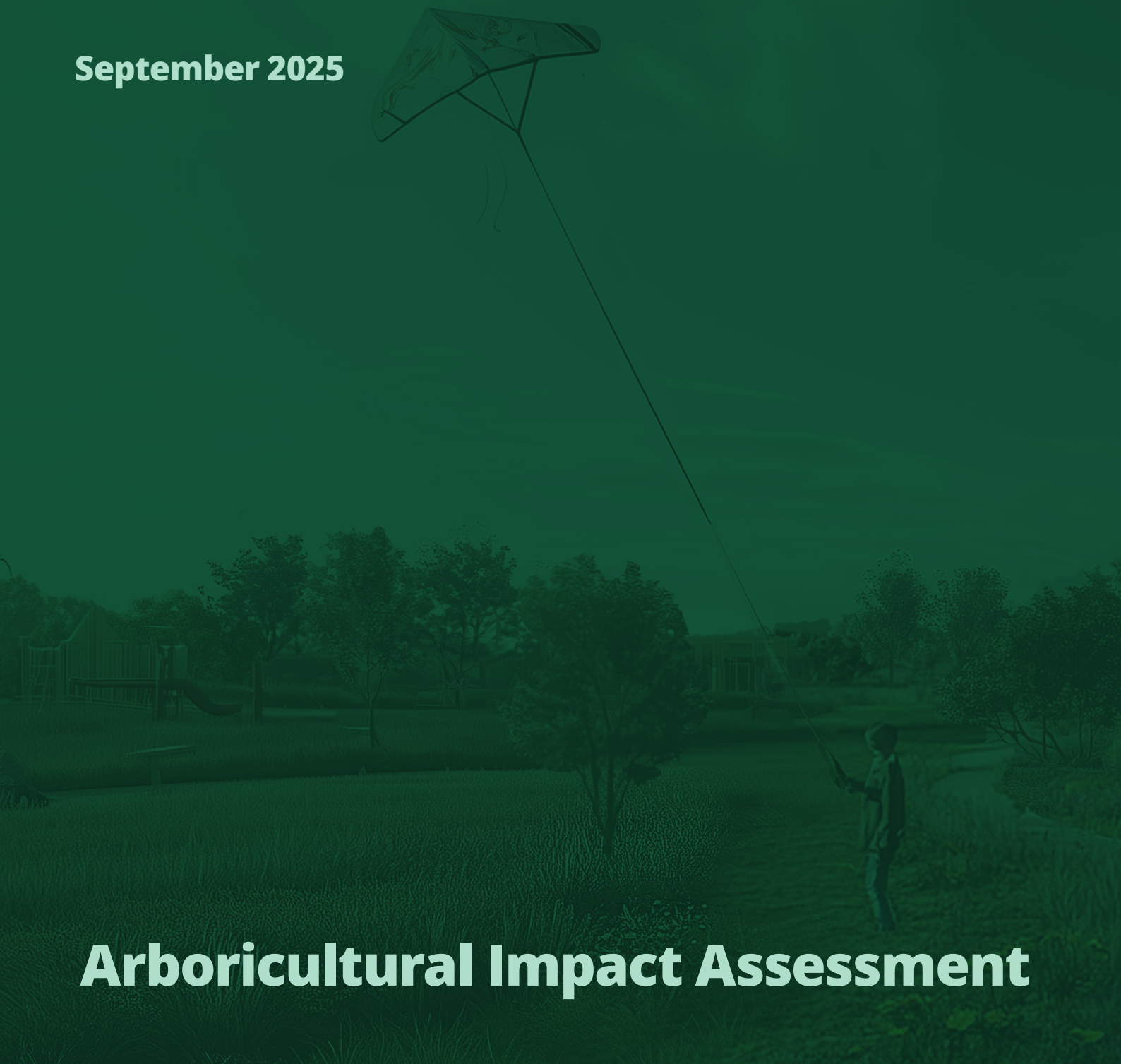
UNIVERSITY OF CAMBRIDGE

North West Cambridge

Future Phases of Eddington

September 2025



Arboricultural Impact Assessment

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TREE FRONTIERS

ENHANCING THE PRESENT TO ENSURE THE FUTURE

Veteran Oak (T001), North West Cambridge Site

ARBORICULTURAL IMPACT ASSESSMENT

Site:	North West Cambridge
Postcode:	CB3 1BF
Client:	University of Cambridge

Document Ref:	NWC27A_Arboricultural Impact Assessment_September 2025
Version No:	1
Date:	12th August 2025
Report Status:	**For Planning**
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Qualifications:	BA Hons BSc Hons MArborA MICFor RCArborA
Position:	Director

DOCUMENT CONTROL

Document Reference: **NWC27A_Arboricultural Impact Assessment_September 2025**

Document Title: **Arboricultural Impact Assessment**

Plans and Schedules to be read in conjunction with this report:

Type	Reference	Version
Tree Schedule	NWC-MP2024-TFL-SW-SU-00003-Tree_Schedule	1
Tree Constraints Plan	NWC-MP2024-TFL-SW-DR-00004-TCP	4
Arboricultural Implications Plan	NWC-MP2024-TFL-SW-DR-00001-AIP	1
Draft Tree Protection Plan	NWC-MP2024-TFL-SW-DR-00001-TPP	1

Third Party Reports relied upon for the Arboricultural Impact Assessment:

Document Name	Authoring Company	Document Reference
Topographical Survey	Sky Vision Surveys	SK-AEC-001_Master Drawing_Cambridge Topograhical Survey_FINAL
Proposed Site Plan	Hawkins Brown Architects	10009 - Illustrative Masterplan_250723
Landscape Masterplan	Grant Associates	NEP718-GRA-00-DR-L-5001-P_20250725

Version Control

Date	Notes	Author	Version
12.08.2025	Issued for planning	NB	1

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Opinions and information provided in the report are prepared using all reasonable skill, care and due diligence in compliance with the industry best practice guidance (BS5837), and The Arboricultural Association and Institute of Chartered Foresters Codes of Professional Conduct.

Contents

EXECUTIVE SUMMARY

I have been instructed to undertake a tree survey at North West Cambridge and to provide advice in regard to the existing tree stock, through the design process for the redevelopment of the Site.

A tree survey has been completed following the guidance provided by BS5837 (2012) *Trees in relation to design, demolition and construction – Recommendations*. A total of 853 trees, groups of trees, hedgerows or woodlands have been recorded within the survey area. All have been categorised as part of a quality assessment to determine the extent of the tree related constraints on site.

- 51 have been assessed as being of high quality and condition (Category A) with a remaining contribution of at least 40 years.
- 166 have been assessed as being of moderate quality and condition (Category B) with a remaining contribution of at least 20 years.
- 561 have been assessed as being of low quality and condition (Category C) with a remaining contribution of at least 10 years.
- 75 have been assessed as being of poor quality and condition (Category U) with a remaining contribution of less than 10 years.

Two trees have been identified as being a veteran specimens (T001 & T592).

There are no ancient woodlands within or in close proximity to the Site.

An online search confirms that the Site is partially located within West Cambridge Conservation Area and that trees have been identified within the Site boundary which are subject to Tree Preservation Orders.

The Proposed Development is for an outline planning application (all matters reserved except for means of access to the public highway) for a phased mixed use development, including demolition of existing buildings and structures, such development comprising

- Living Uses, comprising residential floorspace (Class C3/C4, up to 3,800 dwellings), student accommodation (Sui Generis), Co-living (Sui Generis) and Senior Living (Class C2);
- Flexible Employment Floorspace (Class E(g) / Sui Generis research uses);
- Academic Floorspace (Class F1); and
- Floorspace for supporting retail, nursery, health and indoor sports and recreation uses (Class E (a) – E (f)).
- Public open space, public realm, sports facilities, amenity space, outdoor play, allotments and hard and soft landscaping works alongside supporting facilities;
- Car and cycle parking, formation of new pedestrian, cyclist and vehicular accesses and means of access and circulation routes within the Site;
- Highway works;

- Site clearance, preparation and enabling works;
- Supporting infrastructure, plant, drainage, utility, earthworks and engineering works.

This development will require the removal of 66 trees, groups of trees or hedges. Additionally new access routes will require the partial removal of two hedges and one group of trees. All losses are associated with new built form and their loss is unavoidable if this scheme is to proceed. All retained trees can be protected throughout the development phase through the use of fencing to form a barrier, behind which there will be no access for machinery or materials required for development. Two of the retained trees will have the RPA encroached and therefore special measures have been proposed to limit the potential for harm to these. There is no proposal for any development work within or in close proximity to the canopies of retained trees.

1. INTRODUCTION

Instruction

1.1 I have been instructed by the University of Cambridge to undertake a tree survey to assist in the design of a new development scheme at North West Cambridge.

Scope

1.2 The scope of this instruction has been to:

- Undertake a tree survey to determine the range, age and quality of trees across the Site,
- Provide advice and guidance to the project design team on all matters relating to trees (excluding ecological matters or landscape design), and
- Prepare the required reports and plans to accompany a full planning application to South Cambridgeshire District Council and Cambridge City Council (the local planning authorities) for the proposed development.

1.3 The tree survey was to be conducted in accordance with the guidance provided in BS5837 (2012) *Trees in relation to design, demolition, and construction - Recommendations* ('BS5837').

1.4 All plans and reports following the tree survey were also to follow the recommended processes defined in BS5837 and any other industry advice that provides best practice guidance for managing the relationship between trees and construction processes.

1.5 Trees are a material consideration in the planning process and this document provides best practice guidance recommendations, seeking to ensure that there is a harmonious relationship between trees and development that will ensure that both trees and structures can be retained in the long term.

Purpose of this document

1.6 This report is an Arboricultural Impact Assessment and is intended to provide an assessment of the potential and actual impact of a development proposal on the existing tree stock at the Site. This document has been prepared to accompany a planning application and may be relied upon for that purpose.

Tree Survey

1.7 The survey was supervised and validated by Nick Bolton, arboricultural consultant for Tree Frontiers Ltd. I am also the author of this report.

1.8 The tree survey was carried out on several days between 17th and 25th October 2024.

Site Description

1.9 The North West Cambridge Masterplan site ("the Site") is located at Eddington on the north-western edge of the City of Cambridge, to the south and west of the village of Girton.

1.10 The Site is bound by:

- a small portion of the A14 to the north, and Girton College, residential properties and agricultural fields which front onto Huntingdon Road (A1307) to the north and north-east;
- residential properties located along Huntingdon Road, Ascension Parish Burial Ground, Trinity Hall (University of Cambridge student accommodation) and Trinity Hall sports grounds to the east of the site;
- Madingley Road Park and Ride, Madingley Road (A1303), and residential properties and buildings associated with the University of Cambridge to the south; and
- the M11 motorway to the west, beyond which lies agricultural fields.

1.11 Cambridge City Centre is located approximately 2km to the south-east of the Site at its nearest point. The Site forms part of the emerging settlement of Eddington

Caveats and Limitations

1.12 While all reasonable efforts have been made to identify the condition and quality of the trees on site, the statements made in this report and schedules do not take into account the effects of extreme weather events, vandalism or accidents, or changes to the Site that may affect trees that have taken place since the date of the survey.

1.13 I can confirm that the survey has been undertaken in accordance with industry best practice recommendations and guidance, but no warranty is provided in relation to changes to the Site that occur after the date of the survey that may have an impact on the tree stock present at the time of the survey.

1.14 Unless stated differently in captions, all photographs used in this report have been taken by the author at the time of the site visit.

1.15 The comments and observations made within this report will cease to be valid either within two years of the date of the survey (unless specifically stated elsewhere within the report), or when site conditions change or any works to trees take place that have not been specified within this report, whichever is the sooner.

1.16 The survey has been undertaken with the benefit of a topographical survey undertaken by SkyVision Surveys in January 2025. The location of all trees and groups detailed in this report have been taken from the topographical survey and no warranty is given as to the accuracy of this data.

1.17 This survey has been limited to identifying arboricultural features within the Site. It does not include any ecological assessment or landscape appraisal of trees, groups, woodlands or hedges beyond the scope of BS5837.

1.18 Although I am occasionally involved in landscape, ecological and planning issues, I have no formal qualifications in these areas and any comments made in this report to such matters are limited to the general context in view of my familiarity through my day-to-day work, and professional advice should be obtained on these matters where required.

2. DEVELOPMENT PROPOSAL

The development proposal is an outline planning application (all matters reserved except for means of access to the public highway) for a phased mixed use development, including demolition of existing buildings and structures, such development comprising

- Living Uses, comprising residential floorspace (Class C3/C4, up to 3,800 dwellings), student accommodation (Sui Generis), Co-living (Sui Generis) and Senior Living (Class C2);
- Flexible Employment Floorspace (Class E(g) / Sui Generis research uses);
- Academic Floorspace (Class F1); and
- Floorspace for supporting retail, nursery, health and indoor sports and recreation uses (Class E (a) – E (f)).
- Public open space, public realm, sports facilities, amenity space, outdoor play, allotments and hard and soft landscaping works alongside supporting facilities;
- Car and cycle parking, formation of new pedestrian, cyclist and vehicular accesses and means of access and circulation routes within the Site;
- Highway works;
- Site clearance, preparation and enabling works;

2.2 Supporting infrastructure, plant, drainage, utility, earthworks and engineering works.

3. ARBORICULTURAL SURVEY DATA COLLECTION AND RESULTS

Tree Survey Methodology

3.1 The survey has been carried out as a ground based visual assessment only following the guidance provided in BS5837.

3.2 The information collected during the survey has been used to assist in the design of the Site. This report includes:

- A schedule of the relevant trees to include base line data and quality assessment; and
- A plan showing the extent of constraints presented by the exiting tree stock (herein after referred to as a Tree Constraints Plan (TCP)) that provides illustrative information on the constraints, for consideration during the design of the Site.

3.3 The purpose of the tree survey has been to provide an assessment as to the quality and non-fiscal value of the trees on Site. This then allows guidance to be given to the design team to inform the Site design and layout.

General Data Capture

3.4 For reference, individual trees are identified with the letter T and associated number on the Tree Schedule and on a plan showing the extent of tree constraints.

3.5 The following measurement conventions have been followed:

- The stem diameter of the trees on Site was recorded using a rounded down diameter tape or a digital hypsometer, measured at 1.5m above ground level. Measurements were recorded in millimetres, rounded to the nearest 10mm.
- The height of the subject trees was estimated to the nearest metre.
- Maximum crown spread of the subject tree was measured from the edge of the trunk to the tips of the live lateral branches taken at four compass points (N-E-S-W) using a Leica Disto digital laser measure. Crown spread measurements were taken in metres.
- Tree age was estimated from visual indicators (such as tree size and appearance of bark) which is provided as a provisional guide.

3.6 Groups of trees were identified with the letter G and number on the associated schedule and plans. Crown spread was assessed using topographical data to position the extents. Stem diameter of groups of trees was set as an average stem diameter of the trees within these individual groups and a maximum height of the tallest tree within the group.

3.7 Hedges are identified with the letter H and number on the associated schedule and plans. Each hedgerow was surveyed recording the species, the maximum height and the average width of the hedge. Any individual trees present within the hedgerow were recorded as an individual tree.

3.8 Woodlands and woodland groups were identified with the letter W and number on the associated schedules and plans.

3.9 If direct access to a tree was not possible, estimations from appropriate vantage points were taken. Any limitations or estimations are presented within the survey limitations section and noted in the associated schedules.

Categorisation

3.10 In compliance with Table 1 of BS5837 the trees surveyed have been categorised according to their arboricultural quality and value (non-fiscal) which is summarised below in Table 1.

Table 1 - Summary of BS5837 categorisation colours

Category	Colour	Description
A	Green	Trees of high quality with an estimated remaining life expectancy of at least 40 years
B	Blue	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years
C	Grey	Trees of low quality with an estimated remaining life expectancy of at least 10 years
U	Red	Those trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

Quality Assessment

3.11 A summary of my assessment of the quality of the trees is presented in Table 2.

Table 2 - Summary of tree quality on site

	Category A	Category B	Category C	Category U	Total
Group	11	56	102	19	**188**
Hedge	-	4	39	-	**43**
Tree	40	103	420	56	**619**
Woodland	-	3	-	-	**3**
Total	**51**	**166**	**561**	**75**	**853**

Above Ground Tree Constraints – Tree Canopies

3.12 The above ground constraints posed by canopy spread are plotted as a continuous line around the tree, with the extent of the canopy spread hatched in the corresponding BS5837 retention category colour.

Below Ground Constraints - Root Protection Area

3.13 The Root Protection Areas (RPA) is 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. This does not account for the actual depth of the soil within the area, nor does it account for any requirement for working space during development.

3.14 The RPA of each tree has been calculated in accordance with Section 4.6.1 in BS5837. This is determined through multiplying the stem diameter of each tree, measured at 1.5m above ground level, by a factor of 12. The below ground constraints posed by the RPA have been plotted on the TCP as a magenta line with the text RPA inscribed.

3.15 The RPA is initially plotted as a circle with the tree in the centre. Where site conditions may influence the shape and size of the RPA (e.g. the presence of roads, buildings or other structures), the shape and size of the RPA can be amended in accordance with Section 4.6.3 in BS5837.

4. STATUTORY AND OTHER CONSTRAINTS

Statutory Considerations – Tree Protection

4.1 Part VII of The Town and Country Planning Act (1990) (the Act) (Section 197) obligates local planning authorities to ensure that, where appropriate, provision is made for the preservation and planting of trees.

4.2 The protection is provided in the form of Tree Preservation Orders (TPO) (Section 198), or by virtue of a tree being located within a Conservation Area (Section 211).

4.3 The Site is located within Cambridge, and falls within the areas of both Cambridge City Council (CCC) and South Cambridgeshire District Council (SCDC) as the Local Planning Authorities.

Tree Preservation Order

4.4 The Town and Country Planning (Tree Preservation Order) (England) Regulations 2012 prohibits any works to trees that are subject to a TPO without the written consent of the local planning authority. There are exemptions to the regulations relating to planning and the conditions of the trees. No works can be undertaken on a protected tree until the authority has granted consent in writing.

4.5 SCDC and CCC hold online records of tree preservation orders. A search of the online data shows that there are both group and individual TPOs within the Site boundary. These have all been identified on the accompanying Tree Constraints Plan as tree numbers within blue hexagons.

Conservation Area

4.6 Section 211 of the Act also provides protection to trees that are located within a Conservation Area. Prior to any works being undertaken on such trees the local planning authority must be informed. Once notice has been given, the authority has up to six weeks to consider whether it wishes to object to the works. After this period and in the absence of any response from the authority, works can be undertaken.

4.7 SCDC and CCC hold details of conservation areas within the district in a searchable digitised format which can be searched online. A search of the records shows that the Site borders several conservation areas and passes within the West Cambridge conservation area (see Plate 1).

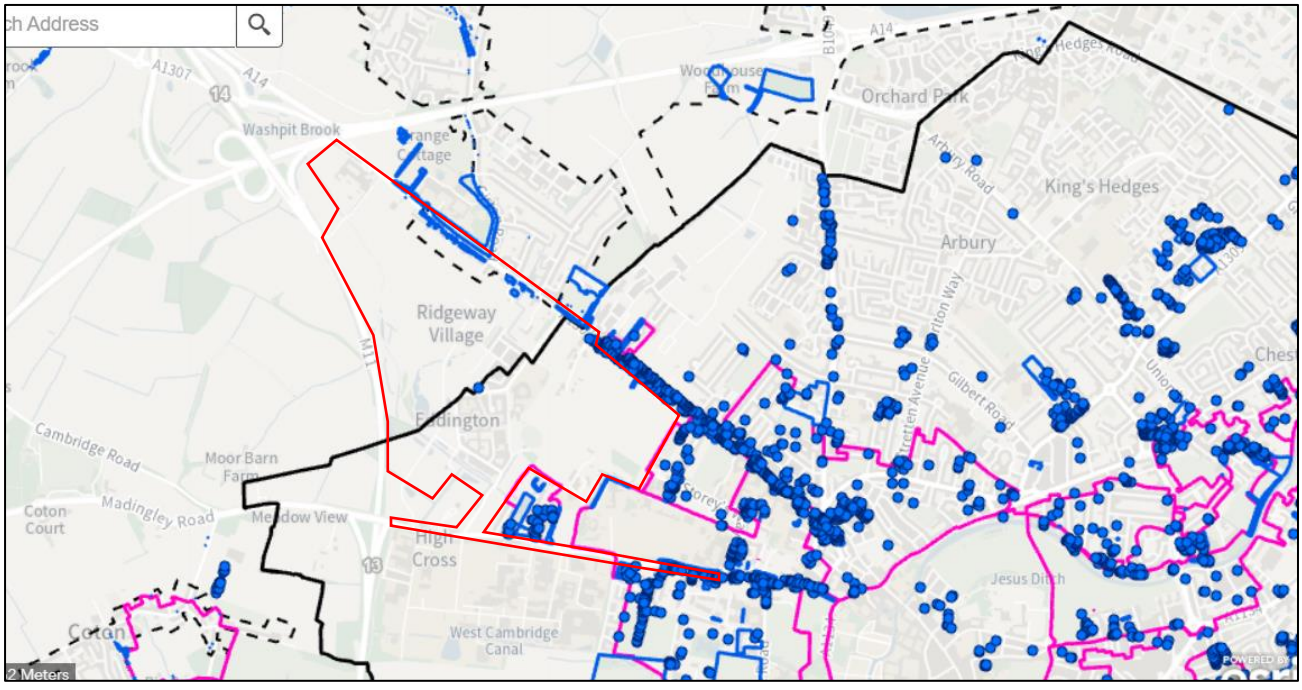


Plate 1: Extract from SDCD/CCC Map for TPOS and conservation areas with INDICATIVE Site boundary in red (Accessed 13.03.2025)

Forestry Act

4.8 The Forestry Act (1967) requires that permission is obtained from the Forestry Commission for the felling of any trees in England or Wales. There are certain exceptions from this requirement including the felling of trees required to allow a planning permission to be carried out[1].

An exception applies where the felling of trees is immediately required for the purpose of carrying out development that is authorised by the approval of full planning permission (granted, or deemed to be granted, under the Town and Country Planning Act 1990, including any planning conditions or s.106 agreements attached to a full planning consent). The approved planning permission will detail the extent of the approved development and may also define the trees that are allowed to be felled or those that must be retained. Any tree felling outside that boundary will require a licence.

The development exception can relate to individual or groups of trees or woodland, and for trees to be exempt from the need for a felling licence at least one of the following conditions must be met:

- *trees must be explicitly identified in the planning consent as being permitted for removal;*
- *the trees must stand within the footprint of the proposed development; or*
- *the removal of the trees must be necessary in order to carry out the proposed development (e.g. they block an access route to which there is no alternative, or lie in such close proximity to the proposed development that they prevent the carrying out of that development).*

The exception does not simply extend to all trees within the boundary of the fully approved proposed development.

Non-statutory considerations

4.9 An online search has also been undertaken to determine any non-statutory designations at the Site that may be a consideration in relation to trees. This has revealed that the Site borders areas designated as priority habitat inventory – deciduous woodland and traditional orchard. There is a Site of Special Scientific Interest within the Site boundary (see Plate 2).

[1] Tree Felling- Getting Permission (Forestry Commission)

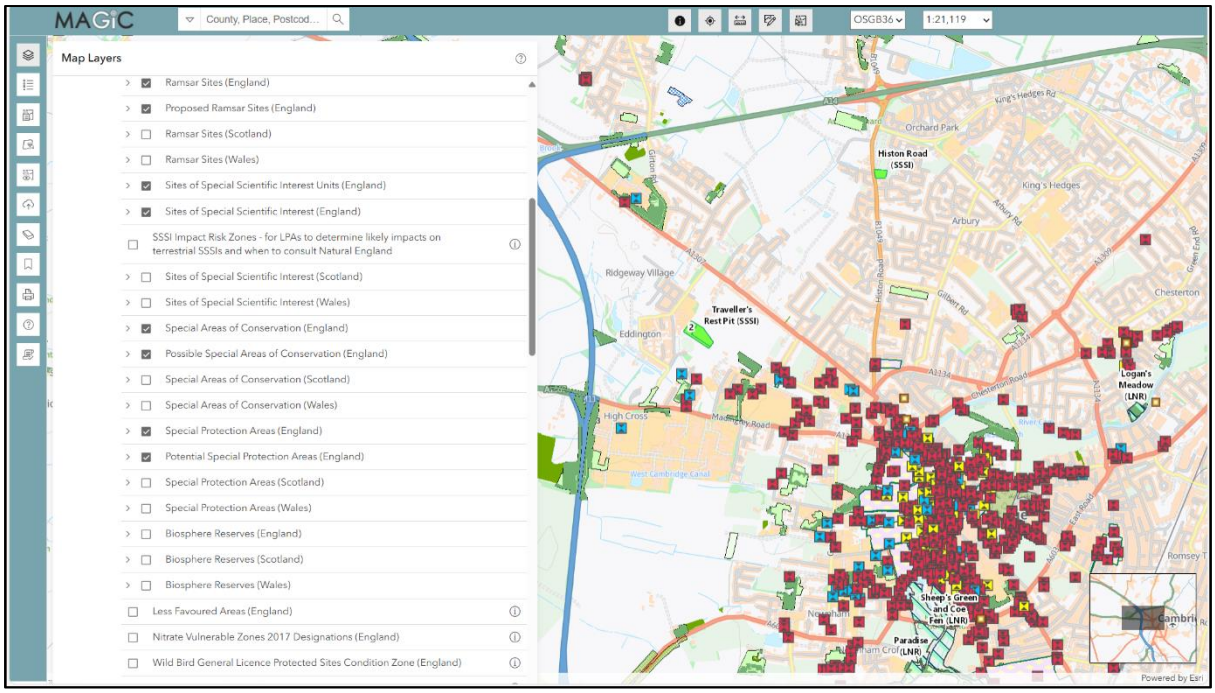


Plate 2: Extract from MAGIC website (Accessed 13.03.2025)

4.10 These designations have no impact on trees and confers no specific additional protection to trees.

4.11 A search on the Multi Agency Geographic Information for the Countryside (MAGIC) mapping system shows that there is no ancient woodland within the Site, although a search on the Ancient Tree Inventory indicates that there are two ancient/veteran trees within the Site (orange markers in Plate 3 / T1 & T592 on the constraints plan and tree schedule).

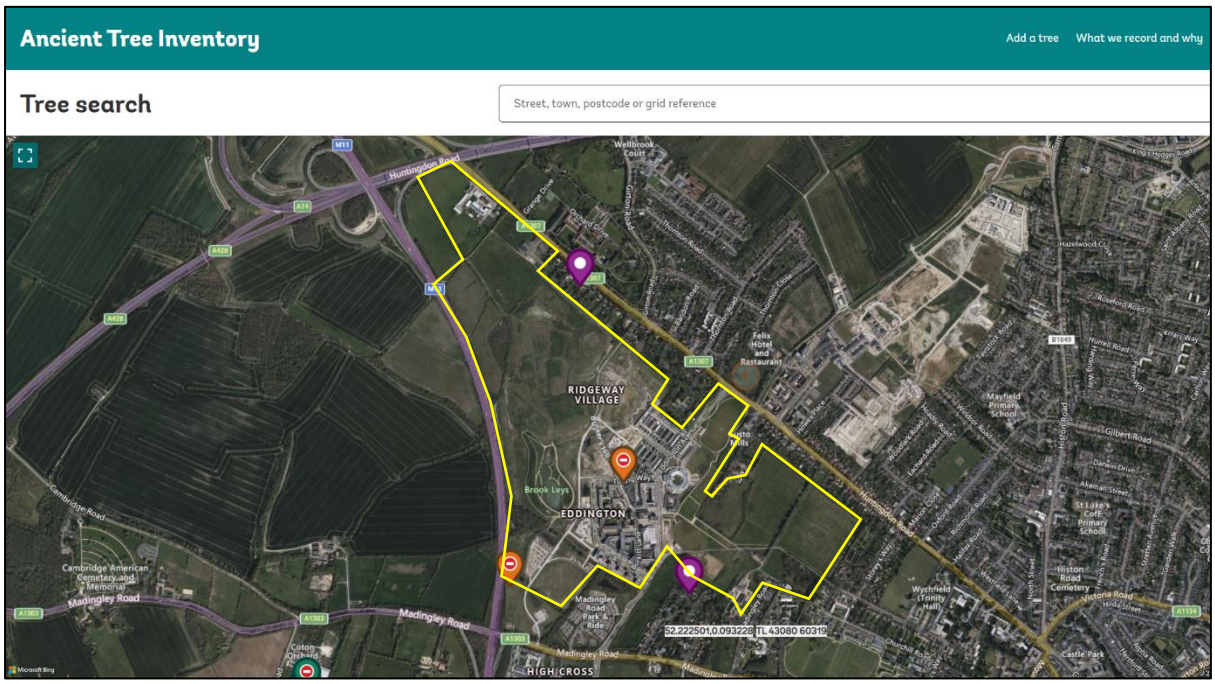


Plate 3 - Extract from ancient tree inventory (accessed 13.03.2025)

Soils

4.12 Paragraph 4.3 of BS5837 recommends that a soil assessment be completed by a competent person to inform decisions relating to the RPA, tree protection, new planting design and foundation design. I am not able to provide this assessment as I have no formal qualifications in this area, and professional advice should be taken to provide any detailed reports.

4.13 However, generic soil data is freely available from online sources such as the Geology of Britain viewer[2] which can provide a broad indication of the underlying geology of a site. The results of a search for this Site describes the geology as being Gault Formation – mudstone, with superficial deposits of clay, sand, silt and gravel. The soils are described as being a mix of freely draining lime-rich loamy, and lime-rich loamy/clayey with impeded drainage.[3] This could weather to produce a shrinkable clay soil and therefore guidance on foundation design in relation to trees, such as NHBC Chapter 4.2, may need to be consulted if site specific soil tests confirm the presence of shrinkable clay.

4.14 The soil type will have an impact on any recommendations for replacement or enhancement planting that may form a part of any landscape strategy for a planning application.

5. NATIONAL AND LOCAL PLANNING POLICIES

National Planning Policy Framework 2024

5.1 National Planning Policy is currently defined by the National Planning Policy Framework (NPPF). This provides the most current and up to date planning guidance.

5.2 At the heart of the NPPF is a presumption in favour of sustainable development, and specifically states that for decision making, the LPA should be approving development proposals that accord with the development plan without delay.

5.3 Section 12 of the NPPF recognises the importance of integrating trees into urban environments as part of achieving well-designed places. While the primary focus is on new tree planting, the importance of retaining existing trees and incorporation into proposals is a driving factor, stating that:

> *"Trees make an important contribution to the character and quality of urban environments, and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined53, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly-planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users."* (Paragraph 136)

[2] https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/
[3] https://www.landis.org.uk/soilscapes

5.4 In addition, Section 15 of the NPPF recognises the importance of conserving and enhancing the natural environment, and specifically acknowledges the role of trees and woodland in the provision of natural capital and ecosystem services.

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by …. recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland".* (Paragraph 187)

5.5 It further acknowledges the importance of ancient woodlands and veteran trees for habitats and biodiversity and requires that planning consent should be refused where development schemes require the removal of such features unless there are wholly exceptional reasons, stating that:

> *"development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists"* (Paragraph 193)

Local Planning Policy

5.6 The LPA has a duty to ensure that local matters are considered through the planning process, and this includes protection of trees.

5.7 SDCD and CCC have prepared specific development plans which includes trees and the natural environment. These plans are the Cambridge Local Plan 2018 and the South Cambridgeshire Local Plan 2018. The two LPAs have also put together a specific Area Action Plan for North West Cambridge.

5.8 The policies within these plans that are relevant to trees are summarised in Table 3.

Table 3: Summary of Local Planning Policy

Policy No	Title	Description (this is not a full copy of the policy. Only extracts relevant to trees are included below)
Cambridge Local Plan		
Policy 52	Protecting garden land and the subdivision of existing dwelling plots	Proposals for development on sites that form part of a garden or group of gardens or that subdivide an existing residential plot will only be permitted where: … b. sufficient garden space and space around existing dwellings is retained, especially where these spaces and any trees are worthy of retention due to their contribution to the character of the area and their importance for biodiversity; …
Policy 58	Altering and extending existing buildings	Alterations and extensions to existing buildings will be permitted where they: a. do not adversely impact on the setting, character or appearance of listed buildings or the appearance of conservation areas, local heritage assets, open spaces, trees or important wildlife features; …

Policy No	Title	Description (this is not a full copy of the policy. Only extracts relevant to trees are included below)
Policy 59	Designing landscape and the public realm	External spaces, landscape, public realm, and boundary treatments must be designed as an integral part of new development proposals and coordinated with adjacent sites and phases. High quality development will be supported where it is demonstrated that: … b. existing features including trees, natural habitats, boundary treatments and historic street furniture and/or surfaces that positively contribute to the quality and character of an area are retained and protected; … g. trees and other planting is incorporated, appropriate to both the scale of buildings and the space available;
Policy 71	Trees	Development will not be permitted which involves felling, significant surgery (either now or in the foreseeable future) and potential root damage to trees of amenity or other value, unless there are demonstrable public benefits accruing from the proposal which clearly outweigh the current and future amenity value of the trees. Development proposals should: a. preserve, protect and enhance existing trees and hedges that have amenity value as perceived from the public realm; b. provide appropriate replacement planting, where felling is proved necessary; and c. provide sufficient space for trees and other vegetation to mature. Particular consideration should be given to veteran or ancient trees, as defined by Natural England, in order to preserve their historic, ecological and amenity value.
South Cambridgeshire Local Plan		
NH/4	Biodiversity	2. New development must aim to maintain, enhance, restore or add to biodiversity. Opportunities should be taken to achieve positive gain through the form and design of development. Measures may include creating, enhancing and managing wildlife habitats and networks, and natural landscape. The built environment should be viewed as an opportunity to fully integrate biodiversity within new development through innovation. Priority for habitat creation should be given to sites which assist in the achievement of targets in the Biodiversity Action Plans (BAPs) and aid delivery of the Cambridgeshire Green Infrastructure Strategy.
NH/6	Green infrastructure	1. The Council will aim to conserve and enhance green infrastructure within the district. Proposals that cause loss or harm to this network will not be permitted unless the need for and benefits of the development demonstrably and substantially outweigh any adverse impacts on the district's green infrastructure network.
NH/7	Ancient woodlands and veteran trees	1. Planning permission will be refused for development resulting in the loss or deterioration of ancient woodland (as shown on the Policies Map) or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss. 2. Development proposals affecting ancient woodland or veteran trees will be expected to mitigate any adverse impacts, and to contribute to the

Policy No	Title	Description (this is not a full copy of the policy. Only extracts relevant to trees are included below)
		woodland's or veteran tree's management and further enhancement via planning conditions or planning obligations.
SPD (2009)	Trees and Development Sites	Trees will not be peripheral to the development as a whole but will be fully integrated into the design. Consideration will be given, wherever possible, to the retention of suitable trees within development, or to incorporating new planting into the design. Trees are a valuable addition to any development, helping to enhance biodiversity and achieve a high quality development in the local landscape or townscape.
North West Cambridge Action Plan		
NW2	Development principles	3. Planning permission will not be granted where the proposed development or associated mitigation measures would have an unacceptable adverse impact: … s) On protected trees and trees of significance.
NW29	Strategic landscaping	Strategic landscaping of the development will be needed to ensure that each part of the development area is landscaped, managed and protected where practical before much of the development is started. Appropriate landscaping will need to be completed promptly upon the completion of each phase of development.

6. POTENTIALLY HARMFUL IMPACTS TO EXISING TREES

General Considerations

6.1 Development can have an adverse impact on trees and other woody vegetation within a site, which can result in:

i. Immediate tree removal to facilitate the footprint of a new development;

ii. Root disturbance and damage within a tree's rooting area;

iii. Canopy removal or damage as a result of construction activity; and

iv. Potential future tree loss from pressure arising from issues such as shading or seasonal nuisance.

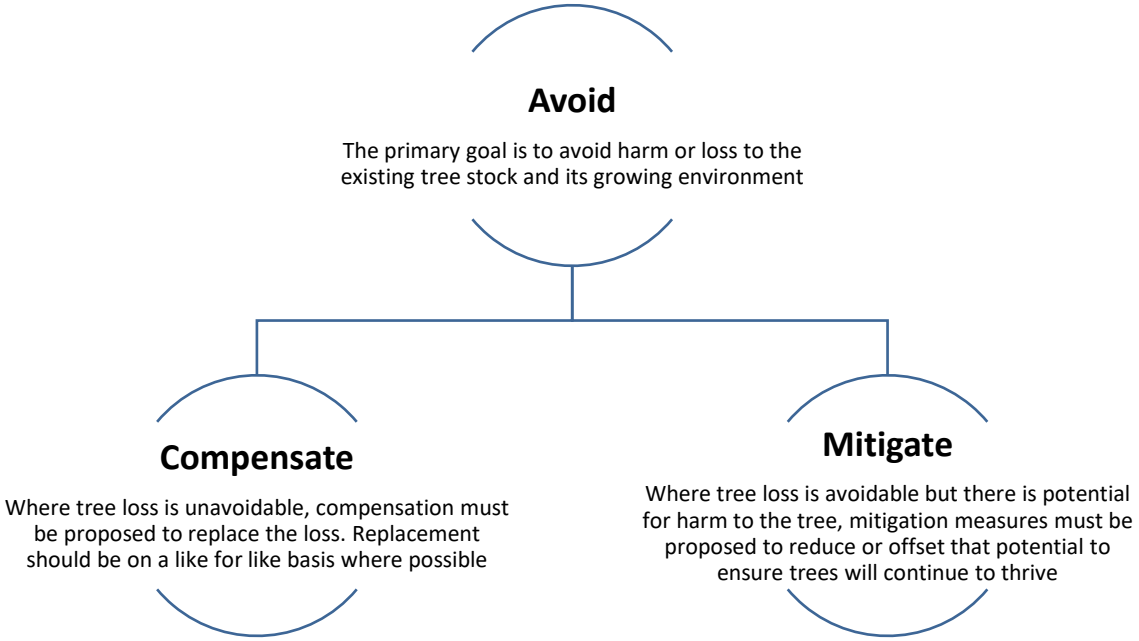
6.2 Best practice guidance proposed by the arboricultural sector seeks to ensure that there is a harmonious relationship between trees and development that will ensure that both trees and structures can be retained in the long term[4].

6.3 Where practical, development should seek to work with the natural environment, and development schemes that might result in harm should follow a mitigation hierarchy to ensure harm is minimised.

6.4 To assist the planning decision makers, this scheme should use the following mitigation hierarchy to consider the influence that trees might have on site design while also continuing

[4] BS5837 (2012) Page 1

to make a positive contribution to the site and local character of the area, both during and post development:



Immediate tree removal to facilitate the footprint of a new development

6.5 The proposed scheme will require the removal of 49 trees, three hedges and 14 groups. It will also require the partial removal of two hedges and one group.

6.6 All of the removals are required as the trees are located within the footprint of new structures (including buildings and roads) and their loss is unavoidable if the scheme is to be developed.

6.7 A summary of the losses by reason and category is presented in Table 4, and the detail of the losses is in Appendix 1.

Table 4 - Summary of tree losses for development

Reason for loss	**Category A**	**Category B**	**Category C**	**Category U**	Total
Built Form	-	1	18	1	20
Infrastructure	-	5	27	5	37
Landscape	-	-	3	6	9
Sub-Total	***0***	***6***	***48***	***12***	***66***
Access (partial removals)	0	0	3	0	3
Total	**0**	**6**	**51**	**12**	**69**

Assessing Potentially Harmful Impacts to Retained Trees

6.8 An Impact Assessment Matrix is provided in Table 5 as a means of evaluating the effects of development activities on retained trees. This provides a structured way to assess potential harm to tree health, condition, and long-term sustainability.

Table 5 - Impact Assessment definitions

Impact Level	Definition	Category Considerations
Major	Significant harm leading to irreversible damage or loss of tree health, structure, or long-term sustainability (e.g., root severance causing instability, substantial canopy loss, or soil compaction beyond recovery).	Likely to affect **Category A or B** trees. Strict protection measures needed to avoid irreversible damage to high-value trees.
Moderate	Noticeable impact that may weaken tree vitality but can be mitigated with remedial measures (e.g., minor root disturbance, partial canopy reduction, or temporary soil degradation).	More likely to affect **Category B or C** trees. Mitigation strategies such as protective barriers or ground protection may reduce the impact and preserve tree health.
Minor	Slight but measurable change that has minimal effect on tree health and can be managed through routine care (e.g., small pruning wounds, minor soil disturbance, or temporary stress due to nearby works).	Can affect **Category C** trees but might be tolerated by **Category A and B** if properly managed. Protection measures, routine maintenance and/or monitoring usually sufficient to offset impact.
Negligible	Insignificant impact with no measurable effect on tree health or sustainability (e.g., short-term minor vibrations, light foot traffic, or non-intrusive activity near the tree).	Applies broadly to **Category A, B, and C** trees if impacts are limited. No significant intervention required other than protection measures
No Change	No discernible impact on the tree's health, condition, or future sustainability (e.g., works conducted outside the root protection area or activities having zero interaction with the tree).	Trees in all categories remain unaffected. Where appropriate, protection measures provide the necessary measure to ensure that the tree remain free from harm.

Root disturbance and damage within a tree's rooting area

6.9 The proposed scheme will encroach the RPA of two trees (T238 & T240). These are both horse chestnut and form a part of the Horse Chestnut Avenue that passes across the Site from Huntingdon Road. Both trees are subject to a TPO.

6.10 A new road is required to provide access to the new plots on the eastern side of the Site, between the Horse Chestnut Avenue and Storeys Way. This road needs to cross the Horse Chestnut Avenue and the optimal location for this is where there is an existing cycle path.

6.11 The process of constructing the new road has the potential to harm the trees through loss of or damage to the root system. This can occur either as a result of severance of roots or through

compaction of the soil. The potential impact from this is **moderate** and special measures will be required to prevent any harm occurring.

Canopy removal or damage as a result of construction activity

6.12 There are no works proposed within the canopy of retained trees and no facilitation pruning is required.

Potential future tree loss from pressure arising from issues such as shading or seasonal nuisance

6.13 The most significant area of potential future conflict between the existing tree stock and proposed development occurs along the Horse Chestnut Avenue. New residential properties are proposed to both the east and west of the Avenue which could be affected by shading, nuisance or falling dead limbs.

6.14 The impact of this future pressure is assessed as being **minor** and specific measures have been proposed through the design process to address this.

7. IMPACT MITIGATION – TREE PROTECTION MEASURES

General principles of tree protection to avoid harm to trees

7.1 The following principles for the protection of retained trees will be adopted across the Site for the duration of the project:

- All retained trees will be protected by fencing that will form the CEZ.
- Where fencing cannot provide the necessary protection measures, alternative systems will be installed that will ensure retained trees are protected. This may include the use of either temporary or permanent ground protection.
- There will be no storage of materials, or access for construction workers or machinery within any CEZ.
- There will be no excavation within a CEZ. All utilities and underground services will be located outside the CEZ or tap into existing service routes.
- Any storage or mixing station located outside of a CEZ will be located in a place that minimises the risk of contaminated runoff entering the CEZ and damaging the rooting environment. This may be achieved by using a non-permeable membrane on the ground, surrounded by sandbags to contain any spillage.
- There will be no fires within a CEZ.
- There will be no use of herbicides within a CEZ.

Site specific mitigation measures

Root disturbance and damage within a tree's rooting area

7.2 The process of constructing new vehicular access within the RPA of retained trees could result in harm through compaction of the soil or severance of tree roots. This can be avoided by using three dimensional cellular confinement systems that are laid onto the existing surface to spread

the load laterally through the system rather than vertically into the ground. This means by which this is done is illustratively presented in Plate 4 & Plate 5.

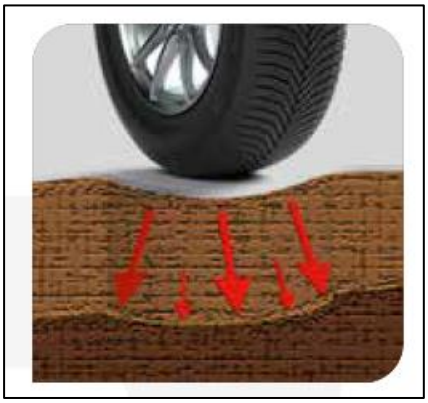


Plate 4 - Without protection, downward pressure can result in compaction of the underlying soil (image source: Core Landscape)

Plate 5 - With protection, the weight of the passing traffic is even distributed through the system (image source: Core Landscape)

7.3 The use of these systems is considered to be best practice where incursions to the RPA of retained trees is unavoidable. This approach is recommended at section 7.4.2 of BS5837 which suggests several key design considerations including:

- There must be no excavation into the soil.
- The structure of the hard surface must be designed to avoid compaction of the soil by ensuring that any loading is evenly distributed.
- Impermeable barriers should be used where there is risk of contamination (eg where de-icing may be required) or the run off must be directed away from the RPA.
- Where possible the surface must remain porous and permeable
- The new hard surface should be resistant to or tolerate of deformation by tree roots

7.4 Specific guidance on the use of cellular confinement systems is also provided in Arboricultural Guidance Note 12 (2020) *The use of cellular confinement systems near trees*. This document explains the principle behind the use of such as system:

> *A cellular confinement system is a series of geocells arranged in a honeycomb-like formation that is combined with an underlying geotextile and angular stone to spread loads in such a way as to minimise compaction of underlying soil. Due to its 3-dimensional structure, a geocell mat offers all-round confinement to the encapsulated material, which provides a long-term improvement in the performance of the sub-base. When a surface is reinforced in this way the load is distributed over a larger area of the subgrade-base interface, leading to lower vertical stress and reduced deformation of the subgrade (Bathurst & Jarrett 1988; Saride et al. 2011). Cellular confinement systems are considered to be cost effective, durable and easy to use. They also function effectively in all weather conditions (Hegde 2017). There are*

a variety of uses for cellular confinement systems in the construction industry, but this guidance focuses on their use when new hard surfacing is installed near trees. [5]

7.5 The general approach to the use of a cellular confinement system is best explained illustratively (see Plate 6).

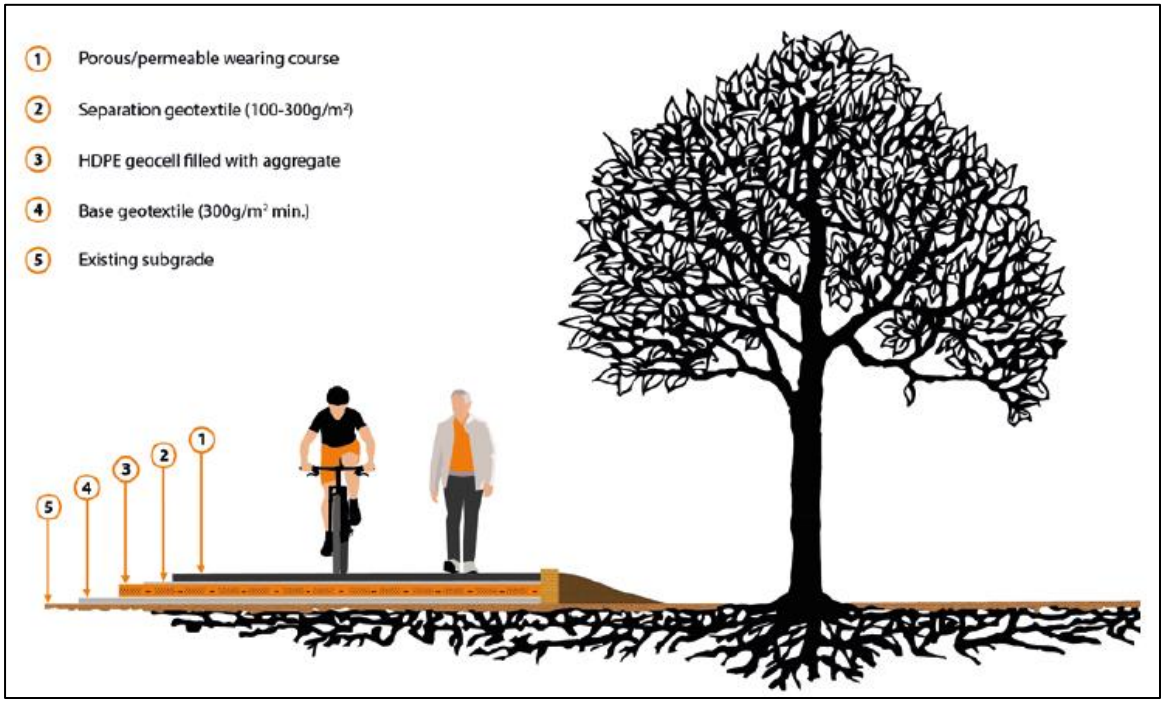


Plate 6 - Extract from AGN 12 showing the general approach to using cellular confinement systems

7.6 The wearing course can be chosen from a variety of options, but as this will be a vehicular access road, the most appropriate wearing course would be porous asphalt. The advantage of porous asphalt is that is never completely hardens and therefore it interacts with the geocellular system to form a more flexible structure. An illustrative representation of how the system is built up is presented in Plate 7.

[5] AGN 12 P. 6

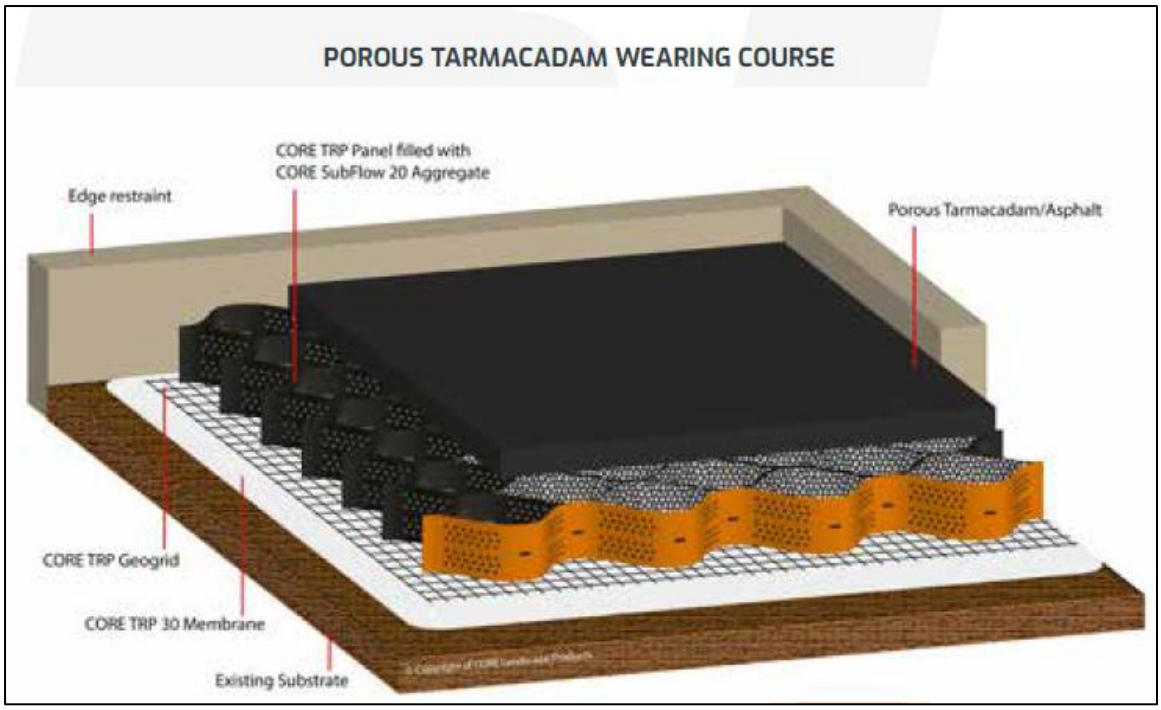


Plate 7 - Illustrative example of porous tarmac surface over a geocellular system (Image source: Core Landscapes)

7.7 The cellular confinement system is available in a range of depths, starting at 50mm for areas of light weight traffic such as pedestrians or cyclists, through to 200mm deep for roots that will need to bear vehicle weights up to 60 tonnes. As this access road needs to be accessible for emergency vehicles and waste lorries, the most appropriate system would be a 200mm deep geocell.

7.8 The topographic survey shows the ground on either side of the existing cycle access is lower than the track itself. Where this occurs it may be necessary stack panels to create a level surface (see Plate 8 for illustrative example).

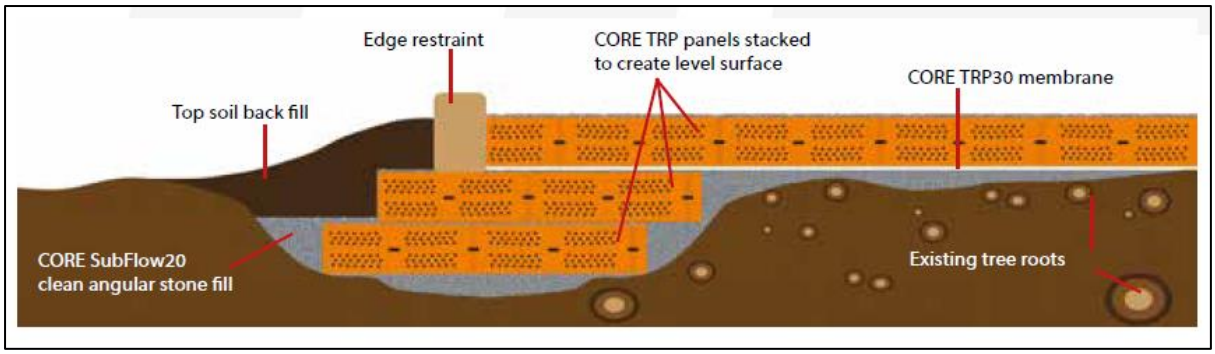


Plate 8- Illustrative example for creating a level surface (source Core Landscape)

Potential future tree loss from pressure arising from issues such as shading or seasonal nuisance

7.9 Potential future tree losses due to pressures such as shading or seasonal nuisance can be mitigated through proactive management including:

- Pruning & Canopy Management

- Selective thinning to reduce canopy density and minimize shading impacts on nearby buildings, gardens, or roadways.
- Crown lifting to improve light penetration beneath trees while maintaining structural integrity.
- Regular deadwood removal to reduce seasonal nuisance from falling debris.

- Ongoing Monitoring & Risk Assessment
  - Regular condition assessments to identify trees likely to experience increased pressure from development or environmental changes.
  - Early intervention measures to address emerging concerns before they result in irreversible decline or removal necessity.

7.10 The University of Cambridge is developing a specific management plan for the Horse Chestnut Avenue which includes a programme to remove and replace those trees in poor condition that are unlikely to make a meaningful long-term contribution and for the ongoing maintenance of the avenue trees.

7.11 The design process for the project has also recognised the potential for future pressure and has therefore ensured that the new residential properties will be set back from the trees with a corridor of open space immediately adjacent to the avenue and then residential gardens.

Compensation for Tree Loss

7.12 Where tree loss is unavoidable, it is reasonable for there to be an expectation of replacement planting to compensate for that loss. A Replacement Tree Planting Strategy (NEP718-GRA-SK-76_Proposed Tree Planting Strategy_Rev05) has been prepared by Grant Associates detailing an extensive scheme of over 2000 new trees which includes:

Tree Type	Species	Proposed number
Forest Scale 40-45cm girth, 6-7m high.	Quercus palustris (Pin Oak) Liriodendron tulipifera (Tulip Tree) Salix babylonica (Weeping Willow) Pinus sylvestris (Scots Pine)	27
Landmark Trees 40-45cm girth, 6-7m high.	Liquidambar styraciflua (Sweet Gum) Ginkgo biloba (Ginkgo) Tilia cordata 'Greenspire' (Small-leaved Lime 'Greenspire') Platanus x hispanica (London Plane) Salix alba (White Willow)	122
Junction Trees 20-25cm girth, 5-6m high.	Tilia tomentosa (Silver Lime) Gleditsia triacanthos 'Skyline' (Honey Locust 'Skyline')	157
Street Trees 18-20cm girth, 4-5m high.	Acer campestre 'Elsrijk'** (Field Maple 'Elsrijk') Alnus cordata (Italian Alder) Ulmus 'New Horizon' (New Horizon Elm) Platanus x hispanica (London Plane)	823

Tree Type	Species	Proposed number
Standard Trees 8-16cm girth,3-4.5m high.	Acer campestre (Field Maple) Alnus glutinosa (Common Alder) Betula pendula (Silver Birch) Populus nigra (Black Poplar) Populus tremula (Aspen)	707
Multi-stem Trees 2-4m high.	Amelanchier lamarckii** (Snowy Mespilus) Corylus avellana (Hazel) Prunus avium (Wild Cherry) Betula nigra (River Birch)	211
Woodland matrix planting. 1+2 transplants. 60-80cm high. Staggered at 900mm centres and interspersed with typically 8-10cm girth trees.	Acer campestre (Field Maple) Corylus avellana (Hazel) Crataegus monogyna (Common Hawthorn) Ilex aquifolium (Holly) Ligustrum vulgare (Privet) Ribes rubrum (Red Currant) Prunus spinosa (Blackthorn) Prunus avium (Wild Cherry) Sambucus nigra (Elder) Viburnum opulus (Guelder Rose)	

Tree Protection Plan

7.13 A tree protection plan has been prepared to provide illustrative guidance on the extent of the tree protection measures to be deployed across the Site. A generic Arboricultural Method Statement (AMS) has also been prepared to accompany this report and it provides the general principles that will be adopted across the Site for the protection of retained trees.

7.14 It would be reasonable for the LPA to secure the protection of the retained trees through the use of planning conditions.

8. ARBORICULTURAL IMPACT ASSESSMENT

8.1 The proposed development scheme has the potential to adversely impact the long term health and condition of retained trees and mitigation measures have been proposed to reduce the potential harm. The assessment of the impacts and mitigation measures is presented in Table 6.

Table 6 - Arboricultural Impact Assessment with mitigation measures.

Operation	Potential Impact with no mitigation	Proposed Mitigation	Potential impact with mitigation
Root disturbance and damage within a tree's rooting area	Moderate	Use of cellular confinement system	Minor
Potential future tree loss from pressure arising from issues such as shading or seasonal nuisance	Minor	Tree management strategy and site design to keep buildings away from trees	Negligible

9. CONCLUSION

9.1 This Arboricultural Impact Assessment has thoroughly evaluated the existing tree stock and the potential impacts of the proposed development. The assessment identified 853 trees, groups of trees, hedgerows, or woodlands within the survey area, categorising them based on their quality and condition. The proposed development will necessitate the removal of 66 trees or groups of trees and the partial removal of two hedges and one group to create new access routes. However, all retained trees can be protected throughout the development phase through the use of fencing and special measures to limit potential harm.

9.2 The assessment also highlights the importance of adhering to best practice guidance to ensure a harmonious relationship between trees and development, minimising adverse impacts on tree health and condition. Mitigation measures, including the use of cellular confinement systems and proactive tree management strategies, have been proposed to reduce potential harm and ensure the long-term sustainability of retained trees.

9.3 A Replacement Tree Planting Strategy outlines an extensive scheme of over 2000 new trees to compensate for the unavoidable tree loss arising from this proposal. This strategy aims to enhance the Site's green infrastructure and contribute to the overall biodiversity and ecological value of the area.

10. ABOUT THE AUTHOR

10.1 I am a director of Tree Frontiers Ltd over 20 years' experience working in the sector. I have a first-class honour's degree in arboriculture from Myerscough College, accredited by the University of Lancaster.

10.2 I am a Registered Consultant of the Arboricultural Association as well as a Chartered Member of the Institute of Chartered Foresters. I abide by the code of ethics and professional standards of these institutions.

11. REFERENCES

11.1 This report has relied upon the following external reference sources:

- British Standards Institution (2012) BS5837: *Trees in relation to design, demolition and construction – recommendations*. London: BSI
- Gov.uk (2024) *National Planning Policy Framework*.
- South Cambridgeshire District Council (2018) *Local Plan*
- Cambridgeshire City Council (2018) *Local Plan*
- North West Cambridge (2009) *Area Action Plan*
- South Cambridgeshire District Council (2025) *Conservation Area and Tree Preservation Order Search*
- British Geological Society (2025) *Geology of Britain Viewer*.
- Cranfield Soil and Agrifood Institute (2025) *Soilscapes*
- Multi Agency Geographic Information for the Countryside (MAGIC) mapping system
- Rose, B (2020) *The Use of Cellular Confinement Systems Near Trees* The Arboricultural Association

12. APPENDIX 1: DETAIL OF TREE REMOVALS

Tree No	Species	Type	Age Class	BS Cat	Status
G002	Willow	Group	Early Mature	C	Remove
H011	Hawthorn Blackthorn	Hedge	Mature	B	Remove
H013	Hawthorn Blackthorn Ash Mixed species	Hedge	Mature	C	Partial Removal
T042	Silver birch	Tree	Early Mature	C	Remove
H043	Privet Blackthorn Berberis	Hedge	Early Mature	C	Remove
T044	Prunus	Tree	Mature	C	Remove
H045	Cypress	Hedge	Early Mature	C	Remove
T046	Copper beech	Tree	Early Mature	U	Remove
T048#	Elder	Tree	Early Mature	C	Remove
T051	Cherry	Tree	Mature	C	Remove
T052	Prunus	Tree	Mature	C	Remove
T052A	Cherry	Tree	Mature	C	Remove
T053	Cherry	Tree	Mature	C	Remove
T054	Cockspur hawthorn	Tree	Mature	C	Remove
T055	Cherry	Tree	Mature	C	Remove
T056#	Horse chestnut	Tree	Early Mature	C	Remove
G068	Ash Sycamore Elder Hawthorn	Group	Mature	B	Remove
T073	Cypress	Tree	Mature	B	Remove
T239	Horse chestnut	Tree	Mature	B	Remove
H243	Elder Hawthorn Mixed species	Hedge	Mature	C	Partial Removal
T247	Plum	Tree	Young	C	Remove
T250	Elder	Tree	Early Mature	C	Remove
T251#	Elder	Tree	Early Mature	C	Remove
T252#	Elder	Tree	Early Mature	C	Remove
T254	Hawthorn	Tree	Mature	C	Remove
G258	Mixed species Elder Laburnum Dogwood	Group	Early Mature	C	Remove
T283A#	Elder	Tree	Over Mature	C	Remove
T405#	Blackthorn	Tree	Early Mature	C	Remove
H408-T1	Goat willow	Tree	Early Mature	C	Remove

Tree No	Species	Type	Age Class	BS Cat	Status
G416#	Hawthorn Mixed species Ash	Group	Mature	C	Remove
T417#	Birch	Tree	Young	C	Remove
T418#	Birch	Tree	Young	C	Remove
T419#	Birch	Tree	Young	C	Remove
G420#	Mixed species Common lilac Ash	Group	Early Mature	C	Remove
G421	Mixed species Hawthorn Ash	Group	Early Mature	C	Remove
G422	Lilac Prunus	Group	Early Mature	C	Remove
G423	Cypress Yew	Group	Mature	C	Remove
G424#	Elm	Group	Early Mature	U	Remove
G425#	Elder Willow Mixed species	Group	Young	C	Remove
G431	Hazel Field maple Sycamore Dogwood Hawthorn Ash Plum	Group	Young	C	Partial Removal
T432#	Birch	Tree	Young	C	Remove
T433#	Birch	Tree	Young	C	Remove
T434#	Birch	Tree	Young	B	Remove
G624	Mixed species Willow	Group	Mature	C	Remove
G637	Plum x5	Group	Mature	U	Remove
T639	Common holly	Tree	Mature	U	Remove
G640	Lawson cypress Common box Monterey cypress Highclere holly	Group	Mature	U	Remove
T640	Lawson cypress	Tree	Mature	U	Remove
T643	Common ash	Tree	Early Mature	U	Remove
T644	Sycamore	Tree	Mature	C	Remove
T645	Sycamore	Tree	Mature	C	Remove
T647	Common hawthorn	Tree	Over Mature	U	Remove
T648	Sycamore	Tree	Mature	C	Remove
T649	Silver birch	Tree	Mature	U	Remove
T650	Sycamore	Tree	Semi Mature	U	Remove

Tree No	Species	Type	Age Class	BS Cat	Status
T651	Sycamore	Tree	Semi Mature	U	Remove
T652	Sycamore	Tree	Semi Mature	U	Remove
T653	Sycamore	Tree	Mature	B	Remove
G674#	Crack willow x11	Group	Semi Mature	C	Remove
P1-T0484	River birch	Tree	Young	C	Remove
P1-T0536	Hornbeam	Tree	Young	C	Remove
P1-T0537	Hornbeam	Tree	Young	C	Remove
P1-T0540	Willow	Tree	Young	C	Remove
P1-T0541	Willow	Tree	Young	C	Remove
P1-T0542	Hornbeam	Tree	Young	C	Remove
P1-T0543	Hornbeam	Tree	Young	C	Remove
P1-T0544	Hornbeam	Tree	Young	C	Remove
P1-T0545	River birch	Tree	Young	C	Remove
P1-T0546	Common alder	Tree	Young	C	Remove

13. APPENDIX 2: PRELIMINARY ARBORICULTURAL METHOD STATEMENT

Overview

13.1 This Preliminary Arboricultural Method Statement (AMS) provides best practice measures to be adopted to protect retained trees during the development process. It has been prepared to provide guidance to the onsite construction team on the extent, purpose and deployment of tree protection measures.

13.2 The document also provides details of generic measures required to protect retained trees from potentially harmful activities such as the construction of hard surfaces within the RPA.

13.3 This Method Statement must be reviewed in conjunction with the Tree Protection Plan (TPP) that has been prepared for this project.

Supervision

13.4 Prior to the commencement of any tree works, installation of protection measures or the mobilisation of construction machinery and materials, a qualified and independent arboricultural consultant shall be appointed as the Project Arboriculturist to provide advice to the construction team and to supervise any works that have the potential to cause harm to retained trees.

13.5 The retained Project Arboriculturist shall be the principle point of contract for the main works contractor on all matters relating to trees and shall liaise as required with the LPA tree officer.

Tree Removals

13.6 Trees for removal have been noted on the TPP with a red circle.

13.7 Great care should be taken during the tree removal process to ensure that retained trees are not adversely impacted. The following methodology should be adhered to at all times:

- Any machinery used during the tree removal process be sited outside the RPA of retained trees.
- The felling of trees will be undertaken to avoid damaging retained trees.
- Where the removal of stumps of felled trees is required, great care will be taken to ensure any retained trees in close proximity remain free from harm.

13.8 All works will be conducted by a suitably qualified arborist working in accordance with BS3998:2010 *Tree Work – Recommendations.*

Remedial Tree Works

13.9 The trees requiring remedial works to facilitate development will be carried out by a suitably qualified arborist working in accordance with BS3998:2010 *Tree Work – Recommendations.*

Protection of Retained Trees

13.10 Where practical all retained trees will be protected through the construction phase using barriers to limit the potential for harm from machinery, materials or personnel.

13.11 The primary form of protection is the use of fencing around the trees to prevent access within a protected buffer zone. This buffer zone is a Construction Exclusion Zone (CEZ) and there will be no access within it during the construction phase.

Construction Exclusion Zone

13.12 The CEZ is a buffer zone identified by the Project Arboriculturist within which access is prohibited for the duration of a project for construction personnel, materials and machinery.

13.13 All areas excluded by protective tree fencing shall be treated as CEZs and the following restrictions shall apply:

- No construction activity can occur within these areas.
- No works on trees unless agreed by the Project Arboriculturist.
- No alterations of ground levels or conditions.
- No chemicals or cement washings.
- No excavation.
- No temporary structures.*
- No storage of soil, rubble or other materials.
- No vehicles or machinery to be used or parked without appropriate ground protection measures as per BS5837 recommendations. This will require the use of a proprietary system of reinforced concrete slabs/steel road plates on a compressible layer, or side butting scaffold boards/ 18mm plywood sheets on a compressible layer. The type of ground protection used shall be appropriate for the potential loading applied.
- No fixtures (*lighting, signs etc.*) to be attached to trees.
- No fires within 10 metres of the canopies of any tree or hedgerow.

*Site huts, provided they are of the “Jack Leg” type, can be sited to act as ground protection for the duration of the construction.

Tree Protection Fencing

13.14 Protective fencing will be erected around retained trees prior to the commencement of any site works including mobilisation of machinery and materials.

13.15 The location of the fencing has been marked on the TPP as a black dashed line, and the CEZ has been highlighted as orange hatching behind the fencing.

13.16 The appropriate form of fencing for this project will be wire mesh panels (heras fencing) that will be supported on the ground by a rubberised foot that will in turn be pinned to the ground using metal stakes driven a minimum of 500mm into the ground. An example of the fencing panel construction is provided in Plate 9 below. Each panel will be connected by a minimum of two anti-tamper couplers per side.

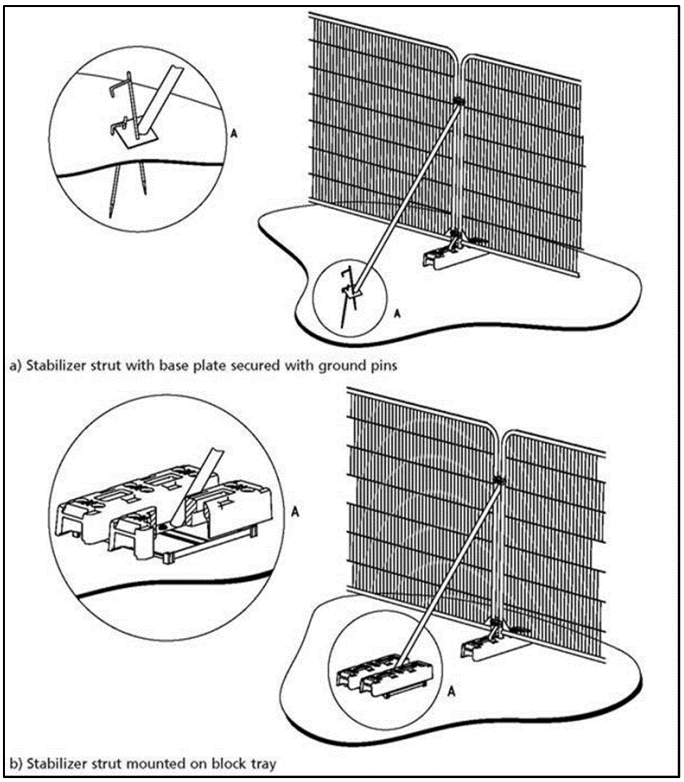


Plate 9 Tree protection fencing specification (extract from BS 5837: 2012)

13.17 Weather-proof notices shall be attached to any protective fencing located adjacent to retained trees displaying the words "Construction Exclusion Zone" and listing restrictions which apply. All personnel must be made aware of these restrictions. An example of a suitable sign for the fencing is provided in Plate 10.

Plate 10: Example of Tree Protective Fencing sign

Temporary Ground Protection

13.18 Temporary ground protection measures will be deployed to protect those parts of the RPA that cannot be excluded by the use of fencing. Such areas may be required for access or as working space close a building.

13.19 New temporary ground protection should be capable of supporting any traffic entering or using the Site without being distorted or causing compaction of underlying soil. The ground protection might comprise one of the following:

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

13.20 Where temporary ground protection is required, this has been marked on the TPP with a cyan hatching.

New Permanent Surfacing Within RPAs

13.21 The installation of the cellular confinement system shall be undertaken following manufacturer's guidance and in accordance with Arboricultural Association Guidance Note 12 *The use of cellular confinement systems near trees: A guide to good practice.*

13.22 Any new surfacing within the RPA of a retained tree shall occur above ground level without soil stripping.

13.23 New surfaces shall be constructed on a three-dimensional cellular confinement system to prevent localised compaction of the rooting medium post development. Porous geotextile membranes shall be used both above and below the cellular confinement system to prevent mixing of materials with the binding layer or the soil.

13.24 The new surface needs to be permeable to air and water (resin bound gravel or similar is recommended). This is to allow roots to respire without there being a build-up of carbon dioxide, and to ensure the roots continue to receive the moisture and oxygen they require to function.

13.25 Traditional kerbing requires excavation to install and will therefore not be suitable within the RPA of retained trees. As an alternative, haunched kerbing, treated timber edging, aluminium L-shaped edging, galvanised metal edging or no fixed edging shall be used.

13.26 Areas requiring permanent ground protection have been marked on the TPP with purple hatching.

General Canopy Protection

13.27 Since the canopies of retained trees may be in close proximity to areas of plant operation, the following restrictions will apply:

- All plant will be sited outside the defined RPAs of retained trees / groups, and the appointed contractor will ensure all relevant personnel shall be made aware of the location of branches and the need to avoid causing damage to them.
- Prior to the implementation of lifting operations, a representative from the equipment supply company shall visit the Site and ensure all operations can be completed without causing damage to retained trees. A lifting plan will be prepared and submitted for approval prior to all lifting operations. The lifting plan will make provision for the potential for damage of retained trees.
- All lifting operations will be completed under the close direction of a qualified banksman, who will be briefed by the appointed contractor as to the need to avoid damage the stems and branches of retained trees.

13.28 Should additional tree removal or pruning be required the LPA Tree Officer shall be contacted and the scope of works agreed in writing.

Hazardous Materials

13.29 Any mixing of cement-based materials is to take place outside the RPAs of all trees. Provision shall be made to ensure that the mixing area is contained so that no water runoff enters the RPA of any trees. All mixers and barrows shall be cleaned within this dedicated mixing area.

13.30 All other chemicals hazardous to tree health, including petrol and diesel, are to be stored in suitable containers as specified by the Control of Substances Hazardous to Health (*COSHH*) Regulations (*HMSO, 2002: The Control of Substances Hazardous to Health Regulations 2002)*, and kept away from the RPAs.

Demolition

13.31 Any demolition works within the RPA of retained trees will be undertaken in accordance with the following methodology:

- Demolition works will be undertaken using a 'top down, pull back' technique. This will minimise the potential of physical harm to retained trees.
- Care must be taken to avoid physical contact with the canopies of offsite trees during the demolition works. A banksman will be used where such conflicts could occur.
- If localised pruning is required the LPA Tree Officer shall be contacted and the scope of works agreed in writing.
- All machinery used to undertake demolition works will be sited outside the RPAs of existing trees or working from on top of existing hard standing.
- Debris may be removed from the RPAs of retained trees by using machinery with a long reach or through pedestrian access. Care must be taken to avoid damage to the existing ground surface to ensure the rooting environment remains sustainable post demolition.
- The removal of existing hardstanding or foundations within the RPAs of retained trees will be undertaken using hand tools only. Appropriate tools for manually removing

debris may include a pneumatic breaker, crow bar, sledgehammer, pick, mattock, shovel, trowel and fork.

- Severance of roots over 25mm diameter should be avoided unless advised by the retained Project Arboriculturist. Secateurs and a handsaw must be available to deal with any roots that are exposed. Where roots will remain exposed for any period of time the roots must be wrapped in hessian sacking for protection.

Contractor compound, site huts and welfare units.

13.32 The contractor's compound, including all site huts, storage and welfare units, will be located outside the CEZ of retained trees.

Service installation overhead and underground

13.33 The following hierarchy shall be applied to the design and installation of underground services:

1) All service trenches shall be located outside the RPA of retained trees.

2) Where it is not feasible to avoid the RPA, trenchless technology shall be utilised to minimise the impact on the rooting environment.

3) Where trenchless technology cannot be applied, excavation shall be undertaken using the less harmful methodology including hand digging or use of an airspade to dislodge soil without severing roots. All excavation must be carried out carefully using spades, forks and trowels, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air may be an appropriate alternative to hand digging, if available. All soil removal must be undertaken with care to minimise the disturbance of roots beyond the immediate area of excavation. Where possible, flexible clumps of small roots, including fibrous roots, should be retained if they can be displaced temporarily or permanently beyond the excavation without damage.

4) Where it is not possible to hand dig a trench, an excavator may be used, located if possible outside the RPA, or sat on a load spreading surface that will minimise the potential for further harm to the rooting environment. Any operation for excavation shall be supervised by the retained Project Arboriculturist.

13.34 There is no requirement for any new underground services within the RPA of a retained tree. Should the need for such works become apparent during construction, the Project Arboriculturist shall be informed immediately and no works shall commence until a plan of operations has been prepared, approved by the client and approved by the LPA.

Project Supervision and Reporting

13.35 All tree protection measures will remain in place throughout the development phase.

13.36 The retained Project Arboriculturist will complete site inspections through this period to ensure that protective fencing and other measures remain fit for purpose and that the sanctity of the CEZ is being maintained.

13.37 A post-inspection report will be prepared after every site visit detailing observations and any recommendations for specific measures that may be required in the forthcoming period. A copy of this report will be sent to the LPA tree officer and circulated to the project team including the site manager for the main works contractor.

Post Development

13.38 No fencing or other protective measures will be moved, dismantled or taken off site until the Project Arboriculturist has confirmed that all machinery has been removed from the site and any construction activity that could cause harm to retained trees has been completed.

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