HAYDEN'S
Arboricultural Consultants

# Tree Survey, Arboricultural Implication Assessment Arboricultural Method Statement & Tree Protection Plan In Accordance with BS 5837:2012

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| Proj. No **11003** | **Hanover & Princess Court, Bentinck Street, Cambridge, CB2 1HG** | | |
| Client: | | Hill Holdings Ltd | |
| Date of Report: | 14/10//2025 | Revision: | Original |

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# *Tree Survey, Arboricultural Impact Assessment, Arboricultural Method Statement & Tree Protection Plan – In Accordance with BS 5837:2012*

## Summary

The purpose of this report is to provide a consideration of the arboricultural implications created by the proposed development. In accordance with the feasibility and planning sections of BS5837:2012 *"Trees in relation to design, demolition and construction – Recommendations"*, trees deemed to be within the influencing distance of the projected construction have been evaluated for quality, longevity, and initial maintenance requirements. Where trees do not have to be removed for health and safety reasons, a detailed and objective assessment has been made of the consequences of the intended layout.

In this circumstance it is intended to demolish the existing buildings and erect five new apartment buildings comprising 165 new homes, new community room, landscaping, parking and associated works. As a result, seventeen individual trees and five groups of trees were inspected. The arboricultural related implications of the proposal are as follows:

1 It is necessary to fell two groups of trees and nine individual trees to achieve the proposed layout.

2 One tree has been identified for removal irrespective of any development proposals due to poor condition.

3 The alignment of new structures does not encroach within the Root Protection Areas of any trees that are to be retained. In view of this, and as assessed in accordance with BS5837:2012, no specialist foundation designs, or construction techniques will be required to prevent damage to tree roots. Specialist foundations may still be required for other reasons, including mitigating the influencing distance of tree roots, subject to expert advice from a structural engineer.

4 The construction of new hard surfacing encroaches within the Root Protection Area of one individual tree to be retained but given the use of modern "no dig" construction techniques this is not considered to be a substantial issue.

5 The removal of existing hard surfacing and associated kerb edges encroaches within the Root Protection Area of one individual tree to be retained

6 It is proposed to construct replacement hard surfaces within the Root Protection Area of two groups of trees and one individual tree to be retained. In this situation hard surfacing already exists. If the process involves top dressing the existing surface there will be no implications for the retained trees. However, if the proposal involves removing the existing hard surface, this must be completed under arboricultural supervision and by hand, or with appropriate lightweight machinery. The new hard surfacing must be of similar construction to that which has been removed to prevent any adverse impact on the RPA, and must include a barrier of sharp sand if roots are exposed during the lifting of the original surface

7 This report recommends that specialist advice is obtained by expert practitioners in other disciplines. Such input should always be sought prior to the submission of this report in support of a planning application to demonstrate that the techniques and methods hereby proposed are achievable. In this circumstance it is necessary to contact the following:

Structural Engineer (foundation design and impact on neighbouring structures, item 4.4.1)
Civil Engineer (“no dig” surfacing, item 4.4.3)

8 All trees and landscape features that are to remain as part of the development should suffer no structural damage provided that the findings with this report are complied with in full. This includes ensuring that protective fencing is erected as detailed at items 4.6 and 5.1 of this report.

# Contact Details

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# Contents

# 1.0 Introduction

## 1.1 Terms of Reference

1.1.1 Hayden's Arboricultural Consultants Limited has been commissioned by Cambridge Investment Partnership to prepare a Tree Survey, Arboricultural Impact Assessment, Arboricultural Method Statement and Tree Protection Plan for the existing trees at Hanover & Princess Court, Bentinck Street, Cambridge, CB2 1HG**.**

1.1.2 The site survey was carried out on the 18/03/2025. The relevant qualitative tree data was recorded to assess the condition of the existing trees, their constraints upon the prospective development and the necessary protection and construction specifications required to allow their retention as a sustainable and integral part of the completed development.

1.1.3 Information is given on condition, age, size and indicative positioning of all the trees, both on and affecting the site. This is in accordance with the British Standard 5837:2012 *Trees in relation to design, demolition and construction - Recommendations.*

## 1.2 Scope of Works

1.2.1 The survey of the trees and any other factors are of a preliminary nature. The trees were inspected based on the Visual Tree Assessment (VTA) method as developed by Mattheck and Breloer (1994). The trees were inspected from ground level with no climbing inspections undertaken. It is not always possible to access every tree and as such some measurements may have to be estimated. Trees with estimated measurements are highlighted in the schedule of trees. No samples have been removed from the site for analysis. The survey does not cover the arrangements that may be required in connection with the removal of existing underground services.

1.2.2 Whilst this is an arboricultural report, comments relating to non arboricultural matters are given, such as built structures and soil data. Any opinion thus expressed should be viewed as provisional and confirmation from an appropriately qualified professional sought. Such points are clearly identified within the body of the report.

1.2.3 An intrinsic part of tree inspection in relation to development is the assessment of risk associated with trees near persons and property. Most human activities involve a degree of risk with such risks being commonly accepted, if the associated benefits are perceived to be commensurate. In general, the risk relating to trees tends to increase with the age of the trees concerned, as do the benefits. It will be deemed to be accepted by the client that the formulation of the recommendations for all tree management will be guided by the cost-benefit analysis (in terms of amenity), of the tree work.

## 1.3 Documentation

1.3.1 The following documentation was provided prior to the commencement of the production of this report;

Definition of site boundary, description of requirements/deadlines.
Topographical survey.
Proposed site layout (Based on "0004UK_HPC_Basefile,dwg").

# 2.0 The Site

## 2.1 Overview

2.1.1 The site is a square of land framed by Union Road to the north, George IV Street to the east, Coronation Street to the south and Bentinck Street to the west. The site contains two apartment buildings known as Hanover Court and Princes Court, plus a garage block extending across the northern width of the site.

## 2.2 Soils

2.2.1 The soils type commonly associated with this site are freely draining lime-rich loams. They are of moderate fertility and mainly support herb-rich chalk and limestone pastures, and lime-rich deciduous woodland type habitats. This soil type constitutes approximately 3.7% the total English land mass.

2.2.2 The data given was obtained from a desk top study which provides indications of likely soil types. This information is not comprehensive and therefore any decisions taken with regards the management, usage or construction on site should be based on a detailed soil analysis.

2.2.3 Further to item 2.2.2, this report provides no information on soil shrinkability. It may be necessary for practitioners in other disciplines (e.g. engineers considering foundation design) to obtain this data as required.

## 2.3 Statutory Tree Protection

### 2.3.1 Tree Preservation Order(s)

The local planning authority Cambridge City Council have deemed it appropriate to provide statutory protection to trees neighbouring this site through the serving of a Tree Preservation Order (TPO), Ref no 177 02/2020. The effect of this on the owners, managers or any persons wishing to undertake work on preserved trees is to require them to obtain written permission from Cambridge City Council prior to actioning any surgery or felling etc. The purpose of this process is to try to ensure that the works are appropriate, proportionate, and in keeping with the long-term aims of the TPO (as expressed in the original TPO statement) but, given that trees are living organisms, and the locality within which they are set is liable to change, it is often the case that local planning authority decisions relating to TPO applications require regular review to reflect the current situation rather than the historical perspective of the original date of protection.

There are certain circumstances where written permission from the local planning authority may not be necessary before undertaking works. These include;

Making a tree safe if it is an imminent threat to people or property.
Removing dead wood, or a dead tree.

Owners, managers or any persons wishing to undertake work as an exemption to the written permission process **are required** to provide the local planning authority with 5 days' notice prior to attending to a tree which they deem as being dead or dangerous, unless such works are required in an emergency.

It is the tree owner's responsibility to provide proof that the tree was indeed dead or dangerous should this exception be challenged; hence, it is advisable always to request an inspection by the Local Planning Authority prior to carrying out such operations. Furthermore, and even in the event of an emergency, there is still a duty to notify the local planning authority that work has been completed including supplying an explanation of the necessity. Failure to comply with the requirements of TPO legislation can lead to a maximum fine of up to £20,000 per tree in the Magistrates Court. Fines in the Crown Court are unlimited.

NB: If **detailed planning permission** is granted and as part of the relevant approval, works (felling or surgery) to trees protected by a TPO are agreed as acceptable by the local planning authority, no **additional** written permission to proceed will be required provided that (i) the planning permission remains live, (ii) the works are in strict accordance with the specification of the extant planning permission, and (iii) the works are being completed solely to implement the detailed planning permission.

This information was sourced using the Local Planning Authority's Online Mapping System (as instructed by them) and to our best knowledge was current and accurate at the time the information was accessed. We would advise it prudent that before any tree work commences, this is checked directly with the Local Planning Authority to confirm that their online mapping system is definitive.

### 2.3.2 Conservation Area

The site is located within a locality specifically identified by Cambridge City Council as a "Conservation Area". This is a planning designation that seeks to provide control over the built environment, but which also has provision for tree protection. The effect of this on the owners, managers or any persons wishing to undertake work on trees sited within a Conservation Area is to require them to submit 6 weeks written notice detailing the surgery or felling they plan to undertake. No work may be carried during the 6-week period unless written permission has been received from Cambridge City Council. The local Planning authority can only prevent works notified to them within the 6-week period by serving a Tree Preservation Order. If this happens, the owner of the tree has a right to object to the serving of the order.

There are certain circumstances where written permission from the local planning authority may not be necessary before undertaking works. These include;

Making a tree safe if it is an imminent threat to people or property.
Removing dead wood, or a dead tree.
Trees with stem diameters of less than 75mm (measured at 1.5m from ground level). If the works being carried out are to help promote the growth of other trees then trees with stem diameters of less than 100mm (at 1.5m) may be removed or pruned.

Owners, managers or any persons wishing to undertake work as an exemption to the written notification process are **required** to provide the local planning authority with 5 days' notice prior to attending to a tree which they deem as being dead or dangerous; unless such works are required in an emergency. It is the tree owner's responsibility to provide proof that the tree was indeed dead or dangerous should this exception be challenged; hence, it is advisable always to request an inspection by the Local Planning Authority prior to carrying out such operations.

Furthermore, and even in the event of an emergency, there is still a duty to notify the local planning authority that work has been completed including supplying an explanation of the necessity. Failure to comply with the requirements of Conservation Area legislation can lead to a maximum fine of up to £20,000 per tree in the Magistrates Court. Fines in the Crown Court are unlimited.

NB: If **detailed planning permission** is granted and as part of the relevant approval, works (felling or surgery) to trees located within a Conservation Area are agreed as acceptable by the local planning authority, no **additional** written permission to proceed will be required provided that (i) the planning permission remains live, (ii) the works are in strict accordance with the specification of the extant planning permission, and (iii) the works are being completed solely to implement the detailed planning permission.

This information was sourced using the Local Planning Authority's Online Mapping System (as instructed by them) and to our best knowledge was current and accurate at the time the information was accessed. We would advise it prudent that before any tree work commences, this is checked directly with the Local Planning Authority to confirm that their online mapping system is definitive.

### 2.3.3 Felling Licence

All trees within the United Kingdom are protected under the Forestry Acts. In All trees within the United Kingdom maybe subject to protections under the Forestry Acts (principally the Forestry Act 1967). In general, anyone felling more than 5 cubic metres of timber in any calendar quarter requires a Felling Licence from the Forestry Commission. There are exemptions however and these are as follows:-

A Felling Licence is not required in the following instances:

To fell trees in a garden, an orchard, a churchyard, or a designated open space (Commons Act 1899 and Section 9 of the Forestry Act 1967).
To carry out surgery operations such as pruning, reduction, dead wooding or pollarding.
To fell less than 5 cubic metres in a calendar quarter. (Please note that not more than 2 cubic metres in a calendar quarter may be sold).
To fell trees that are 8 centimetres or less in diameter when measured 1.3 metres from the ground. Trees removed for thinning may have a diameter of up to 10 centimetres and trees managed under a coppice regime may have a diameter of up to 15 centimetres.
To fell trees previously approved for removal under a Dedication Scheme, or where Detailed Planning Permission has been granted.
To fell trees to prevent danger or abate a legal nuisance.
To fell trees in compliance with any obligation imposed by or under an Act of Parliament.
To fell trees at the request of an electricity operator, because the trees are or will be in such close proximity to installed or about to be installed electric line or electrical plant in accordance with paragraph 9(1)(a) or (b) of Schedule 4 to the Electricity Act 1989.

Substantial fines exist for not complying with the requirements of a Felling Licence.

# 3.0 Tree Survey

3.1 As part of this survey a total of seventeen individual trees and five groups of trees have been identified. These have been numbered T001 – T017 and G001 – G005 respectively.

3.2 A topographical survey was provided which showed the position of the trees on site. It should be noted however that topographical surveys are not always comprehensive and sometimes it is considered appropriate to record details of trees and landscape features omitted from or beyond the scope of the plan. If this circumstance occurs, the location of the individual tree or landscape feature is estimated. The position of each tree is shown on the attached drawing no. 11003-D-AIA.

3.3 In order to provide a systematic, consistent and transparent evaluation of the trees included within this survey, they have been assessed and categorised in accordance with the method detailed in item 4.3 of *BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations"*. For further information, please see the attached Explanatory Notes.

3.4 The detailed assessment of each tree and its work requirements with priorities are listed in the attached Schedule of Trees.

3.5 Several items would benefit from tree surgery or additional investigation, be it for health and safety, cultural, aesthetic, or structural reasons as detailed in the attached Schedule of Trees. Including the trees recommended for felling, the items requiring the **most urgent** intervention are as follows:

As soon as possible:

| | |
|---|---|
| G002 | Undertake aerial inspection. Remove major deadwood over path. |
| T003 | Undertake decay analysis (Picus Tomograph/Micro-drill). |
| T005 | Fell and remove stump. |

3.6 In accordance with item 4.2.4 (c) of BS 5837:2012, the items inspected and detailed within this report have been selected for inclusion due to the likely influence of any proposed development on the trees, rather than strictly adhering to the curtilage of the site. However, it must be understood that there may be trees beyond the site and not included in this survey which may exert an influence on the development. Where works for cultural, health and safety, quality of life, or development purposes have been recommended on trees outside the ownership of the site, these can only progress with the agreement of the owner, except where it involves portions of the trees overhanging the boundary.

# 4.0 Arboricultural Impact Assessment

## 4.1 The Proposal

4.1.1 It is proposed to demolish the existing buildings and erect five new apartment buildings comprising 165 new homes, new community room, landscaping, parking and associated works.

## 4.2 Access

4.2.1 Details of Demolition and Construction Access are yet to be finalised. If possible, the demolition and construction access points and routes should be located outside the crown spread and Root Protection Areas of retained trees. Existing hard surfaced access points or routes may be used provided that the existing hard surfacing is suitably robust as to act as a form of root protection. Once further details become available, a detailed appraisal of the arboricultural implications will be required.

## 4.3 Demolition

4.3.1 It is understood that a detailed Demolition Management Plan is in production but has not yet been finalised. Tree retention and removal have been informed by the scale and footprint of the structures to be demolished, as well as the required working space. Trees to be retained will be protected using temporary protective fencing and ground protection measures, installed, phased and adjusted in line with the Demolition Management Plan. Once further details become available, a detailed appraisal of the arboricultural implications will be required.

4.3.2 Existing hard surfacing is to be broken up and removed from the RPA of the following retained trees – G002, G003, T003, T004 and T010. The hard surfaces and edges within the theoretical RPA must be broken out with extreme care, either manually or with a breaker and small mini digger (operating outside the RPA, or on the temporary load bearing surface), and under Arboricultural supervision. If possible, the existing hard surfaces should be retained until they may be removed and replaced in successive phases of works, to prevent a long period of time elapsing with the potential for exposed tree roots, and to reduce the potential for rutting or compaction of the soft earth and tree roots below the removed hard surfacing. If portions of the RPA covered by existing hard surfacing are to be returned to soft earth, this must coincide with a phase of development that allows the full RPA to be enclosed by temporary protective fencing, or alternatively, allows for a large portion of the RPA to be enclosed by protective fencing and the remaining RPA covered by a temporary ground protection measure.

## 4.4 Construction

4.4.1 Construction of foundations or structural supports do not encroach within the Root Protection Area (RPA) of any trees to be retained. Therefore, from an arboricultural perspective, no specialised construction or foundation techniques will be required to protect tree roots. However, dependent on the soil type, species and topography, trees may have an influence on the soil beyond their calculated RPA. Given the proximity of the proposed construction to the trees to be retained, it is recommended that a Structural Engineer is consulted to assess the implications of the tree retention on the required foundation design.

4.4.2 Installation of new hard surfaces encroach within the RPA of the following item to be retained – T009. Provided that these work with finished levels and required load bearings without cutting into the ground, the surfaces should be attended to using “no dig” construction methods. In the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden’s Arboricultural Consultants will supply a sample design of “no dig” surfacing. However, the exact specification (adhering to the principles of the sample design) must be designed by a Civil Engineer who can confirm that the finished levels and load bearings are achievable with this type of design without cutting into the ground. It is anticipated that the installation of the hard surfaces will take place upon completion of the construction of the new apartment buildings, with protective fencing sited to the edge of the RPA until the time that the hard surfacing installation works commence.

4.4.3 It is proposed to construct replacement hard surfaces in the RPA of G002, G003 and T003. In this situation hard surfacing already exists. If the process involves top dressing the existing surface there will be no implications for the retained trees. However, if the proposal involves removing the existing hard surface and concrete kerb edges, this must be completed under arboricultural supervision and by hand, or with appropriate lightweight machinery. The new hard surfacing must be of the same or lesser construction depth to that which has been removed to prevent any adverse impact on underlying tree roots and must include a barrier/buffer of soft material if roots are exposed during the lifting of the original surface.

## 4.5 Requirement for Tree Barrier Fencing

4.5.1 Prior to the commencement of the phases of demolition and construction and immediately after the completion of the necessary tree surgery and felling work, protective fencing will be erected on site. This must be fit for purpose (including any ground protection if necessary) in full accordance with the requirements of BS 5837:2012 and positioned as shown on the attached Arboricultural Impact Assessment & Tree Protection drawing.

## 4.6 Compound

4.6.1 The site provides limited internal space to locate a construction compound outside the RPA of any trees that are to be retained. As such the project will require careful phasing to manage the storage of materials.

## 4.7 Phasing

4.7.1 The proposal involves the integration of several complex aspects that affect tree protection (e.g. – but not exclusively – access, movement of materials and the installation of services). For this reason, the project must be carefully phased to ensure the highest level of protection for retained trees. Shown on drawing 11003-D-AIA is an in-depth phasing recommendation to cover the major operations on site as they affect retained trees.

## 4.8 Monitoring

4.8.1 The proposal involves the integration of several complex aspects that affect tree protection (e.g. – but not exclusively – access, movement of materials and the installation of services). For this reason, the project must be carefully phased to ensure the highest level of protection for retained trees. As part of the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden’s Arboricultural Consultants will produce an in-depth phasing recommendation to cover the major operations on site as they affect retained trees.

## 4.9 Tree Surgery to Facilitate Proposed Development

4.9.1 In order to enable the proposed development it will be necessary to undertake the following tree surgery works to retained trees: -

| Feature No | Description of Works Required | BS Category* |
|---|---|---|
| T009 | Crown lift on the northern aspect to provide 5m ground clearance over the refuse access. | B |

## 4.10 Landscape Implications

4.10.1 In addition to one tree (T005) necessitating removal for health and safety, cultural or quality of life reasons, (as detailed in the attached Schedule of Works - Irrespective of Development) the items listed in the table below require felling to permit the proposed development to proceed: -

| Feature No | Reason for Removal | BS Category* | Visual Amenity Assessment* |
|---|---|---|---|
| G004 | Within the necessary construction space of a new apartment block | B | High |
| G005 | Cumulative impacts of demolition, construction and the removal and replacement of underground services | A | High |
| T001 | Within the footprint of a new apartment block | C | Low |
| T002 | Within the necessary construction space of a new apartment block | B | High |
| T011 | Within the necessary construction space of two new apartment blocks | B | Moderate |
| T012 | Within the necessary construction space of two new apartment blocks | B | Moderate |
| T013 | Within the necessary construction space of two new apartment blocks | B | Moderate |
| T014 | Within the footprint of new footpaths | C | Moderate |
| T015 | Within the footprint of new footpaths | C | Low |
| T016 | Within the footprint of new footpaths | C | Moderate |
| T017 | Within the necessary construction space of a new apartment block | B | Moderate |

* Please see definitions in the Explanatory Notes attached to this report.

## 4.11 Post Development Implications

4.11.1 It is understood that the proposed development will be supplemented by a robust landscaping plan, including new tree planting.

4.11.2 Due to the dynamic nature of trees and their interaction with the environment, their health and structural integrity is liable to change over time. Because of this it is recommended that all trees on or adjacent to the site be inspected on an annual basis.

# 5.0 Design Advice, Arboricultural Method Statement & Tree Protection Plan

## 5.1 Securing of Tree Structure and Root Protection Areas (RPA)

5.1.1 The trees to be retained will be protected using stout barrier fencing erected in the positions indicated on the attached Arboricultural Impact Assessment & Tree Protection drawing no. 11003-D-AIA. This fencing will be in accordance with the requirements of BS 5837:2012 including any necessary ground protection.

5.1.2 All fencing provided for the safeguarding of trees will be erected prior to any demolition or development commencing on the site, therefore ensuring the maximum protection. This fencing, which must have all weather notices attached stating “Construction Exclusion Zone – No Access” will be regarded as sacrosanct and, once erected, will not be removed or altered without the prior consent of the Local Planning Authority.

5.1.3 Where footpaths, access drives, or parking bays are constructed within the RPA of retained trees, careful attention will be paid to the type of surface treatment used in these areas, details of which are given in item 5.8, below. If possible, these should be installed as a final phase of the project, thereby protecting the RPA throughout the major construction phase of the proposed development.

5.1.4 Where fencing is impractical, consideration must be given to other forms of effective above ground tree structure protection. An example of this would be a combination of Barksavers to secure the stems and a temporary load bearing surface to shield the ground.

## 5.2 Location of Site Office, Compound and Parking

5.2.1 The position of the office, compound and parking will be agreed in writing with the Local Planning Authority prior to commencement of any permitted development works. Any proposed re-location of these items through the various phases of development will be agreed prior to re-siting with the Local Planning Authority.

## 5.3 On Site Storage of Spoil and Building Materials

5.3.1 Prior to and during all construction works on site, no spoil or construction materials will be stored within the RPA of any tree on, or adjacent to the site, even if the proposed development is to be within the RPA. This is to reduce to a minimum the compaction of the roots of the trees. Details of the RPA for each tree where no spoil or building materials will be stored are indicated on the attached Arboricultural Impact Assessment & Tree Protection drawing no. 11003-D-AIA. Any encroachment within this protected area will only be with the prior agreement of the Local Planning Authority.

5.3.2 Any facilities for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bund compound shall be at least equivalent to the capacity of the tank plus 10%. If there is a multiple tankage, the compound shall be at least equivalent to the capacity of the largest tank, or the combined capacity of interconnected tanks, plus 10%. All filling points, vents, gauges and sight glasses shall be located within the bund. The drainage system of the bund shall be sealed with no discharge to any watercourse, land or underground strata. Associated pipework shall be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets shall be detailed to discharge downwards into the bund.

5.3.3 All material storage facilities and work areas must consider the effects of sloping ground on the movement of potentially harmful liquid spillages towards or into protected areas.

## 5.4 Programme of Works

5.4.1 All tree surgery works, once approved by the Local Planning Authority, will be carried out prior to any other site works. Once completed, the proposed protective fencing will be erected along the lines indicated above. All of this will be carried out prior to commencement of any development works on the site. Outline details of the proposed programme are given in the Design and Construction and Tree Care flow chart attached (Appendix G-1).

## 5.5 Tree Surgery

5.5.1 All tree work will be agreed with the Local Planning Authority and will be carried out in line with BS 3998:2010 (Recommendations for Tree Works). An appropriately qualified, experienced and insured arboricultural contractor will carry out the work. Any alterations to the proposed schedule of works will be agreed with the Local Planning Authority prior to commencement of works.

## 5.6 Levels

5.6.1 Other than for any specific exception which may be referred to at item 4.0, no alterations to soil levels within the RPA of retained trees are envisaged. However, if it is necessary for these to occur, appropriate measures must be taken to prevent or minimise any detrimental effects on the affected root systems as detailed in 5.6.2 and 5.6.3 below.

5.6.2 If it is necessary to excavate so close to trees that roots greater than 50mm diameter are likely to be encountered, particular care will be taken to avoid damage. Excavation in these areas will be undertaken by hand or using an air spade, avoiding any damage to the bark. The roots will be surrounded with sharp sand prior to the replacing of any soil or other material in the vicinity.

5.6.3 If it is necessary to raise levels, it is essential that adequate supplies of water and oxygen pass through the soil to the trees' roots. Therefore, where necessary, a granular material will be used which will not inhibit gaseous diffusion. Possible options are no-fines gravel, cobbles or, Type 2 road-stone. All hard surfaces will be of suitable specification to allow such gaseous diffusion, e.g. brick pavers.

## 5.7 Services

5.7.1 At the time of writing this report, no details on proposed services were available. However, the following principles should be adhered to when planning for their installation.

5.7.2 It is proposed that all underground service runs will be placed outside the RPA of the trees on or adjacent to the site. Where it is not possible to do this, the proposed length infringing the RPA will be hand dug 'broken trenches' (NJUG 4 paragraph 4) to ensure the maximum protection of the trees' roots. The trenches may also be excavated using an air spade, or trenchless technology can be employed if this methodology is considered appropriate by the relevant service company (thus allowing services to pass below and through the roots without the need for traditional excavation). If it is necessary to cut any small roots as part of any of these processes, they should be severed in such a way as to ensure that the final wound is as small as possible and free from ragged, torn ends.

5.7.3 All routes for overhead services will aim to avoid the trees. Where this is not possible, any tree work will be agreed prior to commencement with the Local Planning Authority.

5.7.4 All service providers (Statutory Authorities) will be consulted prior to commencement of works with the aim of minimising the number of service runs on the site.

5.7.5 All service runs/trenches where they encroach within the RPA of retained trees will be agreed with the Local Planning Authority prior to commencement of works.

## 5.8 Hard Surface Types & Construction within the Root Protection Area

5.8.1 Where it is necessary to construct footpaths, driveways, non adoptable roads, and other hard surfaces within the RPA as calculated in accordance with BS 5837:2012 (item 4.6.1), it is proposed that the design will comply with the 'no-dig' principles of the Arboricultural Advisory Information Services (AAIS) Practice Note 12 "*Through the Trees to Development*" - the only difference being that instead of a geo-grid, a geo-textile base is provided, and the no-fines road stone is incorporated in and retained by a geo-web cellular confinement system. Given the individual requirements of each site, it is essential that a specialist engineer is consulted to specify the construction detail. Where it is necessary to remove any existing hard surface, or lower the ground level within the RPA, this may expose roots. This operation must be undertaken using hand tools or an air spade. Any roots found should be treated with the greatest care and surrounded by sharp sand to provide a level base. Please note that 'no-dig' surfaces are not always considered acceptable for adoption.

5.8.2 Where it is shown that the construction of a boundary wall or dwelling encroaches within the RPA of a retained tree, the foundations of the wall or dwelling will be designed in such a manner so as to minimise the detrimental effect of the construction on the tree's roots. In these situations, any excavations within the RPA of an affected tree will only be undertaken following exploration of the existing root system with an air spade (or by hand digging if soil conditions preclude) and the necessary root pruning undertaken to allow excavation without unnecessary pulling and tearing of the roots to be retained. This will ensure minimal damage to tree roots where pad and beam or cantilever foundations are considered appropriate. Should a piling rig be required to create piles, any access facilitation pruning or felling necessary to allow access must be undertaken before the commencement of works and only with prior consent of the Local Planning Authority.

5.8.3 If boundary fencing is to be erected within the RPA of retained trees, it is proposed that the fence posts will be secured using "Met-Posts" or similar design to keep the disturbance and damage of the roots of the trees to a minimum.

5.9 **Reporting and Monitoring Procedures**

5.9.1 In accordance with item 6.3 of BS 5837:2012, the site and associated development should be monitored regularly by a competent arboriculturalist to ensure that the arboricultural aspects of the planning permission (e.g. the installation and maintenance of protective measures and the supervision of specialist working techniques) are implemented. Furthermore, regular contact between the Site Manager and the Arboriculturalist allows them to effectively deal with and advise on any tree related problems that may occur during the development process. This system should be auditable. Should any issues arise during the arboricultural monitoring of the development the Arboriculturalist will contact the Local Planning Authority and appropriate action taken only with the prior permission of Hill Holdings Ltd and the Local Planning Authority.

# 6.0 Recommendations

6.1 Tree surgery should be completed as detailed in the Schedule of Trees. Where this has been identified for reasons other than to permit development, this work should be completed within the advised timescales irrespective of any development proposals.

6.2 The tree surgery works proposed as part of this Survey are recommended to mitigate any identified problems that may be caused by trees near the proposed development. To this end, should these recommendations be overruled, this Survey stands as the opinion of Hayden's Arboricultural Consultants Limited, and therefore any damage or injury caused by trees recommended by this practice for felling or tree surgery works, to which the proposed schedule of works has been altered or the tree has been requested to be retained by the Local Planning Authority, cannot be the responsibility of this practice.

# 7.0 Limitations & Qualifications

Tree inspection reports are subject to the following limitations and qualifications.

**General exclusions**

Unless specifically mentioned, the report will only be concerned with above ground inspections. No below ground inspections will be carried out without the prior confirmation from the client that such works should be undertaken.

The validity, accuracy and findings of this report will be directly related to the accuracy of the information made available prior to and during the inspection process. No checking of independent third-party data will be undertaken. Hayden's Arboricultural Consultants Limited will not be responsible for the recommendations within this report where essential data are not made available or are inaccurate.

This report will remain valid for one year from the date of inspection subject to the recommendations specified within being adhered to. It must also be appreciated that recommendations proposed within this report may be superseded by extreme weather, or any other unreasonably foreseeable events.

However, if any additional alterations to the property or soil levels are carried out and/or further tree works undertaken other than specified within the report, it will become invalid and a new tree inspection strongly recommended.

It will be appreciated, and deemed to be accepted by the client and their insurers, that the formulation of the recommendations for the management of trees will be guided by the following: -

1. The need to avoid reasonably foreseeable damage.
2. The arboricultural considerations - tree safety, good arboricultural practice (tree work) and aesthetics.

The client and their insurers are deemed to have accepted the limitation placed on the recommendations by the sources quoted in the attached report. Where sources are limited by time constraints or the client, this may lead to an incomplete quantification of the risk.

**Signed:**

**October 2025…….**
**For and on Behalf of Hayden's Arboricultural Consultants Limited**

# 8.0 References


British Standards Institute. (2010). *Recommendations for Tree Work BS 3998:2010* BSI, London.

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NJUG 4 Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. Issued 16 November 2007.

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Lonsdale, D. (1999). *Research for Amenity Trees No 7: Principles of Tree Hazard Assessment and Management*, HMSO, London.

Strouts, R.G. & Winter, T.G. (1994). *Research for Amenity Trees No.2: Diagnosis of Ill-Health in Trees*. Department of the Environment, HMSO, London.

# 9.0 Appendices

Appendix **A** Species List & Tree Problems

Appendix **B** Schedule of Trees

Appendix **C** Schedule of Works - Irrespective of Development

Appendix **D** Schedule of Works to Allow Development

Appendix **E** Explanatory Notes

Appendix **F** Tree Preservation Order Enquiry/Response

Appendix **G** Advisory Information & Sample Specifications

1. BS 5837:2012 Figure 1 - Flow Chart – Design and Construction & Tree Care
2. European Protected Species and Woodland Operations Checklist (v.4)
3. BS 5837:2012 Figure 2 - Default specification for protective barrier
4. BS 5837:2012 Figure 3 - Examples of above-ground stabilising systems
5. Figure 4 Detail of protective barrier where construction encroaches within BS5837:2012 Root Protection Area
6. Method Statement for 'No Dig' Construction in line with Arboricultural Practice Note 12 '*Through the Trees to Development*'
7. GroundGuards Multitrack Ground Protection
8. Supa-Trac Ground Protection

Appendix **H** Statement of Supervision

Appendix **I** Drawing No 11003-D-AIA

# Appendix A - Species List & Tree Problems

**Species List:**

| | |
|---|---|
| Cherry | *Prunus sp* |
| False Acacia | *Robinia pseudoacacia* |
| London Plane | *Platanus x hispanica* |
| Norway Maple | *Acer platanoides* |
| Pagoda tree | *Styphnolobium japonica* |
| Pine | *Pinus sp* |
| Portugal (Portuguese) Laurel | *Prunus lusitanica* |
| Silver Birch | *Betula pendula* |
| Silver Maple | *Acer saccharinum* |
| Sycamore | *Acer pseudoplatanus* |
| Tibetan Cherry | Prunus serrula |
| Winter Flowering Cherry | *Prunus subhirtella 'Autumnalis'* |

**Tree Problems:**

This gives a brief description of the problems identified in the attached Tree Survey.

| **Name: Deadwood** | |
|---|---|
| **Symptoms/damage type and cause:** | This relates to dead branches in the crown of the tree. In the majority of cases, this is caused by the natural ageing process of the tree or shading due to its close proximity to neighbouring trees. However, in some situations, it may be related to fungal, bacterial or viral infection. |
| **Consequence:** | Depending upon the location and mass of dead wood removal of the affected tissue may be necessary to prevent harm to persons or property as the wood will become unstable as it decays and in some circumstances is likely to fall from the tree with little or no warning. |
| **Control:** | Detailed monitoring should be undertaken on those trees showing signs of excessive deadwood production to identify the underlying cause. |
| **Species affected:** | Most tree species. |
| **Images:** |   |

| **Name:** ***Ganoderma adspersum*** | |
|---|---|
| **Symptoms/damage type and cause:** | Fungus is parasitic and saprophytic, with a perennial bracket typically found low on the stem or close to the roots. The bracket is flat and usually a series of dull grey concentric semi circles for each year of growth. The bracket has a 1-2mm thick crust above the brown internal pore layers. The crust cannot be cracked with a nail. The underside of the bracket is cream/white colour. The perennial nature of the fungus means that the infection is constant and the extent of decay can align with the size of the bracket. It is not uncommon for more than one bracket to be present on a single tree and compounds the effects of the fungus on the host. The spores produced by the fungus are a red-brown colour that can heap up at the base of host trees. |
| **Consequence:** | The fungal pathogen causes white rot in the sapwood and heartwood. The wood becomes soft and prone to tearing or windthrow during high wind events. |
| **Control:** | There is no control for this fungus and it may be necessary to fell the infected tree to prevent it becoming a hazard in the future. |
| **Species affected:** | Broadleaved species |

| **Name:** ***Ganoderma applanatum*** **(Artist's Fungus, *Ganoderma lipsiense*)** | |
|---|---|
| **Symptoms/damage type and cause:** | is parasitic and saprophytic, with a perennial bracket typically found low on the stem or close to the roots. The bracket is flat and usually a series of dull grey concentric semi circles for each year of growth. The bracket has a 1-2mm thick crust above the brown internal pore layers. The crust cannot be cracked with a nail. The underside of the bracket is cream/white colour. The perennial nature of the fungus means that the infection is constant and the extent of decay can align with the size of the bracket. It is not uncommon for more than one bracket to be present on a single tree and compounds the effects of the fungus on the host. The spores produced by the fungus are a red-brown colour that can heap up at the base of host trees. |
| **Consequence:** | The fungal pathogen causes white rot in the sapwood and heartwood. The wood becomes soft and prone to tearing or windthrow during high wind events. |
| **Control:** | There is no control for this fungus and it may be necessary to fell the infected tree to prevent it becoming a hazard in the future. |
| **Species affected:** | Broadleaved species |

| **Name:** ***Pholiota squarrosa*** **(Shaggy Pholiota)** | |
|---|---|
| **Symptoms/damage type and cause:** | Distinctive “shaggy” toadstools are found around the base of the tree (September to November) affecting the lower stem and primary roots. The damage caused is an intense white rot which can lead to hollowing of the stem. |
| **Consequence:** | Decay can become extensive enough to cause failure, however, some trees are able to produce sufficient reactive growth to compensate for any loss of strength. |
| **Control:** | The extent of decay should be assessed in detail when the impact in the event of failure of the host tree has the potential to harm persons or property. |
| **Species affected:** | Various broadleaves, especially *Populus* spp., *Robinia* spp. and *Sorbus aucuparia*. |

# Appendix **B**

Schedule of Trees

## SCHEDULE OF TREES (AIA)

Hanover & Princess Court, Bentinck Street, Cambridge,

Surveyed By: Alex Garnham Date: 18/03/2025
Managed By: Alex Garnham

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| On site | | RPA (m²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| **G001** | Norway Maple | 610 | 14.5 | | Moderate | N6, E6, S6, W6 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Three Norway Maple located in small bare earth pits surrounded by hard surfaced car parking, footpaths and highway. The northern specimen is largest, the central specimen is suppressed and the southern specimen is growing over a lamp column. Each specimen has been subject to some pruning, mainly crown lifting over the surrounding infrastructure. Good amenity value but located in a setting where growth space and nutritional resources are limited. | B2 | No work required. | 4 | | |
| | | 7.32 | 3 | | EM | Moderate | | | | | | |
| **No** | | 168.3 | | | 20+ years | Mixed soft/hard surface | | | | | | |
| **G002** | Chinese Scholar Tree | 650 | 18.5 | | High | N10.5, E10.5, S10.5, W10.5 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Two mature Chinese Scholar trees located in a footpath between the apartment blocks to the east, parking to the north and west and highways to the east and south. Despite a tough extra urban growing environment, both trees appear to be doing very well. Each is twin-stemmed from approx. 3 metres with a strong naturally formed union. Both display good physiological condition. The southern specimen has two large dead branches on the southern aspect which overhang a footpath and should be removed urgently. The northern specimen has a dead pruning stub gradually absorbing into the live western limb. Recommend a climbing inspection to examine the extent of residual healthy sapwood in relation to the wound. | A2 | Undertake aerial inspection. Remove major deadwood over path. | 1 | | |
| | | 7.8 | 4 | | M | Moderate | | | | | | |
| **Yes** | | 191.1 | | | 40+ years | Mixed soft/hard surface | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| On site | | RPA (m²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| **G003** | Chinese Scholar Tree | 510 | 18.5 | | High | N8, E8, S8, W8 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Two mature Chinese Scholar trees located in small bare earth beds between parking to the north and south, with a vehicle access between them. Despite a tough extra urban growing environment, both trees appear to be doing quite well. Each is twin-stemmed from approx. 3 metres with a cup union forming from a previous bark included union. Both display good physiological condition and both have stubs from previous pruning. Overhead lines pass through the crowns. The surrounding hard surfaces are being lifted by the roots. Exposed and damaged surface roots, caused by vehicles when parking. | B2 | No work required. | 4 | | |
| | | 6.12 | 4 | | M | Moderate | | | | | | |
| **Yes** | | 117.7 | | | 20+ years | Mixed soft/hard surface | | | | | | |
| **G004** | Sycamore | 610 | 15.5 | | High | N5.5, E5.5, S5.5, W5.5 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Group of 6 Sycamore stems located in the northern terminus of a communal garden, west of an apartment block, east of Bentinck Terrace and south of a footpath. Specimens form one homogeneous crown. One stem is twin-stemmed with a bark included union that is gradually strengthening as evidenced by the early formation of elephant ear bulges. Good amenity value but of limited long term value. | B2 | No work required. | 4 | Fell to allow development | 0 |
| | | 7.32 | 3.5 | | EM | Moderate | | | | | | |
| **Yes** | | 168.3 | | | 20+ years | Mixed soft/hard surface | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| On site | | RPA (m²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| **G005** | London Plane | 990 | 23 | | High | N11, E11, S11, W11 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Three fine specimens of London Plane at the northern terminus of a communal garden. Garage structure and footpath located to the north. Each tree is in good structural and physiological condition and are specimens of high quality. | A2 | No work required. | 4 | Fell to allow development | 0 |
| | | 11.88 | 5 | | M | Moderate | | | | | | |
| **Yes** | | 443.4 | | | 40+ years | Mixed soft/hard surface | | | | | | |
| **T001** | Cherry Sp | 100 | 5 | | Low | N2.5, E2.5, S2.5, W2.5 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Young Cherry in bare earth landscape area surrounded by structures and hard surfaces. Good form and condition. Good future potential, though clearly there will be a requirement to prune the crown to maintain clearance from the stair core, structures and surfaces as the specimen matures. | C1 | No work required. | 4 | Fell to allow development | 0 |
| | | 1.2 | 2 | | Y | Moderate | | | | | | |
| **Yes** | | 4.5 | | | 40+ years | Mixed soft/hard surface | | | | | | |
| **T002** | False Acacia | 410 | 15 | | High | N8.5, E7.5, S9, W4 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Early mature False Acacia in bare earth landscape area surrounded by structures and hard surfaces. Specimen has two pendulous low lateral limbs that appear to have had some end weight previously pruned out. The western crown has clearly been reduced clear of the apartment block to the west. The unions of the two low laterals are cup shaped, likely having adapted from bark included unions. Good overall condition and high amenity. | B2 | No work required. | 4 | Fell to allow development | 0 |
| | | 4.92 | 4 | | EM | Moderate | | | | | | |
| **Yes** | | 76 | | | 20+ years | Mixed soft/hard surface | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| On site | | RPA (m²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| **T003** | Chinese Scholar Tree | 600 | 20 | | High | N11.5, E8.5, S12, W9.5 | Mar 2025: No fungal fruiting bodies present at the time of inspection, though it is out of season and they may appear late summer or early autumn.<br><br>Dec 2021: Mature Chinese Scholar tree located in a narrow shrub bed between car parks to the north and south. There are exposed and damaged surface roots where cars and Van's frequent scrape the roots as the edge of the vehicle passes over the kerb as they park. There are two fungal fruiting bodies of Pholiota squarrosa at the base on the west side. The specimen comprises three stems from approx. 3 metres, with strong naturally formed unions. The crown is tall and broad, giving high amenity value. There is deadwood over the parking areas. Recommend decay investigation of the buttress roots and base of stem, which will inform future management or categorisation of safe useful life expectancy and BS5837 2012 Category. | C1 | Undertake decay analysis (Picus Tomograph/Micro-drill). | 1 | | |
| | | 7.2 | 4 | | M | Moderate | | | | | | |
| **Yes** | | 162.9 | | | 10+ years | Mixed soft/hard surface | | | | | | |
| **T004** | Chinese Scholar Tree | 480 | 16 | | High | N9.5, E9.5, S10, W2.5 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Chinese Scholar tree located in a narrow shrub bed between car parks to the north and south. The specimen is asymmetric to the east due to competition with the adjacent mature tree to the west. There are exposed and damaged surface roots where vehicles scrape the roots as they park. Evidence of previous surgery. There is a branch abutting a lamp column on the southern aspect. Good amenity value, but of lesser individual quality than the surrounding Chinese Scholar trees. | B2 | No work required. | 4 | | |
| | | 5.76 | 4.5 | | SM | Moderate | | | | | | |
| **Yes** | | 104.2 | | | 20+ years | Mixed soft/hard surface | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| On site | | RPA (m²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| **T005** | Cherry Sp | 280 | 7.5 | | Moderate | N5, E4, S6, W2 | Mar 2025: No fungal fruiting bodies present at the time of inspection, though it is out of season and they may appear late summer or early autumn.<br><br>Dec 2021: Semi-mature Cherry in bare earth landscape area surrounded by structures and hard surfaces. Twin-stemmed from 3 metres with two pendulous stems emanating away from one another north and south. Appears to have been pruned on the west side, clear of the structure. There is a bracket of Ganoderma at the base on the south side, which appears to have been snapped off, and the point of attachment covered over by post mix concrete. When tapping the stem, it sounds dull and decayed. Option 1, fell and replace. Option 2, undertake decay detection testing and develop management plan thereafter. | U | Fell and remove stump. | 1 | | |
| | | 3.36 | 3.5 | | SM | Moderate | | | | | | |
| **Yes** | | 35.5 | | | <10 years | Mixed soft/hard surface | | | | | | |
| **T006** | Cherry Sp | 270 | 7.5 | | High | N5, E3.5, S4.5, W6 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Cherry in shrub bed on western edge of communal garden between apartment block to the east and Bentinck Terrace to the west. Good amenity value. Good structural and physiological condition. A tree of moderate quality. | B2 | No work required. | 4 | | |
| | | 3.24 | 3 | | SM | Moderate | | | | | | |
| **Yes** | | 33 | | | 20+ years | Bare earth | | | | | | |
| **T007** | Cherry Sp | 340 | 7.5 | | High | N5.5, E5, S6, W6 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Cherry in shrub bed on western edge of communal garden between apartment block to the east and Bentinck Terrace to the west. Good amenity value. Good structural and physiological condition. A tree of moderate quality. | B2 | No work required. | 4 | | |
| | | 4.08 | 3 | | SM | Moderate | | | | | | |
| **Yes** | | 52.3 | | | 20+ years | Bare earth | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| On site | | RPA (m²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| **T008** | Cherry Sp | 340 | 6.5 | | High | N5.5, E5, S6, W6.5 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Cherry in shrub bed on western edge of communal garden between apartment block to the east and Bentinck Terrace to the west. Good amenity value. Good structural and physiological condition. A tree of moderate quality. | B2 | No work required. | 4 | | |
| | | 4.08 | 3 | | SM | Moderate | | | | | | |
| **Yes** | | 52.3 | | | 20+ years | Bare earth | | | | | | |
| **T009** | Silver Maple | 620 | 17 | | High | N8, E8, S8, W8 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Mature Silver Maple located in shrub bed in south west corner of communal garden between an apartment block to the east and Bentinck Terrace to the west. Good structural form and condition. Unable to inspect base of tree due to tall vegetation. High amenity value. | B2 | No work required. | 4 | Crown lift on the northern aspect to provide 5m ground clearance over the refuse access. | 0 |
| | | 7.44 | 3.5 | | M | Moderate | | | | | | |
| **Yes** | | 173.9 | | | 20+ years | Shrub bed | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| On site | | RPA (m²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| **T010** | Chinese Scholar Tree | 690 | 13.5 | | High | N9, E10.5, S10, W10 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Mature Chinese Scholar tree located in a shrub bed between Coronation street to the south and the hard and soft landscaped communal garden of Hanover and Princes Court to the north. Good structural and physiological condition. A pruning wound at 3.5 metres on the west aspect is bleeding down the stem, but should naturally close up over time. The large limb to the south bifurcates at 2 metres along its length with both subsequent stems sharing a bark included union and the twist and rub together. This may be problematic in future, so management of the crown on the south side to limit end weight is recommended. There is a piece of major deadwood over the footpath of Coronation Street to the south which should be removed urgently. Otherwise a fine specimen with high amenity value. No fungal fruiting bodies or indicators of disease at the time of inspection. | A2 | No work required. | 4 | | |
| | | 8.28 | 3.5 | | M | Moderate | | | | | | |
| **Yes** | | 215.4 | | | 40+ years | Mixed soft/hard surface | | | | | | |
| **T011** | Portugal Laurel | 400 | 6.5 | | Moderate | N4, E4, S4, W4 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Portugal Laurel in a mixed soft and hard surfaced communal garden. Specimen has been well maintained to globular ornamental shape. Good structural and physiological condition. | B2 | No work required. | 4 | Fell to allow development | 0 |
| | | 4.8 | 2.5 | | SM | Low | | | | | | |
| **Yes** | | 72.4 | | | 20+ years | Mixed soft/hard surface | | | | | | |
| **T012** | Silver Birch | 240 | 15 | | Moderate | N4, E4.5, S4.5, W4 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Dalecarlican Birch in a soft landscape area of communal garden. Specimen is of good structural and physiological condition and high amenity. | B2 | No work required. | 4 | Fell to allow development | 0 |
| | | 2.88 | 3.5 | | SM | Low | | | | | | |
| **Yes** | | 26.1 | | | 20+ years | Grass | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| On site | | RPA (m²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| **T013** | Winter Flowering Cherry | 240 | 6.5 | | Moderate | N4, E4.5, S4.5, W4.5 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Winter Flowering Cherry in a soft landscape area of communal garden. Good structural and physiological condition. | B2 | No work required. | 4 | Fell to allow development | 0 |
| | | 2.88 | 3 | | SM | Moderate | | | | | | |
| **Yes** | | 26.1 | | | 20+ years | Grass | | | | | | |
| **T014** | Tibetan Cherry | 110 | 8.5 | | Moderate | N2, E2, S2, W2 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Young but tall and well formed Tibetan Cherry located close to Princes Court apartment block to the west. | C1 | No work required. | 4 | Fell to allow development | 0 |
| | | 1.32 | 2 | | Y | Moderate | | | | | | |
| **Yes** | | 5.5 | | | 20+ years | Mixed soft/hard surface | | | | | | |
| **T015** | Pine Sp | 70 | 3 | | Low | N1.5, E1.5, S1.5, W1.5 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Young Pine in grass communal garden. Good future potential but limited wider landscape value at present. | C1 | No work required. | 4 | Fell to allow development | 0 |
| | | 0.84 | 0 | | Y | Moderate | | | | | | |
| **Yes** | | 2.2 | | | 40+ years | Grass | | | | | | |
| **T016** | Silver Birch | 150 | 11 | | Moderate | N2, E2, S2, W2 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Dalecarlican Birch in grass communal garden. Good future potential but limited wider landscape value at present. | C1 | No work required. | 4 | Fell to allow development | 0 |
| | | 1.8 | 3 | | SM | Low | | | | | | |
| **Yes** | | 10.2 | | | 40+ years | Grass | | | | | | |
| **T017** | Winter Flowering Cherry | 210 | 7.5 | | Moderate | N1.5, E4.5, S5, W5 | Mar 2025: No significant change since previous survey.<br><br>Dec 2021: Semi-mature Winter Flowering Cherry in a soft landscape area of communal garden. Bark wounds on stem. Asymmetric crown. Crown reduction pruning evident on east side over ancillary structure. Good structural and physiological condition. | B2 | No work required. | 4 | Fell to allow development | 0 |
| | | 2.52 | 3 | | SM | Moderate | | | | | | |
| **Yes** | | 20 | | | 20+ years | Grass | | | | | | |

# Appendix **C**

Schedule of Works - Irrespective of Development

## SCHEDULE OF WORK IRRESPECTIVE OF DEVELOPMENT

Hanover & Princess Court, Bentinck Street, Cambridge,

Surveyed By: Alex Garnham
Surveyed: 18/03/2025
Managed By: Alex Garnham

| Tree No. | Species | Work required | Priority |
|---|---|---|---|
| **G002** | Chinese Scholar Tree | Undertake aerial inspection. Remove major deadwood over path. | **1** |
| **T003** | Chinese Scholar Tree | Undertake decay analysis (Picus Tomograph/Micro-drill). | **1** |
| **T005** | Cherry Sp | Fell and remove stump. | **1** |

# Appendix D

Schedule of Works to Allow Development

## SCHEDULE OF WORKS (AIA)

Hanover & Princess Court, Bentinck Street, Cambridge,

Surveyed By: Alex Garnham
Surveyed: 18/03/2025
Managed By: Alex Garnham

| Tree No. | Species | Work required | Priority |
|---|---|---|---|
| **G004** | Sycamore | Fell to allow development | **0** |
| **G005** | London Plane | Fell to allow development | **0** |
| **T001** | Cherry Sp | Fell to allow development | **0** |
| **T002** | False Acacia | Fell to allow development | **0** |
| **T009** | Silver Maple | Crown lift on the northern aspect to provide 5m ground clearance over the refuse access. | **0** |
| **T011** | Portugal Laurel | Fell to allow development | **0** |
| **T012** | Silver Birch | Fell to allow development | **0** |
| **T013** | Winter Flowering Cherry | Fell to allow development | **0** |
| **T014** | Tibetan Cherry | Fell to allow development | **0** |
| **T015** | Pine Sp | Fell to allow development | **0** |
| **T016** | Silver Birch | Fell to allow development | **0** |
| **T017** | Winter Flowering Cherry | Fell to allow development | **0** |

# Appendix E

Explanatory Notes

# Explanatory Notes

HAYDEN'S Arboricultural Consultants

## Categories

Below is an explanation of the categories used in the attached Tree Survey.

**No** Identifies the tree on the drawing.

**Species** Common names are given to aid understanding for the wider audience.

**BS 5837 Main Category** Using this assessment (BS 5837:2012, Table 1), trees can be divided into one of the following simplified categories, and are differentiated by cross-hatching and by colour on the attached drawing:

**Category A** - Those of high quality with an estimated remaining life expectancy of at least 40 years;

**Category B** - Those of moderate quality with an estimated remaining life expectancy of at least 20 years;

**Category C** - Those 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** - Those trees in such 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 Sub Category** Table 1 of BS 5837:2012 also requires a sub category to be applied to the A, B, C, and U assessments. This allows for a further understanding of the determining classification as follows:

**Sub Category 1** - Mainly arboricultural qualities;

**Sub Category 2** - Mainly landscape qualities;

**Sub Category 3** - Mainly cultural values, including conservation .

Please note that a specimen or landscape feature may fulfil the requirements of more than one Sub Category.

**DBH (mm)** Diameter of main stem in millimetres at 1.5 metres from ground level. Where the tree is a multi-stem, the diameter is calculated in accordance with item 4.6.1 of BS 5837:2012.

**Age** Recorded as one of seven categories:

**Y** Young. Recently planted or establishing tree that could be transplanted without specialist equipment, i.e. less than 150 mm DBH.

**S/M** Semi-mature. An established tree, but one which has not reached its prospective ultimate height.

**E/M** Early-mature. A tree that is reaching its ultimate potential height, whose growth rate is slowing down but if healthy, will still increase in stem diameter and crown spread.

**M** Mature. A mature specimen with limited potential for any significant increase in size, even if healthy.

**O/M** Over-mature. A senescent or moribund specimen with a limited safe useful life expectancy. Possibly also containing sufficient structural defects with attendant safety and/or duty of care implications.

**D** Dead.

| | |
|---|---|
| **Height** | Recorded in metres, measured from the base of the tree. |
| **Crown Base** | Recorded in metres, the distance from ground and aspect of the lowest branch material. |
| **Lowest Branch** | Recorded in metres, the distance from ground and aspect of the emergence point of the lowest significant branch. |
| **Life Expectancy** | Relates to the prospective life expectancy of the tree and is given as 4 categories:<br><br>1 = 40 years+;<br>2 = 20 years+;<br>3 = 10 years+;<br>4 = less than 10 years. |
| **Crown Spread** | Indicates the radius of the crown from the base of the tree in each of the northern, eastern, southern and western aspects. |
| **Minimum Distance** | This is a distance equal to 12 times the diameter of the tree measured at 1.5 metres above ground level for single stemmed trees and 12 times the average diameter of the tree measured at 1.5 metres above ground level tree for multi stemmed specimens. (BS 5837:2012, section 4.6). |
| **RPA** | This is the Root Protection Area, measured in square metres and defined in BS5837:2012 as "a layout design tool indicating 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". The RPA is shown on the drawing.. Ideally this is an area around the tree that must be kept clear of construction, level changes of construction operations. Some methods of construction can be carried out within the RPA of a retained tree but only if approved by the Local Planning Authority's tree officer. |
| **Water Demand** | This gives the water demand of the species of tree when mature, as given in the NHBC Standards Chapter 4.2 "Building Near Trees". |
| **Visual Amenity** | Concerns the planning and landscape contribution to the development site made by the tree, hedge or tree group, in terms of its amenity value and prominence on the skyline along with functional criteria such as the screening value, shelter provision and wildlife significance. The usual definitions are as follows:<br><br>Low — An inconsequential landscape feature.<br><br>Moderate — Of some note within the immediate vicinity, but not significant in the wider context.<br><br>High — Item of high visual importance. |
| **Problems/ Comments** | May include general comments about growth characteristic, how it is affected by other trees and any previous surgery work; also, specific problems such as deadwood, pests, diseases, broken limbs, etc. |
| **Work Required (TS)** | Identifies the necessary tree work to mitigate anticipated problems and deal with existing problems identified in the "Problems/comments" category. |

| | |
|---|---|
| **Work Required (AIA)** | Identifies the tree work specifically necessary to allow a proposed development to proceed. |
| **Priority** | This gives a priority rating to each tree allowing the client to prioritise necessary tree works identified within the Tree Survey.<br><br>**1** Urgent – works required immediately;<br><br>**2** Works required within 6 months;<br><br>**3** Works required within 1 year;<br><br>**4** Re-inspect in 12 months,<br><br>**0** Remedial works as part of implementation of planning consent. |

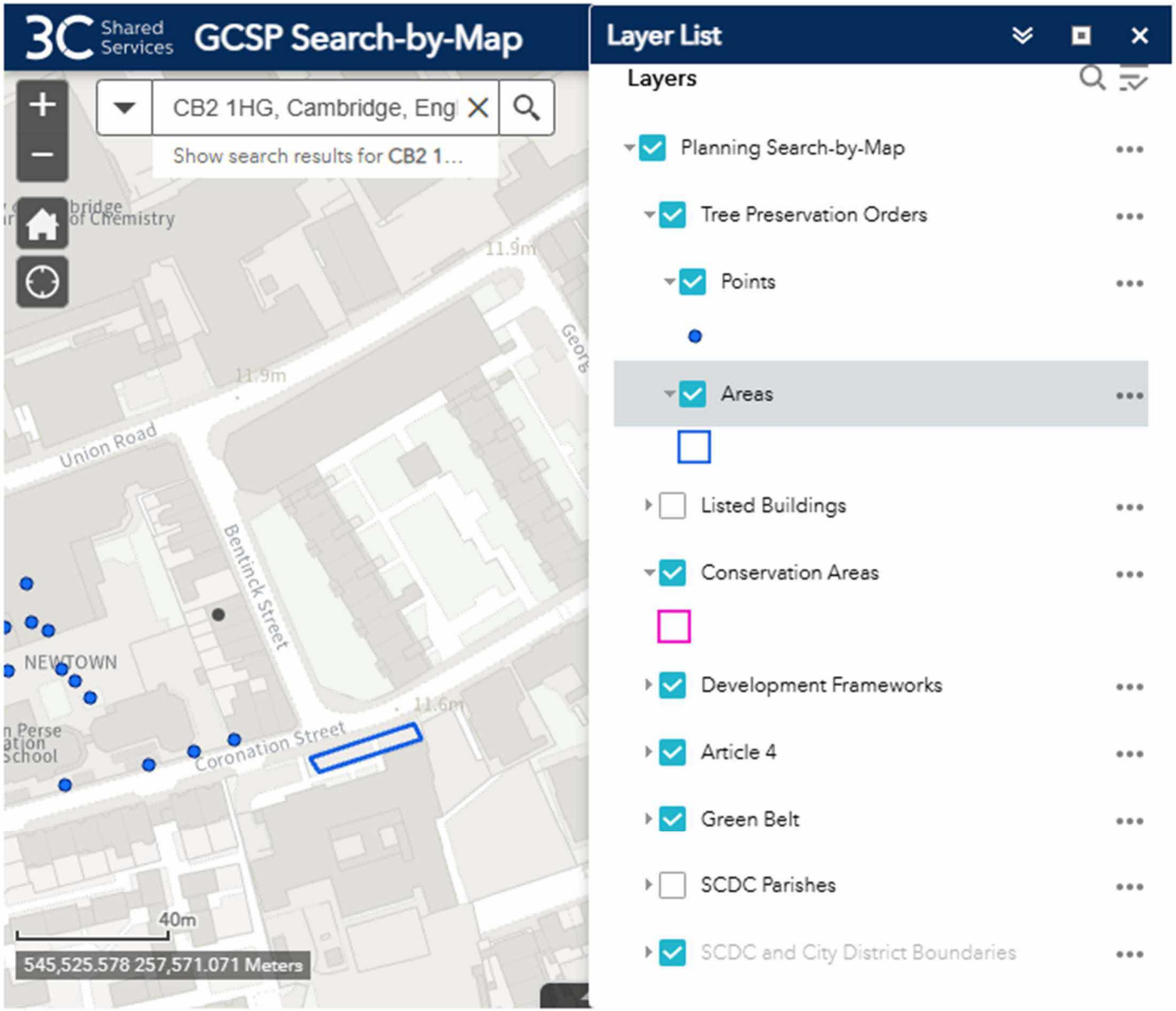
**BS 5837:2012 Terms and Definitions**

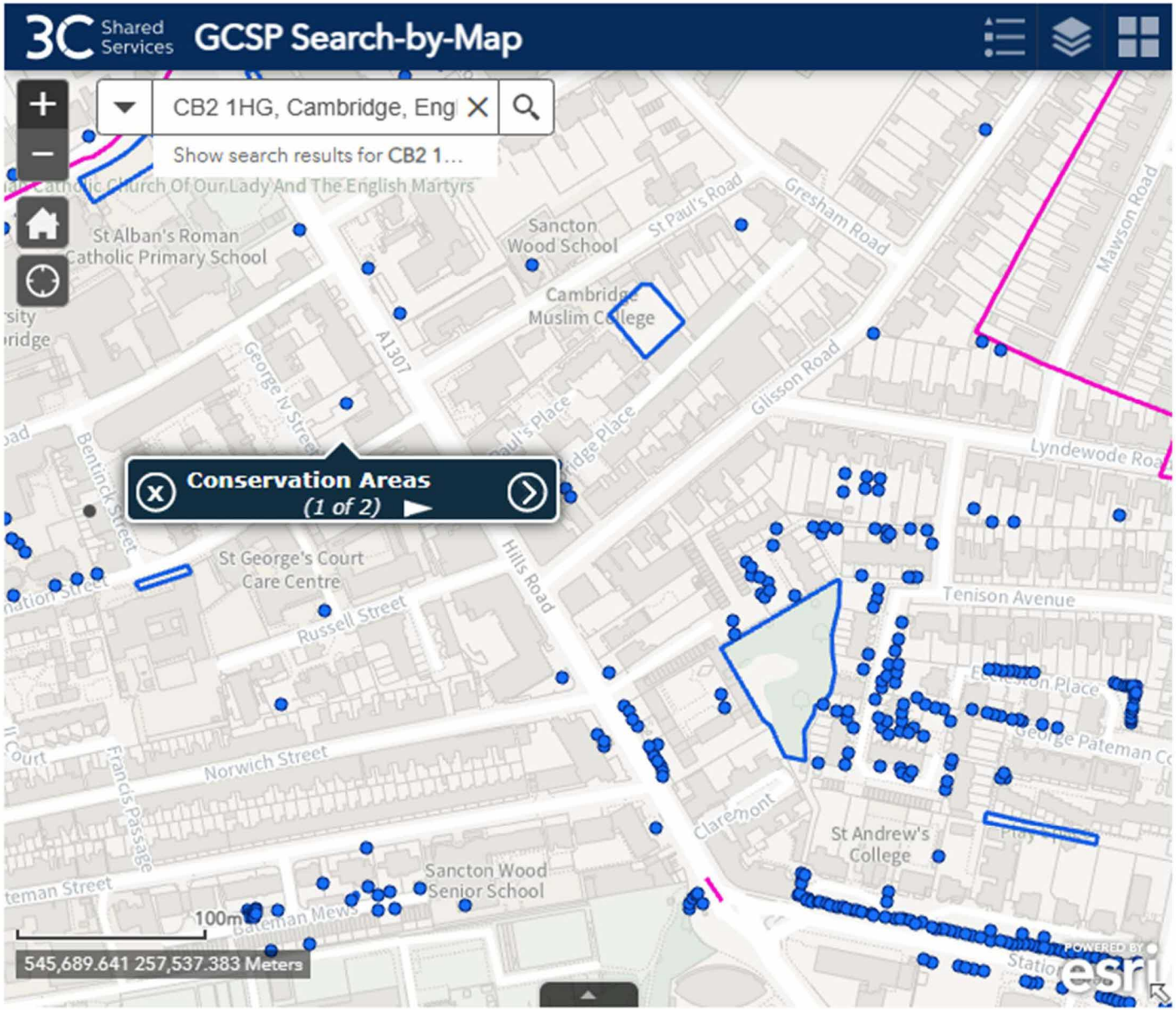
| | |
|---|---|
| **Access Facilitation Pruning** | One-off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site. |
| **Arboricultural Method Statement** | Methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained. |
| **Arboriculturist** | Person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction. |
| **Competent Person** | Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached. *NOTE - a competent person is expected to be able to advise on the best means by which the recommendations of this British Standard may be implemented.* |
| **Construction** | Site-based operations with the potential to affect existing trees. |
| **Construction Exclusion Zone** | Area based on the root protection area from which access is prohibited for the duration of a project. |
| **Root Protection Area (RPA)** | Layout design tool indicating 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. |
| **Service** | Any above or below ground structure or apparatus required for utility provision.<br>**NOTE** - examples include drainage, gas supplies, ground source heat pumps, CCTV and satellite communications. |
| **Stem** | Principal above ground structural component(s) of a tree that supports its branches. |
| **Structure** | Manufactured object, such as a building, carriageway, path, wall, service run, and built or excavated earthwork. |
| **Tree Protection Plan** | 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. |
| **Veteran Tree** | 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.<br>**NOTE** - these characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem. |

# Appendix F

Tree Preservation Order Enquiry/Response

# Tree Preservation Order / Conservation Area Online Mapping Extract



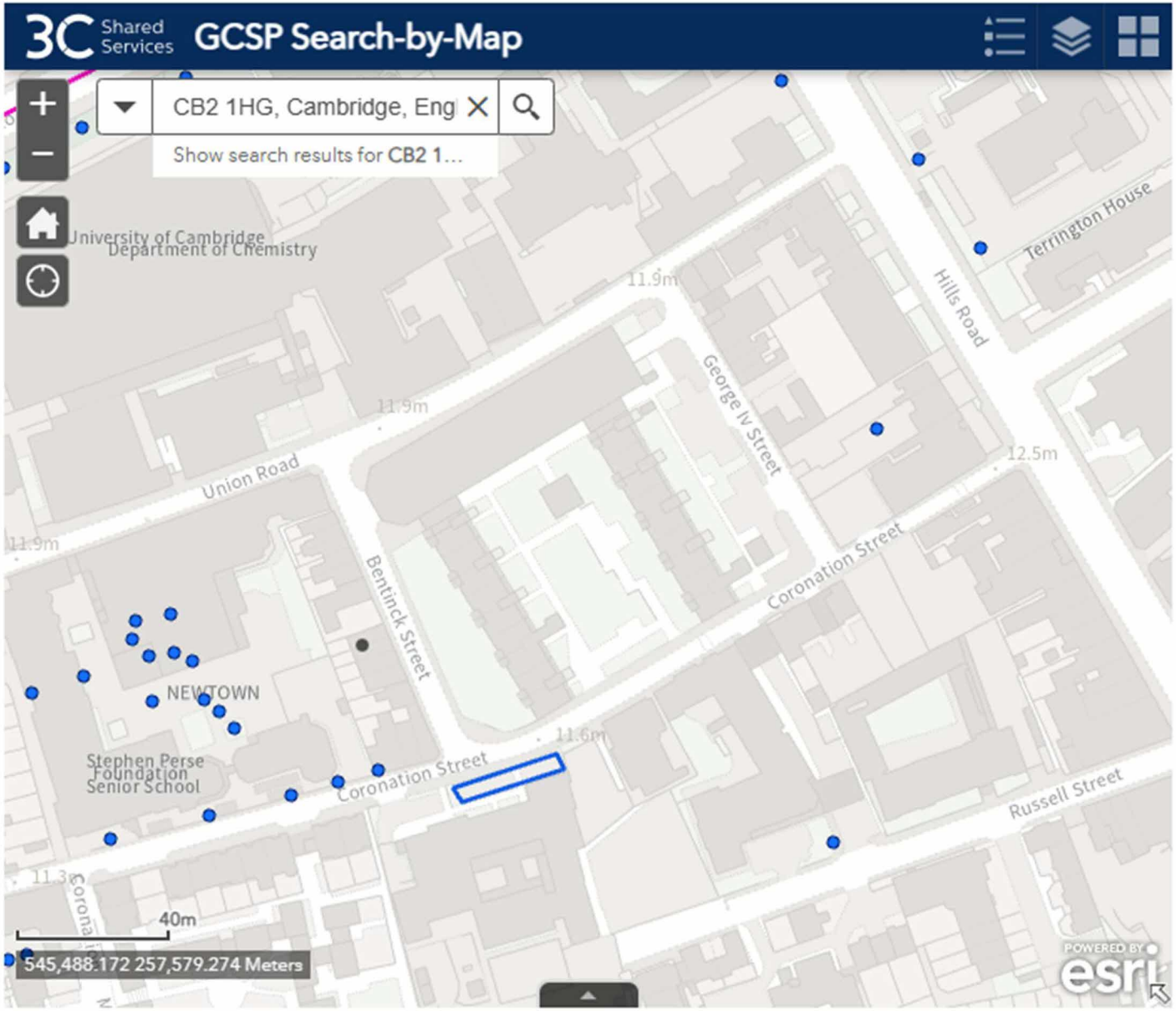

3C Shared Services
GCSP Search-by-Map
CB2 1HG, Cambridge, Eng
Show search results for CB2 1...
Conservation Areas
(1 of 2)
St Alban's Roman Catholic Primary School
Sancton Wood School
St Paul's Road
Gresham Road
Mawson Road
Cambridge Muslim College
A1307
George IV Street
Glisson Road
Lyndewode Road
Bentinck Street
St George's Court Care Centre
Hills Road
Russell Street
Tenison Avenue
Norwich Street
Francis Passage
Claremont
St Andrew's College
Sancton Wood Senior School
Bateman Mews
100m
545,689.641 257,537.383 Meters
POWERED BY esri

(1 of 2)

**Conservation Areas**

| | |
|---|---|
| Name | Central |
| Designation Date | 25/02/1969 |
| Latest Extension | 21/11/2018 |

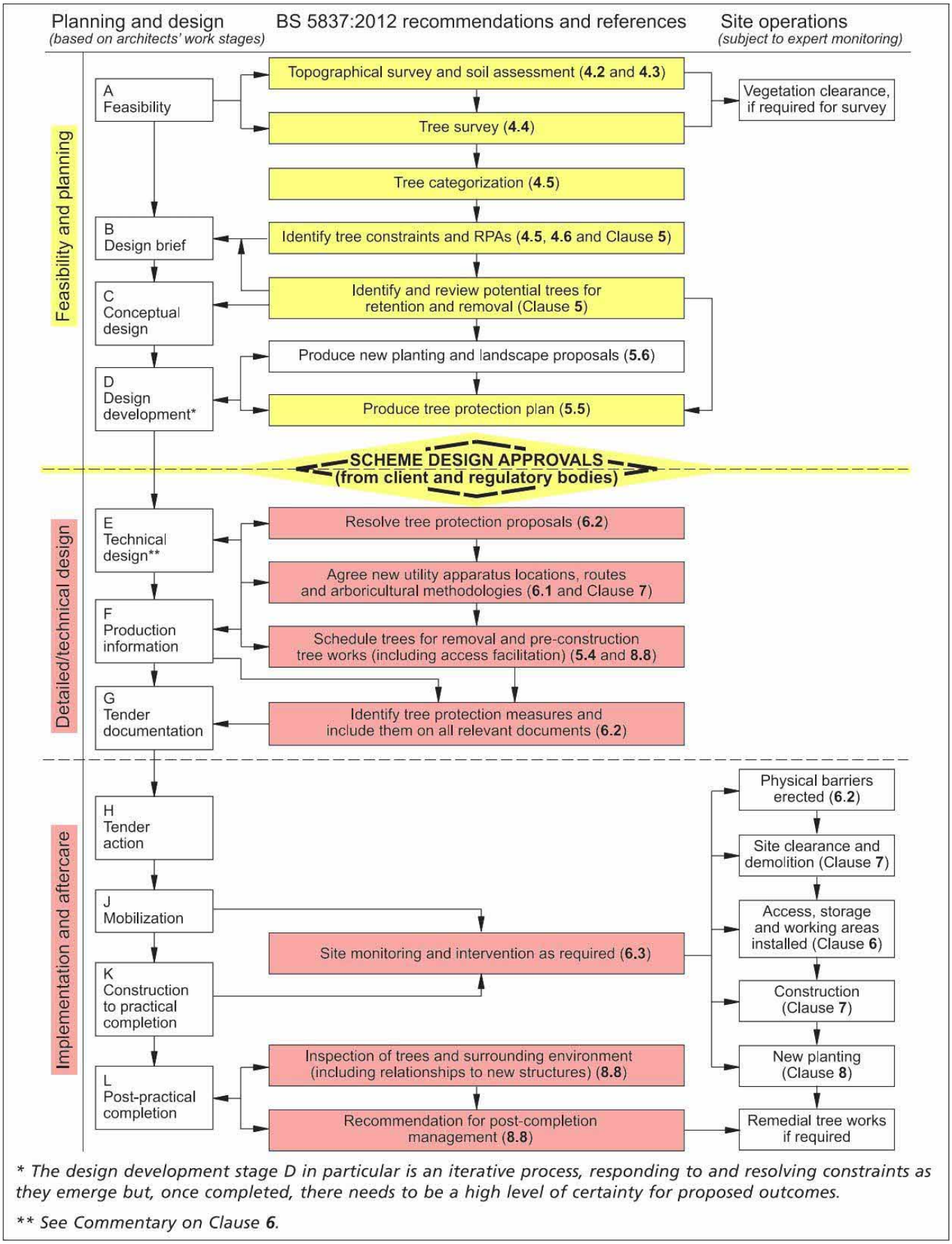
•••


3C Shared Services
GCSP Search-by-Map
CB2 1HG, Cambridge, Eng
Show search results for CB2 1...
University of Cambridge
Department of Chemistry
Terrington House
Hills Road
George IV Street
Union Road
Bentinck Street
Coronation Street
NEWTOWN
Stephen Perse Foundation Senior School
Russell Street
11.9m
12.5m
11.6m
11.3m
40m
545,488.172 257,579.274 Meters
POWERED BY esri

# Appendix G

Advisory Information & Sample Specifications

## 1. BS 5837:2012 Figure 1 - Flow Chart – Design and Construction & Tree Care




** The design development stage D in particular is an iterative process, responding to and resolving constraints as they emerge but, once completed, there needs to be a high level of certainty for proposed outcomes.*

*** See Commentary on Clause **6**.*

2.

# European Protected Species and woodland operations. (V4)

Complete all sections of the Checklist

✔

## Checklist

**1** Are you within, or close to, the known mapped range of any of the protected species OTHER THAN BATS which are potentially everywhere? Tick any that apply.
See distribution maps in the Good Practice Guidance for each species -

- ☐ Dormice
- ☐ Otters
- ☐ Great crested newts
- ☐ Sand lizards
- ☐ Smooth snakes

YES ☐ NO ☐

**2** Does your wood contain any of the following habitats? Tick any that apply.

- ☐ Old trees with holes and crevices which might be used bats
- ☐ Species rich scrub/coppice, early growth stage plantations and forest interfaces
- ☐ Rivers on which otters might be found
- ☐ Ponds which might be occupied by great crested newts
- ☐ Open areas on heathy soils

YES ☐ NO ☐

**3** Have any of the protected species been recorded in this wood or on adjoining sites? Tick any that apply.
Indicate which sources of information you have checked:

- ☐ National Biodiversity Network (www.nbn.org.uk)
- ☐ Local Biological Records Centre
- ☐ Local Wildlife Trust
- ☐ Other

*Specify Other:*

YES ☐ NO ☐

**4** Have your inspections or any expert surveys found any of the following signs or evidence? Tick any that apply.

- ☐ Signs (e.g. otter spraint, nuts gnawed by dormice, leaves folded by newts)
- ☐ Sightings (or echo-location)
- ☐ Potential breeding or roosting sites (e.g. veteran trees, old trees with crevices, riverside hollow trees, ponds, timber stacks, large fallen deadwood)
- ☐ Confirmed breeding or roosting sites (i.e. evidence of sites actually being used)

*Details:*

YES ☐ NO ☐

**CHECK POINT**

**If you have answered NO to ALL of the above then only bats need to be considered in your operations.**

**If you have answered YES to any of the above then the species concerned must be considered as well as bats.**

**5** Do the operations comply with Good Practice for bats and any other species found (or likely to be found in your wood) or can the operations be modified to do so?
*Details: Use reverse of form to expand as required:*

YES ☐ NO ☐

**6** Whether or not a licence is required...
Has the information been communicated to operators (including the location of breeding sites and sensitive areas)? Tick any that apply.

- ☐ Included in documentation (e.g. contract, letter of instruction, site assessment or other management plan)
- ☐ Shown to operators and/or their supervisor
- ☐ Marked with paint or hazard tape
- ☐ Shown on the site plan

*Other means:*

YES ☐ NO ☐

**7** Have arrangements for supervision been made to ensure Good Practice guidance is complied with during the operations?
*Details:*

YES ☐ NO ☐

## Details

**Name of Wood:**

**Grid Reference:**

**Area: (ha)**

**Date of Assessment:**

**Name of Assessor:**

## Notes

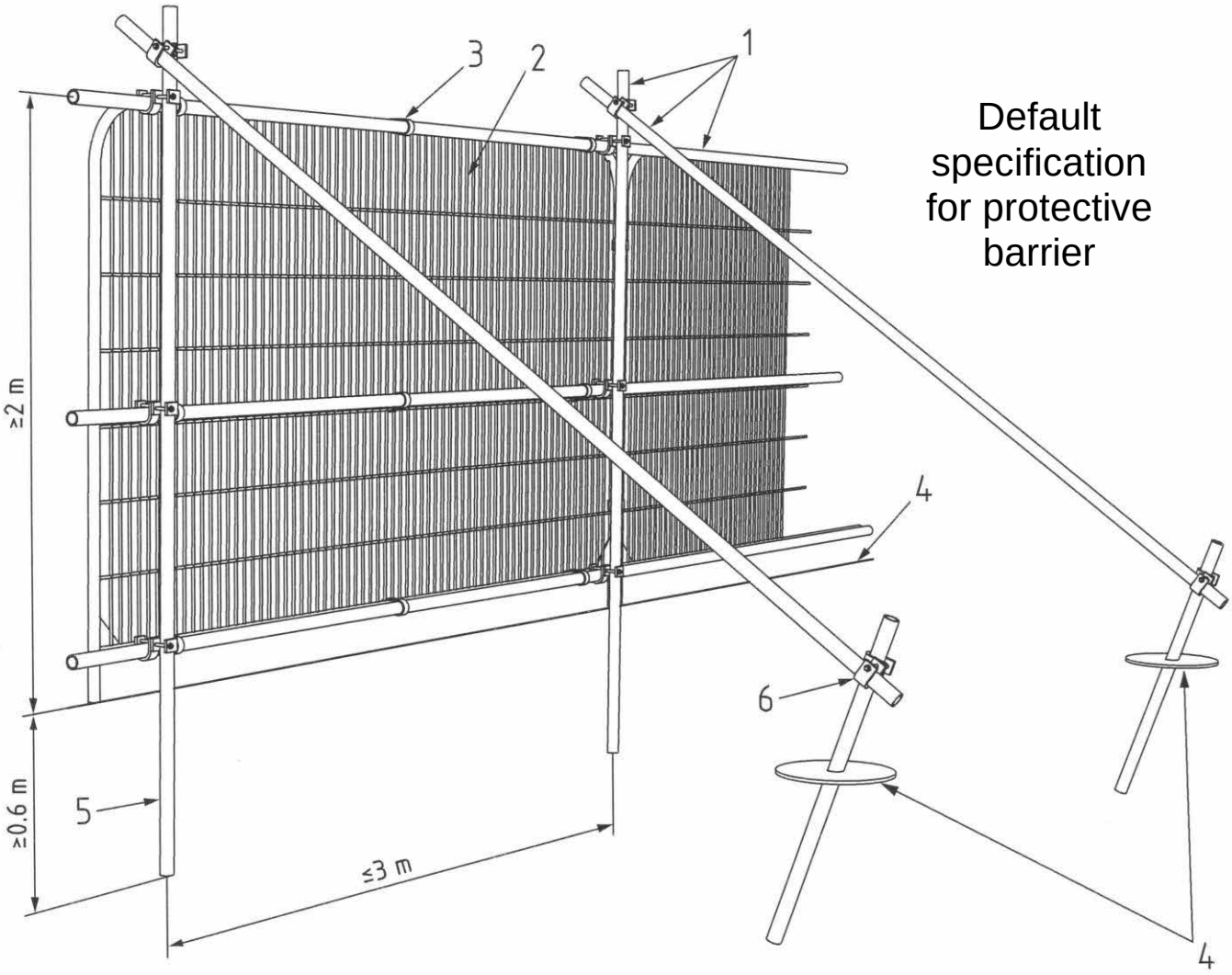
A licence is not required but continue to sections 6 and 7 below

You will need to obtain a licence BEFORE carrying out the work (see EPS Licence Application Forms and Notes)

You may commit an offence if you do not tell your operators about the protected species in your wood.

You may commit an offence if you do not take steps to ensure that your operators comply with the Good Practice guidance.

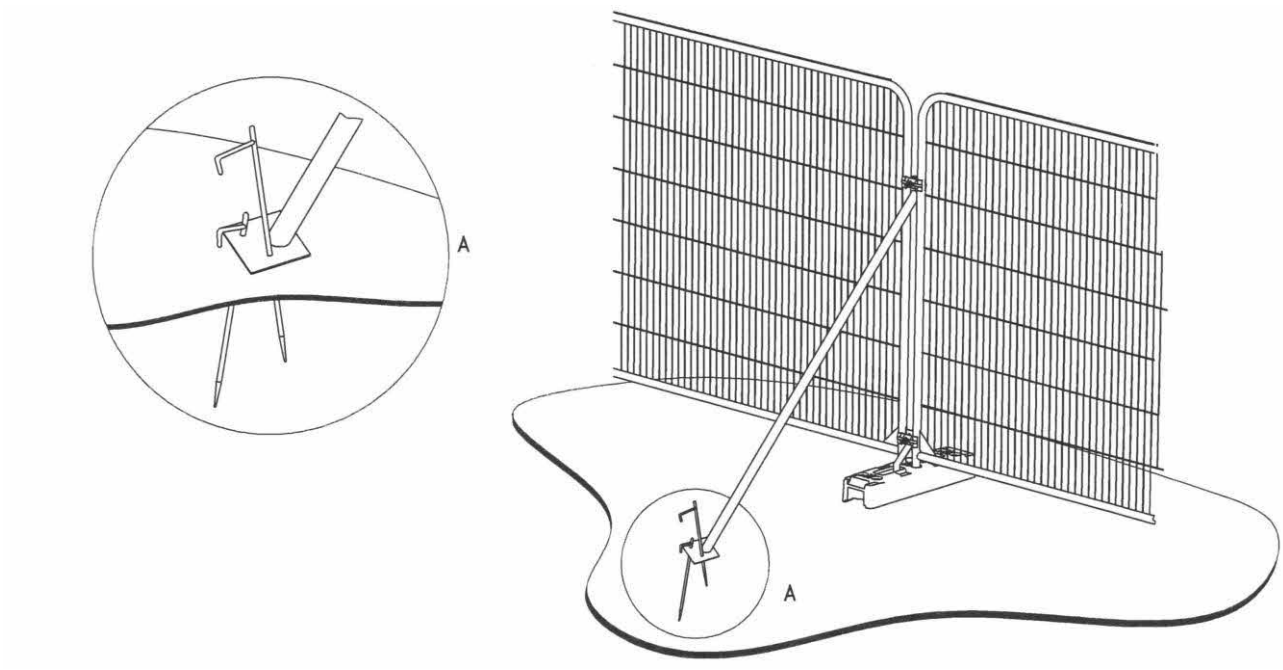
**3. BS 5837:2012 Figure 2: Default specification for protective barrier**



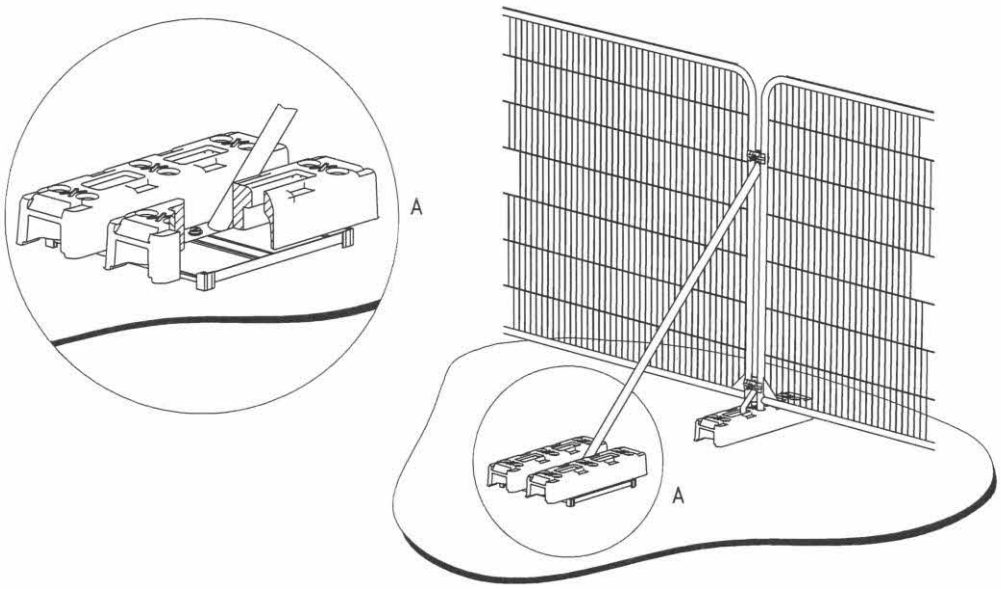

Key

| | |
|---|---|
| 1 | Standard scaffold pole |
| 2 | Heavy gauge 2m tall galvanised 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 0.6m |
| 6 | Standard scaffold clamps |

**4. BS 5837:2012 Figure 3: Examples of above-ground stabilizing systems**

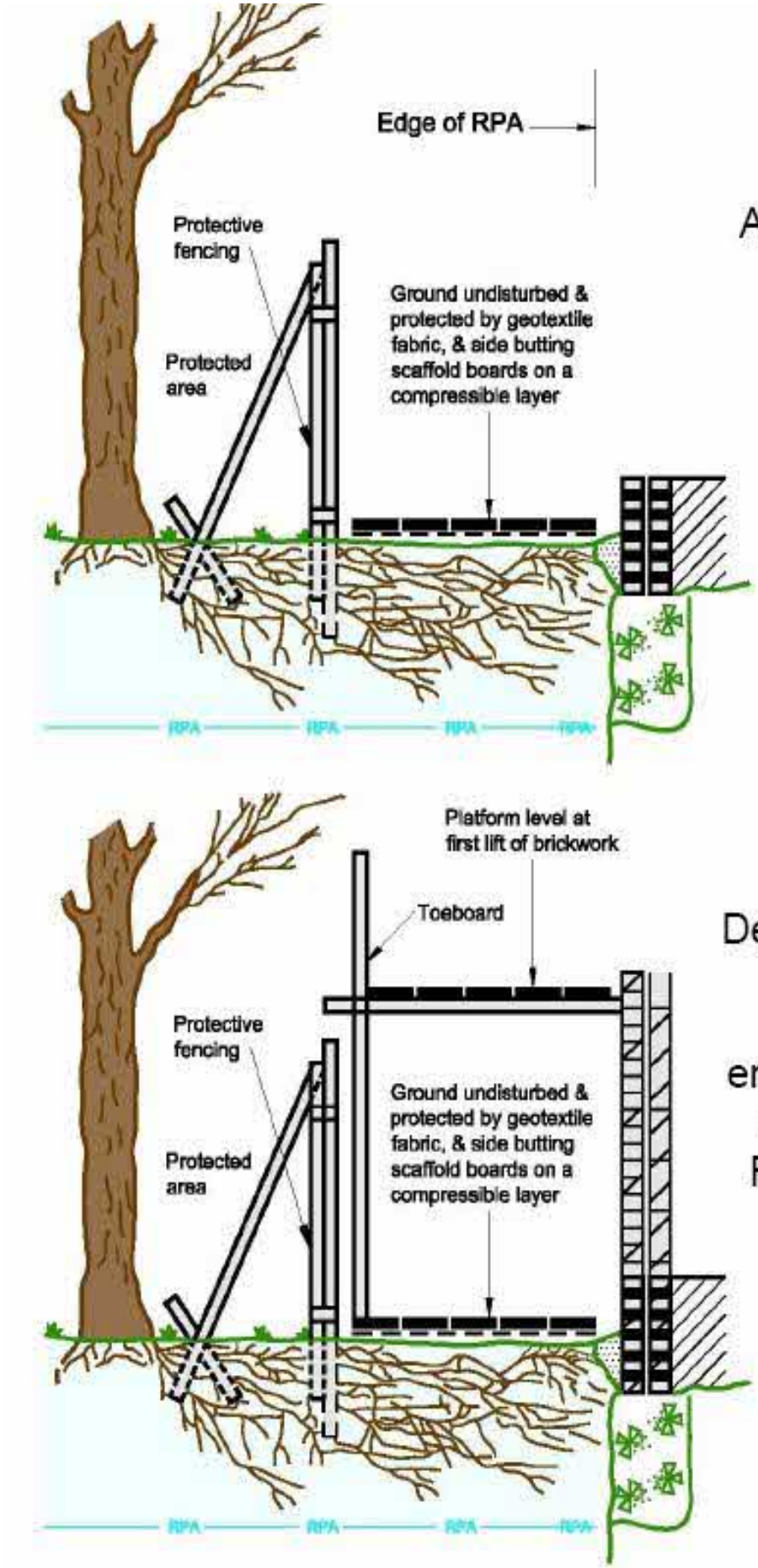



a) Stabilizer strut with base plate secured with ground pins




b) Stabilizer strut mounted on block tray

**5. Figure 4 Detail of protective barrier where construction encroaches within BS5837:2012 Root Protection Area**




Appendix No 2.1

Figure 4 –

Detail of protective barrier where construction encroaches within BS 5837:2012 Root Protection Area (RPA)

## 6. METHOD STATEMENT FOR "NO-DIG" CONSTRUCTION IN LINE WITH ARBORICULTURAL PRACTICE NOTE 12 "*Through the Trees to Development"*

Prior to commencing any demolition or construction on site, erect protective fencing around trees to form an exclusion zone (see attached plan).

This will ensure that roots will not be severed during the construction work and the soil in the area of the exclusion zone will not be compacted thus enabling oxygen to continue to diffuse into the soil beneath.

Construction of the driveway, path or other hard surface should be undertaken in dry weather between May and October when the ground is driest and least prone to compaction.

1 Remove the dead or organic material from the site and ensure that large stones and shrub stumps are removed from the proposed route.

2 Any tree stumps should be ground out rather than excavated to minimise soil disturbance.

3 The resulting hollows and any other holes along the route driveway, path or other hard surface should be filled with sharp sand.

4 Lay *Terram Geotextile* matting across the full width of the driveway, path or other hard surface. This will prevent the intrusion of roots into the sub-base whilst still allowing nutrients and gaseous exchange.

5 Lay *Terram 150 Geocell* (cellular confinement system). (This is available from Terram Ltd, Tel: 01495 757722, fax: 01495 762393, and can be cut with a Stanley knife on-site to the length, width and profile of the path required).

6 The driveway, path or other hard surface is to be supported against 150 x 20mm tanalised softwood boarding and 200mm long tanalised softwood pegs driven into the ground at 1500mm centres.

7 Carefully push 20mm – 40mm gravel chippings (no fines) into the *Geo 150 Geocell* matting to form an aggregate sub-base.

8 The chippings should be placed at one end of the matting and pushed/spread across the mat to prevent compaction of the soil, working on either side of the driveway, path or other hard surface.

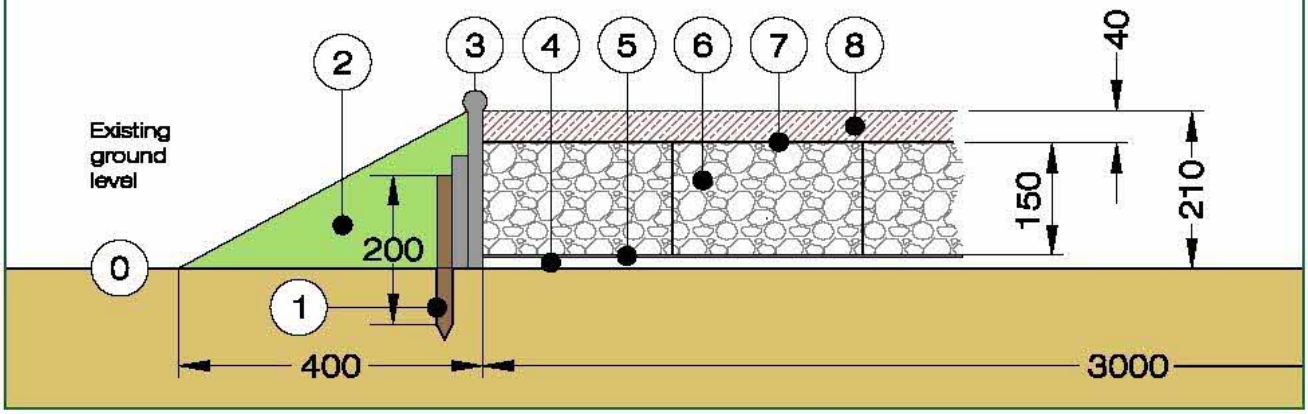
9 Compact the sub-base to ensure binding with the *Geocell* and to minimise future wheel rutting.

10 Lay a second layer of *Terram Geotextile* matting across the full width of the driveway, path or other hard surface. This will prevent the intrusion of fines into the gravel chippings.

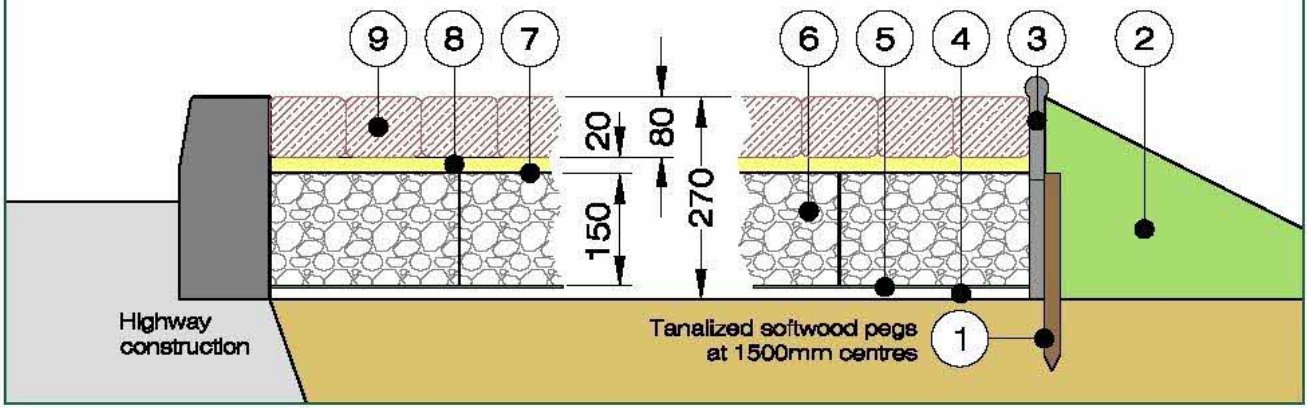
11 Add layer of 'no fines' sharp sand and compact if using pavers as surface treatment.

12 Place the proposed surface treatment (e.g. Pavers) on top of the compacted sub-base to form the finished surface to the path and 'bank up' the edging with topsoil, which is to be grass-seeded in spring/autumn. This will form a gentle slope from the edging to the existing ground level.

1) Tanalised softwood pegs at 1500mm centres
2) Topsoil banked up to edging
3) Softwood boards / Concrete edging 'tiles'
4) Existing surface to be cleared of ground vegetation.
5) Geo-textile matting "Terram" laid on top of footpath
6) "Geocell" Cellular Confinement System (150mm deep) with gravel chippings
7) Geo-textile matting "Terram" laid on top of cellular confinement system
8) Gravel or paving laid on top of permeable sub-base




2) Topsoil banked up to edging
3) Softwood boards / Concrete edging 'tiles'
4) Existing surface to be cleared of ground vegetation.
5) Geo-textile matting "Terram" laid on top of the footpath
6) "Geocell" Cellular Confinement System (150mm deep) with gravel chippings
7) Geo-textile matting "Terram" laid on top of cellular confinement system
8) 'No fines' sand laid on top of geo-textile matting
9) Aquaflow permeable paving laid on top of no fines sharp sand and permeable sub-base

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Fax: 01284 765181
Mob: 07850167400
info@treesurveys.co.uk
www.treesurveys.co.uk



# 'No Dig' Driveway & Parking Specification

Scale
1:10 (A4)

Drg No.
Hayden's.ND

HAYDEN'S
Arboricultural Consultants

5 Moseley' Farm
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Fax: 01284 765181
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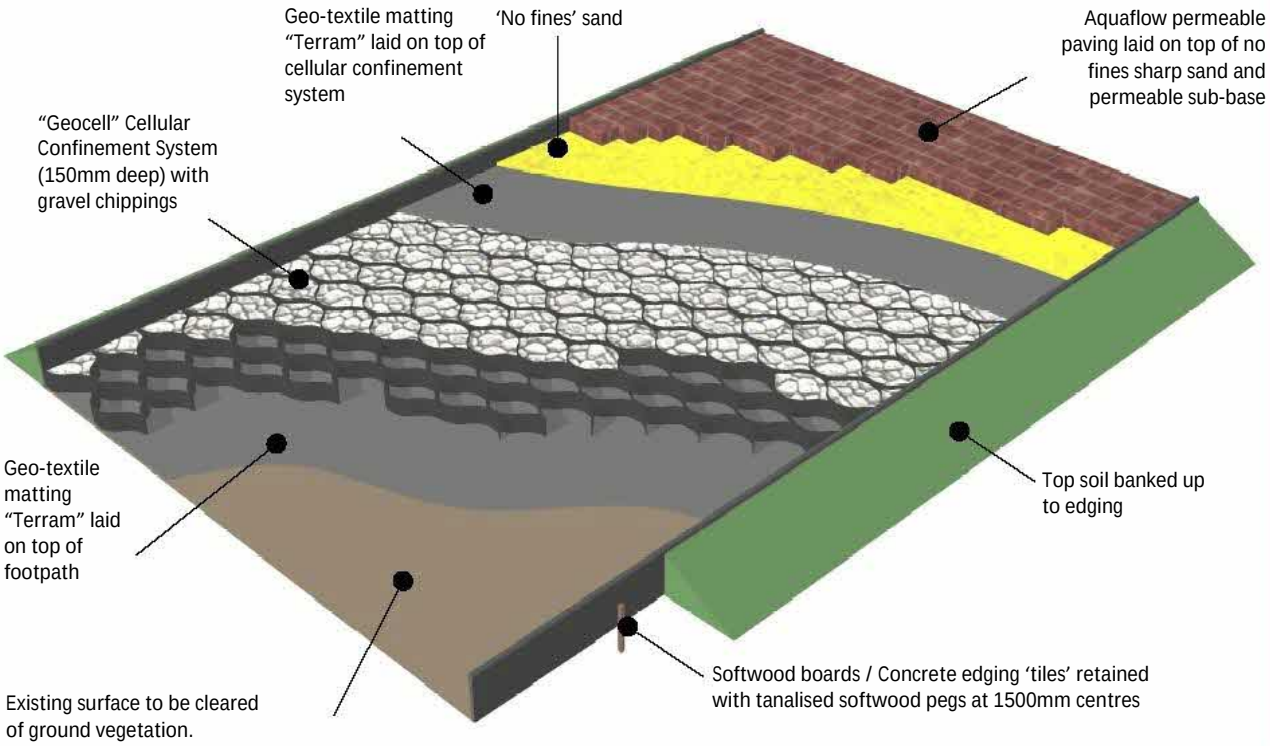
info@treesurveys.co.uk
www.treesurveys.co.uk



# 'No Dig' Footpath & Driveway Specification

Scale
1:10 (A4)

Drg No.
Hayden's.ND




The 3D drawing above may not accurately depict the construction to be carried out and should be taken as indicative only. Use the section drawings on the previous page for full details on the required construction method

'No Dig' system during construction (right)

"Geocell" Cellular Confinement System (100mm deep) with gravel chippings (below)

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www.treesurveys.co.uk

# The Aquaflow® range of permeable paving

## Aquaslab®

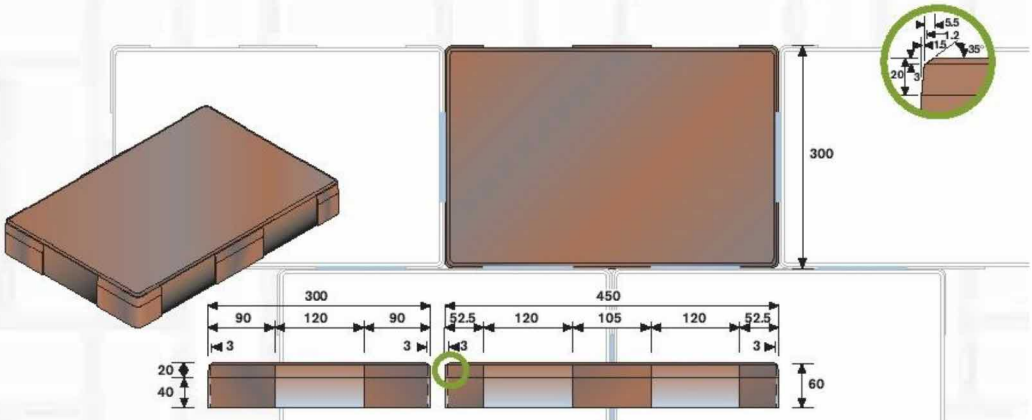
For use on Pedestrian areas

**Size**
300 x 450 x 60mm

**Laying pattern**
Staggered stretcher bond

**Colours***
Natural, Burnt Red, Red brindle, Golden brindle and Charcoal

**Finish**
Standard
Bush hammered to special order




## Aquasett®

For use on footpaths, domestic drives and roads (80mm)

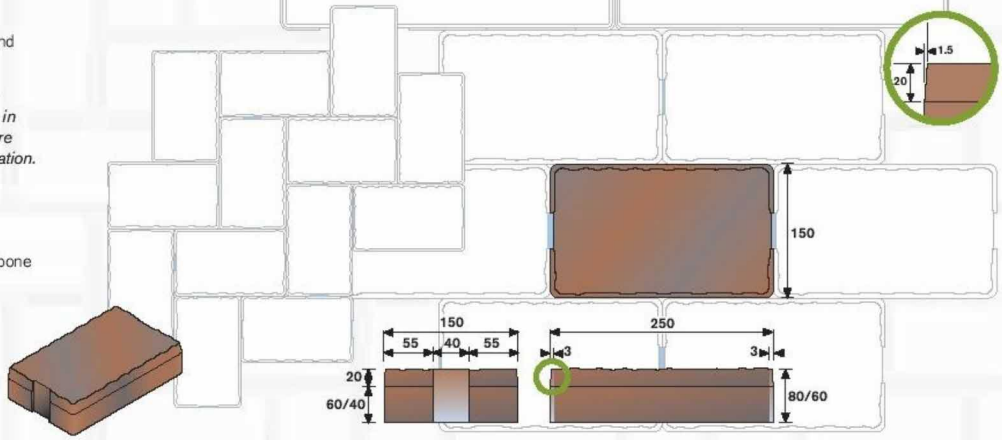
*Range of colours and the Olden finish make the Aquasett appropriate for use in conservation areas or on projects where architectural heritage is a major consideration.*

**Sizes**
150 x 250 x 60/80mm

**Laying pattern**
Staggered stretcher bond or 90° herringbone for trafficked areas.

**Colours***
Traditional, Red Brindle, Vendage and Pennant.

**Finish**
Olden
Bush hammered to special order




## Aquasett combined®

For use on footpaths and domestic drives

*Range of colours and the Olden finish make the Aquasett combined appropriate for use in conservation areas or on projects where architectural heritage is a major consideration*

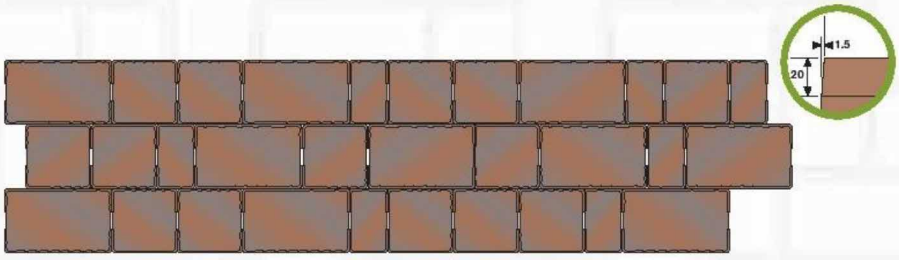
**Sizes**
Large 150 x 250 x 60/80mm
Medium 150 x 150 x 60/80mm
Small 100 x 150 x 60/80mm

Ratio of blocks in 0.8 square metre manufactured format: 10 large, 14 medium and 7 small.

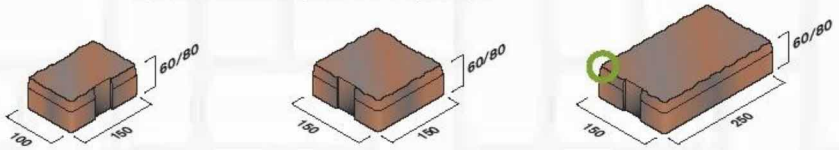
**Laying pattern**
Staggered stretcher bond

**Colours***
Traditional, Red Brindle, Vendage and Pennant.

**Finish**
Olden
Bush hammered to special order




Aquasett combined (0.8 square metres-one pallet layer)



Formpave have designed a range of Aquaflow paving blocks to be used in conjunction with either tanked or infiltration systems.

The range consists of six blocks manufactured from concrete with a tensile splitting strength in accordance with BS EN 1338:2003.

Included within the range is the Aquaslab which has been designed for use on non-trafficked pedestrian areas.

All of the blocks and slabs provide drainage through vertical channels and will allow water through the surface at a rate of approximately 9000mm per hour (9000 litres per $m^2$ per hour). The Inbitex geotextile beneath the laying course will allow approximately 4500 litres per $m^2$ per hour through and this figure should be used for design purposes.

The Aquaflow ML block system consists of an interlocking block with specialist top, bottom and edge blocks and has been specifically designed for heavy duty applications.

The ML blocks can be laid by hand or by machine. Where the blocks are machine laid modules of .65$m^2$ are laid in one pass. Laying rates of over 600$m^2$ per day have been readily achieved with a three man crew.

* **Other colours and finishes such as EcoGranite are available to special order.**

## Aquaflow block®

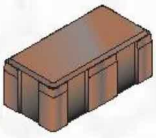
For use on car parks, drives and moderately trafficked areas

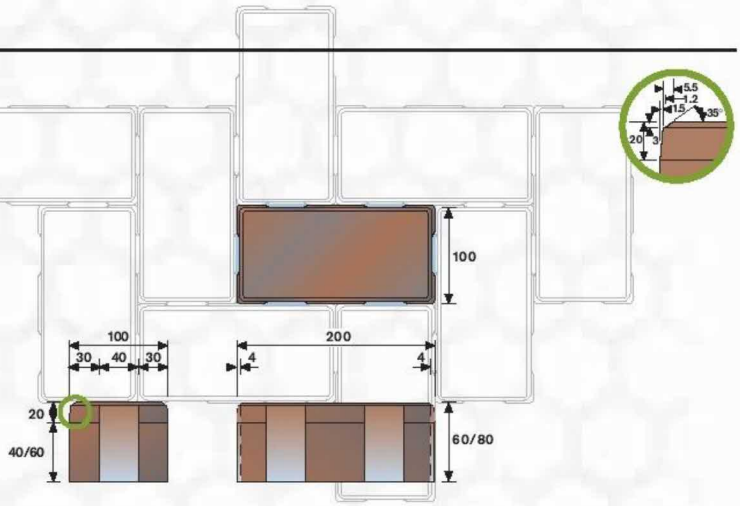
**Sizes**
100 x 200 x 60/80mm

**Laying pattern**
Must be laid in 90º herringbone

**Colours***
Natural, Burnt Red, Red brindle, Golden brindle and Charcoal.

**Finish**
Standard
Bush hammered to special order






## Aquaflow ML block®

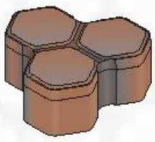
For Roads and heavy duty use

**Size**
80mm

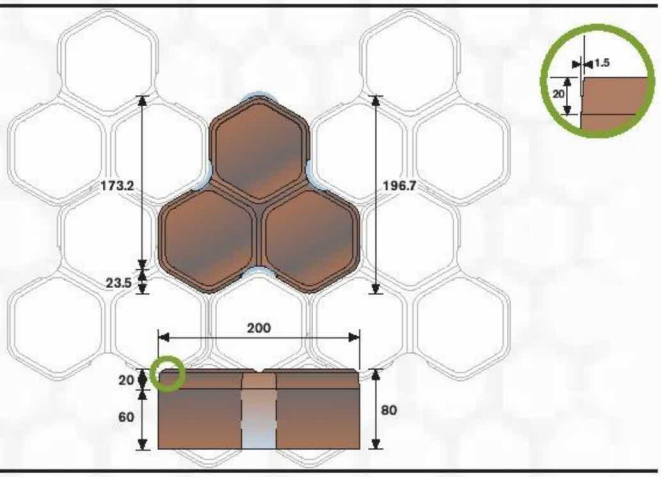
**Laying pattern**
Include stretcher course around edge in conjunction with MLE and MLTB

**Colours***
Natural, Burnt Red, Red brindle, Golden brindle and Charcoal.

**Finish**
Standard



*Not available in EcoGranite*




## Aquaflow MLE® *top drawing*

End block
For use with Aquaflow ML blocks

## Aquaflow MLTB® *bottom drawing*

Top and bottom block
For use with Aquaflow ML blocks

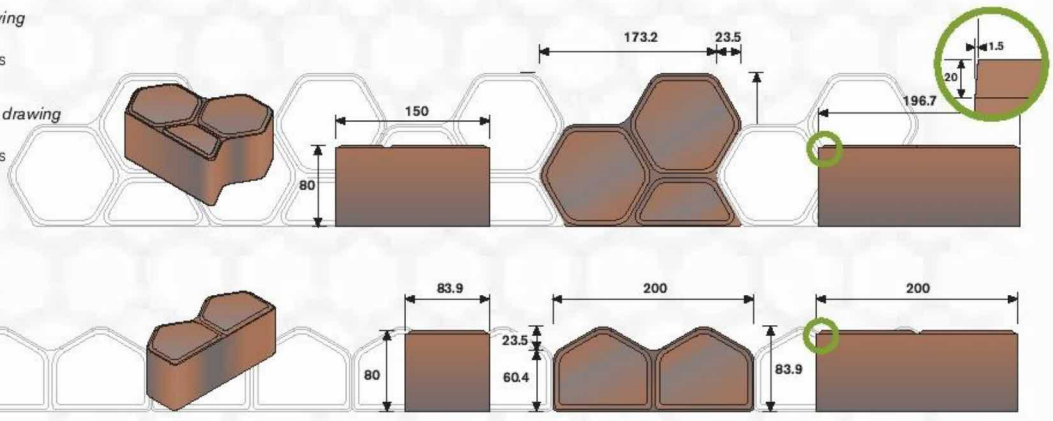
**Size**
80mm

**Colours***
Natural, Burnt Red, Red brindle, Golden brindle and Charcoal.

**Finish**
Standard



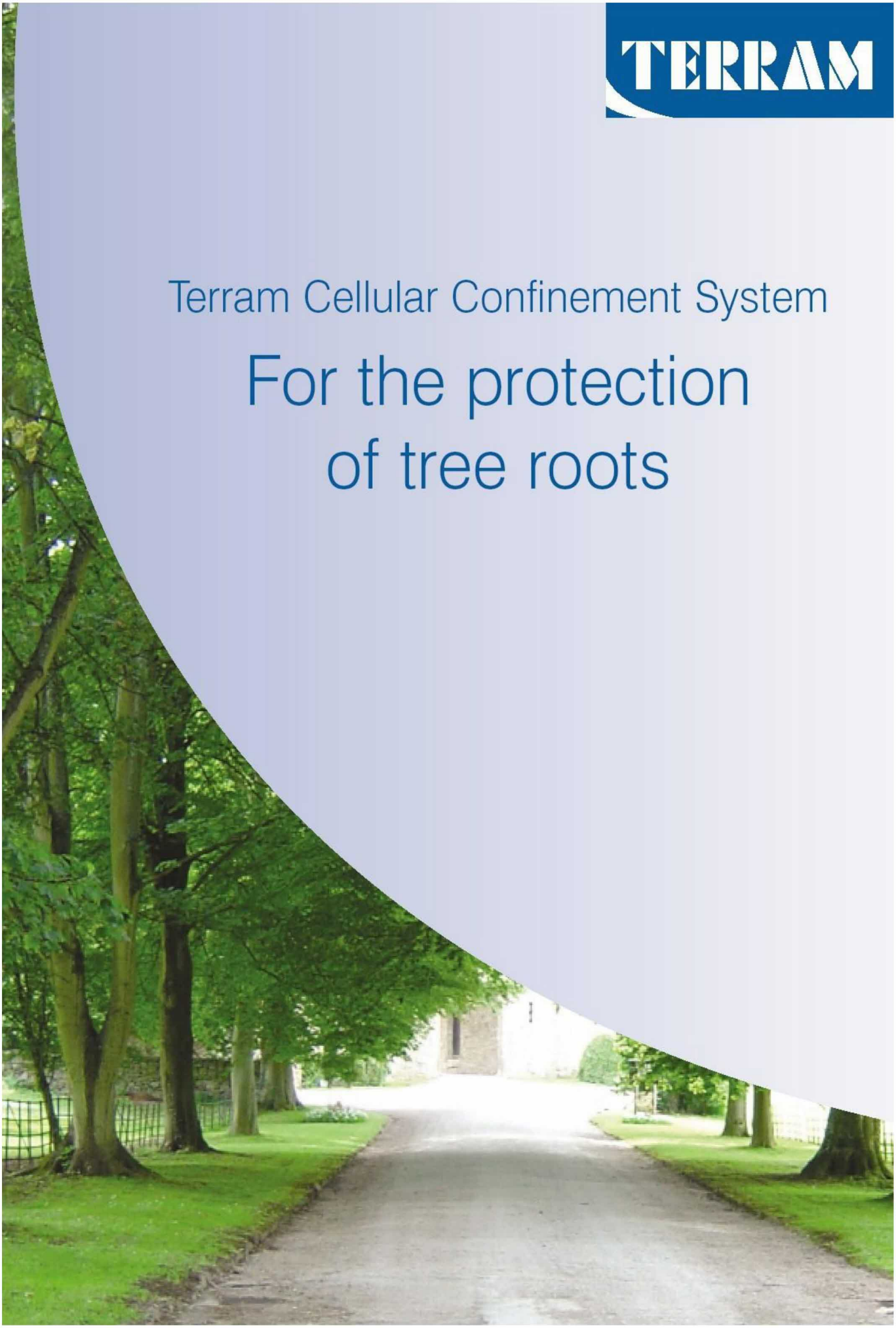
*Not available in EcoGranite*



TERRAM

Terram Cellular Confinement System

# For the protection of tree roots

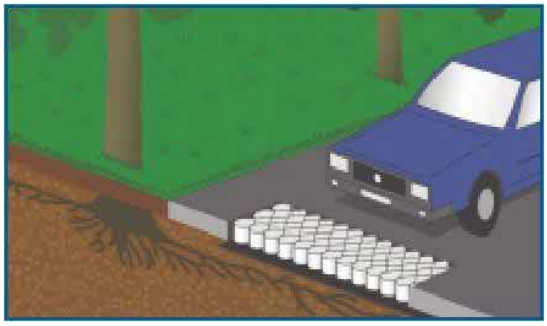


# Cellular Confinement Systems

## The perfect no-dig ground reinforcement system. Provides above-ground load bearing for paths and driveways whilst preventing soil compaction and protecting tree roots.

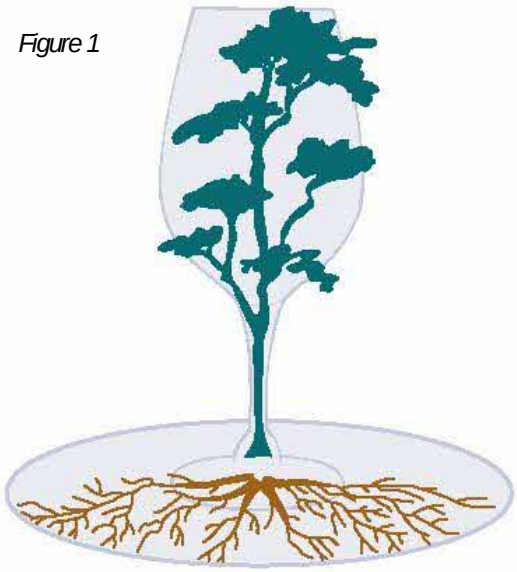
### Damage to tree roots during driveway construction

The conventional method for constructing paths, drives and roads involves excavating soil to enable the installation of a sub-base that will adequately support traffic loads. Unfortunately this method of construction can badly damage trees since a by-product of the excavation is root severance. Most people don't realise that trees are very sensitive to disturbances in the soil around them. The reason for this is that, contrary to popular belief, trees do not have massive roots that go deep down into the soil but rather have lots of relatively small roots (frequently only a few centimetres in diameter) which spread out from the tree very close to the soil surface for quite large distances (often equal to the height of the tree).



If you imagine a tree system as a wine glass standing on a dinner plate you will have a roughly accurate idea of the above and below ground proportions of a tree (Figure 1). It may come as a surprise to learn that about 80-90% of all tree's roots are in the upper metre of soil (Figure 2). These roots serve two purposes: anchorage and absorption of moisture. If even relatively small roots are severed, for example by digging a trench, the tree can begin to suffer symptoms of drought stress as it is no longer able to obtain all its water needs. In addition the tree may become unstable as cutting the roots is a bit like cutting the guy roots on a tent.

*Figure 1*



It is not only root severance that may harm trees but also compaction of the soil. If the root zone of a tree is not protected during development then the soil may become compacted by vehicles or heavy machinery moving repeatedly over the ground (Figure 3). The effect of compaction is to close up pores in the soil which contain air and water. The tree's roots then suffer from both a lack of oxygen and a lack of moisture, and, as the soil becomes denser, roots find it hard to penetrate the soil. All this can lead to a dieback of the root system and frequently dieback of the tree. Raising of soil levels has a similar damaging effect as it deprives roots of oxygen and creates a build up of harmful carbon dioxide around the roots.

## So, How Do Tree Roots Grow?

People often wrongly assume that tree roots are thick and grow down into the soil for many metres (Figure A). In reality tree roots:

- Are usually only large near to the trunk and get thinner the deeper and further from the tree they go. At a distance of just 3-4 metres from the trunk most roots are no bigger than a few centimetres in diameter.
- Spread outwards from the trunk, more or less parallel with the soil rather than growing downwards (Figure B).
- Can spread horizontally in any direction for a distance equivalent to at least the tree's height.
- Are usually relatively shallow; 80-90% of a tree's roots are in the Upper metre of soil. Few roots reach depths of more than about 2-3 metres and at this depth they are only a few millimetres in diameter.

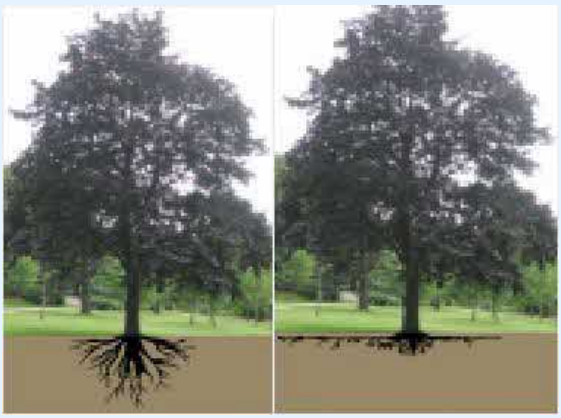


*Figure A: Incorrect* *Figure B: Correct*

## British standard for trees in relation to construction and APN1

In recognition of the fact that trees are sensitive to disturbance the British Standards Institution has published recommendations on how to protect trees during development. In line with the earlier British Standard (BS 5837: 1991) the most recent guide, published in September 2005 (see further reading), recommends that there should be a 'root protection area' in which development should not be permitted.

In most case this are has a radius equal to twelve times the trunk diameter and forms a exclusive zone around the tree protected by means of robust fencing. This guidance had the effect of prohibiting the installation of roads, driveways and parking areas near to trees. But in 1996 the Arboricultural Advisory and Information Service published Arboricultural Practice Note 1 Driveways Close to Trees (APN1) which suggested that driveways could be installed within the root protection area provided roots and soil were not damaged.

The conditions set out for a suitable system were as follows:

- Roots must not be severed
- Soil should not be compacted
- Free movement of oxygen and carbon dioxide into and out of the soil should be maintained
- Water infiltration into the soil should not be impeded

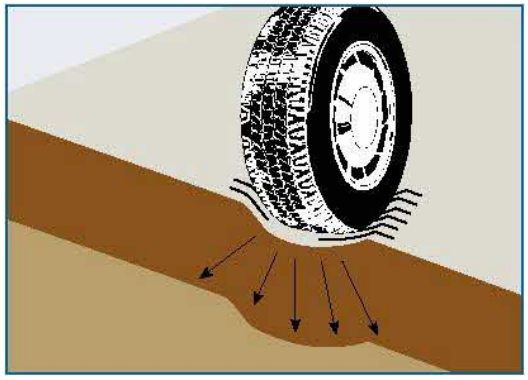
The, APN1 advised that driveways could be installed within the root protection zone provided that an above-ground, no-dig construction was used. This advice was incorporated into the recent British Standard which recommended that the most effective means of achieving this was through the use of a three-dimensional cellular confinement system.

## Terram Geocell ground protection

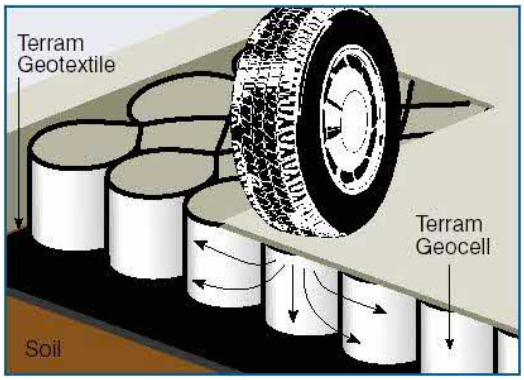
Terram Geocell is an ideal solution for providing ground reinforcement with tree protection areas. It confines fill material within its strong flexible cell structure in order to provide a stable base for traffic and an even load distribution (Figure 3 and 4). A big advantage of Terram Geocell over other products is that the geotextile material is permeable and allows lateral movement of air and water.

Terram Geocell is suitable for permanent woodland trails, paths, driveways, roads and parking areas.

It may also be used as temporary ground reinforcement where access to a site is limited by the presence of trees. Once operations on site are completed the temporary surface can easily be removed and the ground left undamaged.



*No ground reinforcement: Unreinforced soil becomes compacted and rutted by vehicle loads*




*Geocell ground reinforcement: Forces are spread Laterally reducing loads on the underlying soil*

*Figure 3. The Geocell Distributes loads evenly In order to prevent rutting*

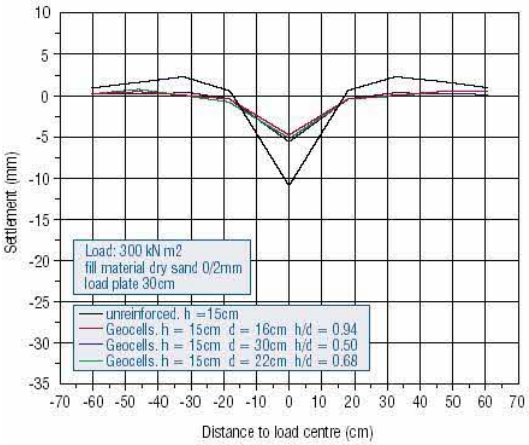



*Figure 4. Static loading tests of up to 300kN/m2 revealed only minimal deflection (<5mm) of the surface of filled Geocell*

## Getting the design right

Every application will be slightly different so it is important to have the input of an engineer and arboriculturist together in order to design the right solution for an installation near to trees. The Arboriculturist will be able to advise on tree protection issues and the engineer will be able to specify details such as cell depth, fill type (Figure 5) and load bearing capacity.

For example, the design of a pedestrian footpath may be less rigorous than that of an access road that may have to withstand the load of a heavy crane or lorry.

But there are some principles that should be considered in every application (see Figure 6):

The ground must be protected at all stages during installation – there is no point in installing a ground protection system where soil or roots have already been damaged by other site activities

Terram Geotextile should be used underneath the Geocell to prevent fill materials penetrating the soil

The fill material should be granular and should permit water and air flow

Any edgings should be carefully designed to avoid excavation and root severance

A permeable and gas-porous wearing course should be installed above the Geocell

In most case the driveway or parking area should not exceed 20% of the root protection area.

If correctly designed and installed the Geocell cellular confinement system should allow paths, drives and parking areas to be located within a tree's protection zone, thus enabling development that might not otherwise be permitted by local authorities.

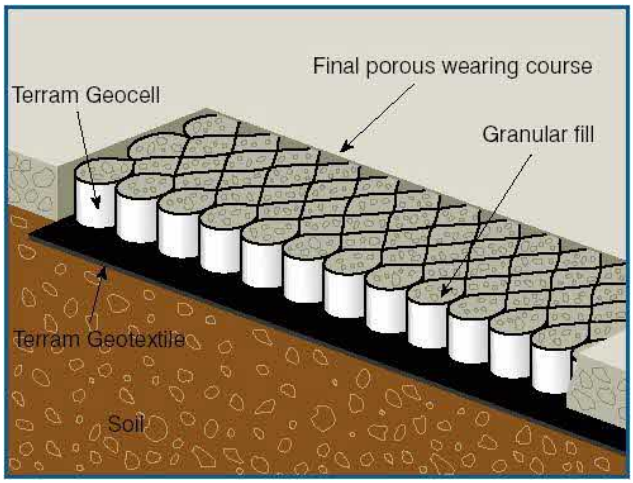



*Figure 6. Components of an above-ground load bearing platform suitable for vehicles*

## Example installation
## Driveway construction

1. Remove grass and other vegetation and the upper organic layer Of soil by hand digging. Arisings should be wheel-barrowed out of the tree protection area. Machinery (even low ground pressure tracked vehicles) should not be used due to the danger of soil compaction
2. Small depressions may be filled with sharp sand
3. Lay out Terram Geotextile over the driveway area
4. Lay out Terram Geocell and carefully peg in place
5. Fill the cells working from the area furthest from the trees first. Further filling should be carried out using the filled Geocell as a platform
6. Install a permeable wearing course, e.g. porous tarmac, block paviours on a sharp sand base (a further layer of Terram above the filled Geocell will be needed in this case to prevent the sand mixing with the granular fill below).

## Conclusion

BS5837 Trees in Relation to Construction and APN1 allow the careful development of paths, drives and roads within the root protection area of trees provided an above-ground, no-dig construction is used.

The use of Terram Geocell as a ground reinforcement Platform is Therefore and Ideal solution that can facilitate such development near to tree which might not otherwise be permitted due to fears of damage to soil structure and tree roots.

## Further reading

*BS 583: 2005 Trees in relation to construction – Recommendations. British Standards Institution.*

*Dobson, M. (1995): Tree Root Systems. Arboriculture Research and Information Note 130/ARB/95. Arboricultural Advisory and information Service, Farnham.*

*Patch, D. and Dobson, M. (1996). Driveways Close to Trees. Arboricultural Practice Note 1. Arboricultural Advisory and Information Service, Farnham.*

*Nicholson, R. (2001). APN1, BS5837 & PPG 3, Guidance for Trees: Conflict or Complement? Arboricultural Journal 25, 361-376.*

| Products Available | Panel size | Depth | Cell Diameter |
|---|---|---|---|
| Erocell 22/20 | 5.0m x 10.1m | 200mm | 220mm |
| Erocell 25/15 | 7.0m x 10.0m | 150mm | 250mm |
| Erocell 25/10 | 7.0m x 10.0m | 100mm | 250mm |

*The cell depth and diameter is dependent upon specific site conditions*



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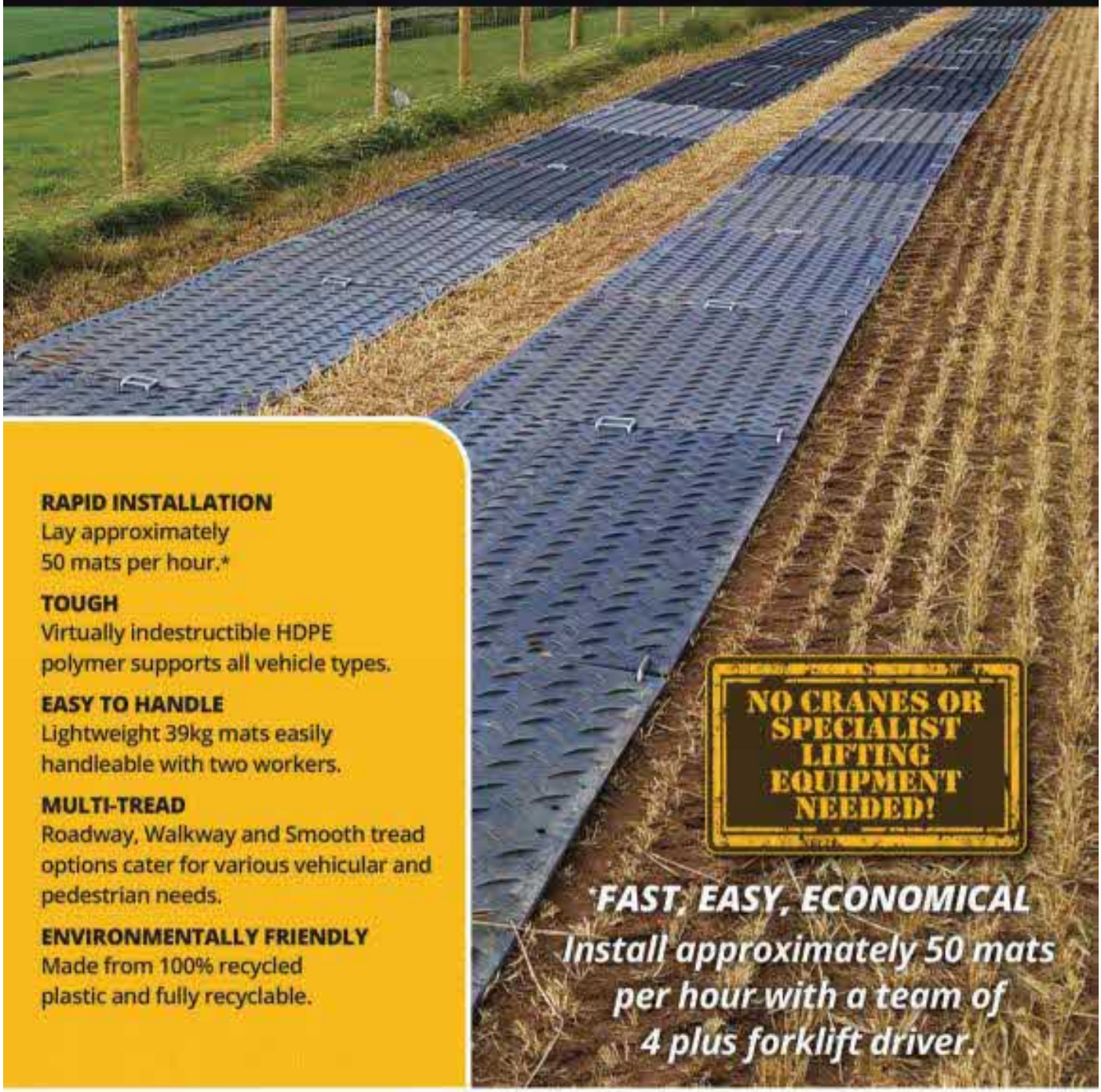
Email: info@terram.co.uk Web: www.terram.com

**7. GroundGuards Multitrack Ground Protection**

# MultiTrack




**RAPID INSTALLATION**
Lay approximately 50 mats per hour.*

**TOUGH**
Virtually indestructible HDPE polymer supports all vehicle types.

**EASY TO HANDLE**
Lightweight 39kg mats easily handleable with two workers.

**MULTI-TREAD**
Roadway, Walkway and Smooth tread options cater for various vehicular and pedestrian needs.

**ENVIRONMENTALLY FRIENDLY**
Made from 100% recycled plastic and fully recyclable.

**GroundGuards®**

+44 (0)113 267 6000
info@ground-guards.co.uk
**www.ground-guards.co.uk**

# MultiTrack

*MultiTrack mats are the strongest in their category*

*Mats are easily moved using a HandiHook*

*Standard no-tools joiners quickly clip the mats together*

*Low profile joiners for walkways plus bolted joiners*

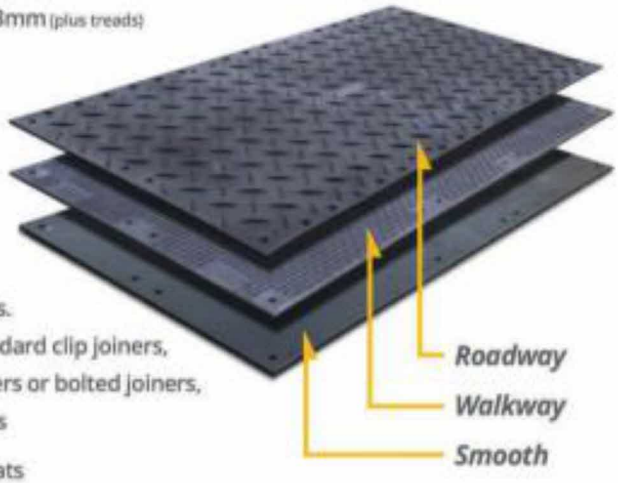
*SafeStore stillages hold 25 mats*

**Overall Size:** 2435 x 1215 x 13mm (plus treads)

**Surface Area:** 2.95m²

**Weight:** 39kg

**Tread Options:** Roadway, Walkway and Smooth, or a combination




**Connectors:** 10 joining points.
A choice of standard clip joiners, low profile joiners or bolted joiners, plus anchor pins

**Packed in:** Stillage of 25 mats

**Stillage Pack:** **Weight:** 1105kg
**Dimensions:** 2550 x 1260 x 900mm

**Slip Testing:** BS7976 part 2

**Deflection:** Tested on varying CBR ground conditions using a 300mm diameter steel platen with 6 tonnes load to simulate the pressure of an HGV wheel

**Ground CBR 11.35% :** Deflection 17.68mm

**Ground CBR 8.58% :** Deflection 20.41mm

**Ground CBR 4% :** Deflection 22.00mm

**Guarantee:**

It is the user's responsibility to assess the load-bearing capacity of the ground, and to only operate vehicles within the weight that the ground is capable of safely supporting. Ground-Guards Ltd accepts no liability whatsoever for any damage, loss or injury arising from the ground conditions on which these products are used.

MultiTrack mats are not suitable to use for bridging purposes. Damage caused by mechanical equipment (e.g. cuts by digger buckets) or sharp protrusions beneath the mats is not covered by this guarantee.

**GroundGuards®**

+44 (0)113 267 6000
info@ground-guards.co.uk
**www.ground-guards.co.uk**

**8. Supa-Trac Ground Protection**

# SUPA-TRAC™

TEMPORARY TRAFFICABLE EVENT SURFACE

**Supa-Trac™** is suitable for medium or heavy weight use and protects the ground underneath as well as protecting the cars, vehicles or people from the ground. The **Supa-Trac™** panels are quick and easy to install with up to 70m² laid per hour and no tools are required.

The temporary flooring panels can be laid on any ground covering and can be fitted to any shape.

With super quick installation and extraction – up to 70m2 per hour – it's the simplest, fastest ground cover solution of its type on the market. No tools or expertise needed.

Additionally, the flooring panels are easy to remove and can be stacked and stored easily. If required the panels can be cleaned by hosing them down.

**Supa-Trac™** creates a firm surface for walkways, roadways, temporary building and structures. Even heli-pads and car parks.

MADE IN BRITAIN

Data Sheets, Installation & Design Guidances and Case Studies can be downloaded from www.groundtrax.com/downloads

# SUPA-TRAC™

TEMPORARY TRAFFICABLE EVENT SURFACE

## Suitable for:

- ✓ Light Duty Roadway
- ✓ Pedestrian Walkway
- ✓ Pitch Covering
- ✓ Self Installation

## Benefits:

- ✓ Pedestrian-friendly surface
- ✓ Light vehicle access
- ✓ Hi-Vis ramps
- ✓ Quick and easy to install

### TECHNICAL SPECIFICATIONS

**Dimensions & Materials**

| | |
|---|---|
| Panel Dimesions: | 966mm x 275mm x 34mm |
| Panel Weight: | 2.025kg (9.7kg/m²) |
| Material: | Nucleated Polypropylene Co-polymer |
| Colour: | Grey/Black/Green (Other colours available to order) |
| Edging Ramps: | Black/Yellow |
| Locks: | Black (Acetal) |

**Operating Conditions**

| | |
|---|---|
| Temperature: | -49c > +49c |
| Static Load: | 80 Tons/m² |
| Max GVW: | 3.5t (Ground dependant) |
| Max GVW with Geotech substrate: | 40t (Ground dependant) |

**Resistance to sunlight and ultra violet light exposure**
The product will not be detrimentally afected with regard to strength and structure for a minimum of 5 years, however over exposure could lead to slight fading of colour.

**Resistance to petrol and oil derivatives**
PP is impervious to the exposure of most substances and the only effect of such contact could be slight discolouration.

**Resistance to corrosion**
We are not aware of any substance that would lead to the product corroding.

**External storage**
The product is suitable for outside, uncovered storage - the only impact being the possibility of slight fading of colour.

**Lateral inclines of 20%**
The product is able to support slopes and inclines. Should it be felt the situation dictates, stakes can be used to secure the roadway.

**Permeable to liquid**
The product is not permeable to liquid. The panels have been designed to ensure liquid drains from the panel surface using the designed holes.

**Usability in muddy conditions**
The product can be used in muddy conditions. By using geotech substrate the product can successfully be deployed, adding value by improving traction and protecting the underlying surface from further deterioration. Should the surface of the roadway become too muddy through traffic movement, this can be easily removed by either pressure washing or sweeping with a hard brush.

For more information, contact us today or visit our website:

**www.groundtrax.com**

GROUNDTRAX
Ground Protection and Reinforcement
Telephone: 03456 800008 | Fax: 03456 800208
E-Mail: info@groundtrax.com | Website: www.groundtrax.com

# Appendix H

## Statement of Supervision

**NB. Items designated ?? cannot be entered until after approval is granted but are to remain in the document to show where updates are required. This document to be reissued prior to any works commencing onsite with this text to be deleted from final document.**

## Hanover & Princess Court, Bentinck Street, Cambridge, CB2 1HG

## Statement of Supervision (Arboriculture)

### Introduction

In accordance with Planning Permission ?? (dated ??/??/????), Hill Holdings Ltd are undertaking the development of the above site.

The purpose of this document is to ensure that all works that have an impact on retained trees are undertaken in accordance with the approved Method Statement and Tree Protection Plan. As such, the purpose of the Statement is to identify the following arboricultural issues:

Approved documents;

Key staff and contacts;

Critical phases of pre-commencement, induction and construction.

### Associated Documents

The following documents must be available to all those with responsibility for arboricultural matters during construction:

BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.

Notice of Planning Decision ??, dated ??/??/????.

Arboricultural Impact Assessment, Preliminary Method Statement & Tree Protection Plan for this project (Ref. 11003) – produced by Hayden's Arboricultural Consultants dated 13/10/2025.

### Key Staff

The following have or are to be appointed responsible for arboricultural matters at the site:

Developer: Hill Holdings Ltd (or their representative).

Arboricultural Consultant: Hayden's Arboricultural Consultants Ltd. Contact Mr David Carmichael (Practice Manager) – 01284 765391, info@treesurveys.co.uk, (or his representative).

Site Manager/Agent – TBC, (or their representative).

**Critical phases of pre-commencement, induction, construction & completion**

| REF | ACTIVITY | ONE OFF /REPEAT | ATTENDEES | ACTION |
|---|---|---|---|---|
| 1 | Pre-commencement meeting (to discuss working methods, timescales and tree protection schemes) | One off | Developer, Arboricultural Consultant, Site Manager/Agent, Ground Works Contractor, LPA Tree Officer | Arboricultural Consultant to record minutes – copies to be submitted to attendees |
| 2 | Inspection of completed tree surgery & erection of fencing | One off | Arboricultural Consultant, Site Manager/Agent | Arboricultural Consultant to record minutes – copies to be submitted to Developer and LPA Tree Officer |
| 3 | Inspection of specific tasks during construction (eg excavation in RPA, realignment of fencing, service installation) | One off (for each identified item) | Arboricultural Consultant, Site Manager/Agent, Contractors (as required) | Arboricultural Consultant to record minutes – copies to be submitted to Developer and LPA Tree Officer |
| 4 | Completion of construction – prior to removal of fencing | One off | Arboricultural Consultant, Site Manager/Agent | Arboricultural Consultant to record minutes – copies to be submitted to Developer and LPA Tree Officer |
| 5 | Final tree assessment – after fencing removal | One off | Developer, Arboricultural Consultant, Site Manager/Agent, Ground Works Contractor, LPA Tree Officer | Arboricultural Consultant to record minutes – copies to be submitted to Developer and LPA Tree Officer |
| 6 | Additional routine inspections (anticipated to be monthly, but frequency to be confirmed by LPA). | Dependent on progress of the project | Arboricultural Consultant, Site Manager/Agent | Arboricultural Consultant to record minutes – copies to be submitted to Developer and LPA Tree Officer |

**Variations and Incidents**

Any proposed variations to the proposed working method (relating to arboricultural matters) will be referred by the on-Site Manger/Agent to the Developer who will seek advice from the Arboricultural Consultant. The Arboricultural Consultant shall advise on minor amendments (e.g. realignment of fencing etc) and will subsequently report these to the Arboricultural Officer by e mail or minutes. Issues directly relating to tree surgery or tree retention will be forwarded by the Arboricultural Consultant (with recommendations) to the Arboricultural Officer for approval. Except in an emergency **and** when the Arboricultural Officer is unavailable, no such actions will occur without the written approval of the Arboricultural Officer.

[redacted]

**Alex Garnham**
Arboricultural Consultant
Hayden's Arboricultural Consultants Ltd
13th October 2025.

HAYDEN'S
Arboricultural Consultants

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# Reasons for a Qualified Monitoring Arboriculturalist

It is essential that the works are monitored by a qualified and experienced Arboriculturalist for the following reasons.

1. An Arboriculturalist has the skill and expertise to identify if the approved tree surgery specification has been complied with and the knowledge to provide appropriate remedial advice.

2. It is necessary for informed decisions to be made regarding the impact of tree surgery, particularly root pruning. The location of roots is assessed via a calculation, but in reality, roots may grow in a more unpredictable fashion dependent on topographic and historic features. Under CDM it is essential that expert individual knowledge is available and can advise on the inevitable unforeseen circumstances that arise.

3. An Arboriculturalist provides the point of liaison and information exchange with the Local Planning Authority's Tree Officer who is also normally a qualified Arboriculturalist. This allows fellow professionals to discuss the technical matters that inevitably arise and agree appropriate and balanced solutions. Having an Arboriculturalist engaged on the supervision of a project provides comfort to the Local Planning Authority that tree protection measures are complied with and hence it is much more likely that there will be less direct scrutiny from the Local Planning Authority (regarding tree matters) during the build of the project than would otherwise be the case.

4. Arboricultural input is essential to confirm that tree protection measures are adequate and fit for purpose. This can often save the client time (and therefore money) by identifying working methods and systems that are site efficient.

5. As living entities sensitive to their environment, the condition of trees changes, and over the course of a project it may be necessary to advise on additional tree surgery or felling as a result of, for example disease or storm damage.

6. An Arboriculturalist will provide detailed briefing notes and "toolbox talks" to site staff to ensure their compliance with conditions and prevent arboricultural breaches of conditions arising which can have severe consequences for project progression.

7. Close liaison between the Site Manager and the Arboriculturalist will ensure that the retained trees are protected but as minimal an inconvenience to construction as possible. This leads to the final outcome which is the completion of the project with retained healthy trees complementing the buildings in the manner that the designers and planners envisaged.

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# Tree Protection Briefing Note

Introduction:

The trees that are to remain as part of the development are important and must not be harmed. They have been carefully selected as part of an extensive appraisal, design and planning process and therefore are legally protected by a combination of Tree Preservation Orders and Planning Conditions. This means that any damage caused to retained trees is a serious offence, as is the undertaking of any work to trees that has not been authorised in writing by the Local Planning Authority. Contravention of this legislation is liable to lead to heavy personal or corporate fines together with the imposition of stop notices, expensive mitigation measures and replacement planting instructions. Given this, it is vital that all development staff are familiar with the approved Tree Protection Plan (TPP).

Typical Forms of Construction Damage to Trees:

1. Physical Injury to Trunk and Crown. Construction equipment can injure the above-ground portion of a tree by breaking branches, tearing the bark, and wounding the trunk. These injuries are permanent and, if extensive, can be fatal.

2. Root Cutting*. Excavation, grading and trenching associated with construction and underground service installation can be very damaging to tree roots which are vital for both anchoring the tree in the ground and gathering moisture and nutrients. Unacceptable levels of damage to the roots will lead to a tree losing vitality, dropping branches, dying or becoming unsafe – either immediately or in the future.

3. Soil Compaction. An ideal soil for root growth and development contains about 50% pore space for water and air movement. Tracking by construction equipment and the storage of materials can compact soil and dramatically reduce pore space. Compaction inhibits root growth, limits water penetration, and decreases oxygen needed for root survival. If the compaction is too severe, in addition to preventing effective root growth, it will cause physical injury to both anchor and feed roots.

4. Smothering Roots by Adding Soil*. The majority of fine moisture and nutrient absorbing roots are within the top 30 cm of soil. Even a few centimetres of soil piled over the root system to change the grade can smother fine roots and eventually lead to the death of larger roots.

5. Rooting Zone Contamination*. Many materials used on development sites (e.g. salt, lime, concrete, cement, oil) are toxic to trees. If such contaminants are spilled or allowed to leach into the RPA, they can quickly kill the roots, thus causing the same effects as root cutting, soil compaction and smothering.

* As the location of tree roots cannot be seen, each retained tree close to a developable portion of the site has a designated Root Protection Area (RPA) as shown on the approved TPP. No excavation, grading, trenching, storage of materials nor any other activity may take place within the designated RPA unless it is in accordance with the approved Tree Protection Plan and completed under the supervision of Hayden's Arboricultural Consultants.

Preventing Damage to Trees During Construction:

The approved TPP provides specific instruction on the tree protection measures required across whole site in order to prevent damage. The primary methods of protection are as follows: -

1. Installation of Protective Fencing. The alignment and specification of this is shown to scale on the approved TPP. It must be erected prior to any demolition or development commencing on site and must not be moved or altered without prior written agreement of the Hayden's Arboricultural Consultants or the Local Planning Authority. No activities may take place within the fenced area, and no materials may be stored within the fenced area. The fencing may not be removed until ALL construction activities in the vicinity have been completed and only then with the written agreement of Hayden's Arboricultural Consultants or the Local Planning Authority.

2. Ground Protection. Where fencing is impractical the TPP provides instruction on other forms of effective ground protection. An example of this would be the provision of a temporary load bearing surface to prevent soil compaction and contamination. This must be of bespoke design for each situation so as to ensure it is fit for purpose. As with the fencing, this must be installed prior to any demolition or development commencing on site and must not be moved or altered without prior written agreement of the Hayden's Arboricultural Consultants or the Local Planning Authority. The temporary ground protection may not be removed until ALL construction activities in the vicinity have been completed and only then with the written agreement of Hayden's Arboricultural Consultants or the Local Planning Authority.

3. Monitoring Visits from Hayden's Arboricultural Consultants. Under the terms of the planning permission the development must be monitored by an Arboriculturalist on a suitably frequent basis. The purpose of this is twofold: -
    a. To ensure that the above tree protection measures are complied with and report findings to the developers AND the Local Planning Authority.
    b. To be available to provide help and advice regarding the inevitable requests for changes and supervision when working around retained tree.

4. Operational Planning. Whilst it is understood that trees are far from the only issue to be managed on site, they do represent a significant and potentially costly constraint if the protection measures required in the TPP are not strictly adhered to and as a result construction damage to trees occurs. Therefore, if problems in terms of work space conflicting with tree protection measures are identified, early liaison with Hayden's Arboricultural Consultants is essential so as to agree supervised works, alternate working methods or if necessary seek additional approval from the Local Planning Authority. Failure to identify these matters at an early stage may lead to significant delays as it can be a lengthy procedure in gaining a response from the Local Planning Authority.

***Conclusion:***

- Tree Protection Measures are there to protect the environment. They are also there to protect you. If they are complied with, trees will not be harmed. Therefore, DO NOT amend the protection unless you have written consent from Hayden's Arboricultural Consultants or the Local Planning Authority.

- If you are unsure on any tree related matter, seek advice before you act. Hayden's Arboricultural Consultants will discuss your concerns and help find practical and timely solutions (where possible).

- Hayden's Arboricultural Consultants, in conjunction with the Local Planning Authority, may change the frequency of Arboricultural Monitoring Inspections if it is deemed necessary to ensure the approved standards of tree protection are adhered to.

- Hayden's Arboricultural Consultants can be contacted in the first instance at the Head Office on 01284 765391.

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**David M Carmichael**
Practice Manager

# Appendix I

Drawing

Arboricultural Impact Assessments

Arboricultural Method Statements

Tree Constraints Plans

Arboricultural Feasibility Studies

Shade Analysis

Picus Tomography

Arboricultural Consultancy for Local Planning Authority

Quantified Tree Risk Assessment

Health & Safety Audits for Tree Stocks

Tree Stock Survey and Management

Mortgage and Insurance Reports

Subsidence Reports

Woodland Management Plans

Project Management

Ecological Surveys