root bark from cement contamination.

9. If root mass/shape is incompatible with the above poly-pipe solution, then a non-permeable flexible barrier must be used. Bubble-wrap type insulation may be appropriate.

10. Cast foundation as required.

11. If the root is at a level above the foundations, within the brickwork, then a lintel must be used to bridge over the root.

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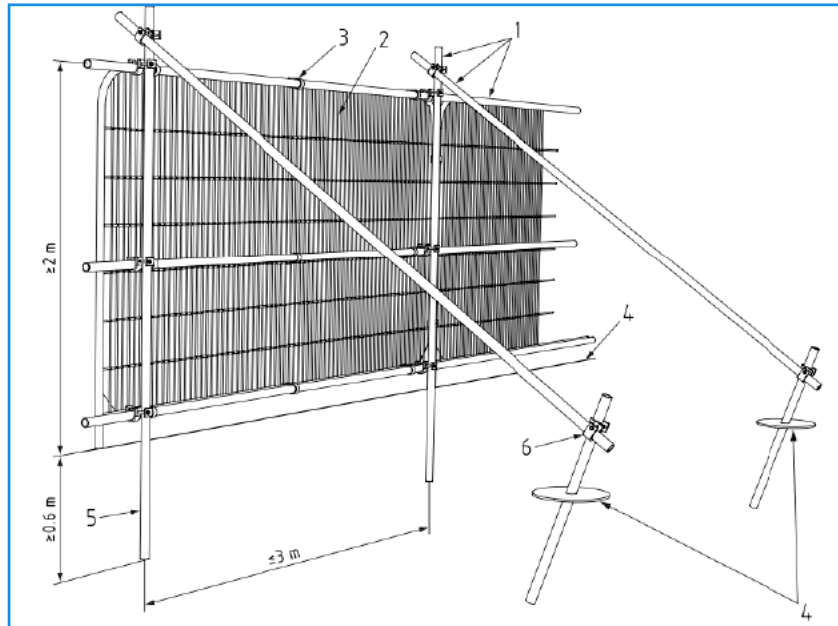
Appendices

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i.

Tree Protection Barriers



1 Standard scaffold poles

2 Heavy gauge 2 m tall galvanised tube and welded mesh infill panels

3 panels secured to up rights and cross members with wire-ties

4 ground level

5 uprights driven into the ground until secure (minimum depth 0.6 m)

6 Standard scaffold clamps

TPF1: Default specification for protective barrier (Fig 2 from BS5837:2012)



TPF 2: Alternative fencing option: scaffold uprights with backstay





TPF 3: Alternative fencing option: on boots with backstay



TPF 4: Plastic barrier for low intensity areas of construction



TPF 5: Chain-link for low intensity areas on large projects

ii.

Tree Categories Explained

BS5837:2012 Table 1 -Cascade chart for tree quality assessment			
Category and definition	Criteria (including subcategories where appropriate)		
Trees unsuitable for retention (see Note)			
<p>Category U</p> <p>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>*Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)</p> <p>*Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline</p> <p>*Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality</p> <p><i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i></p>		
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation
Trees to be considered for retention			
<p>Category A</p> <p>Trees of high quality with an estimated remaining life expectancy of at least 40 years</p>	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
<p>Category B</p> <p>Trees of moderate quality with an estimated remaining life expectancy of at least 20 years</p>	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value
<p>Category C</p> <p>Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm</p>	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value



iii.

Protection Plan

Plan on following page

BS5837 Tree Survey: Trees & Groups to be Retained

Ref	Species	Common Name	Height	Stem Diameter	Canopy NESW	Crown Clearance	Age Class	Observations	Tree Surgery	Est. Remaining Contribution	Date Surveyed	No.	BS Cat
01	Quercus robur	Pedunculate Oak	25m	1400mm	12 N 12 E 10 S 12 W	6m	Mature	Off-site tree. Location estimated. Fair overall physiological and structural condition. No reinforcement. Very little inner canopy. Pronounced buttressing. Northern stem removed.		40 Years	6/4/2023	1	A1
02	Fagus sylvatica	Common Beech	19m	500mm	5 N 8 E 5 S 9 W	3m	Mature	Off-site tree. Location estimated. Good and inaccessible. Some basal decay.		20 Years	6/4/2023	1	B1
03	Quercus robur	Pedunculate Oak	21m	1100mm	8 N 9 E 10 S 9 W	4m	Mature	Off-site tree. Location estimated. Recently cut back over site. Pronounced buttressing.		40 Years	6/4/2023	1	A1
04	Quercus robur	Pedunculate Oak	22m	600mm; 600mm	11 N 11 E 11 S 11 W	3m	Mature	Group of off-site stems. Location estimated. Scattered dead wood.		40 Years	6/4/2023	1	A2
05	Fagus sylvatica	Common Beech	17m	460mm	4 N 8.5 E 6 S 2 W	2m	Early-Mature	Fair quality and condition. Growing on boundary. Slightly suppressed by adjacent oak trees.		20 Years	6/4/2023	1	B1
06	Prunus cerasifera	Cherry Plum	8m	130mm	2 N 3 E 1 S 1 W	2m	Mature	Off-site and inaccessible. Limited long term value.		10 Years	6/4/2023	1	C1
07	Fagus sylvatica	Common Beech	12m	270mm	6 N 6 E 6 S 6 W	2m	Early-Mature	Fair overall physiological and structural condition.		20 Years	6/4/2023	1	B1
08	Pinus sylvestris	Scots Pine	25m	700mm	6 N 5 E 6 S 7 W	2m	Mature	Good overall physiological and structural condition.		40 Years	6/4/2023	1	A1
09	Chamaecyparis lawsoniana	Lawson Cypress	12m	150mm	2.5 N 2.5 E 2.5 S 2.5 W	2.5m	Mature	Off-site and inaccessible. Lower crown cut back to boundary. Provides a screen.		10 Years	6/4/2023	1	C1
10	Taxus baccata	English Yew	7m	120mm; 120mm; 120mm	2 N 2 E 2 S 3 W	3m	Early-Mature	Off-site and inaccessible. Competing with yew.		10 Years	6/4/2023	1	C1
11	Cupressocyparis leylandii X	Leyland Cypress	9m	200mm	3 N 1.5 E 1.5 S 2 W	2m	Early-Mature	Off-site and inaccessible. Competing with yew.		10 Years	6/4/2023	1	C1
12	Fagus sylvatica	Common Beech	18m	600mm	7 N 7 E 7 S 7 W	2m	Mature	Off-site and inaccessible. Good overall physiological and structural condition. Roadside tree. Fine branch retention somewhat impoverished. Distack. Historically topped at about 9m. Scattered wounds and scars.		40 Years	6/4/2023	1	A1
13	Quercus robur	Pedunculate Oak	14m	720mm	7 N 7 E 7 S 7 W	3m	Mature	Roadside tree. Historically reduced. Limited response growth to reduction.		20 Years	6/4/2023	1	B1
14	Quercus robur	Pedunculate Oak	11m	760mm	6 N 6 E 4 S 7 W	3m	Mature	Good overall physiological and structural condition.		40 Years	6/4/2023	1	A1
15	Quercus robur	Pedunculate Oak	10m	810mm	8 N 9 E 9 S 9 W	2m	Mature	Off-site. Roadside tree. Diameter estimated. Scattered dead wood.		10 Years	6/4/2023	1	C1
16	Cupressocyparis leylandii X	Leyland Cypress	13m	30mm	2.5 N 2.5 E 2.5 S 2.5 W		Early-Mature	Off-site. Roadside tree. Diameter estimated. Scattered dead wood.		40 Years	6/4/2023	1	A2
17	Quercus robur	Pedunculate Oak	15m	700mm	8 N 8 E 8 S 8 W	3m	Mature	Off-site. Roadside tree. Diameter estimated. Scattered dead wood.		40 Years	6/4/2023	1	A2
Total: 17													

Survey by Mark Welby (RPS), TechCat(Arbor), Arboricultural Association Registered Consultant.
www.mwvelby.com

† denotes estimated dimension. Typically due to the tree being inaccessible.
Where dimensions are not listed please refer to the plan graphics for an indicative representation (typically for groups).

Construction Exclusion Zone

It is the responsibility of everyone engaged in the construction process to respect the tree protection measures and observe the necessary precautions within and adjacent to them.

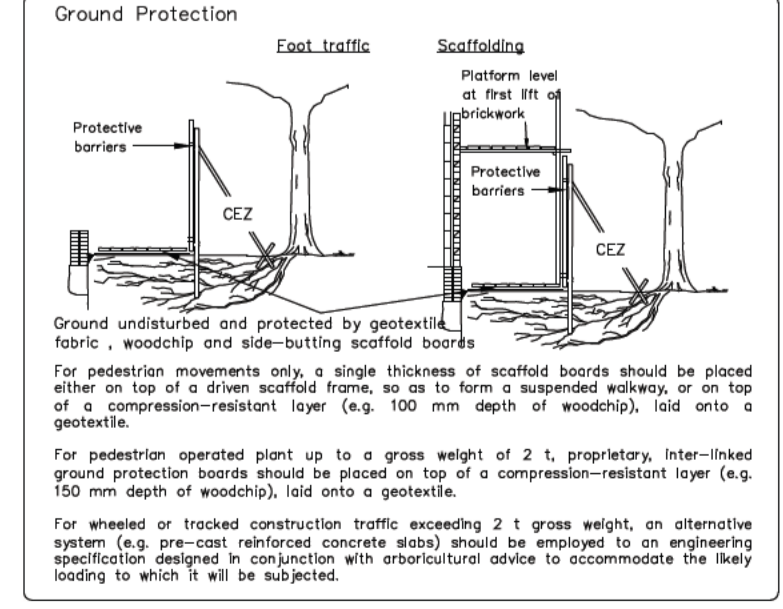
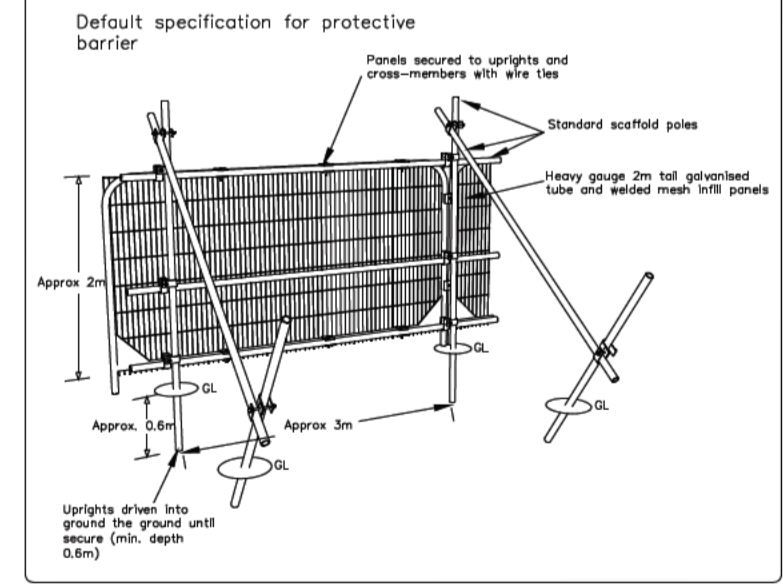
Inside the exclusion zone, the following apply:

- No mechanical excavation whatsoever.
- No excavation by any other means without arboricultural site supervision.
- No hand digging without a written method statement having first been approved by the project arboriculturalist.
- No overing of eaves for any purpose except removal of grass sward using hand tools.
- No storage of paint or materials.
- No storage or handling of any chemicals including cement washings.
- No vehicle or access.
- No fire lighting.

In addition to the above, further precautions are necessary adjacent to trees:

- No substances injurious to tree health, including fuel, oil, bitumen, cement, including cement washings, builders' sand, concrete mixing and other chemicals, shall be stored or used within or directly adjacent to the protection area of retained trees.
- No fire shall be lit such that flames come within 5m of tree foliage.

A weather sign shall be erected at reasonable intervals on the barriers. See example inset.



Key

Number/category/species

Crown spread

Stem location & Category colour

Root protection area (RPA)

BS 5837 2022 see also CEZ, CEZ, CEZ, CEZ

CEZ type A - High quality

CEZ type B - Moderate quality

CEZ type C - Low quality

CEZ type U - Unavailable or uncertain

CEZ Construction Exclusion Zone (CEZ)

CEZ extent. To be protected with temporary protective barriers or ground protection to allow construction access. See insets and method statement for details.

Tree to be removed

Ground protection within RPAs. See inset and method statement.

Existing dwelling in RPA. Limited root presence anticipated. Supervised excavation. See inset and method statement.

Bin store to be founded upon no-dig base constructed as method statement.

Indicative service route. All new service trenches (drainage, telecoms, water, gas, electric, etc) to avoid CEZ and no-dig areas.

NOTES

This tree survey has been undertaken with the recommendations of British Standard 5837 2012 and current arboricultural best practice.

- The reference numbers of surveyed trees and groups of trees are shown.
- Stem locations within groups may be estimated, and not taken as canopy only.
- The tree survey was carried out from ground level only, with the aid of binoculars as necessary, following the Visual Tree Assessment (VTA) method.
- Where trees are located on neighbouring land an estimated appraisal has been made of their quality and dimensions.
- Where stems or branches are obscured by ivy or other material a full assessment of those parts will not be possible.
- Height dimensions are estimated and are given in metres.
- Trunk/stem diameters are measured in mm at 1.5 metres above ground level, unless otherwise stated. Where this is not possible, then Figure C1 of the British Standard is followed.
- Tree canopies, where markedly asymmetrical, were measured for estimated by pacing in four directions using a laser measure. Symmetrical canopies are measured in one direction only. Width dimensions in the remaining directions assumed to be similar. For the canopies of groups of trees, the maximum radius for each compass point is measured (more complicated groups will have further notes taken and an accurate representation will be shown on the plan).

Base plan/s to survey reference: 23/01013-Oak Trees Clandon-Topo-Preliminary.dwg

Statutory Tree Protection on Tree Protection Orders: none found within the LPA search.

Conservation Area: NO

Felling Licence: Garden areas are exempt.

This plan has been drafted in colour. A monochrome version must not be relied upon.

Date Notes Rev

Tree Protection

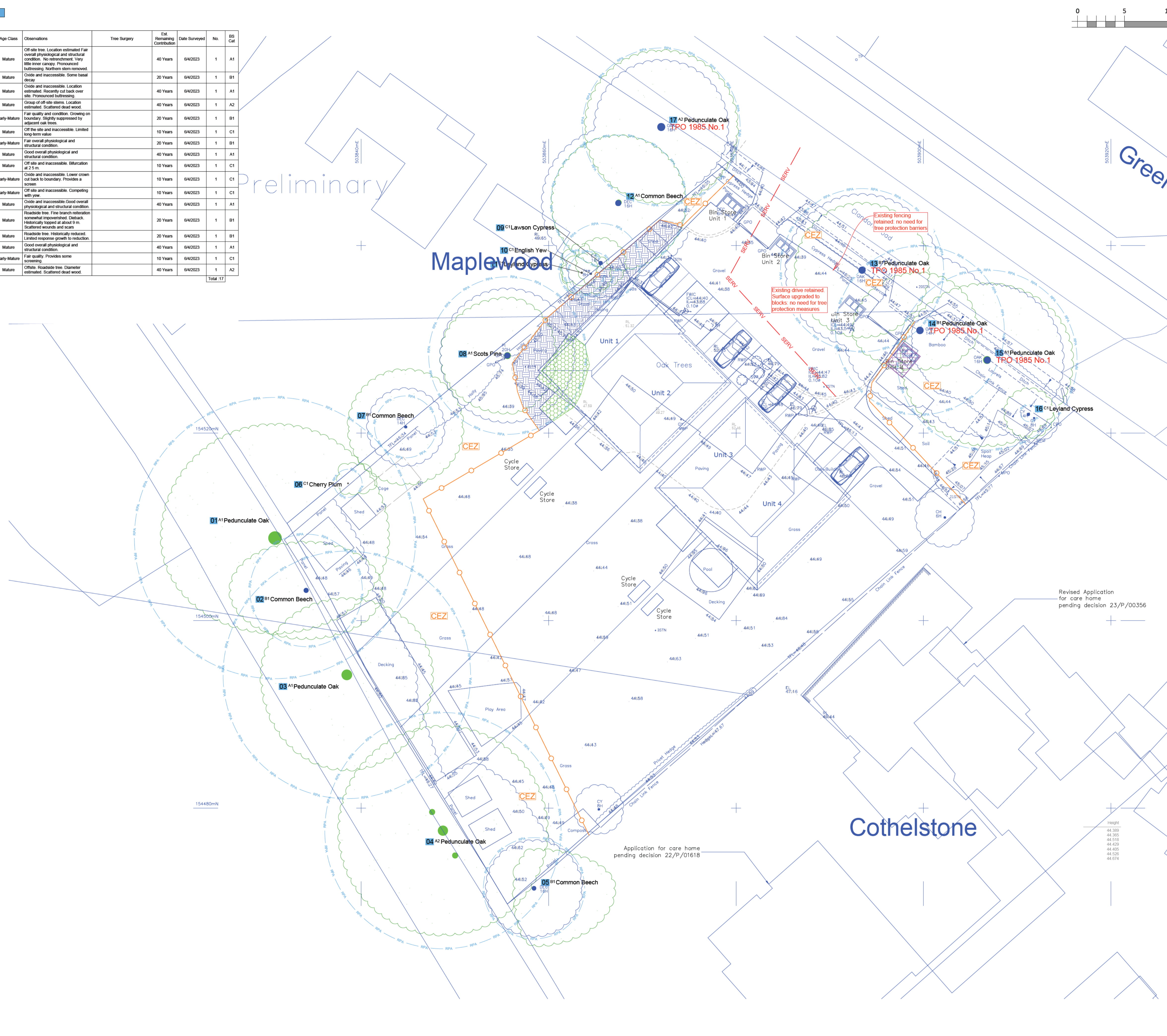
Oak trees Clandon Road Send, GU23 7LA

Date: 27/06/2023 Scale: 1:200 @A1

DWG Ref: MW.2304.OCRS.TPP

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Revised Application for care home pending decision 23/P/00356

Application for care home pending decision 22/P/01618