Project: 20_5837_09_28
Site: 12 Penroath Avenue, Reading, RG30 2ED
Client: Nabeel Mughal

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Project Title:	12 Penroath Avenue, Reading, RG30 2ED

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Re-Survey Date.

Survey Type:	Lifecycle:	Re-survey Date:
BS5837: 2012	Planning Only	N/A

Report no: 20_5837_09_28

Date: 1/10/2020

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Summary:

The tree survey for 12 Penroath Avenue contains the details of one tree group, five individual trees and one headrow feature that are all located on the periphery of the usable site.

Our brief has been to obtain details of the tree population on site with a view to assessing any arboricultural constraints.

We understand that the site is to be redeveloped with a part two-storey, part single-storey rear extension, a single storey side extension, an upper floor side extension and an entrance porch.

There is a conflict between the proposed side extension and the Root Protection Area of tree T1. However, as the area is already covered in a hard surface of paving it is likely that the roots are offset. Further investigation is required and would be carried out on consent.

The paving should be excavated by hand to check for roots. If fibrous roots are detected then further arboricultural advice should be sought in order to facilitate the project which may require bridged foundations.

Some temporary tree protection will be required in the form of HERAS fencing and possibly some ground protection boarding during the construction phase.

Tree protection fencing will be required around trees T1, T2 and H4 before any works commence on site.

If construction access is required within the radial RPA of any retained trees, then ground protection boarding will be required.

Overall, the scheme has been designed to be sympathetic to the mature tree stocks which should be welcomed. There will be no unnecessary pressure on the tree as it grows to be unsympathetically pruned providing a precautionary approach is taken to assess tree T1's root system.

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Report Author.

Matthew Harmsworth attended Merrist Wood College in Guildford, Surrey in the late 1990's studying horticulture and arboriculture as well as a National Diploma in Countryside Recreation before gaining employment as a Countryside Ranger with Surrey County Council (later Surrey Wildlife Trust).

After a number of years Matthew started an Arboricultural Contracting business serving residential and commercial clients across the SE of England and also gained his aerial NPTC certificates.

Following the sale of this business in 2009 Matthew moved to North Wales as a junior self-employed consultant for Fairley Arboriculture and studied at Myerscough online to study an FDSc in Arboriculture and become a technician member of the Arboricultural Association.

ROAVR Environmental was formed in 2010 and since then has carried out arboricultural consultancy Nationwide with directly employed consultants. Matthew has written well in excess of 600 BS 5837 2012 tree reports.

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Arboricultural implications assessment to BS 5837 2012 of trees at:

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12 Penroath Avenue, Reading, RG30 2ED.

1 Scope

1.1 We have recently been instructed to undertake an appraisal of mature tree cover at Penroath Avenue, Reading, RG30 2ED.

1.2 The data was collected to the British Standard BS5837 'Trees in Relation to Design, Demolition and Construction - Recommendations' 2012.

1.3 The survey has been commissioned to offer guidance on the arboricultural constraints with a view to the future development of the site.

1.4 The trees were inspected on the 21/09/20 following the guidance in the British Standard by Connor Harmsworth. The crowns and stems were inspected from the ground using the 'Visual Tree Assessment (VTA)' method; non invasive techniques were used at this stage. Although a sounding hammer was used to determine the presence of any decay.

1.5 The site was assessed and data was collected on one tree group, five individual trees and one headrow feature. Trees were grouped or designated woodlands as per the allowance in the British Standard when the area in question was uniform in terms of species, age or geography.

Photographic Plates.

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Photographic plate showing trees T2 and T1, both of which are mature Large-leaved Limes.

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Photographic plate showing tree T3, a mature Atlantic Cedar.

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Photographic plate showing hedge H4, consisting of mature Leyland Cypress.

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Photographic plate showing hedge H4, located along the site boundary.

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Photographic plate showing tree T5, located on site.

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Photographic plate showing tree T5, a mature Silver Birch.

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Photographic plate showing tree group G6, consisting of mature Leyland Cypress.

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Photographic plate showing tree T7, located adjacent to the garage.

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Photographic plate showing tree T7, a mature Large-leaved Lime.

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Photographic plate showing the mature tree cover on site.

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2. Site Conditions & Site Surroundings

2.1 The site is situated in Reading in the Reading Borough Council control area. The site is located on the west side of the town and has an urban feel.

2.2 The site is home to a detached residential dwelling house with associated hard and soft landscape.

2.3 The wider locality is predominantly residential. The site is accessed via a private drive off from the adjacent public highway.

2.4 A desktop assessment has highlighted that the site is not within a Conservation Area. However, there is a TPO protected tree group on site.

2.5 All desktop assessment data was cross checked and validated on the 25/09/2020 using the web portal provided by the local planning authority and cross checked with the DEFRA MAGIC database.

https://www.reading.gov.uk/planning/trees/

21	PARKSIDE ROAD	63/003	(T4)	Wilton House – now Parkside House
22	PARKSIDE ROAD	6/07	(T42) (G1)	West Fryerne
23	PEMBROKE GRANGE	14/004	(T4) (G1)	Pembroke Grange, Amersham Road (SEB Depot)
24	PENDRAGON COURT	7/004	(T6)	Southcote Lane
25	PENROATH AVENUE	105/03	(G1)	12
26	PEPPARD ROAD	7/18	(T1)	Land at junction with Derby Road
27	PEPPARD ROAD	2/20	(T1)	13
28	PEPPARD ROAD	15/15	(T2)	14a-16 (Caversham Prep School)
29	PEPPARD ROAD	8/17	(T5)	18 - Chiltern Nursery & Training College
30	PEPPARD ROAD	41/003	(T6)	32
31	PEPPARD ROAD	11/004	(T1)	34

Image plate showing the desktop analysis results of the surveyed plot.

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https://magic.defra.gov.uk/MagicMap.aspx?chosenLayers=sacPIndex,sacIndex,backdropDIndex,backdropIndex,europeIndex,vmlBWIndex,25kBWIndex,50kBWIndex,250kBWIndex,miniscaleBWIndex,baseIndex&box=469078:172776:469694:173137&useDefaultbackgroundMapping=false

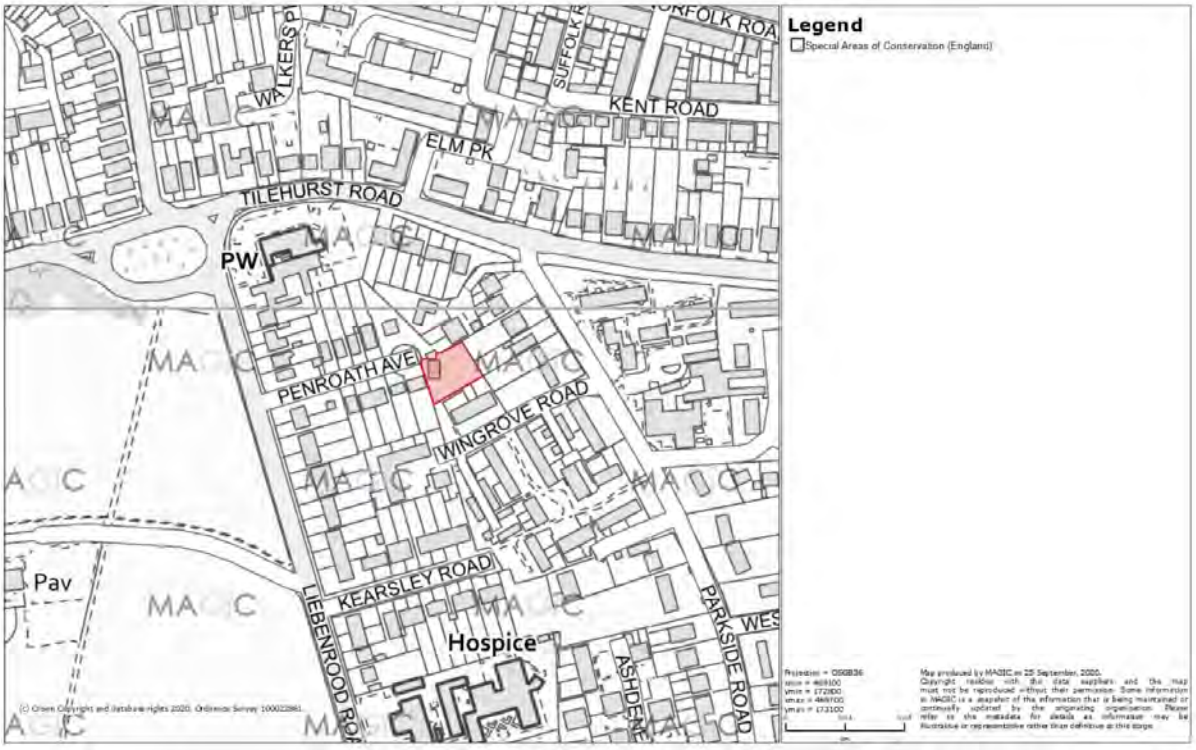

Image plate showing the desktop analysis results of the surveyed plot.

2.6 Works to protected trees require consent from the local planning authority. In the case of TPO's an application must be made. In the case of conservation areas a notification must be made. TPO applications take up to eight weeks, conservation area notifications take six weeks.

2.7 Certain exemptions apply; for example the removal of deadwood. In the case of dangerous trees 5-days written notice should be given to the local authority (in the cases of immediate danger the work should proceed, but the local authority contacted as soon as possible afterwards) with the works evidenced by photographs and video where possible.

2.8 It should be noted that planning consent overrides protected trees, where the works or removal are necessary for development to proceed and have been highlighted in the tree survey documents.

2.9 Bats. Under current legislation it is an offense to 'intentionally or recklessly disturb a bat' or 'damage, destroy or block access to the resting place of any bat'. For further details consultation must be made with the Statutory Nature Conservancy Organisation. Where relevant any current ecological surveys for the site will take precedence in this matter.

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2.10 Birds. It is an offense to kill, injure or take any wild bird; or take, damage or destroy the nest of any wild bird while it is in use or being built. Therefore work likely to disturb nesting birds must be avoided from late March to August.

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3. Drawings

3.1 Appended to this report is drawing 12 Penroath Avenue-TcP1_A3_200.

3.2 The tree constraints plan has been produced using an OS supplied .dwg (AutoCAD) base plan as no topographical survey was available. Tree positions and data have been applied using our survey handset as an onsite exercise with the constraints plan being produced as a PDF through Auto CAD.

3.3 An autoCAD .dwg file of the tree constraints is available on request for project stakeholders to utilise.

3.4 The *Tree Constraints Plan* shows the existing layout. For each tree the stem location is indicated and scaled according to its diameter, the canopy is indicated according to measurements taken along the four cardinal points of the compass. Root protection areas (RPAs) are indicated which are calculated according to the guidelines within BS 5837 (2012).

3.5 Where appropriate, the shapes of the RPAs have been amended to reflect actual site conditions. The 'original' RPAs are indicated on the tree constraints plan whereas the amended RPAs are indicated on the tree assessment plan. Only T7 has been amended to fit with the existing garage and hard surfacing.

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4. The Tree Population

4.1 BS5837: 2012 Tree Categorisation:

BS5837: 2012 sets out the methodology for surveying trees on potential development sites in order to identify them within a prioritised system of retention categories, as summarised below and given in full within the BS5837: 2012 Cascade Chart for Tree Retention.

A Category Trees of high quality and value in such a condition as to be able to make a substantial contribution for a minimum of 40 years.

B Category Trees of moderate quality and value in such a condition as to make a significant contribution for a minimum of 20 years.

C Category Trees of low quality and value currently in adequate condition to remain until new planting could be established and expected to remain for a minimum of 10 years, or young trees with a stem diameter less than 150mm measured at 1.5 meters above ground level.

U Category Trees in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural or forestry management.

4.2 Additionally, BS5837: 2012 provides subcategories 1-3 within the category system outlined above which indicate the area(s) in which a tree or group retention value lies. An explanation of these values is given within the BS5837: 2012 Cascade Chart for Tree Retention.

1 - Retention values that are mainly arboricultural
2 - Retention values that are mainly landscape.
3 - Retention values that are mainly cultural, including conservation.

4.3 In line with BS5837: 2012, A and B category trees should be considered as a constraint on site and provide a substantial contribution to the site. As a result, A and B category trees should be retained and incorporated into the scheme where possible.

4.4 Generally C and U category trees are considered to be of low quality or are young specimens that can be readily replaced and therefore should not be a constraint in terms of future development.

4.5 However, it is generally considered desirable to retain trees wherever reasonably possible to ensure continuity of tree cover and to provide a mature landscape to the development.

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4.6 The survey contains details of one tree group, five individual trees and one headrow feature. The comments including species, age, condition and the BS5837:2012 retention category for each individual tree and group of trees are provided in detail in the Tree Schedule (data tables). The full data collection methodology is appended behind the data tables.

4.7 The location of each individual tree and their associated constraints are illustrated on the appended Tree Constraints Plan.

Preliminary Management Recommendations - regardless of the proposals.

4.8 Trees T1 and T2 are mature Large-leaved Limes located on the sites boundary. Both have epicormic growth present. Their branches are encroaching upon the adjacent building. The epicormic growth should be removed. These trees will need to be continually managed as pollards into the future to maintain them in the current location.

4.9 Tree T3 is a mature Atlantic Cedar located on site. The tree has been topped and is suffering from heavy unsympathetic pruning. The former poor pruning has reduced the tree's useful life expectancy.

4.10 Hedgerow H4 consists of mature Leyland Cypress located on the sites boundary. The hedge is in decline and has broken branches within its crown. There is overgrown vegetation at the base. The branches are hanging low over the adjacent footpath. It is recommended that the hedgerow be removed.

4.11 Tree T5 is an early-mature Silver Birch located on site. The tree is showing good structure, form and vitality, however, would benefit from some formative pruning.

4.12 Tree group G6 consists of mature Leyland Cypress located on the sites boundary. The trees have poor shape and form and are in decline. The stems are covered in ivy. The trees have limited long-term prospects as they have been heavily side pruned, of which they will not recover.

4.13 Tree T7 is a mature Large-leaved Lime located on the sites boundary, adjacent to the garage. The tree has poor shape and form, with the stem dividing at ground level. The branches hang low over the adjacent driveway and are encroaching upon the adjacent building. The tree requires some formative pruning and a crown raise to 3m. A crown reduction should also be considered to prevent the branches from encroaching upon the garage.

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Future Management Recommendations - regardless of the proposals.

4.14 Trees T1, T2, T5 and T7 should be inspected annually, as well as any other retained trees.

4.15 The trees should be inspected sooner if there is a noticeable decline in their condition, or following extreme weather events.

4.16 The removal of tree T3 and tree group G6 should be considered in the future due to their limited-long term prospects.

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5. Trees & Construction - General Issues

5.1 This report has been prepared to inform the design layout of potential development and should be submitted with a planning application.

5.2 Due to the changing nature of trees and other site circumstances this report and recommendations are limited to a one year period. Similarly, this report could be invalidated if any alterations are made to the site that could change the conditions as seen at the time of inspection.

5.3 Under certain circumstances, roots can affect foundations, drains and other underground services. These issues have not been addressed by this report. Trees are dynamic structures that can never be guaranteed 100% safe; even those in good condition can suffer occasional damage under only average weather conditions. A lack of recommended work does not imply that a tree will never suffer damage.

5.4 Typically, about 80% of roots will be found in the upper 500mm of soil and often extending well beyond the canopy spread. The threat to the trees by development comes from:

(a) root severance or fracture
(b) compaction of the soil, preventing gaseous exchange and moisture percolation
(c) possible change to moisture gradients due to surface water run-off or interception
(d) physical damage to low branches and trunk.
(e) damage from chemical run-off from construction activities

The consequences for the tree of such damage are:

(i) instability, if severe enough
(ii) entry points for pathogenic fungi at wounds / fractures
(iii) loss of vitality due to reduced oxygen, mineral and moisture take-up; all leading to
(iv) root death, and
(iv) a general decline or possible death of the tree.

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6. Tree Constraints - Information

6.1 Constraints imposed by trees during development, both above and below ground need to be considered within the site layout design. Protection is afforded to the tree by defining a Root Protection Area (RPA) within which no development activity should take place. The size of the RPA is defined in the British Standard and relates to trunk diameter. The RPA is normally the minimum position for placement of tree protective fencing. The data tables hold a column figure as an offset in meters from the stem that the root protection area extends to.

6.2 Nominally the RPA is represented by a circle around the tree. The area of the RPA may however, subject to the consideration of the arboricultural consultant, and be altered to a polygon in order to reflect the site conditions and requirements. For example, existing hard surfaces and foundations are likely to restrict or limit root growth while good quality soil may promote and extend root growth.

6.3 Root Protection Areas primarily relate to below ground constraints (root protection). Other constraints that must be considered include:

- The current as well as ultimate height and spread of a tree
- Large trees close to a building, particularly a dwelling, can cause apprehension to owners/occupiers that result in pressure for tree removal or inappropriate pruning. Buildings should be sited allowing for the species height, spread and overall habit
- Species characteristics; i.e. density of foliage, fruit-fall, susceptibility to honeydew drip, or branch drop. Trees are shedding organisms. The leaves of some species may cause problems with blocking of gullies and gutters. Fruit may cause slippery patches and honeydew drop can affect surfaces (particularly cars).
  If conflicts may arise, detailed design may address such issues, such as non-slip paths, use of car-ports, provision of leaf guards or grilles etc.
- The potential impact on direct and diffuse light of a particular location of land; shading of buildings by trees can be a problem, especially where rooms require natural light, in addition open spaces such as gardens and sitting areas should be designed to meet requirements for direct sunlight (for at least part of the day)
- Infrastructure requirements in relation to trees e.g. easements for underground or above ground apparatus and visibility splays
- Space for the provision of new planting or landscaping
- The proposed end use of space within Root Protection Areas
- The requirement to protect overhanging canopies of trees that overhang or extend beyond Root Protection Areas

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7. Structures within the RPA of trees - Information

7.1 In the development layout design structures should be positioned outside of RPAs as far as practicable. In some exceptional instances there may be an overriding justification for construction within the RPA. In such cases technical solutions may be available to minimise to an acceptable level of disturbance to the tree or trees. Where such technical solutions may be relied upon full details will need to be included within a method statement. Advice must be sought from a suitably qualified arboriculturalist to develop a solution.

7.2 In some cases it may be unavoidable to place permanent hard surfacing within an RPA (for example the placement of an access driveway or parking area). In such cases the following should apply:

- No excavation of the soil should take place, other than scraping of the turf/ vegetation layer
- Any design must avoid compaction, allowing an even distribution of weight
- New hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA
  If the proposed surface is is likely to require de-icing salt then run-off should be directed away from the RPA
- Permeable hard surfacing can result in soil moisture saturation for long periods (resulting in root death). Where there is a risk of water-logging a design should incorporate land drainage

7.3 Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems (cell-web). Piles, pads or elevated beams can support bridges over RPAs. In all cases full specifications and methodology must be included within a supporting method statement.

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8. Arboricultural Impact Assessment - Site Specific

8.1 Overview

8.1.1. It is proposed to redevelop the site with a part two-storey, part single-storey rear extension, a single storey side extension, an upper floor side extension and an entrance porch.

8.1.2. A tree assessment plan has been produced to allow us to accurately assess the implications to the current tree stocks.

8.1.3. The proposed side extension conflicts with the Root Protection Area of tree T1. However, as the area is already covered in a hard surface of paving it is likely that the root mass is offset. Further investigation is required to determine whether the tree will be a constraint.

8.1.4. A precautionary approach will be required to ensure successful retention of the trees throughout the construction phase. Including the use of tree protective fencing and ground protection boarding.

8.1.5. The table below summarises the potential impact on trees due to various activities.

Trees Potentially Affected:

Retention Category A: None
Retention Category B: Four individual trees
Retention Category C: One individual tree; One hedgerow feature; One tree group
Retention Category U: None

Tree Pruning:

The proposed development does not conflict with the crown of any trees.

RPA:

RPA: No ground level changes are required within the Root Protection Areas of any trees, as conflicting areas are already covered in a hard surface of paving.

RPA: Soil Compaction Trees adjacent the construction area (preventable by installing tree protection measures).

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8.1.6. Other potentially damaging activities often associated with construction sites include, demolition or the careless use of plant machinery, hazardous materials, or fires.

8.1.7. All of the above potential impacts are considered in detail throughout this section. Section 9 specifies the measures proposed to minimise all possible potential risks of damage to the retained trees.

8.2. Tree Removal.

8.2.1. All trees to be removed are indicated on the Tree Removal Plan and are listed below:

Retention Category A: Our survey did not identify any Retention Category A trees.

Retention Category B: It is proposed to retain all Retention Category B trees.

Retention Category C: It is proposed to retain all Retention Category C trees.

Retention Category U: Our survey did not identify any Retention Category U trees.

8.2.2. Details specific to each tree can also be found in the Tree Data Schedule.

8.3. Mitigation Planting.

8.3.1. As no trees are to be removed to facilitate the project. No mitigative planting will be required.

8.4. Impact on Tree Canopies.

8.4.1. No pruning works are required to facilitate the proposed development.

8.5. Impact on Tree Roots.

8.5.1. The proposed development conflicts with the Root Protection Area of tree T1. However, as the area is an existing hard surfaced area it is likely that the roots are offset. A precautionary approach is recommended. The paving should be lifted by hand to check for fibrous roots. If roots are detected, arboricultural advice should be sought.

8.6. New Surfaces.

8.6.1. No new hard surfaces are proposed within the Root Protection Areas of any trees.

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8.7. Underground Services.

8.7.1. No underground services are to be installed through any Root Protection Areas as they are to be run from the existing building.

8.8. Changes in Ground Levels.

8.8.1. No ground level changes are proposed within the Root Protection Areas of any trees.

8.9. Soil Compaction.

8.9.1. The majority of tree roots lie within the upper soil horizons. This is because the availability of oxygen decreases with depth and roots need to breathe to stay alive. In addition, nutrients are more readily available in the form of organic matter close to the soil surface.

8.9.2. Healthy soils contain about 25% air space between solid particles. Increased loading of the soils caused by construction activity causes air to be squeezed out as the soil becomes compacted preventing roots from breathing. Even an increase in pedestrian activity may cause some soil compaction.

8.9.3. It is important therefore that ground compaction and soil disturbance over Root Protection Areas should be avoided during the construction phase. This may be done by installing protective fencing and ground protection measures as recommended within the tree protection plan.

8.10. Demolition Activities.

8.10.1. The tree protection measures specified within the TPP should be installed prior to the commencement of all demolition activities (including soil stripping) to prevent any detrimental impact on tree health. Where this is not practicable, demolition of structures within Construction Exclusion Zones shall be undertaken very early on in the demolition phase and the protective barriers installed immediately thereafter.

8.11. Hazardous Materials.

8.11.1. All hazardous materials (including cement and petrochemical products) will need to be controlled according to COSHH regulations in order to ensure there is no detrimental impact on tree health. Provision shall need to be made to ensure that cement and cement run-off are contained outside of all Root Protection Areas.

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8.12. Cabins and Site Facilities.

8.12.1. Consideration should be given to the location of any site welfare facilities in terms of potential impact on trees. Where it is proposed to install cabins or site facilities in Root Protection Areas, the appointed arborist should be consulted and approval obtained from the local authority.

8.13. Boundary Treatments.

8.13.1. No changes are proposed to the existing boundary features that might impact on trees.

8.14. Impact of Retained Trees on the Development.

8.14.1. Providing no fibrous roots are detected under the hard surfacing within the Root Protection Area of tree T1, no retained trees will be impacted by the development. If fibrous roots are detected, arboricultural advice should be sought to gain advice on facilitating the side extension without impacting on tree T1.

8.15. Summary.

8.15.1. It is recommended that no trees be removed in order to facilitate the development.

8.15.2. There is conflict between the proposed side extension and the Root Protection Area of tree T1. However, the proposed location is already covered in a hard surface of paving so it is likely that the roots are offset.

Foundations are required for the external wall of the WC. A trial trench will need to be dug in this location by hand and any root mass discovered photographed and provided as evidence to the LPA before the trench is back filled.

If root mass is discovered then mini-piles and bridged foundations will be required for this part of the extension.

8.15.2. Tree protection fencing will be required around trees T1, T2 and H4 before any works commence on site.

8.15.3. Ground protection boarding should be used if construction access is required within the RPA of any trees.

8.15.4. The development does not require the removal of any trees on site. Although, the proposals conflict with the Root Protection Area of tree T1. Further inspection is needed to determine whether the root mass is offset.

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8.15.5 It is anticipated that the matter of root investigation works within the foundation run required for the new WC could be conditioned but must be carried out and signed off before any works commence on site. It would be preferable to use an air spade for this investigation given the heavily compacted nature of this piece of ground.

9. Limitations

9.1 ROAVR Environmental has prepared this Report for the sole use of the above named Client/Agent in accordance with our terms of business, under which our services were performed. No other warranty, expressed or implied, is made as to the professional advice included in this Report or any other services provided by us.

9.2 This Report may not be relied upon by any other party without the prior and express written agreement of ROAVR Environmental. The assessments made assume that the land use will continue for their current purpose without significant change. ROAVR Environmental has not independently verified information obtained from third parties.

9.3 This report, video walkthrough, data tables and raw data remain the copyright of ROAVR until such time as any monies owed are settled in full and the report may be withdrawn at any time.

Should you require any further information, please do not hesitate to contact us at any time.

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Appendix 1: BS 5837: 2012 – Guidance Notes

This Standard prescribes the principles to be applied to achieve a satisfactory juxtaposition of trees and structures. It sets out to assist those concerned with trees in relation to design, demolition and construction to form balanced judgements.

It acknowledges the positive contribution trees may offer to a site, as well as the negative aspects of retaining inappropriate trees. It addresses the negative impacts that construction activity may have upon trees and offers mitigation strategies to minimise these impacts.

The Standard suggests a three stage approach to ensure best practice is followed when developing close to trees:

Stage 1: Survey Details and Notes

A ground level visual survey was undertaken. No climbed inspections or specialist decay detection were undertaken. Only trees with a stem diameter over 75mm, which lie within the site boundary or relatively close to it, were included.

Where applicable, trees with significant defects have been highlighted and appropriate remedial works have been recommended. However, this report should not be seen as a substitute for a full Safety Survey or Management Plan which are specifically designed to minimise risk and liability associated with responsibility for trees.

Wherever practicable dimensions were obtained using diameter tapes, logger's tapes, distometers and clinometers. Where obstacles prevent accurate measurement, dimensions are estimated. Trees on privately owned third parties are surveyed from the best available vantage point and observations relating to the condition of these trees should be treated accordingly. All height measurements should be regarded as approximate.

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Appendix 2: Survey Methodology

Ground level visual surveys are carried out using the Visual Tree Assessment technique described by Mattheck and Broeler (1994) and endorsed by the Arboricultural Association (LANTRA Professional Tree Inspection course, 2007).

Structural condition is assessed by inspecting the stem and scaffold branches from all angles looking for weak branch junctions or symptoms of decay. Particular attention is paid to the stem- base. Cavities are explored using a metal probe in order to assess the extent of any decay. If this is not possible further inspection is recommended in the form of a climbed inspection or using specialist decay detection equipment.

The physiological condition is assessed by inspecting the stem, branches and foliage for symptoms of disease. The overall vigour of the tree is also taken into account.

Where significant defects are observed, recommendations are made according to a scale of priority in order to reduce the likelihood of structural failure. The position of the tree and its potential targets are taken into account.

Measurements are obtained using a diameter tape, clinometer, distometer and loggers tape.

Where this is not practical measurements are estimated.

Some trees are surveyed as groups, though this is usually avoided close to areas likely to be developed.

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Appendix 3: Site Location

Image plate showing satellite mapping of the surveyed plot and surrounding area.

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Appendix 4: Arboricultural Data Tables

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Tree Number	Species	Age Class	DBH	Height (crown height)	N	E	S	W	Condition	Life Expectancy	Physical Description	Comments	Managment Recommendations	RPA offset from stem.	Category Rating
T1	Tilia platyphyllos (Large-leaved Lime)	M	600	15(1)	2.5	2.5	2.5	2.5	Fair	20+	Epicormics on stem. Branches encroaching upon building; have been reduced heavily in the past	Covered in epicormic growth.	Remove epicormic growth. Crown reduction to prevent branches encroaching upon adjacent building.	7.2	B1
T2	Tilia platyphyllos (Large-leaved Lime)	M	650	10(3)	3	3	3	3	Fair	20+	Epicormics on stem. Branches encroaching upon building; have been reduced heavily in the past	Covered in epicormic growth.	Remove epicormic growth. Crown reduction to prevent branches encroaching upon adjacent building.	7.8	B1
T3	Cedrus libani atlantica (Atlantic Cedar)	M	400	6(2)	3	3	3	3	Fair	<10	Heavy unsympathetic pruning in the past; has been topped	Poor pruning has reduced useful life expectancy	Limited long term prospects due to pruning work	4.8	C1
H4	X Cupressocyparis leylandii (Leyland Cypress)	EM	00,250,10	5(2)	1	1	1	1	Poor	<10	Declining. Unable to inspect stem due to undergrowth. Stem divides below 1.5m. Stem divides above 1.5m. Broken branches in crown. Low branches over road/footpath.	Heavily side pruned and will not recover	Fell	5.69	C2
T5	Betula pendula (Silver Birch)	EM	100	5(2)	2	2	2	2	Fair	20+	Young tree showing good structure, form and vitality	Young and formaly planted	Formative pruning.	1.2	B1
G6	X Cupressocyparis leylandii (Leyland Cypress)	M	250	4(2)	1	1	1	1	Poor	10+	Poor shape & form. Declining. Ivy on tree.	Heavily side pruned and will not recover	Limited long term prospects.	3	C2
T7	Tilia platyphyllos (Large-leaved Lime)	M	650	11(2)	4	4	4	4	Fair	20+	Poor shape & form. Stem divides at ground level. Stem divides below 1.5m. Multiple stems at ground level. Multiple stems below 1.5m. Low branches over road/footpath. Branches encroaching upon building.	Located close to built footprint.	Formative pruning. Crown raise to 3m. Crown reduction to prevent branches from encroaching upon adjacent building.	7.8	B1

Arboricultural Data Tables Terms

Tree Number	Reference number (T1, T2 etc for trees / G1, G2 etc for tree groups / H1, H2 etc for hedgerows)
Species	Common name
Height	Height of tree to the nearest metre
DBH	Diameter of stem (mm) at breast height (1.5 metres above ground)
RPA radius (m)	The radial measurement of the Root Protection Area in metres indicating the minimum distance from the centre of the trees stem to the recommended position of the protective (Heras) fencing.
RPA (m2)	The Root Protection Area, measured in square metres. This measurement is directly proportional to and calculated from the trees DBH measurement as specified in section 4.6 of BS 5837 (2012) Trees in relation to design, demolition and construction – Recommendations.
Crown Spread	The maximum spread of the trees canopy measured from the stem in four directions (North, East, South, West)
Age class	The estimated age class of the tree (relative to species) o Y - Young o SM - Semi-mature o EM - Early-mature o M - Mature o LM - Late-mature
Comments	A brief description of the tree which refers to tree form, condition, health and significant defects. Comments regarding environmental conditions affecting the tree (e.g. ground conditions) will also be included where relevant.
Preliminary management recommendations	Recommendations (made with respect to the development proposals if available) for removal, retention and/or remedial arboricultural works.
Estimated remaining years	Estimated safe, usable life expectancy
Category grade	Tree categorisation based on section 4.5 of BS 5837 (2012) Trees in relation to design, demolition and construction – Recommendations. Four categories are used (A, B, C, U) with categories A, B & C being assigned one of three separate sub categories (1, 2 or 3): **A** – Trees of high quality with an estimated remaining life expectancy of at least 40 years. **B** – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. **C** – Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm **Subcategories: 1:** Mainly arboricultural & aesthetic qualities **2:** Mainly landscape qualities **3:** Mainly cultural values, including conservation **U** – Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

General Notes
Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.
Depictions of tree canopies are based on measurements taken to four cardinal compass points.
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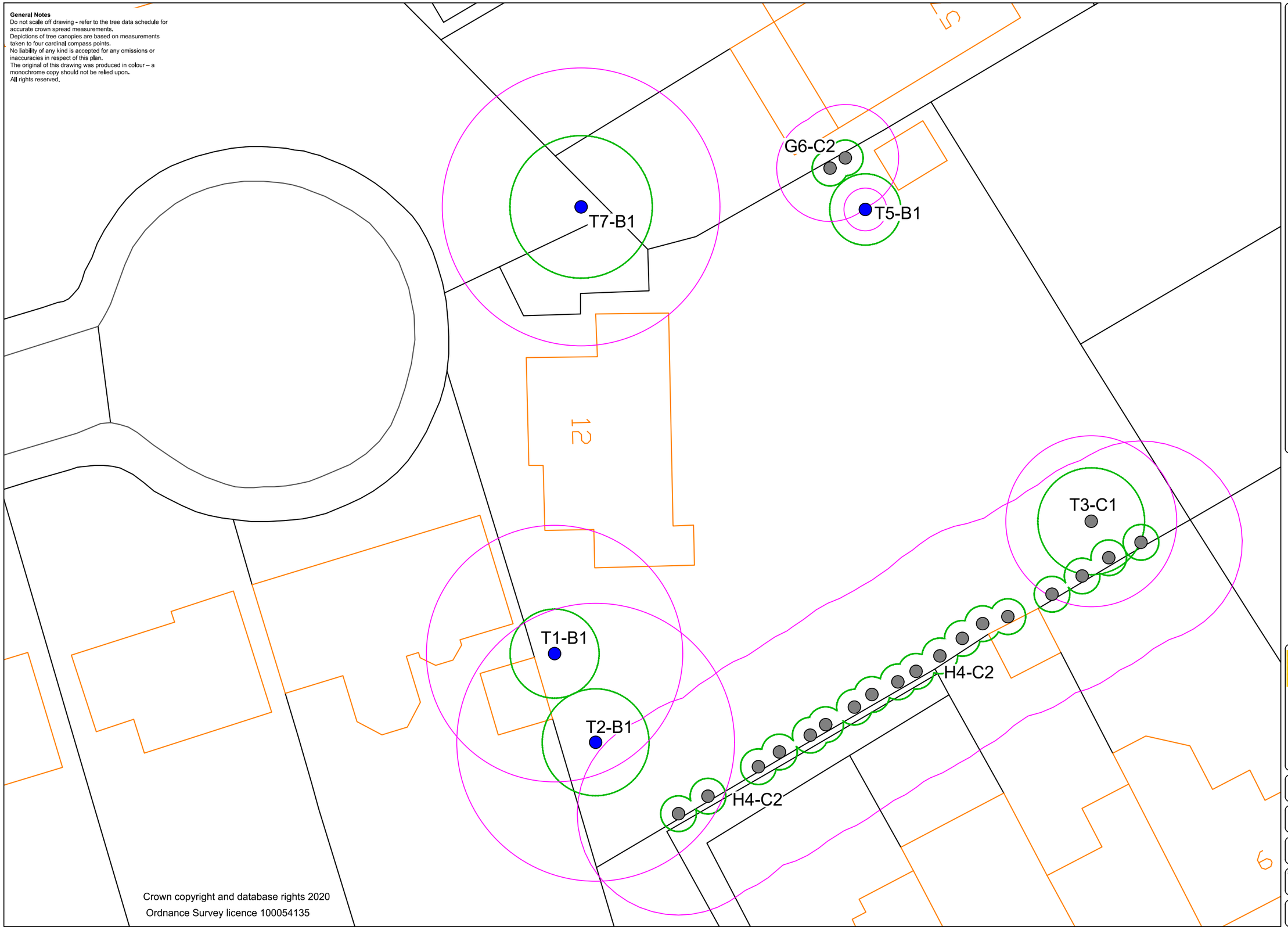

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Tree Constraints Plan showing existing layout with tree categories and root protection zones.

BS5837:2012 Tree Categories

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

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

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

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

BS 5837:2012 Root Protection Area
Note: The RPA limits for some groups may be represented by a dashed/hatched category coloured line.

Tree
Showing Canopy extents, category colour, tag number (with category) and optional indication arrow showing bearing of first significant branch.

Tree/Group/Hedge numbering: 1-7.

N

1:200
0 2 4 6m

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Drawing Title	Tree Constraints Plan
Scale	1:200@A3
Date	Sept 2020
DB	CS
CB	MH
Drawing Number	20_5837_09_28
Rev	1

GROUND BOARDING

New temporary ground protection should be capable of supporting and traffic entering or using the site without being distorted or causing compaction of underlying soil.

Ground protection might comprise one of the following:

1) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression resistant layer (e.g. 100mm depth of woodchip) laid onto a geotextile membrane;
2)for pedestrian operated plant up to a gross weight of 2t, proprietary inter-linked ground protection boards placed on top of a compression resistant layer (e.g. 150mm depth of woodchip), laid onto a geotextile membrane;
3) for wheeled or tracked construction traffic exceeding 2t gross weight (such as a mini-pile rig), an alternative system (e.g. proprietary system or pre-cast reinforced slabs) to an engineering specification designed in conjunction with the ACoW to accommodate the likely loading to which the ground could be subjected.

MANUAL EXCAVATION

Excavation within the RPAs will be initially undertaken by hand under direct on-site arboricultural supervision to a minimum of 750mm deep of any excavation, whether for proposed foundations, hard surfacing or underground services. The soil is to be loosened with the use of a fork or pick and then cleared with the aid of an air-spade and air-vac. All roots to be cut will be cleanly severed with the use of a hand saw or be covered with damp hessian to prevent drying out and where necessary shuttered to prevent soil collapse or contamination by concrete. If appropriate soil beneath the depth of 750mm may be sheet piled or individual piles. Any deeper excavations may be undertaken by a machine provided it works outwith of the RPA's or has appropriate ground protection in place to work from.

HARD SURFACE REMOVAL

Removal of and or replacement of hard surfacing situated either partially or completely within the RPAs of retained trees shall be undertaken with care and under the direct on-site arboricultural supervision as these areas are likely to contain roots.
Where this is necessary the wearing course will be broken up using a hand held pneumatic breaker, hand tools and a wheel barrow.
If it is necessary to remove the sub-base this is to be undertaken using hand tools such as a fork to loosen the material and removed using shovels and wheel barrows.
In some situations and at the discretion of the ACoW it may be possible to use an excavator fitted with a hydraulic breaker and suitably sized toothless bucket. If an excavator is used it must be situated outside the RPAs on top of hard surfacing or on ground protection boarding. Whichever system is utilized, there is to be NO disturbance of the soil beneath. If roots are encountered, they are to be covered with damp hessian and a layer of either sharp sand, woodchip or top soil to prevent dessication.

ARBORICULTURAL SUPERVISION

The erection of tree protection fencing should be signed off by the ACoW before any works commence on site.

A precautionery approach should be adopted when removing the hardsurface for the southern extension.

If any roots are encountered then guidance should be sought from the project ACoW.

General Notes
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Figure 2 Default specification for protective barrier

Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights 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

The Ground Guards temporary road system can be used on construction sites to protect virgin ground from erosion and damage by construction vehicles. Ground-Guards are usually installed as a construction 'haul' roadway consisting of a parallel track of 2.4m x 1.2m panels with a 1.2m space in between. Where a temporary 'haul' roadway must pass near to trees, the following extra precautions must be taken in order to spread the loading applied to the track way:

1. Edge rails of 200 x 50mm sawn timber or un-treated sleepers should be installed where the track way will pass over exposed retained tree RPA's. These should be installed on either side of the track way using either 50x50x500mm timber stakes of 500mm steel pins at 1.5m spacings.
2. A layer of geotextile membrane should then be laid over the area of ground to have the track way installed upon it.
3. A base layer of Ground Guards should be laid over the top of the geotextile membrane at least three boards wide between the installed timber edging.
4. A minimum layer of at least 150mm deep coarse, preferably green wood chippings should be laid as a compressible layer over the top of the Ground Guards.
5. The twin surface Ground Guard track way can then be laid over the top of the wood chippings

200X50 timber rails
50X50X500 timber stakes
Geotextile Membrane
Base layer of Ground-Guards
Wood Chippings
Ground-Guard Trackway

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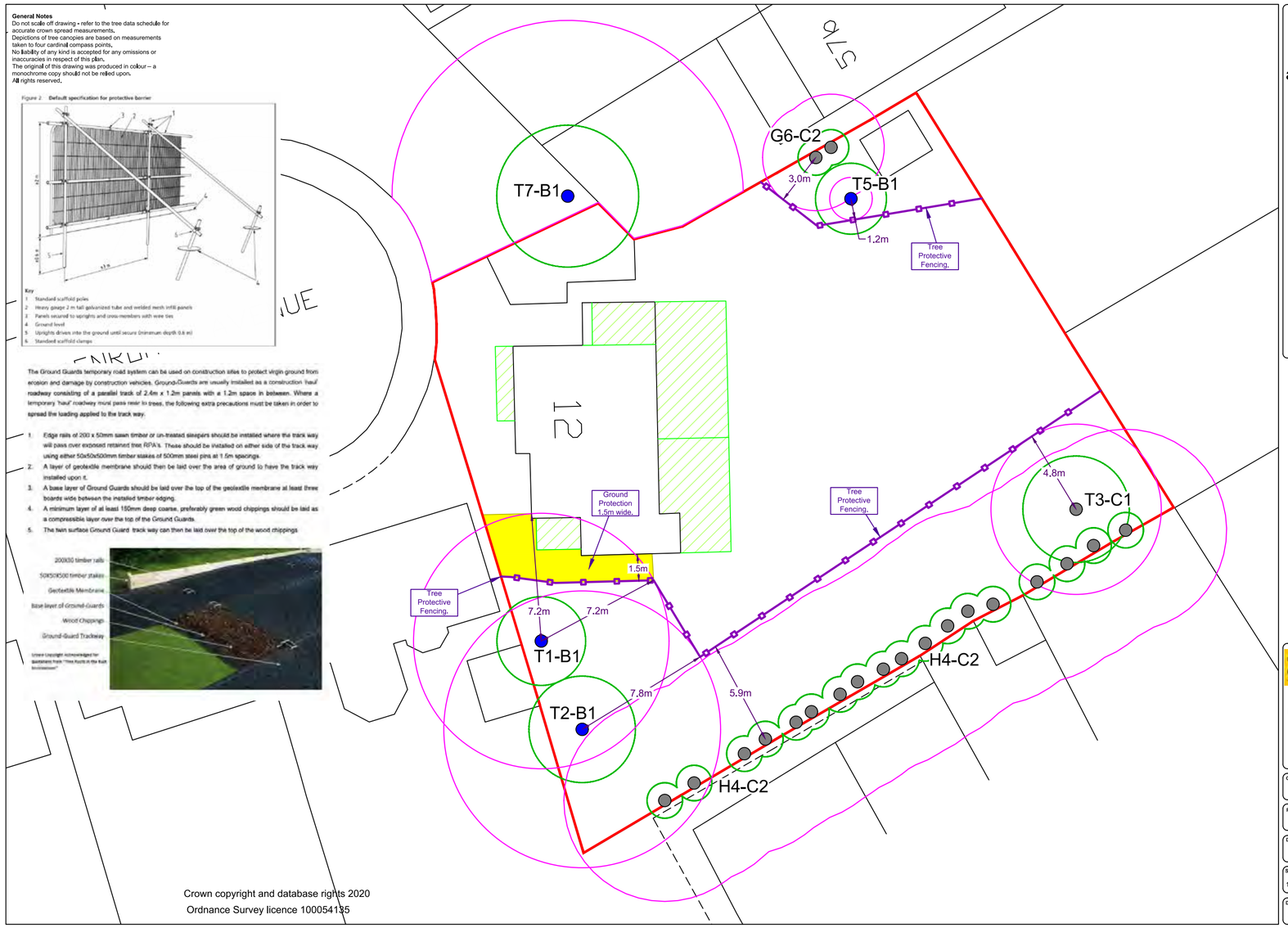

Tree Protection Plan showing proposed layout with trees and arboricultural controls.

Key

- Tree — Showing category colour and tag number with category. (T35-B)
- Tree Root Protection Area — Shown where applicable.
- Tree Protective Fencing
- Ground Protection

Tree/Group/Hedge numbering: 1-7.

N

1:200
0 2 4 6m

TREE WORK SCHEDULE

All tres to be retained and protected behind tree protection fencing to the specification in Figure 2 OR through the use of HERAS panel fencing that shall be braced.

FOUNDATIONS WITHIN RPAs

The southern foundations sit within the radial RPA of tree T1 and a precautionery approach is to be adopted.

It is not anticipated any root mass will be within this area but the hard surface must be lifted by hand.

Information contained herein is compliant with BS5837 2012 Section 7.5

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