Arboricultural Report for the demolition of a glass house and the erection of a detached residential dwelling

Reference GRS.20.25

Site: Land at Old Manor Drive off Echo Square Gravesend, DA12 1NP

Client: Mr Locker

Local Planning Authority: Dartford Borough Council

GRS
ARBORICULTURAL CONSULTANT LTD

Arboricultural
ASSOCIATION
Professional Member

DATE OF REPORT 2ND OCTOBER 2025

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APPENDICES:

Appendix A: Tree survey information

Appendix B: Tree survey data

Appendix C: Root protection formulae

Appendix D: NJUG Guidance Notes 2007

Drawings:

Tree Location Plan	TLP-01
Tree Constraints Plan	TCP-01
Tree Removal Plan	TRP-01
Tree Protection Plan Demolition	TPP-01
Tree Protection Plan Construction	TPP-02

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 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.

1.6 **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.

1.7 **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.

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. CONSTRUCTION EXCLUSION ZONES

- 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 1 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 2 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	**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.
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	• **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.

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.	• **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.
Landscape value	• **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
Estimated Years	Estimated life expectancy based on current condition. • 0 Dead trees. • <10 Less than ten years. • 10+ more than ten years. • 20+ more than twenty years. • 40+ more than forty years
Comments:	General comments relating to identified structural defects or hazards, vitality, pathogens or observational notes.
Recommendation of work	**Arboricultura**l – 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. **Safety works**- nature of the works is to ensure the trees are kept in a safe manner. **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.
Category	**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 1- Mainly arboricultural qualities 2- Mainly landscape qualities 3 – Mainly cultural values , including conservation values
Root Protection Area: (RPA)	• 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.
Root Protection Area m^2	• Root Protection Area (RPA) as radius (m) from the centre of the trunk

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clear-ance	Height to 1st Branch	Life Stage	Physiology	Structure	Landscape Value	Est. Years	Comments	Recommendation	Category	RPA Radius	RPA m^2
T1	Bay	12m	9 stems @ 250mm est	N4m E4m S4.5m W4m	N1.5m E1.5m S1.5m W2m	1m N	SM	Good	Fair	Low	20+	Off site tree. No access. Remote inspection only; multi-stemmed from base; of low level screening value only.		C (1)	9.0m	254.5m²
T2	Wild cherry	16m	550mm ivy est	N6.5m E6m S5.5m W6m	N4m E3.5m S2.5m W4.5m	5m S	SM	Good	Good	Moderate	20+	Largest tree in the site; partially ivy clad, twin stemmed at c. 2 m.	Fell to ground level	B (1)	6.6m	136.8m²
T3	Common Yew	7m	250mm est	N5m E5m S5m W6m	N0.5m E0.5m S0.5m W2m	0.5m S	SM	Good	Good	Low	20+	External views restricted by adjacent trees; unbalanced crown as suppressed.	Fell to ground level	C (1)	3.0m	28.3m²
T5	Beech	20m	3 stems @ 500mm est	N6m E3m S7m W7m	N2m E4m S3m W4m	3m W	SM	Good	Fair	Moderate	20+	Rear garden tree; off site tree. No access. Remote inspection only; three stemmed from base.		B (1)	10.4m	339.3m²
T6	Beech	20m	400mm estW 200mm estS 500mm estN	N6m E6m S7m W5m	N4m E2.5m S2m W3m	3m W	SM	Good	Fair	Moderate	20+	Rear garden tree; off site tree. No access. Remote inspection only; four stemmed from base.		C (1)	8.0m	203.6m²
T7	Common walnut	15m	400mm est	N5m E3m S6m W3m	N5m E5m S5m W7m	5m S	SM	Good	Fair	Low	20+	Rear garden tree; off site tree. No access. Remote inspection only; mutually drawn up and suppressed stems.		C (1)	4.8m	72.4m²
T8	Common Oak	20m	600mm est	N6m E6m S4.5m W3.5m	N5m E4.5m S6m W4m	3m E	SM	Good	Good	Moderate	20+	Off site tree. No access. Remote inspection only; reduced on the west side leaving an unbalanced crown.		C (1)	7.2m	162.9m²
G4	Lawson cypress	9m	Min 100mm est Max 300mm est	N3m E2m S2m W2m	1.5m	1.5m E	SM	Good	Good	Low	10+	Of low level screening value only.		C (2)	3.6m	40.7m²

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:

$$\sqrt{(\text{stem diameter1})^2 + (\text{stem diameter2})^2 \ \ldots + (\text{stem diameter 5})^2}$$

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

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

APPENDIX D - NJUG Guidance Notes 2007 - Acceptable techniques for excavating near trees as stated by NJUG Guidelines for the Planning, Installation and Maintenance of utility Apparatus in Proximity to Trees.

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Trenchless

Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones.

In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g., oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

Broken Trench - Hand-dug

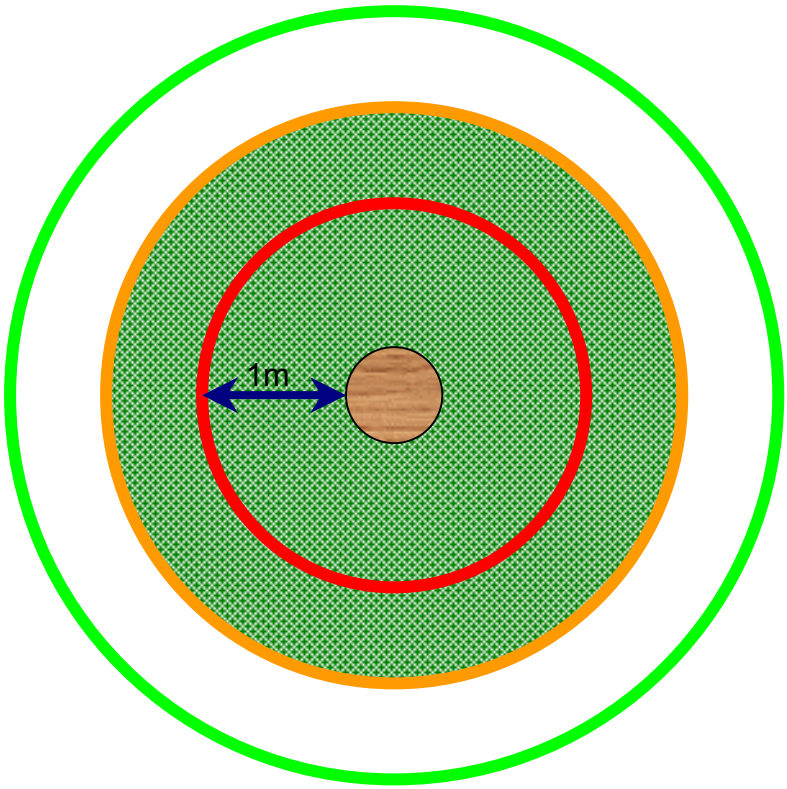
This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.

Continuous Trench - Hand-dug

The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Roots, whilst exposed, shall immediately be wrapped by hessian to prevent dessication and to protect them from rapid temperature changes. Any wrapping shall be removed prior to backfilling, which will take place as soon as possible. Throughout the excavation works great care should be taken to protect the bark around the roots. All roots greater than 25mm diameter should be preserved and worked around.



TREE PROTECTION ZONE

Key to Diagram

Trunk of Tree

Spread of canopy or branches

PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.

PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.

PERMITTED ZONE – outside of precautionary zone. Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

DAMAGE TO TREES

Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil and often grow out further than the tree's height. The majority of these roots are very fine; even close to a tree few will be thicker than a pencil. Most street tree roots grow under the footway but may also extend under the carriageway. If roots are damaged the tree may suffer irreversible harm and eventually die.

PROTECTING ROOTS - DO'S and DON'TS

There are three designated zones around a tree each of which has its own criteria for working practices.

THE PROHIBITED ZONE

Don't excavate within this zone.

Don't use any form of mechanical plant within this zone

Don't store materials, plant or equipment within this zone.

Don't move plant or vehicles within this zone.

Don't lean materials against, or chain plant to, the trunk.

Do contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.

Do protect any exposed roots uncovered within this zone with dry sacking.

Do backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PRECAUTIONARY ZONE

Don't excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Don't repeatedly move / use heavy mechanical plant except on hard standing.

Don't store spoil or building material, including chemicals and fuels, within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PERMITTED ZONE

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Do use caution if it is absolutely necessary to operate mechanical plant within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

Notes	Positions of T7 and T8 are approximate
Revisions	

Trunk 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 than10 years

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

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

Trunk 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

Canopy edge

1 ——— Tree no.
Ash ——— Tree species

0 2 4 6 8 10 20m
1:500 Scale

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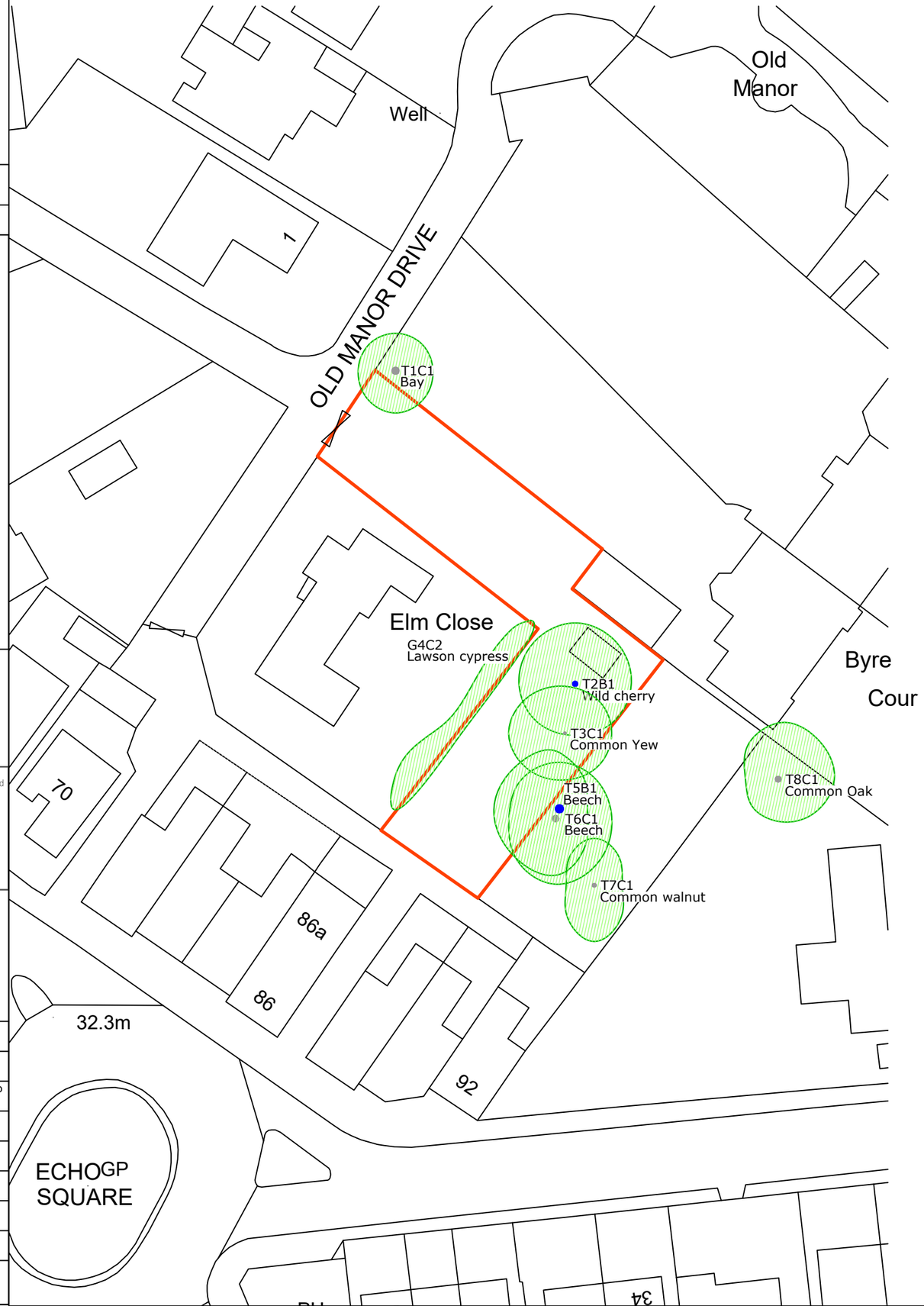
Please ensure all dimensions on site and any if there are any discrepancies please notify us.

Client	Mr J Loker
Title	Tree Location Plan - TLP-01
Site	Land at Old Manor Drive off Echo Square, Gravesend, DA12 1NP
Date	01/03/2025
Drawn	GRS
Job ref	GRS.20.25
Scale	1:500
Paper size	A3
Drawing reference	Block plan



1. Tree survey

1.1. In total seven individual trees and one group 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. Report limitations: Inspection methodology: The inspection was carried out by Guy Stephens Fd.Sc M.Arbor.M. The trees were inspected from the ground level using Visual Tree Assessment (VTA) techniques.

1.5. No root or soil samples were taken during the site visit.

1.6. Trees are living organisms whose health and condition can change and therefore they should be checked on a regular basis. The conclusions and recommendations are valid for one year. It is recommended that any trees within the site are inspected after adverse weather conditions such as high winds.

1.7. Status of trees. At the time of preparing this report it has not been possible to ascertain whether any of the trees are subject to a Tree Preservation Order, or if the site is located in a conservation area.

1.8. Appraisal of tree stock.

1.9. T1 (Fig 1) is an off-site tree which is included because of it being next to the site. T2 and T3 (Fig 2) are the only trees within the site. Included in the survey are T5, T6, T7 and T8 (Fig 3) all of which are off-site, and like T1 their dimensions have been estimated.

1.10. G4 (Fig 4) is a line of mature Leyland cypress located in the neighbouring property Elm Close.


Fig 1 - T1


Fig 2 - T2, T3 and T5


Fig 3 - T6 and T7


Fig 4 - G4

Legend:

Shading arc:	
Root Protection Area (RPA):	RPA RPA

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Please ensure all dimensions on site and any if there are any discrepancies please notify us.

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Site	Land at Old Manor Drive off Echo Square, Gravesend, DA12 1NP
Date	01/03/2025
Drawn	GRS
Job ref	GRS.20.25
Scale	1:500
Paper size	A3
Drawing reference	Block plan

1. CONSTRAINTS

2. These can be described as above and below ground constraint which have to be identified to ensure the retained trees can be integrated into the proposed layout and continue to enhance the local landscape.

3. Identification of trees that are subject to a Tree Preservation Order, or if the site located within a Conservation Area. At the time of proparing this report it has not been possible to ascertain either of these constraints. Removing protected trees can potentially lead to enforcement action that possibly result in fines being imposed.

4. DIRECT IMPACT - Assessing the incursion into the root protection areas (RPA) of nearby trees. The RPA is hown as a circle and is defined as layout design tool indicating the minimum area around a tree deemed to contain sufficent roots and rooting volume to maintain the trees viability and where the protection of the roots and soil structure is treated as a priority.

5. Unless it can be proven otherwise no part of the structure should be located within the RPA.

6. Where underground suervices are likely to be located within the RPA the least intrusive method should be used as detailed in NJUG 2005.

4. INDIRECT IMPACT - Assessing whether the retained trees will be exposed to unreasonable post-development pressure from issues such as shading or overbearing nature mature trees may have on future occupants.

5. This inlcudes the growth of the tree and individual branches that may overhang, or come into contact with the proposed dwelling.

6. The shading arcs indicate the passage of shading through the greater part of the day shown as dashed lines.

Legend:

B grade tree to be removed	
C grade tree to be removed	

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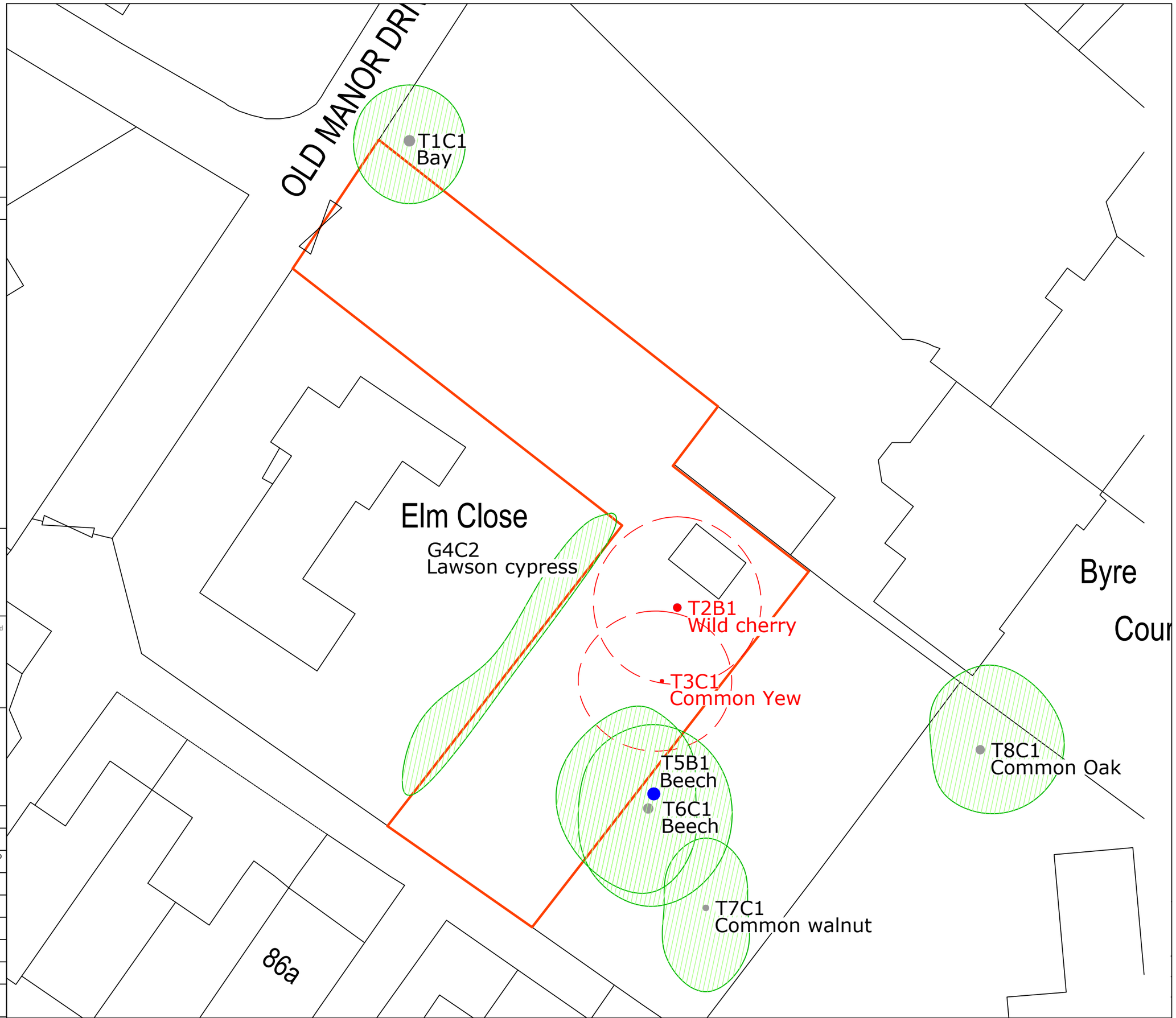

Legend:

Temporary ground protection:		Existing structure to be demolished	
Root Protection Area (RPA):	RPA	Protective fencing:	
Notes	Positions of T7 and T8 are approximate		
Revisions			

Trunk 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 than10 years

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

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

Trunk 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

Canopy edge

1 ——→Tree no.
Ash——→Tree species

0 1 2 3 4 5 10m
1:250 Scale

GRS Arboricultural Consultant Ltd
The Old Coach House,
Waterside Mews,
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Kent, ME18 5AB

Tel: 01622 817516
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www.grstrees.co.uk

Please ensure all dimensions on site and any if there are any discrepancies please notify us.

Client	Mr J Loker
Title	Tree Removal Plan - TRP-01
Site	Land at Old Manor Drive off Echo Square, Gravesend, DA12 1NP
Date	01/03/2025
Drawn	GRS
Job ref	GRS.20.25
Scale	1:250
Paper size	A3
Drawing reference	Block plan

CHRONOLOGICAL ORDER OF EVENTS*

*See the accompanying Aboricultural Method Statement (AMS) for full details of the order of events and specifications for tree protection.

1. Pre-start meeting
2. Tree removals
3. Protective fencing installed
4. Temporary ground protection installed
5. Demolition of glasshouse
6. Installation of service and drainage routes
7. Construction of building
8. Installation of above soil surfacing
9. Removal protective fencing

CONSTRUCTION EXCLUSION ZONES (CEZs)
Area which access is prohibited during development (based on the RPAs).
Construction Exclusion Zones shall be safeguarded during development by the installation of protective fencing and / or fit for purpose ground protection before any development works occur.
There shall be no development within CEZs including*:
- No soil disturbance
- No trenches for foundations, services or drainage
- No soil level changes
- No new hard surfaces

*If any such works are later proposed within any RPAs of trees to be retained these shall be supervised by the arboricultural consultant.

OLD MANOR DRIVE

T1C1
Bay

Elm Close

G4C2
Lawson cypress

T5B1
Beech

T6C1
Beech

T7C1
Common walnut

T8C1
Common

86a

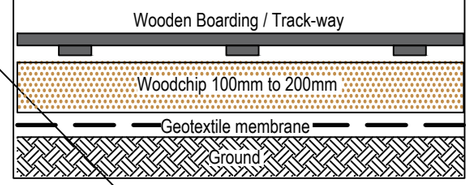
RPA

Temporary ground protection

For pedestrian movements only, a single thickness of scaffold boards shall be placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane.

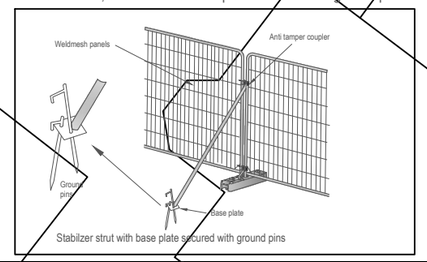
For pedestrian-operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards (or similar) shall be placed on top of a compression-resistant layer (150 mm depth of woodchip), laid onto a geotextile membrane.

For wheeled or tracked construction traffic exceeding 2t gross weight, interlinking aluminium or metal track way shall be placed on top of a compression-resistant layer (200mm depth of woodchip), laid onto a geotextile membrane



Tree protective fencing

Protective fencing shall consist of a scaffold framework in accordance with *figure 3* of British Standard 5837 (2012); comprising 2m tall welded
mesh panels on rubber or concrete feet. Onto this, weldmesh panels shall be securely fixed with wire or scaffold clamps joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers shall be at least 1m and shall be uniform throughout the fence. The panels shall be supported on the inner side by stabilizer struts, attached to a base plate secured with ground pins.



Stabilizer strut with base plate secured with ground pins

CHRONOLOGICAL ORDER OF EVENTS*

*See the accompanying Aboricultural Method Statement (AMS) for full details of the order of events and specifications for tree protection.

1. Pre-start meeting
2. Tree removals
3. Protective fencing installed
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CONSTRUCTION EXCLUSION ZONES (CEZs)

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Construction Exclusion Zones shall be safeguarded during development by the installation of protective fencing and / or fit for purpose ground protection before any development works occur.

There shall be no development within CEZs including*:

- No soil disturbance
- No trenches for foundations, services or drainage
- No soil level changes
- No new hard surfaces

*If any such works are later proposed within any RPAs of trees to be retained these shall be supervised by the arboricultural consultant.

Legend:

Above soil surfacing:			
Temporary ground protection:		Supervised manual excavation:	
Root Protection Area (RPA):	RPA	Protective fencing:	

Notes	Location of all trees are approximate and part of W5/69/00004/TPO
Revisions	

Trunk 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 than10 years

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

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Canopy edge

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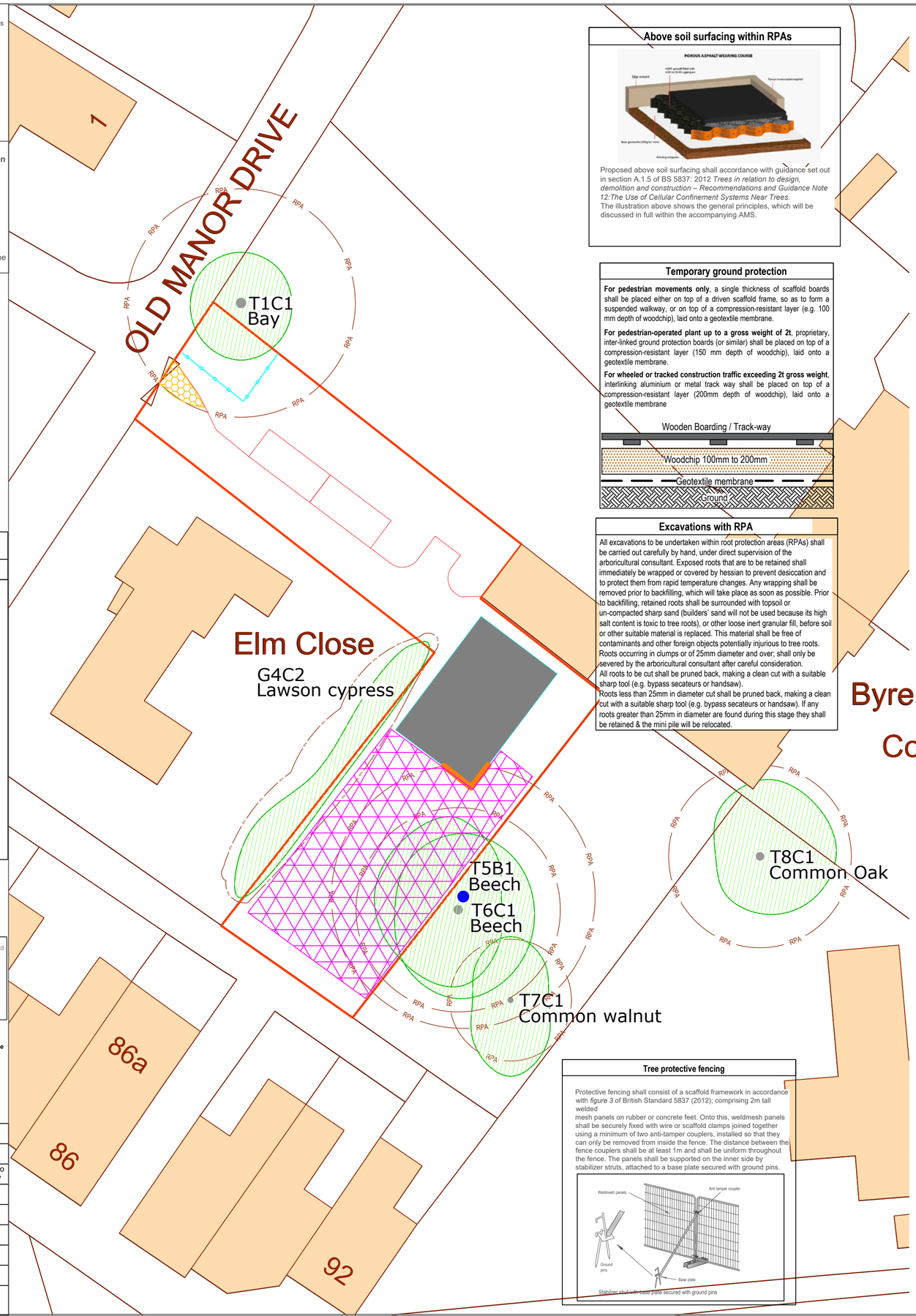
GRS ARBORICULTURAL CONSULTANT LTD

Please ensure all dimensions on site and any if there are any discrepancies please notify us.

Client	Mr J Loker
Title	Tree Protection Plan - TPP-02
Site	Land at Old Manor Drive off Echo Square, Gravesend, DA12 1NP
Date	01/03/2025
Drawn	GRS
Job ref	GRS.20.25
Scale	1:250
Paper size	A3
Drawing reference	Block plan



Above soil surfacing within RPAs

Proposed above soil surfacing shall accordance with guidance set out in section A.1.5 of BS 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations and Guidance Note 12:The Use of Cellular Confinement Systems Near Trees.*
The illustration above shows the general principles, which will be discussed in full within the accompanying AMS.

Temporary ground protection

For pedestrian movements only, a single thickness of scaffold boards shall be placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane.

For pedestrian-operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards (or similar) shall be placed on top of a compression-resistant layer (150 mm depth of woodchip), laid onto a geotextile membrane.

For wheeled or tracked construction traffic exceeding 2t gross weight, interlinking aluminium or metal track way shall be placed on top of a compression-resistant layer (200mm depth of woodchip), laid onto a geotextile membrane

Excavations with RPA

All excavations to be undertaken within root protection areas (RPAs) shall be carried out carefully by hand, under direct supervision of the arboricultural consultant. Exposed roots that are to be retained 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. Roots occurring in clumps or of 25mm diameter and over; shall only be severed by the arboricultural consultant after careful consideration.
All roots to be cut shall be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw).
Roots less than 25mm in diameter cut shall be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw). If any roots greater than 25mm in diameter are found during this stage they shall be retained & the mini pile will be relocated.

Tree protective fencing

Protective fencing shall consist of a scaffold framework in accordance with *figure 3* of British Standard 5837 (2012); comprising 2m tall welded
mesh panels on rubber or concrete feet. Onto this, weldmesh panels shall be securely fixed with wire or scaffold clamps joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers shall be at least 1m and shall be uniform throughout the fence. The panels shall be supported on the inner side by stabilizer struts, attached to a base plate secured with ground pins.

1. ARBORICULTURAL IMPACT ASSESSMENT

1.1. This report provides an analysis and evaluation for the demolition of the existing glass huse and the erection of a detached residential will have on the on and off-site trees.

2. EXECUTIVE SUMMARY

2.1. The removal of the glass house is shown on TPP- 01 and can be completed without the need to prune or fell any trees.

2.2. The existing ground conditions within the site are unmade and to soil compaction within T1 RPA above ground soil surfacing will be used in a small area shown as orange hatching. The extent of the incursion has been measured and amounts to 2% which is well below the 20% threshold.

2.3. T2 and T3 are shown on the Tree Removal Plan TRP-01. Both are set back from the entrance, although T2 has been classed as moderate in quality it is not readily visible from the public realm, Echo Square or the neighbouring roads.

2.4. T5 and T6 have been included in the survey due their location and potential above and below ground constraints they may pose to the development of the site.

2.5. The southern corner of the proposed dwelling does result in a minor incursion into the RPA of T5 and to avoid damaging any roots that may be found in this area the arboriculturist shall oversee this part of the excavation.

2.6. Part of the canopies of T5, T6, and G4 overhang into the garden but not to such an extent that prevents the rear garden from being used by the future occupants.

2.7. To prevent soil compaction during the development phase temporary ground protection shown as purple hatching will be laid prior to the commencement of the construction phase and will be kept in place during the entire course of the development.

2.8. Tree protection fencing shown as light blue to protect T1 to prevent mechanical damage happening during the development.

3. Arboricultural Method Statement

There shall be regular monitoring visits by the project arboriculturist (unless otherwise later agreed in writing by the LPA tree officer) which may be undertaken at the same time as site visits listed in the table below. The pre-commencement meeting will be used to clarify all aspects of the implementation of tree protection sequencing to all relevant parties.

The council tree officer shall be invited to the meeting, however if she/he is unable to attend the minutes of the meeting will be sent for the council records within 5 working days.

The specific works or events during which the project arboriculturist will need to visit to undertake supervision or inspection will be confirmed, and a suitable length of time between the 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 and robust. The inspections will be recorded and sent to the project arboriculturist who will forward it onto the council tree officer within 5 working days.

Any damage to stems, branches or any roots of the retained trees will be reported immediately to the project arboriculturist who will visit the site as soon as possible and inspect the damage, and send a report to the tree officer with a program to mitigate the damage.

If there is a change of project arboriculturist, the council will be informed before any scheduled site visits. Details of their qualifications and experience will be forwarded to the council tree officer at the earliest convenience.

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 developers responsibility to ensure that details of this AMS and any agreed amendments are known and understood by all site personnel.

Stages of the erection and removal of tree protective fencing (TPF) and signs.

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

- Demolition
- 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. Installing and maintaining the TPF:

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

Approved works to start.

Installation of above ground soil surfacing

To protect the soil from becoming compacted and damaging roots the proposed driveway located within the RPA identified as yellow hatching, shall be installed in accordance with the recommendations set out in 7.4 of BS5837 2012.

- The following principles shall be applied:
- Construction shall be undertaken in dry weather, ideally between May and October when the soil is at its driest and least prone to compaction.
- within the RPA there shall be no lowering of existing levels.
- no stripping of turf or top soil shall occur; herbaceous vegetation shall be cut as close to ground level as possible and raked by hand. Any hollows are to be filled with sharp sand.
- A permeable geotextile membrane such s Treetex T300 shall be laid on the ground to prevent contamination and be secured by pegs or pins.
- An impermeable layer shall be laid to prevent contamination of the rooting area and run off shall directly away from the trunk of the tree (preferably out of the RPA)
- Edge supports shall be laid above ground level, on top of the geogrid, either on concrete haunchings, secured with pegs driven into the ground**. If concrete haunching is used** a strip heavy gauge polythene shall be laid underneath, on top of the geotextile membrane to prevent leaching of wet cement into the soil. The outer side of the edge supports shall be banked up with top soil, graded down to existing ground level.
- A perforated cellular confinement system eg. geoweb shall be laid above the geotextile membrane. The grade and type of this web shall be selected by the appointed structural engineer to ensure all vehicles accessing the site will be supported and not cause compaction to the soil. A 200 mm standard cell width shall be used; cell depth shall be a minimum of 150 mm. Should a second strip of geoweb be used, the cellular structure shall be maintained by stapling adjacent sections together using 10 mm galvanized staples.
- Angular aggregate with a particle size of between 20 mm and 40 mm with no fines shall be placed into the geoweb. To avoid damaging the soil structure trucks will not be permitted to drive onto the area to deposit the aggregate. It shall be tipped on the edge and then pushed into position
- A second layer of permeable membrane shall be laid on top of the geoweb to prevent sand or other materials used as the base of the wearing course falling into the aggregates below.
- The final wearing course shall be permeable and be in accordance with structural engineers recommendations.