APP11 Proof of Evidence - Appendices

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APP11-14281-Appendices-Cover

LPA reference: 20/01238/OUTMAJ

PINS Reference: APP/W0340/W/20/3265460

1st April 2021

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Appendix 1

British Standard 5837:2021 Trees in relation to design, demolition and construction – Recommendations

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BS 5837:2012

BSI Standards Publication

Trees in relation to design, demolition and construction – Recommendations

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Publishing and copyright information

Published by BSI Standards Limited 2012

ISBN 978 0 580 69917 7

ICS 65.020.40; 91.020

The following BSI references relate to the work on this standard:
Committee reference B/213
Draft for comment 11/30213641 DC

Publication history

First published January 1980
Second edition, December 1991
Third edition, September 2005
Fourth (present) edition, April 2012

Amendments issued since publication

Date	Text affected

Contents

List of tables

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 42, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 April 2012. It was prepared by Technical Committee B/213, *Trees and tree work*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 5837:2005, which is withdrawn.

Information about this document

This is a full revision of the standard, and introduces the following principal changes:

- takes account of current practice regarding planning for the management, protection and planting of trees in the vicinity of structures, and for the protection of structures near trees;
- updates the guidance in relation to building regulations;
- recognizes the contribution that trees make to climate change adaptation.

This British Standard provides recommendations and guidance for arboriculturists, architects, builders, engineers, and landscape architects. It is also expected to be of interest to land managers, contractors, planners, statutory undertakers, surveyors, and all others interested in harmony between trees and development in its broadest sense.

Annex A contains general information which is expected to be of use to developers, builders and engineers.

Use of this document

This British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people, for whose use it has been produced.

BSI permits the reproduction of BS 5837:2012, Figure 2 and Figure 3, to ensure compliance with the standard (e.g. when seeking planning consent).

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Trees are given special consideration under the statutory planning system and in civil case law, and their protection can change with time. It is advisable to seek expert advice on the legal implications for any plans or projects that fall within the scope of this British Standard.

Introduction

Trees can offer many benefits, including:

- providing visual amenity, softening or complementing the effect of the built environment, and adding maturity to new developments;
- displaying seasonal change and providing opportunities for wildlife in built-up areas;
- making places more comfortable in tangible ways by contributing screening and shade, reducing wind speed and turbulence, intercepting snow and rainfall, and reducing glare.

Trees are also important elements of green infrastructure, contributing to urban cooling through evapo-transpiration and providing micro-climatic effects that can reduce energy demands in buildings. They therefore represent a key resource that can significantly contribute to climate change adaptation.

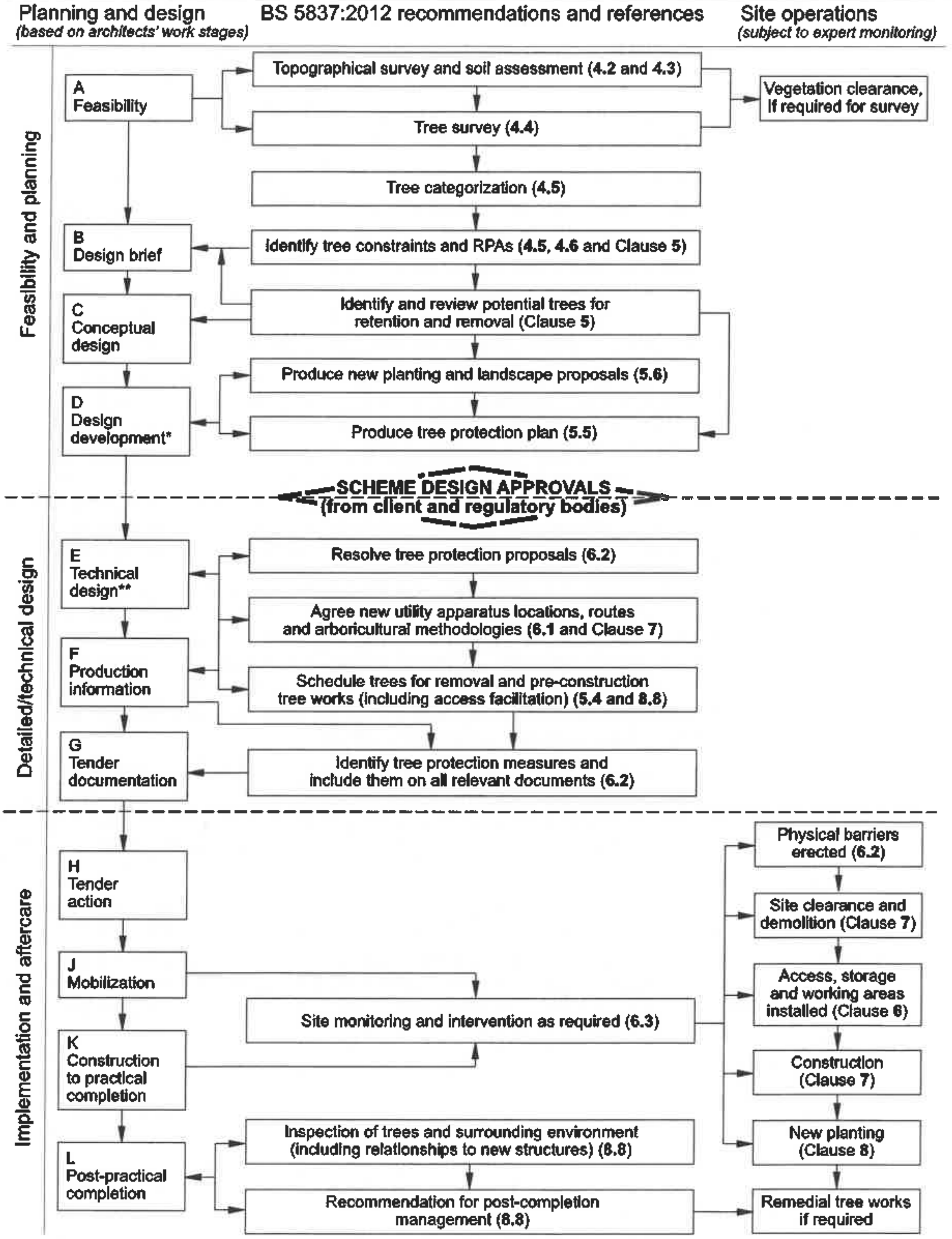
Existing trees are an important factor on construction sites, whether on or near the working areas, and trees are a material consideration in the UK planning system (see Annex B). This British Standard is intended to assist decision-making with regard to existing and proposed trees in the context of design, demolition and construction. Root systems, stems and canopies, with allowance for future movement and growth, need to be taken into account in all projects, including those that do not require planning permission. The space required for any proposed new trees to become established is an important consideration.

During their lifetime, trees will be vulnerable to disturbance, injury, environmental changes, pests and diseases. Construction work often exerts pressures on existing trees, as do changes in their immediate environment following the construction. A tree that has taken many decades to reach maturity can be damaged irreparably in a few minutes by actions that might be unwitting, negligent or wilful (see Annex A). The early provision of physical protection from damage is therefore critical.

Where tree retention or planting is proposed in conjunction with nearby construction, the objective should be to achieve a harmonious relationship between trees and structures that can be sustained in the long term. The good practice recommended in this British Standard is intended to assist in achieving this objective.

The standard follows a logical sequence of events that has tree care at the heart of the process. This is summarized as a flow diagram in Figure 1. The full sequence of events might not be applicable in all instances; for example, a planning application for a conservatory might not require the level of detail that needs to accompany a planning application for the development of a site with one or more dwellings.

Figure 1 The design and construction process and 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.*

1 Scope

This British Standard gives recommendations and guidance on the relationship between trees and design, demolition and construction processes.

It sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.

The standard is applicable whether or not planning permission is required.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS 3998:2010, *Tree work – Recommendations*

Other publications

[N1] NATIONAL JOINT UTILITIES GROUP (NJUG). *Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees.* Volume 4, issue 2. London: NJUG, 2007.

3 Terms and definitions

For the purposes of this British Standard, the following terms and definitions apply.

3.1 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

3.2 arboricultural method statement
methodology for the implementation of any aspect of development that is within the root protection area (**3.7**), or has the potential to result in loss of or damage to a tree to be retained

3.3 arboriculturist
person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction

3.4 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.

3.5 construction
site-based operations with the potential to affect existing trees

3.6 construction exclusion zone
area based on the root protection area (**3.7**) from which access is prohibited for the duration of a project

3.7 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

3.8 service
any above- or below-ground structure or apparatus required for utility provision

NOTE Examples include drainage, gas supplies, ground source heat pumps, CCTV and satellite communications.

3.9 stem
principal above-ground structural component(s) of a tree that supports its branches

3.10 structure
manufactured object, such as a building, carriageway, path, wall, service run, and built or excavated earthwork

3.11 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

3.12 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

NOTE These characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem.

[BS 3998:2010]

4 Feasibility: surveys and preliminary constraints

4.1 General

All plans should be to scale and should state to which ISO A paper size the scale relates, as well as showing a scale bar and a north point. When plans are drawn in colour, they should carry the following statement (or similar): "The original of this drawing was produced in colour – a monochrome copy should not be relied upon".

4.2 Topographical survey

4.2.1 An accurately measured topographical survey should be undertaken showing all relevant features.

NOTE 1 A method of carrying out topographical surveys is given in RICS specification Surveys of land buildings and utility services at scales of 1:500 and larger *[1].*

NOTE 2 Prior to commencing the topographical survey, it might be appropriate to seek the advice of an arboriculturist on its scope, particularly where there are woodlands or substantial tree groups present.

4.2.2 Where clearance of undergrowth is essential to facilitate the survey process, it is important that this is undertaken in consultation with relevant professionals, in order to avoid damage to, for example, arboricultural, archaeological or ecological features. Where appropriate, this should include expert attendance on site during the works.

4.2.3 The survey should be made available as scale drawings and preferably also in a commonly recognized digital format. It should be used to inform all design and planning decisions.

4.2.4 The survey should record:

a) spot levels at the base of trees and throughout the site at an interval appropriate to meet design requirements, recorded as a grid and interpolated as contours, ensuring that any abrupt changes, embankments, ditch inverts and retaining features are recorded;

b) the position of all trees within the site with a stem diameter of 75 mm or more (see Note), measured at 1.5 m above highest adjacent ground level;

NOTE In the case of woodlands or substantial tree groups, only individual trees with stem diameters greater than 150 mm usually need be plotted.

c) the position of trees with an estimated stem diameter of 75 mm or more that overhang the site or are located beyond the site boundaries within a distance of up to 12 times their estimated stem diameter;

d) for individual trees, the crown spread taken at four cardinal points; for woodlands or substantial tree groups, the overall extent of the canopy;

e) the extent, basal ground levels and height of shrub masses, hedges, hedgerows and stumps;

f) other relevant landscape features and artefacts, such as streams, buildings and other structures, boundary features and means of enclosure, trenching scars near to trees, and overhead and underground utility apparatus, including drainage runs with manholes and invert levels.

4.3 Soil assessment

4.3.1 A soil assessment should be undertaken by a competent person to inform any decisions relating to:

- the root protection area (RPA);
- tree protection;
- new planting design; and
- foundation design to take account of retained, removed and new trees.

4.3.2 The assessment should determine whether the soil is shrinkable. If it is, trees and other vegetation have the potential to cause indirect damage to structures (see Annex A). In such cases, desiccation assessments should be carried out at a specialist laboratory to check the extent to which existing vegetation has dehydrated the soil.

4.3.3 Soil structure, composition and pH should be included in the assessment for the purpose of designing new planting and landscape proposals.

4.4 Tree survey

4.4.1 Timing

4.4.1.1 A tree survey should be undertaken by an arboriculturist to record information about the trees on or adjacent to a site. The results of the tree survey, including material constraints arising from existing trees that merit retention, should be used (along with any other relevant baseline data) to inform feasibility studies and design options. For this reason, the tree survey should be completed and made available to designers prior to and/or independently of any specific proposals for development.

4.4.1.2 Tree surveys undertaken after a detailed design has been prepared can identify significant conflicts: in such cases, the nature of and need for the proposed development should be set against the quality and values of affected trees. The extent to which the design can be modified to accommodate those trees meriting retention (see Clause **5**) should be carefully considered.

4.4.1.3 Where proposed development is subject to planning control, a tree survey should be regarded as an important part of the evidence base underpinning the design and access statement. Accordingly, local planning authorities should not rely on planning conditions to secure a tree survey (see Annex B), as by this stage in the formal planning process its findings might not be capable of influencing design, potentially resulting in uncontrolled arboricultural impacts.

NOTE The risk of project delay due to material constraints being identified only at a late stage is avoided by the early procurement of a tree survey.

4.4.2 Parameters

NOTE Prior to a full tree survey, a pre-purchase arboricultural site appraisal can be useful to inform likely developable area.

4.4.2.1 The tree survey should include all trees included in the topographical survey (see **4.2**), as well as any that might have been missed [e.g. on shrinkable soils, additional off-site trees that could have an effect on foundation design (see Annex A)]. The trees should be sequentially numbered and, where appropriate, tagged, with the tags being placed as high as is convenient on the stem of each tree.

4.4.2.2 Individual trees, groups of trees and woodlands should be assessed for their quality and benefits within the context of proposed development, in a transparent, understandable and systematic way. The quality of each tree or group of trees should be recorded by allocating it to one of four categories (see **4.5**). The categories should be differentiated on the tree survey plan by colours (see **4.5** and Tables 1 and 2), and/or by suffixing the category adjacent to the tree identification number on the tree survey plan (e.g. 217-A, 218-C etc; see **4.4.2.1**).

4.4.2.3 Trees growing as groups or woodland should be identified and assessed as such where the arboriculturist determines that this is appropriate. However, an assessment of individuals within any group should still be undertaken if there is a need to differentiate between them, e.g. in order to highlight significant variation in attributes (including physiological or structural condition).

*NOTE The term "group" is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally, including for biodiversity (e.g. parkland or wood pasture), in respect of each of the three subcategories (see **4.5**).*

4.4.2.4 The categorization of a group or woodland can reflect a future potential that is contingent on appropriate management being undertaken to promote the development of the better specimens, based upon established arboricultural and silvicultural principles. Such management requirements should be noted under "general observations" within the schedule and included within the post-development management plan (see **8.8.3**).

NOTE Typically, the works will need to be phased over a number of years so as to maintain the necessary degree of companion shelter.

4.4.2.5 A schedule to the survey should list all the trees or groups of trees. The following information should be recorded (see **4.4.2.6** for measurement conventions):

a) sequential reference number (to be recorded on the tree survey plan);

b) species listed by common name, with a key provided to scientific names;

c) height;

d) stem diameter, measured in accordance with Annex C;

e) branch spread, taken as a minimum at the four cardinal points, to derive an accurate representation of the crown (to be plotted on the tree survey plan);

f) existing height above ground level of:

   1) first significant branch and direction of growth (e.g. 2.4-N);

   2) canopy,

   to inform on ground clearance, crown/stem ratio and shading;

g) life stage (e.g. young, semi-mature, early mature, mature, over-mature);

h) general observations, particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect), and/or preliminary management recommendations;

i) estimated remaining contribution, in years (<10, 10+, 20+, 40+);

j) category U or A to C grading (see **4.5** and Tables 1 and 2), to be recorded on the tree survey plan.

NOTE 1 It is not always practical or necessary to record branch spread for every tree within a group or woodland.

NOTE 2 In some cases, layout design might be aided by the arboriculturist providing data on future tree height and crown spread.

4.4.2.6 The measurement conventions should be as follows.

a) height, crown spread and crown clearance should be recorded to the nearest half metre (crown spread should be rounded up) for dimensions up to 10 m and the nearest whole metre for dimensions over 10 m;

b) stem diameter should be recorded in millimetres, rounded to the nearest 10 mm (0.01 m);

c) estimated dimensions (e.g. for off-site or otherwise inaccessible trees where accurate data cannot be recovered) should be clearly identified as such (e.g. suffixed with a "#").

4.4.2.7 Relevant details of shrub masses, hedges, hedgerows and stumps are expected to have been recorded during the topographical survey (see **4.2**), but should be checked by the arboriculturist for inclusion in the tree survey. In the case of regularly maintained domestic hedges and the majority of shrub masses, it will normally be sufficient to record their height and species on the tree survey plan or note these in the schedule.

4.4.2.8 Hedgerows and substantial internal or boundary hedges (including evergreen screens) should be recorded in a similar fashion to groups, with the lateral spread and average (or maximum and minimum) height and stem diameter ranges recorded, to allow the potential constraints associated with the features to be fully assessed. All woody species present should be recorded. Where woody plants are present within a hedgerow that are significantly different in character from the remainder of it, these should be identified and recorded separately, especially where they comprise distinct trees.

NOTE Attention is drawn to the Hedgerows Regulations 1997 [2].

4.4.2.9 On shrinkable soils (known or suspected), if it is evident that trees or substantial stems have been removed from a hedgerow, this should be recorded, along with any apparent signs of past management, such as laying or significant height reduction. Such information can be of particular relevance to foundation design, where the current species composition and dimensions might not reflect the previous influence of a hedgerow on ground moisture levels.

4.5 Tree categorization method

4.5.1 As part of the tree survey (see **4.4**), trees should be categorized using the criteria shown in Table 1.

NOTE The means of identifying each category on the tree survey plan is shown in Table 2.

4.5.2 The purpose of the tree categorization method, which should be applied by an arboriculturist, is to identify the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.

4.5.3 For a tree to qualify under any given category, it should fall within the scope of that category's definition (U, A, B, C) and, for trees in categories A to C, it should qualify under one or more of the three subcategories (1, 2, 3). Subcategories 1, 2 and 3 are intended to reflect arboricultural and landscape qualities, and cultural values, respectively.

4.5.4 The tree survey schedule should list which subcategory applies. It is intended that each subcategory has equal weight such that, for example, an A1 tree has the same retention priority as an A2 tree. Some trees could qualify under more than one criterion.

4.5.5 When determining the appropriate category for any given tree, group or woodland (see **4.4**), the arboriculturist should start by considering whether the tree falls within the scope of category U. Assuming that it does not, the arboriculturist should then proceed on the presumption that all trees are considered according to the criteria for inclusion in category A. Trees that do not meet these criteria should then be considered in light of the criteria for inclusion in category B. This process should be repeated, as required, until the appropriate quality or value assessment is reached.

4.5.6 Trees of generally high quality and/or value which have a defect or defects that do not reduce their retention span below the suggested 40 year threshold, should be placed in category A, i.e. they should not be downgraded as a result of minor imperfections.

4.5.7 Where trees would otherwise be categorized as U, but have identifiable conservation, heritage or landscape value, even though only for the short term, they may be upgraded, although they might be suitable for retention only where issues concerning their safety can be appropriately managed.

4.5.8 When categorizing a tree, the presence of any serious disease or tree-related hazards should be taken into account. If disease is likely to be fatal or irremediable, or likely to require sanitation for the protection of other trees, it might be appropriate for the trees concerned to be categorized as U, even if they otherwise have considerable value. If structural defects present an unacceptable risk to people or property, the extent to which the defects are remediable, including the effect that this might have on the tree's remaining value, will influence whether the tree be assigned to the category that it would otherwise merit.

Table 1 Cascade chart for tree quality assessment

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

Table 2 **Identification of tree categories**

Category (from Table 1)	Colour [A)]	RGB code [A)]
U	Dark red	127-000-000
A	Light green	000-255-000
B	Mid blue	000-000-255
C	Grey	091-091-091

[A)] Colours verified against http://safecolours.rigdenage.com/palettefiles.html#files [viewed 2012-03-26].

4.5.9 During the course of a tree survey, it might be found that certain trees require immediate attention. For example, they might present an imminent and serious hazard to life or property, or they might be affected by a pest or pathogen which would cause widespread and serious damage unless controlled or eradicated. These issues should be recorded and promptly brought to the attention of the relevant person or organization (including statutory authorities where applicable).

4.5.10 Particular care is needed when evaluating young trees, especially where they occur as individual specimens. Where these are less than 150 mm stem diameter at 1.5 m above adjacent ground level, it might be acceptable and relatively straightforward to mitigate their loss, if necessary, with similar new tree planting. Alternatively, it might be practicable to relocate such trees within the site (e.g. using a tree spade). Whilst the presence of young trees of good form and vitality is generally desirable (i.e. those trees which have the potential to develop into quality mature specimens), they need not necessarily be a significant constraint on the site's potential.

NOTE It is sometimes possible to relocate mature trees. However, as this is a costly and complex operation with a variable chance of success, it is a viable option only in exceptional cases.

4.5.11 The tree survey might identify the presence of veteran trees on the site. The implications of their presence on the use of the surrounding land should be assessed at the earliest possible stage of the design process. Where such trees are to be retained, particular care should be taken in the design to accommodate them in a setting that aids their long-term retention.

NOTE Whilst veteran trees typically provide a range of niche habitats, they are especially valuable if ancient, due to their scarcity and high habitat values for associated species of fungi, lichens and saproxylic invertebrates, including some which are rare or endangered and occur only where such trees have been continuously present for centuries. These trees will therefore almost always be included in the A3 category.

4.6 Root protection area (RPA)

4.6.1 For single stem trees, the RPA (see **3.7**) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below should be used. In all cases, the stem diameter(s) should be measured in accordance with Annex C, and the RPA should be determined from Annex D. The calculated RPA for each tree should be capped to 707 m^2.

a) For trees with two to five stems, the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2}$$

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

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

4.6.2 The RPA for each tree should initially be plotted as a circle centred on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.

4.6.3 Any deviation in the RPA from the original circular plot should take account of the following factors whilst still providing adequate protection for the root system:

a) the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures and underground apparatus);

b) topography and drainage;

c) the soil type and structure;

d) the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.

5 Proposals: conception and design

5.1 General

5.1.1 The constraints imposed by trees, both above and below ground (see Note to **5.2.1**) should inform the site layout design, although it is recognized that the competing needs of development mean that trees are only one factor requiring consideration. Certain trees are of such importance and sensitivity as to be major constraints on development or to justify its substantial modification. However, care should be taken to avoid misplaced tree retention; attempts to retain too many or unsuitable trees on a site can result in excessive pressure on the trees during demolition or construction work, or post-completion demands for their removal.

5.1.2 As trees can affect and be affected by many aspects of site operations, during the conception and design process the project arboriculturist should be involved in ongoing review of layout, architectural, engineering and landscape drawings. All members of the design team should be made aware of the requirements for the successful retention of the retained trees and should make provision for these throughout the development process.

5.2 Constraints posed by existing trees

5.2.1 The RPA (see **4.6**) and any other relevant constraints should be plotted around each of the category A, B and C trees on relevant drawings, including proposed site layout plans.

NOTE RPAs represent below-ground constraints. Above-ground constraints might arise from the following attributes:

a) the current and ultimate height and spread of the tree;

b) species characteristics, including evergreen or deciduous, density of foliage, and factors such as susceptibility to honeydew drip, branch drop, fruit fall, etc.

5.2.2 The attributes listed in the Note to **5.2.1** can significantly affect potential land use or living conditions, including the effect of the tree on daylight and sunlight. Whilst either shade or sunlight might be desirable, depending on the potential use of the area affected, the design should avoid unreasonable obstruction of light.

NOTE 1 An indication of potential direct obstruction of sunlight can be illustrated by plotting a segment, with a radius from the centre of the stem equal to the height of the tree, drawn from due north-west to due east, indicating the shadow pattern through the main part of the day.

NOTE 2 Proprietary software is available that can assist with calculation and plotting of tree shadow extent (see also BRE CP75/75 [3] and BR 209 [4]).

5.2.3 The following factors should also be taken into account during the design process:

a) the presence of tree preservation orders, conservation areas or other regulatory protection;

b) potential incompatibilities between the layout and trees proposed for retention;

c) the working and access space needed for the construction of the proposed development;

   NOTE This might involve access facilitation pruning, or the use of a height restriction bar to prohibit tall vehicles accessing a site containing trees with low canopies.

d) the effect that construction requirements might have on the amenity value of trees, both on and near the site, including the effects of pruning to facilitate access and working space;

e) the requirement to protect the overhanging canopies of trees where they could be damaged by machinery, vehicles, barriers or scaffolding, where it will be necessary to increase the extent of the tree protection barriers to contain the canopy;

f) infrastructure requirements in relation to trees, e.g. easements for underground or above-ground apparatus; highway safety and visibility splays; and other infrastructural provisions, such as substations, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines;

g) the proposed end use of the space adjacent to retained trees;

h) the potential for new planting to provide mitigation for any losses.

5.2.4 Particular care is needed regarding the retention of large, mature, over-mature or veteran trees which become enclosed within the new development (see **4.5.11**). Where such trees are retained, adequate space should be allowed for their long-term physical retention and future maintenance.

NOTE The presence of large species trees is increasingly being seen as advantageous, since it contributes to climate change resilience, amongst other benefits. Achieving successful integration of large species trees requires careful consideration at the conceptual and design stages.

5.3 Proximity of structures to trees

5.3.1 The default position should be that structures (see **3.10**) are located outside the RPAs of trees to be retained. However, where there is an overriding justification for construction within the RPA, technical solutions might be available that prevent damage to the tree(s) (see **Clause 7**). If operations within the RPA are proposed, the project arboriculturist should:

a) demonstrate that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA;

b) propose a series of mitigation measures to improve the soil environment that is used by the tree for growth.

5.3.2 The cumulative effects of incursions into the RPA, e.g. from excavation for utility apparatus, are damaging and should be avoided. Where there is evidence that a tree has been previously subjected to damage by construction activity, this should be taken into account when considering the acceptability of further activity within the RPA.

5.3.3 On shrinkable soils, the foundation design should take account of the risks of indirect damage, i.e. subsidence and/or heave brought about by changes in moisture content of the soil due to remaining and removed vegetation, as well as the future influence of new planting (see Annex A).

5.3.4 A realistic assessment of the probable impact of any proposed development on the trees and vice versa should take into account the characteristics and condition of the trees, with due allowance and space for their future growth and maintenance requirements. To maximize the probability of successful tree retention, the following factors should be taken into account during the design process.

a) **Shading.** Shading by trees affects buildings and open spaces.

   1) **Shading of buildings.** Shading of buildings by trees can be a problem, particularly where there are rooms which require natural light. Proposed buildings should be designed to take account of existing trees, their ultimate size and density of foliage, and the effect that these will have on the availability of light.

   2) **Shading of open spaces.** Open spaces such as gardens and sitting areas should be designed to meet the normal requirement for direct sunlight for at least a part of the day.

   NOTE 1 Shading can be desirable to reduce glare or excessive solar heating, or to provide for comfort during hot weather. The combination of shading, wind speed/turbulence reduction and evapo-transpiration effects of trees can be utilized in conjunction with the design of buildings and spaces to provide local microclimatic benefits.

b) **Privacy and screening.** It might be highly desirable for trees to provide screening to a building, e.g. for internal privacy, to reduce overlooking by neighbours or to mitigate undesirable views, such as busy roads, railway lines or industrial premises. In order to achieve the desired outcome, account should be taken of the proposed orientation and aspect of the building, the type of building, its use and location relative to the tree, and the species attributes of the tree.

c) **Direct damage.** Below-ground damage to structures can occur as a result of incremental root and stem growth. Above-ground damage can occur to trees and structures by the continuous whipping of branches against the fabric of a building. Branch ends might have to be cut back periodically, possibly affecting the shape of the tree. Structures should therefore be designed and/or located with due consideration for a tree's ultimate growth, so as to reduce the need for frequent remedial pruning or other maintenance.

NOTE 2 Exceptions might arise where this is a known and acceptable management outcome (e.g. cyclical maintenance of previously pollarded trees or where retention of desirable trees would otherwise not be feasible).

d) **Future pressure for removal.** The relationship of buildings to large trees can cause apprehension to occupiers or users of nearby buildings or spaces, resulting in pressure for the removal of the trees. Buildings and other structures should be sited allowing adequate space for a tree's natural development, with due consideration given to its predicted height and canopy spread. However, this does not mean that trees should not be retained within any particular distance of a structure (see Table A.1 for new planting).

e) **Seasonal nuisance.** Trees are naturally growing and shedding organisms. Leaves of some species can cause problems, particularly in the autumn, by blocking gullies and gutters. Fruit can cause slippery patches, and accumulation of honeydew can be damaging to surfaces and vehicles. Buildings, footpaths and hard-standing areas should be designed with due consideration to the proximity of retained trees, especially in terms of their foliage, flowering and fruiting habits. Where conflicts might arise, detailed design should address these issues, e.g. use of non-slip paving; provision of leaf guards or grilles on gutters and gullies; provision of access and means of maintenance.

5.4 Arboricultural impact assessment

5.4.1 The project arboriculturist should use the information detailed in **5.2** and **5.3** to prepare an arboricultural impact assessment that evaluates the direct and indirect effects of the proposed design and where necessary recommends mitigation.

5.4.2 The assessment should take account of the effects of any tree loss required to implement the design, and any potentially damaging activities proposed in the vicinity of retained trees. Such activities might include the removal of existing structures and hard surfacing, the installation of new hard surfacing, the installation of services, and the location and dimensions of all proposed excavations or changes in ground level, including any that might arise from the implementation of the recommended mitigation measures. In addition to the impact of the permanent works, account should be taken of the buildability of the scheme in terms of access, adequate working space and provision for the storage of materials, including topsoil.

NOTE Scaled cross-sections and other drawings might be required to demonstrate the feasibility of the proposals (see Annex B).

5.4.3 As well as an evaluation of the extent of the impact on existing trees, the arboricultural impact assessment should include:

a) the tree survey (see **4.4**);

b) trees selected for retention, clearly identified (e.g. by number) and marked on a plan with a continuous outline;

c) trees to be removed, also clearly identified (e.g. by number) and marked on a plan with a dashed outline or similar;

d) trees to be pruned, including any access facilitation pruning, also clearly identified and labelled or listed as appropriate;

e) areas designated for structural landscaping that need to be protected from construction operations in order to prevent the soil structure being damaged;

f) evaluation of impact of proposed tree losses;

g) evaluation of tree constraints (see **5.2**) and draft tree protection plan (see **5.5**);

h) issues to be addressed by an arboricultural method statement (see **6.1**), where necessary in conjunction with input from other specialists.

5.5 Tree protection plan

5.5.1 The tree protection plan should be superimposed on a layout plan, based on the topographical survey (see **4.1** and **4.2**) and showing all hard surfacing and other existing structures within the RPA.

5.5.2 The plan should clearly indicate the precise location of protective barriers to be erected to form a construction exclusion zone around the retained trees. It should also show the extent and type of ground protection, and any additional physical measures, such as tree protection boxes, that will need to be installed to safeguard vulnerable sections of trees and their RPAs where construction activity cannot be fully or permanently excluded.

5.5.3 These measures should be indicated on the plan, accompanied by descriptive text as required. Barrier and ground protection offsets should be dimensioned from existing fixed points on the site to enable accurate setting out. The position of barriers and any ground protection should be shown as a polygon representing the actual alignment of the protection (see **4.6**).

5.5.4 Where temporary access is to be permitted into a construction exclusion zone, the extent of the set-back of the permanent barrier should be clearly indicated, along with the temporary ground protection measures to be adopted for the duration of the works within the RPA (**6.2.3**).

5.5.5 These details should be incorporated into relevant subsequent plans, method statements used for design purposes and construction drawings issued for use on site, to ensure that all interested parties are fully aware of the areas in which access and works may and may not take place.

5.5.6 To avoid disturbance to the physical protection, it is essential to make allowance for, and plan, all construction operations which will be undertaken in the vicinity of trees. Factors that need to be considered include, but are not limited to:

a) site construction access;

b) the intensity and nature of the construction activity;

c) contractors' car parking;

d) phasing of construction works;

e) the space needed for foundation excavations and construction works;

f) the availability of special construction techniques;

g) the location and space needed for all temporary and permanent apparatus and service runs, including foul and surface water drains, land drains, soakaways, gas, oil, water, electricity, telephone, television or other communication cables;

h) all changes in ground level, including the location of retaining walls, steps and making adequate allowance for foundations of such walls and backfillings;

i) working space for cranes, plant, scaffolding and access during works;

j) space for site huts, temporary toilet facilities (including their drainage) and other temporary structures;

k) the type and extent of landscape works which will be needed within the protected areas, and the effects these will have on the root system;

l) space for storing (whether temporary or long-term) materials, spoil and fuel and the mixing of cement and concrete;

m) the effects of slope on the movement of potentially harmful liquid spillages towards or into protected areas.

NOTE Attention is drawn to the Construction (Design and Management) Regulations 2007 [5] and the Construction (Design and Management) Regulations (Northern Ireland) 2007 [6].

5.6 New planting design and associated landscape operations

*COMMENTARY ON **5.6***

All new tree planting proposals are an essential consideration in the layout, design and future use of a development site, the local landscape character and the contextual surroundings. As trees generally form the dominant elements of the long-term landscape structure of a site, careful consideration needs to be given to their ultimate height and spread, form, habit and colour, density of foliage and maintenance implications, in relation to both the built form of the new development, and the retained landscape features.

Trees, either individually or as formal or informal groups, perform a variety of functional roles that can be exploited by a well-designed landscape. These include:

a) contributions to green infrastructure networks, of particular importance in built-up areas;

b) the inherent aesthetic attractiveness of trees as prominent landscape architectural features;

c) screening of undesirable views and provision of privacy;

d) articulation and definition of spaces;

e) definition and direction of routes and views;

f) introduction of natural character and seasonal change that can relieve or complement artificial environments;

g) reflection of local landscape character and providing a sense of place, sometimes as significant landmarks;

h) control of soil erosion, attenuation of surface water run-off and mitigation of flood risk, through root system reinforcement and canopy interception of precipitation.

Many of these factors can provide a significant enhancement to the value of property. This is reflected in research carried out by CABE [7] and in anecdotal evidence of high property values in well-treed areas.

5.6.1 General

The purpose of proposed new planting should be understood from the start of the design process so that long-term structural landscape objectives inform decisions regarding appropriate locations and species. Advice on detailed design and how this would integrate with proposed development infrastructure should be sought from a landscape architect or other competent person.

5.6.2 New planting adjacent to structures

5.6.2.1 New planting should normally be selected and located to ensure that adequate space is allowed for future growth of root systems (see Table A.1), stems and canopies to maturity, without this causing direct physical contact with and potential direct damage to nearby structures, or causing obstruction of access, light or other avoidable nuisance. Exceptions could include planned short-term planting.

5.6.2.2 Paths, patios and driveways can be vulnerable to damage by trees. Design decisions should take into account the known habits of tree species and/or options for flexible pavings or other appropriate hard landscape specifications.

5.6.2.3 On shrinkable clay soils, account should be taken of the risk of subsidence that might be caused or exacerbated by new planting removing moisture from load-bearing soils.

5.6.2.4 The foundation construction and condition of existing structures, especially on shrinkable clay soils, should be a determining factor when taking decisions on species and location for new plantings, to minimize subsidence risks and to seek compatibility between structures and trees.

5.6.2.5 In the case of new structures, especially on shrinkable soils, the design and construction of foundations should be undertaken in conjunction with planting proposals to minimize the risks of structural movement, taking account of the possibility of periods of prolonged drought associated with climate change. It is therefore important to ensure that foundation design of permanent structures follows up-to-date guidance. Expert advice should be sought as necessary.

5.6.2.6 The obstruction of light and views, the creation of shade by new trees, and the likely extent and density of tree crowns when fully grown, should be taken into account when designing new planting adjacent to buildings. Design and species selection should allow the enjoyment of reasonable light and shading where desirable as the trees develop into mature specimens.

NOTE An appropriate balance of views and screening should be provided. The planting of large and/or fast-growing evergreen trees as screens or hedging could lead to the unacceptable obstruction of light all year round and might therefore be unsuited to nearby residential accommodation.

5.6.3 New planting adjacent to roads

Roadside trees can make a significant contribution to the character of new developments. They are of increasing importance as green infrastructure elements in existing built-up areas, providing shade, shelter, urban cooling and biodiversity benefits. Their siting and species selection should be carefully coordinated at an early stage with other aspects of highway design and, in the case of adopted roads, with the agreement of the relevant highway authority. Sight line requirements, lighting schemes, CCTV, underground and overhead service routes and avoidance of physical obstruction or damage should all be taken into account, with due consideration for future growth and periodic maintenance requirements.

5.6.4 New planting in the vicinity of underground utility apparatus and overhead cables

Trees should not be planted where they might obstruct overhead power lines or cables. In new developments, early consultation and cooperation between the developer and the utility company is essential, and proposed service routes should be coordinated with the landscape design proposals. Underground apparatus should be ducted or otherwise protected at the time of construction to enable trees to be planted nearby without conflict. Wherever possible, common service trenches should be specified to minimize the land take associated with underground services and to facilitate future maintenance.

NOTE Further guidance is given in Volume 4 of the NJUG guidelines [N1].

6 Technical design

COMMENTARY ON CLAUSE 6

Technical design includes information sufficient to provide a high level of confidence in the outcome for trees retained on development sites. Where planning permission or other statutory controls apply, details might need to be submitted in draft form or heads of terms to allow for changes to the design that might occur after permission has been granted. In these cases, it will be necessary for the project arboriculturist to set out a series of parameters for construction activity (e.g. where service routes and/or construction activity should not occur), based on the RPA and the physiological needs of the tree, to which the finalized specifications and statements will apply.

6.1 Arboricultural method statement

6.1.1 A precautionary approach towards tree protection should be adopted and any operations, including access, proposed within the RPA (or crown spread where this is greater) should be described within an arboricultural method statement, in order to demonstrate that the operations can be undertaken with minimal risk of adverse impact on trees to be retained.

6.1.2 The arboricultural method statement should be appropriate to the proposals and might typically address some or all of the following, incorporating relevant information from other specialists as required:

a) removal of existing structures and hard surfacing;

b) installation of temporary ground protection (see **6.2.3**);

c) excavations and the requirement for specialized trenchless techniques (see **7.7.2**);

d) installation of new hard surfacing – materials, design constraints and implications for levels;

e) specialist foundations – installation techniques and effect on finished floor levels and overall height;

f) retaining structures to facilitate changes in ground levels;

g) preparatory works for new landscaping;

h) auditable/audited system of arboricultural site monitoring, including a schedule of specific site events requiring input or supervision.

6.1.3 The arboricultural method statement should also include a list of contact details for the relevant parties.

6.2 Barriers and ground protection

6.2.1 General

6.2.1.1 All trees that are being retained on site should be protected by barriers and/or ground protection (see **5.5**) before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone. Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection should be installed (see **6.2.3**).

6.2.1.2 Areas of retained structural planting, or designated for new structural planting, should be similarly protected, based on the extent of the soft landscaping shown on the approved drawings.

6.2.1.3 The protected area should be regarded as sacrosanct, and, once installed, barriers and ground protection should not be removed or altered without prior recommendation by the project arboriculturist and, where necessary, approval from the local planning authority.

6.2.1.4 Where required, pre-development tree work may be undertaken before the installation of tree protection measures, with the agreement of the project arboriculturist or local planning authority if appropriate (see also **8.8.1**).

6.2.1.5 It should be confirmed by the project arboriculturist that the barriers and ground protection have been correctly set out on site, prior to the commencement of any other operations.

6.2.2 Barriers

6.2.2.1 Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.

6.2.2.2 The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 2. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.

6.2.2.3 Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray (Figure 3b).

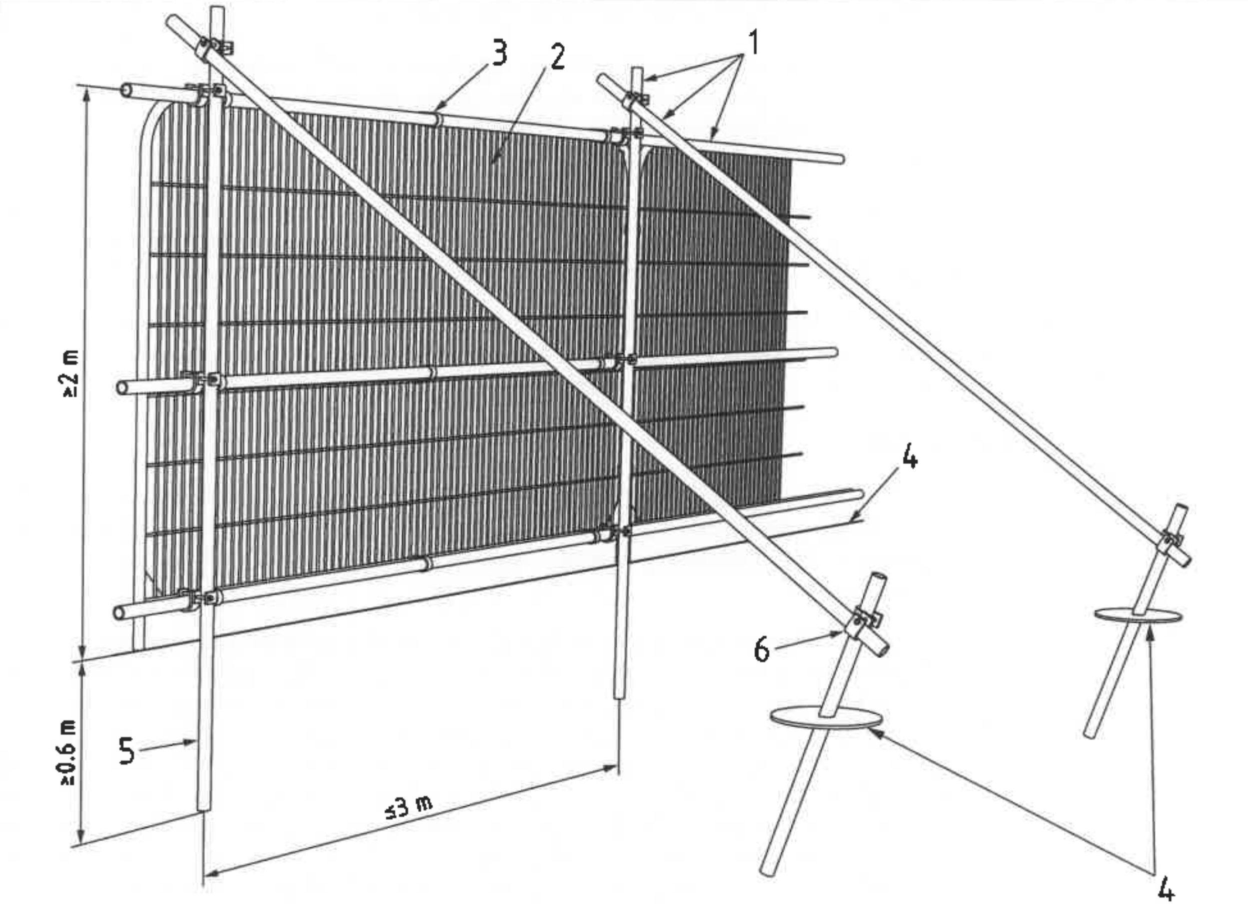
NOTE 1 Examples of configurations for steel mesh perimeter fencing systems are given in BS 1722-18.

NOTE 2 It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without damaging the retained trees or their rooting environment.

6.2.2.4 All-weather notices should be attached to the barrier with words such as:

"CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

Figure 2 **Default specification for protective barrier**



Key

1 Standard scaffold poles

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

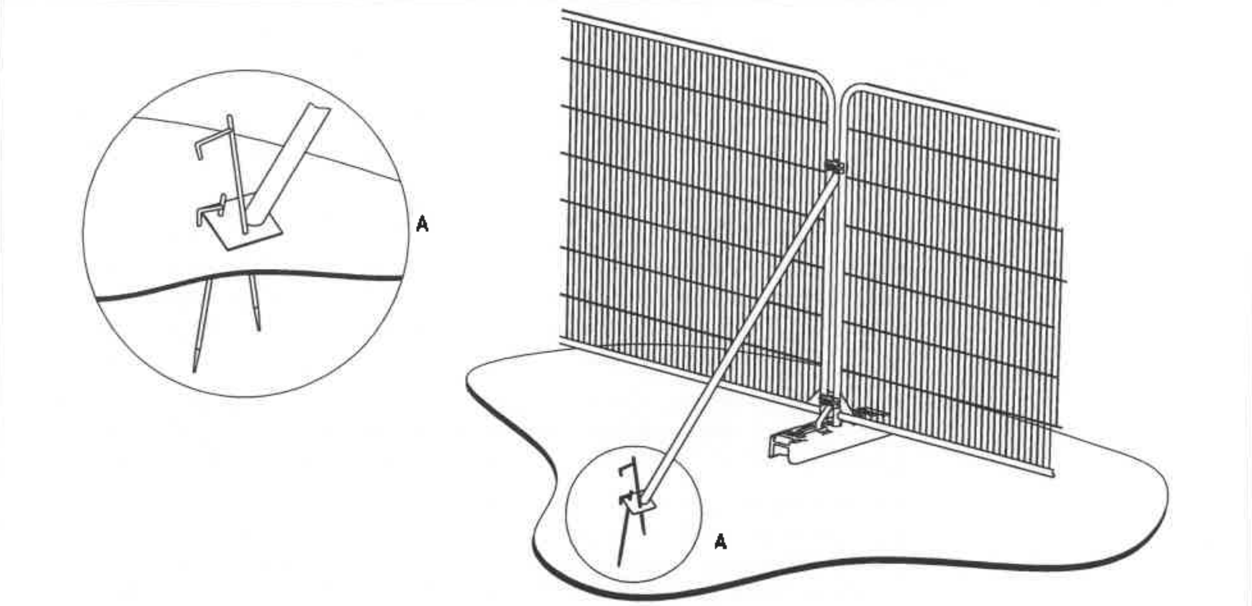
3 Panels secured to uprights and cross-members with wire ties

4 Ground level

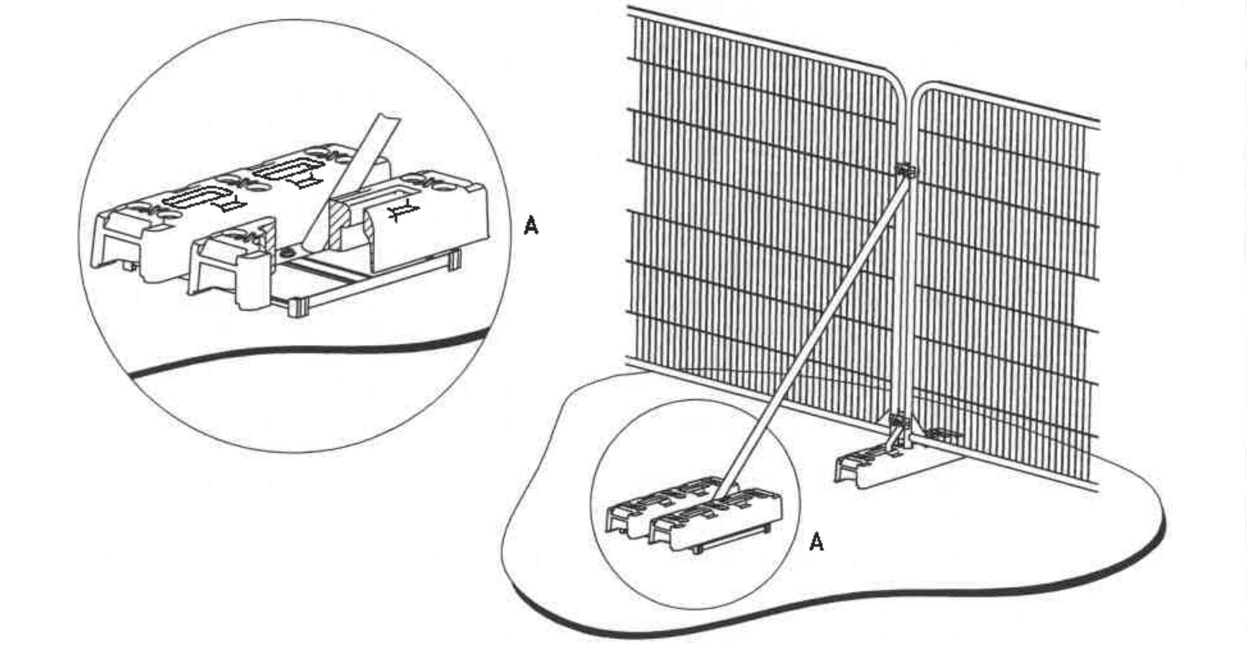
5 Uprights driven into the ground until secure (minimum depth 0.6 m)

6 Standard scaffold clamps

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

6.2.3 Ground protection during demolition and construction

6.2.3.1 Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a set-back in the alignment of the tree protection barrier. In such areas, suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during construction, rather than being removed during demolition. The suitability of such surfacing for this purpose should be evaluated by the project arboriculturist and an engineer as appropriate.

6.2.3.2 Where the set-back of the tree protection barrier would expose unmade ground to construction damage, new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.

6.2.3.3 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.

NOTE The ground protection might comprise one of the following:

a) 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;

b) 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;

c) for wheeled or tracked construction traffic exceeding 2 t 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 likely loading to which it will be subjected.

6.2.3.4 The locations of and design for temporary ground protection should be shown on the tree protection plan and detailed within the arboricultural method statement (see **6.1**).

6.2.3.5 In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

6.2.4 Additional precautions outside the exclusion zone

6.2.4.1 Planning of site operations should take sufficient account of wide loads, tall loads and plant with booms, jibs and counterweights (including drilling rigs), in order that they can operate without coming into contact with retained trees. Such contact can result in serious damage to the trees and might make their safe retention impossible. Consequently, any transit or traverse of plant in proximity to trees should be conducted under the supervision of a banksman, to ensure that adequate clearance from trees is maintained at all times. Access facilitation pruning should be undertaken where necessary to maintain this clearance.

NOTE In some instances, local planning authority consent for pruning might be required.

6.2.4.2 Fires on sites should be avoided if possible. Where they are unavoidable, they should not be lit in a position where heat could affect foliage or branches. The potential size of a fire and the wind direction should be taken into account when determining its location, and it should be attended at all times until safe enough to leave.

NOTE Local environmental health authorities might have specific restrictions.

6.2.4.3 Any materials whose accidental spillage would cause damage to a tree should be stored and handled well away from the outer edge of its RPA.

6.3 Site monitoring

Wherever trees on or adjacent to a site have been identified within the tree protection plan for protective measures, there should be an auditable system of arboricultural site monitoring. This should extend to arboricultural supervision whenever construction and development activity is to take place within or adjacent to any RPA.

NOTE Existing planning regulations include the provision for local authorities to enforce planning requirements. The project arboriculturist appointed by the developer can help monitor site activity, but enforcement is the responsibility of the local authority.

7 Demolition and construction in proximity to existing trees

7.1 General

7.1.1 Construction within the RPA should accord to the principle that the tree and soil structure take priority, and the most reliable way to ensure this is to preserve the RPA completely undisturbed. Soil structure should be preserved at a suitable bulk density for root growth and function (of particular importance for soils of a high fines content), existing rootable soil retained and roots themselves protected.

7.1.2 The ability of a tree to tolerate some disturbance and alteration of its growing conditions depends on specific circumstances, including prevailing site conditions, and in general, the older the tree, the less successfully it will adapt to new conditions.

7.1.3 Where alternative design solutions are not available such that construction is proposed within the RPA, the potential impact of the proposals on the tree should be assessed (**5.4**), and a tree protection plan (**5.5**) and arboricultural method statement (**6.1**) produced. Details of design proposals should be developed in conjunction with the project arboriculturist and, where required, input from a suitably qualified engineer. In order to demonstrate that the proposals are technically feasible (see Commentary on Clause **6**), such details should be included within planning applications. The exception to this is the installation of underground utility apparatus, where it can be demonstrated that this is achievable by the use of trenchless technology (see **7.7**) and where entry and retrieval pits can be formed outside the RPA. Where utility operations do not require planning permission, including those performed by statutory undertakers, they should still be undertaken in accordance with these principles. As a minimum standard, such operations should be undertaken in accordance with NJUG Volume 4, issue 2 [N1].

7.2 Avoiding physical damage to the roots during demolition or construction

7.2.1 To avoid damage to tree roots, existing ground levels should be retained within the RPA. Intrusion into soil (other than for piling) within the RPA is generally not acceptable, and topsoil within it should be retained in situ. However, limited manual excavation within the RPA might be acceptable, subject to justification. Such excavation should be undertaken carefully, using hand-held tools and preferably by compressed air soil displacement.

NOTE Due to the demands that manual excavation places on a development project, and limitations arising from health and safety considerations, it is not realistic to plan for excavation using hand-held tools where there is a need for trench shoring or grading the sides of the excavation to a stable angle of repose.

7.2.2 Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

7.2.3 Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist, as such roots might be essential to the tree's health and stability.

7.2.4 Prior to backfilling, retained roots should be surrounded with topsoil or uncompacted sharp sand (builders' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

7.3 Tree protection during demolition

7.3.1 Where demolition is proposed on a site where trees are to be retained, access facilitation pruning should be undertaken as necessary to prevent injurious contact between demolition plant and the tree(s). In some cases, working space may be provided by temporarily tying back tree branches. Pruning or tying should be undertaken in accordance with a specification prepared by an arboriculturist.

NOTE The local authority will be able to advise whether the trees are under statutory protection such that consent for tree works might be required.

7.3.2 When demolishing a structure (including underground structures) within what would otherwise be the RPA, barriers should be erected, and ground protection installed (see **6.2.3**), to protect the underlying soil to the edge of the existing structure.

7.3.3 All plant and vehicles engaged in demolition works should either operate outside the RPA, or run on the ground protection (see **6.2.3**). Where such ground protection is required, it should be installed prior to commencement of operations.

7.3.4 Where trees stand adjacent to structures to be removed, the demolition should be undertaken inwards within the footprint of the existing building (often referred to as "top down, pull back").

NOTE Where there is a significant build-up of dust on the foliage, it might be necessary to hose down the tree(s).

7.3.5 The advice of an arboriculturist should be sought where underground structures present within the RPA are, or will become, redundant. In general it is preferable to leave such structures in situ, as their removal could damage adjacent tree roots.

7.3.6 Where an existing hard surface is scheduled for removal, care should be taken not to disturb tree roots that might be present beneath it. Hand-held tools or appropriate machinery should be used (under arboricultural supervision) to remove the existing surface, working backwards over the area, so that the machine is not moving over the exposed ground (see **7.2.2** for protection of exposed roots). If a new hard surface is to be laid, it might be preferable to leave any existing sub-base in situ, augmenting it where required.

7.4 Permanent hard surfacing within the RPA

NOTE This subclause does not apply to veteran trees, where it is recommended that no construction, including the installation of new hard surfacing, occurs within the RPA.

7.4.1 General

Where permanent hard surfacing within the RPA is considered unavoidable, site-specific and specialist arboricultural and construction design advice should be sought to determine whether it is achievable without significant adverse impact on trees to be retained.

*NOTE Specialist arboricultural advice includes, for example, advice on the tolerance of a tree species to the installation of a permanent hard surface within the RPA or tolerance of salt damage (see **7.4.2.4**).*

7.4.2 Design recommendations

7.4.2.1 The design should not require excavation into the soil, including through lowering of levels and/or scraping, other than the removal, using hand tools, of any turf layer or other surface vegetation. If it is intended to use the new surface for construction access, it is essential that the extra loading and wear arising from this are taken into account during the design process.

7.4.2.2 The structure of the hard surface should be designed to avoid localized compaction by evenly distributing the loading over the track width and wheelbase of any vehicles expected to use the access.

7.4.2.3 New permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

7.4.2.4 If the new surface is likely to be subject to de-icing salt application, an impermeable barrier should be incorporated to prevent contamination of the rooting area. Run-off should be directed away from the RPA (see also **8.6.5**).

7.4.2.5 Where a permeable surface is to be used by vehicular traffic, a geotextile should be used at the base of construction to help prevent pollution contamination of the rooting area below.

7.4.2.6 Permeable hard surfacing can result in soil volume moisture content remaining at or near field capacity for long periods. Where there is a risk of waterlogging, the design should incorporate appropriate land drainage (see also **4.3** and **8.6.5**). Land drainage within the RPA should be designed to avoid damage to the tree and the soil structure, e.g. sand slitting formed by compressed air soil displacement with the slits set radially to the tree.

7.4.2.7 The hard surface should be resistant to or tolerant of deformation by tree roots, and should be set back from the stem of the tree and its above-ground root buttressing by a minimum of 500 mm to allow for growth and movement. Resulting gaps may be filled using appropriate inert granular material.

NOTE 1 Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems. Alternatively, piles, pads or elevated beams can be used to support surfaces to bridge over the RPA or, following exploratory investigations to determine location, to provide support within the RPA while allowing the retention of roots greater than 25 mm in diameter.

NOTE 2 The use of two-dimensional load suspension systems is not recommended for surfaces intended for use by vehicles.

7.4.2.8 When designing the hard surface, account should be taken of finished levels in relation to adjacent structures, including damp-proof courses, garage slabs and links to existing vehicular cross-overs.

NOTE Attention is drawn to the Building Regulations 2010 [8], the Building (Scotland) Regulations 2004, as amended [9] and the Building Regulations (Northern Ireland) 2000 [10], in respect of the need for accessible thresholds.

7.4.2.9 If a permeable surface is to be used by construction traffic, this should be protected with a temporary sacrificial surface laid over a geotextile separator to ensure that its permeability is retained (i.e. interstices should not become blocked during construction).

7.4.3 Edge supports

The excavation needed for the placement of kerbs, edgings and their associated foundations and haunchings can damage tree roots. Within the RPA, this should be avoided either by the use of alternative methods of edge support or by not using supports at all.

NOTE For example, where kerbing is required for light structures, such as footpaths, above-ground peg and board edging might be acceptable. Where areas of hard surface require edge support, the use of sleepers (pinned in place where required), gabions or other non-invasive ground-contact structures, including the use of proprietary products, can provide appropriate solutions.

7.4.4 Precautions

7.4.4.1 The soil structure including the area beneath the proposed new hard surface should be protected from compaction during installation. This may be achieved by:

a) the use of temporary ground protection in accordance with **6.2.3** to safeguard the working area;

b) constructing the new surface with machinery working forward from the surface as it is constructed (known as "rolling out").

7.4.4.2 Where a herbicide is used to control vegetation prior to construction of hard surfacing, the manufacturer's guidance should be strictly followed and care should be taken to avoid any damaging effects on trees or other vegetation to be retained.

NOTE The use of appropriate geotextiles can provide a barrier that inhibits weed growth but allows water and gases to pass freely.

7.4.4.3 The ground should not be skimmed to establish the new hard surface at the former ground level. Loose organic matter and/or turf should be removed carefully using hand tools. The new surface should then be established above the soil.

7.4.4.4 Raising levels should be achieved by use of a granular material which remains gas- and water-permeable throughout its design life.

7.4.4.5 Due to the highly alkaline leachate produced during the curing of wet concrete, concrete should not be poured within the RPA unless an impermeable liner has been installed.

7.5 Special engineering for foundations within the RPA

7.5.1 The use of traditional strip footings can result in extensive root loss and should be avoided. The insertion of specially engineered structures within RPAs may be justified if this enables the retention of a good quality tree that would otherwise be lost (usually categories A or B). Designs for foundations that would minimize adverse impact on trees should include particular attention to existing levels, proposed finished levels and cross-sectional details. In order to arrive at a suitable solution, site-specific and specialist advice regarding foundation design should be sought from the project arboriculturist and an engineer. In shrinkable soils, the foundation design should take account of the risk of indirect damage (see **A.1.4**).

7.5.2 Root damage can be minimized by using:

- piles, with site investigation used to determine their optimal location whilst avoiding damage to roots important for the stability of the tree, by means of hand tools or compressed air soil displacement, to a minimum depth of 600 mm;
- beams, laid at or above ground level, and cantilevered as necessary to avoid tree roots identified by site investigation.

7.5.3 Where a slab for a minor structure (e.g. shed base) is to be formed within the RPA, it should bear on existing ground level, and should not exceed an area greater than 20% of the existing unsurfaced ground.

7.5.4 Slabs for larger structures (e.g. dwellings) should be constructed with a ventilated air space between the underside of the slab and the existing soil surface (to enable gas exchange and venting through the soil surface). In such cases, a specialist irrigation system should also be employed (e.g. roof run-off redirected under the slab). The design of the foundation should take account of any effect on the load-bearing properties of underlying soil from the redirected roof run-off. Approval in principle for a foundation that relies on topsoil retention and roof run-off under the slab should be sought from the building control authority prior to this approach being relied on.

7.5.5 Where piling is to be installed near to trees, the smallest practical pile diameter should be used, as this reduces the possibility of striking major tree roots, and reduces the size of the rig required to sink the piles. If a piling mat is required, this should conform to the parameters for temporary ground protection given in **6.2.3**. Use of the smallest practical piling rig is also important where piling within the branch spread is proposed, as this can reduce the need for access facilitation pruning. The pile type should be selected bearing in mind the need to protect the soil and adjacent roots from the potentially toxic effects of uncured concrete, e.g. sleeved bored pile or screw pile.

7.6 Subterranean construction within the RPA

7.6.1 Where it is proposed to form subterranean structures, e.g. basement extensions, within the RPA, it is essential to avoid excavating down through rootable soil if trees are to be retained. In some cases, it might be technically possible to form the excavation by undermining the soil beneath the RPA.

7.6.2 The following factors should be taken into account, in light of site-specific and specialist arboricultural, engineering and geotechnical advice:

- the future growth potential of the tree;
- the minimum depth of overburden (i.e. that overlying the roof of the proposed structure) required for retention in situ to ensure the survival of the tree and its stability against the wind;
- the potential for vibration-induced granular flow within the retained overburden, caused by the undermining process, to destabilize the tree through reduced root adhesion;
- the mass of the tree and of the retained overburden;

- the potential for ponding (i.e. perched water table) and the need for a drainage/runoff control system;
- the potential for adverse affects on local soil hydrology, and the possible impact of these on tree health.

7.7 Underground and above-ground utility apparatus

7.7.1 Mechanical trenching for the installation of underground apparatus and drainage severs any roots present and can change the local soil hydrology in a way that adversely affects the health of the tree. For this reason, particular care should be taken in the routeing and methods of installation of all underground apparatus. Wherever possible, apparatus should be routed outside RPAs. Where this is not possible, it is preferable to keep apparatus together in common ducts. Inspection chambers should be sited outside the RPA.

7.7.2 Where underground apparatus is to pass within the RPA, detailed plans showing the proposed routeing should be drawn up in conjunction with the project arboriculturist. In such cases, trenchless insertion methods should be used (see Table 3), with entry and retrieval pits being sited outside the RPA. Provided that roots can be retained and protected in accordance with **7.2.2**, excavation using hand-held tools (see **7.2.1**) might be acceptable for shallow service runs.

NOTE The suitability of these for differing applications is summarized in Table 3.

Table 3 **Trenchless solutions for differing utility apparatus installation requirements**

Method	**Accuracy** mm	**Bore dia.** [A] mm	**Max. sub.** [B] **length** m	**Applications**	**Not suitable for**
Microtunnelling	<20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/ roadway undercrossings	Low-cost projects due to relative expense
Surface-launched directional drilling	≈100	25 to 1 200	150	Pressure pipes, cables including fibre optic	Gravity-fall pipes, e.g. drains and sewers [C]
Pipe ramming	≈150	150 to 2 000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling [D]	≈50 [E]	30 to 180 [F]	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5 m

[A] Dependent on strata encountered.

[B] Maximum subterranean length.

[C] Pit-launched directional drilling can be used for gravity fall pipes up to 20 m subterranean length.

[D] Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.

[E] Substantial inverse relationship between accuracy and distance.

[F] Figures given relate to single pass: up to 300 mm bore achievable with multiple passes.

7.7.3 Above-ground apparatus (including CCTV cameras and lighting) should be sited to avoid the need for detrimental tree pruning. In this regard, the current and future crown size of the tree should be assessed. Tree branches can be pruned back with care to provide space, though it is not appropriate for repetitive and significant tree work to be an initial design solution unless this is a suitable management outcome for the tree. Pruning should be undertaken in accordance with BS 3998:2010.

8 Site works, landscape operations and management

NOTE BS 4428:1989 contains recommendations and guidance on general landscape operations, with sections on preliminary investigations, drainage, grading and cultivation, tree planting, and woodland planting. A new British Standard, BS 8545, is currently in preparation to provide detailed guidance on trees from nursery through to independence in the landscape.

8.1 General

The general treatment of areas around newly planted and existing trees should allow for adequate infiltration of water and free gas exchange, reduction of water evaporation and the retention of an open soil structure to encourage root growth. Care should be taken to ensure that grass or weed growth does not compete with young root growth by intercepting available water supply. Care should also be taken to avoid the risk of damage to the stems of young trees from future strimming or mowing operations. An area with a radius of at least 500 mm from the stem of newly planted trees should therefore be kept free from competing vegetation by chemical weed control or by the more environmentally friendly option of mulching (see **8.5**).

NOTE 1 Soft landscape finishes, including mulch and cultivated beds, will generally provide more favourable conditions for young tree establishment than most hard surfaces or grass. The use of ground-cover shrubs with an appropriate organic mulch is particularly beneficial: this treatment suppresses weeds, reduces maintenance, discourages intrusion and maintains a permeable open soil structure.

NOTE 2 BS 4428:1989 provides recommendations for the treatment of soft surfaces, but excludes hard surfaces.

8.2 Drainage

New development can have an effect on the existing drainage pattern and ground water levels of a site, due to level changes, increased areas of hard surface and new drainage installations. The root systems of mature trees do not generally adapt as well as younger specimens to alterations to groundwater. Expert advice on both drainage and trees should be taken where groundwater conditions are liable to change.

NOTE It is both good practice and, in many cases, a regulatory requirement to maintain existing groundwater conditions within, and reduce run-off from, a development site. This can be achieved, for example, through the use of permeable hard surfaces and techniques associated with sustainable urban drainage systems (SUDS). Such techniques can be designed and implemented to benefit both existing and new trees. (SUDS water might need to be treated/filtered and/or tree rooting areas protected from direct contamination in risk areas.)

8.3 Topsoil quality and amelioration

8.3.1 The quality of topsoil is a critical factor for the establishment and growth of new planting or seeding, and should be assessed by a competent person for depth, structure, texture and content. If there is any doubt regarding the suitability of soil to be used as a growing medium, appropriate samples should be analysed by a specialist soil laboratory for horticultural/landscape use, with particular reference to nutrients, organic content and any potential toxic materials or other contaminants. The report should include an assessment of suitability and any recommendations for appropriate remedial work, including the need for further specialist site investigation if necessary. Imported topsoil to be used in planting or seeding operations should be from a source approved by a competent person, samples should be submitted for analysis, and deliveries should be certified and verified for their consistency with approved samples.

8.3.2 Topsoil depths should be appropriate for, and may vary according to, the type and size of planting or seeding to be undertaken.

8.4 Soil compaction and remediation measures

COMMENTARY ON 8.4

Soil that has been compacted will not provide suitable conditions for the survival and growth of vegetation, whether existing or new, and is a common cause of post-construction tree loss on development sites. Compacted soil will adversely affect drainage, gas exchange, nutrient uptake and organic content, and will seriously impede or restrict root growth. The risk of soil compaction is greatest in soils with a significant clay content and in wet conditions. It can result from temporary or short-term loadings, such as the passage of a single vehicle, or from longer-term construction activities, including materials storage.

Soil compaction should be avoided around existing vegetation, including trees, and in areas where new planting or seeding is proposed. Where soil compaction has occurred in the vicinity of existing trees, arboricultural advice should be taken before carrying out any remedial or other works within RPAs to mitigate risk of further damage to roots. Remedial works may include sub-soil aeration using compressed air, and the addition of other materials, preferably of a bulky, organic nature (but excluding peat), to improve structure. Heavy mechanical cultivation such as ploughing or rotavation should not occur within the RPA. Any cultivation operations should be undertaken carefully by hand in order to minimize damage to the tree, particularly the roots. Decompaction measures include forking, spiking, soil augering and tilthed radial trenching. Care should be taken during such operations to minimize the risk of further damage to tree roots.

8.5 Use of mulch

NOTE Further guidance on mulching is given in BS 3998:2010.

8.5.1 Open soil and shrub planting areas around newly planted trees should be mulched to inhibit weed growth, reduce groundwater evaporation, resist and mitigate soil compaction and reduce maintenance requirements, whilst allowing gas exchange and water penetration to roots. The mulch material should be weed-free, easy to apply, containable within the area of application and readily available. The choice of material will be informed by local availability of materials, site characteristics and aesthetic requirements. The mulch should be periodically replenished as it decomposes so that it does not become depleted, and ideally when the soil is warm and moist.

8.5.2 The materials that may be used for mulching include coarsely divided plant matter, such as well-composted wood chip, pulverized bark, leaf mould or green waste conforming to PAS 100, and these may be combined with well-rotted animal manure. If the sole intention is to conserve moisture, a layer of gravel or well-secured sheets of material such as permeable geotextile fabric may be used, and may be covered for cosmetic purposes. Any such sheets should be maintained to avoid damage to the tree (e.g. by clogging, weed growth, restriction of air movement or constriction of the stem).

8.5.3 The mulched area should extend over as much of the root system as can be allowed by other site-usage requirements. The depth of an organic mulch should not be so much as to inhibit aeration of the root system (normally no more than 100 mm). The area around the tree should be well-watered prior to the application of mulching material and the mulch should be periodically replenished as it decomposes, so that it does not become depleted.

NOTE Mulches that retain water encourage the development of roots near the soil surface and in the mulch itself. This can become a disadvantage owing to desiccation if the mulch is removed or not replenished.

8.5.4 Mulches should be kept away from direct contact with the bark of the stem, or of major roots, since this might encourage infection by pathogens by maintaining wet conditions.

NOTE Although, by improving the soil texture and acting as a buffer for rainfall, mulches generally help to prevent extremes of soil wetness and dryness, they can prolong waterlogging on sites where drainage is seriously impeded. This in turn can harm tree roots and make them more susceptible to certain pathogens such as Phytophthora *spp.*

8.6 Hard surfaces

NOTE Guidance on types of hard surface materials is given in Annex A.

8.6.1 Where surfaces adjacent to new tree planting locations are paved, the settlement of the soil in tree pits which occurs gradually after planting can cause movement of the paved area, including the partial collapse or instability of paving or disruption of flexible surfaces, where these are laid over prepared pits. Adjacent paving should therefore be retained and supported by a conventional edging and sub-base set at a distance where it is unlikely to be affected by settlement. Where this is not feasible, the outer edges of the backfilled area of the tree pit should be treated as a transition zone, using interlocking surface reinforcement grids backfilled with a flexible surface dressing of a permeable, granular material (e.g. gravels, shingles, other aggregates) which will allow for minor movement and can be topped up if required.

8.6.2 Where load-bearing paving is to be laid over pits, it should:

a) incorporate a below ground structural system; or

b) incorporate a purpose-designed tree grille with appropriate support around the edges; or

c) utilize structural soil from an approved source (i.e. a composite material that is certified as capable of enabling root growth and development while supporting likely surface loadings); or

d) be laid when the soil has settled and the level made good.

8.6.3 Due allowance should be made for the future growth of stem and roots of a tree when determining the finished dimensions and the design of edge or kerb treatments of tree pits and planted areas. Where necessary, precautions should be taken at the time of planting to limit future surface distortion near trunks, e.g. by the use of technical solutions such as root deflectors.

8.6.4 Where there is a risk of damage to the tree arising from intrusion within the tree planting station area (e.g. by vehicles in car parks), an above-ground barrier, such as bollards or fencing, should be incorporated into the design to provide appropriate physical protection.

8.6.5 Where there is risk of a tree pit receiving surface water run-off that might be contaminated by de-icing salt, either species that are known to be sensitive to salt damage should be avoided, or impermeable paving should be designed and laid to fall away from the pit.

NOTE Contamination by fuel spillages, or other materials that might be toxic or harmful to trees, can be mitigated by the incorporation of hydrocarbon capture systems in the drainage system design.

8.7 Use of herbicides

The use of herbicides in the vicinity of existing trees should be appropriate for the type of vegetation to be killed, and all instructions, warnings and other relevant information from manufacturers should be strictly observed and followed. Care should be taken to avoid any damaging effects upon existing plants and trees to be retained, species to be introduced, and existing sensitive habitats, particularly those associated with aquatic or drainage features.

NOTE Attention is drawn to the Control of Pesticides Regulations 1986, as amended [11], the Control of Substances Hazardous to Health Regulations 1994, as amended [12], and HSE publication INDG 257 [13]. Guidance is also available from the Pesticides Safety Directorate (www.pesticides.gov.uk) [viewed 2012-03-26].

8.8 Tree management

8.8.1 Pre-development tree work

NOTE Consideration could be given to the reuse of wood from felled trees. Guidance on the disposal, utilization and retention of arisings is given in BS 3998:2010.

8.8.1.1 Once a layout for the development area has been finalized, an arboriculturist should review the relationship of the development to the trees, and should prepare a schedule of tree works listing all the trees that require work (by number), accompanied by a plan showing where each tree is located.

8.8.1.2 The schedule of works should include:

a) trees for removal to enable development;
b) remedial tree works, including those required to establish acceptable levels of risk and management in the context of the proposed land use;
c) access facilitation pruning;
d) pre-emptive root pruning.

8.8.1.3 The schedule of works should be accompanied by a detailed specification prepared in accordance with BS 3998:2010.

8.8.2 Working within the root protection area (RPA)

8.8.2.1 Care should be taken to ensure during tree removal or remedial work that damage to the retained trees and/or disturbance to the RPA is avoided. Precautions should include dismantling techniques to reduce the risk of accidental damage, and ground protection measures where excessive pedestrian movements or use of plant and machinery might lead to compaction.

8.8.2.2 If temporary access is required for plant or vehicles within the RPA, this should be provided by means of temporary ground protection (see **6.2**).

NOTE In all cases, the objective is to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain undamaged.

8.8.2.3 To avoid adverse impact on retained trees, stumps to be removed within RPAs should not be dug or pulled out but should be ground out.

8.8.3 Post-development management: existing trees

A programme of inspections to advise on any necessary work to retained trees should be drawn up in conjunction with an arboriculturist. This programme might include recommendations for frequency of inspection and/or proposals for tree work [see Note to **5.3.4c**)], and should take the form of a management plan. A copy of this plan should be supplied to all parties with an interest in future site management.

NOTE 1 Trees growing on a site before development takes place can, if adversely affected, be in decline over a period of several years before they die.

NOTE 2 Where the trees in question are subject to legal, planning or other regulatory controls, the appropriate authority needs to be informed and any necessary agreements obtained prior to work being undertaken.

8.8.4 Post-development management: new plantings

8.8.4.1 Regular maintenance of newly planted trees is of particular importance for at least three years during the critical post-planting period and might, where required by site conditions, planning requirements or legal agreement, be for 5 years or more. A detailed maintenance schedule covering this period should be prepared in conjunction with the landscape design proposals, and appropriate arrangements made for its implementation.

NOTE Maintenance operations would normally include weed control and watering as necessary, inspection and adjustment of support systems and monitoring of growth. Formative pruning might also be required to achieve desired effects or to provide for access or clearance.

8.8.4.2 Defects that become apparent during the maintenance period should be addressed by appropriate remedial works (including replacement planting where necessary) as advised by a competent person.

Annex A (informative) General advice for other interested parties

NOTE This annex contains general advice that is expected to be of use to land managers, contractors, planners, statutory undertakers, surveyors, and all others interested in harmony between trees and construction.

A.1 Avoiding damage by trees to structures

A.1.1 General

Buildings need to be designed and constructed to accommodate the current and potential future influence of existing and removed vegetation, as well as planned new planting.

In some situations, trees and vegetation can adversely affect structures either by direct action (see **A.1.2**) or by indirect action (see **A.1.4**).

A.1.2 Direct damage by trees to structures

Trees can cause direct damage to structures by:

a) the disruption of underground utility apparatus;

b) displacement, lifting or distorting;

c) the impact of branches with the superstructure;

d) structural failure of the tree.

The potential for direct damage needs to be considered throughout the design and construction process.

The growth of the base of the stem or of roots near the surface exerts relatively small forces. Whilst paving slabs or low boundary walls can be lifted or pushed aside easily, heavier or stronger structures are more likely to withstand these forces without damage, as the root distorts around the obstruction before damage occurs. The greatest risk of direct damage occurs close to the tree from the incremental growth of the main stem and the roots, and diminishes rapidly with distance.

It is advisable that new tree planting is kept at distances from structures of at least those in Table A.1.

Where construction work is to take place near to existing trees, allowance for future tree growth needs to be factored in to the construction process in order to protect the structure. For example:

1) walls or structural slabs need to bridge over roots allowing sufficient clearance for future growth;

2) paving and other surfaces need to be laid on a flexible base to allow movement and to facilitate relaying if distortion becomes excessive.

Water leaking from damaged drains and sewers encourages localized root growth; roots are then likely to enter a drain or sewer through the defect and proliferate, causing blockage and an enlarging of the initial defect. Provided they are further from trees than the distances stipulated in Table A.1, intact drains are not likely to suffer direct damage and will not attract roots. Damage to drains and sewers can be avoided by:

i) re-routeing to conform to Table A.1;

ii) ensuring watertight joints;

iii) in clay soils, use of flexible materials and/or joints to accommodate movement;

iv) not using perforated land drains near trees.

Allowance needs to be made for the swaying of stem and branches during storm conditions. Branches which are liable to strike the structure need to be removed or pruned back to a suitable branching point as appropriate (see BS 3998:2010).

Table A.1 **Minimum distance between young trees or new planting and structure to avoid direct damage to a structure from future tree growth**

Type of structure	Minimum distance between young trees or new planting and structure, in metres (m)		
	Stem dia. <300 mm [A)]	Stem dia. 300 mm to 600 mm [A)]	Stem dia. >600 mm [A)]
Buildings and heavily loaded structures	—	0.5	1.2
Lightly loaded structures such as garages, porches etc.	—	0.7	1.5
Services			
<1 m deep	0.5	1.5	3.0
>1 m deep	—	1.0	2.0
Masonry boundary walls	—	1.0	2.0
In-situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

[A)] Diameter of stem at 1.5 m above ground level at maturity

A.1.3 Allowance for future growth

Where the installation of paths or light structures such as walls is unavoidable near to trees, the design and construction specification needs to take account of future growth.

If it is necessary to build a wall or similar structure over a root greater than 50 mm diameter, provision for future diameter growth needs to be made by surrounding the root with uncompacted sharp sand, void-formers, or other flexible fill materials, and by laying an adequately reinforced lintel or raft over the surface.

A.1.4 Indirect damage by trees to structures

Damage by indirect action can occur in shrinkable soils such as clay when vegetation takes moisture from the ground, causing a significant volume change resulting in ground movement. Non-cohesive soils such as sand and gravel are not shrinkable, as their volume does not alter with a change in moisture content, and so structures on these soils are unaffected by indirect damage.

Buildings and drainage need to be protected against the effects of subsidence and heave.

- Subsidence takes place when water is withdrawn from the soil causing it to shrink.
- Heave takes place when previously dehydrated soil takes up water and swells. This can happen after the felling or removal of vegetation. It can also occur beneath a building if roots are severed. These activities make heave more prevalent in new build construction than older buildings. Heave is three-dimensional, exerting both vertical and lateral pressures on structures.

Detailed guidance is given in NHBC Standards Chapter 4.2 [14].

A.1.5 Types of hard surface materials and their suitability in proximity to trees

*NOTE Materials in common use include those described in **A.1.5.1** to **A.1.5.4**. Other materials are available.*

A.1.5.1 Washed gravel

Washed gravel retains its porosity unless excessively consolidated, and is particularly useful where changes of level occur or an irregular shape is needed around the stem of a tree. Gravel is easily renewed or topped up. Although weeds might become established, they can be controlled by chemical or mechanical means. However, gravel is rarely suitable for use where there is vehicle or pedestrian traffic, e.g. in residential areas. Materials with a high fines content, such as self-binding gravels or hoggin, ought not to be used due to their almost impermeable texture when consolidated.

A.1.5.2 Paving slabs and block pavers

Paving slabs and block pavers are available with built-in infiltration spaces between the slabs or blocks. These are ideal, but need to be laid dry-jointed on a sharp sand or coarse aggregate no-fines foundation to allow air and moisture to penetrate to the rooting area.

A.1.5.3 In-situ concrete

As in-situ concrete forms an impermeable surface, falls and openings need to be provided for water and air to enter the soil (the necessary liner can be penetrated through the falls or openings once the concrete has set). This can be achieved by forming 50 mm diameter holes in the construction of a slab at regular spacings of 300 mm to 600 mm (as determined by an engineer) and backfilling the resulting holes with no-fines gravel or aggregate. A high standard of materials and workmanship is needed if frost damage and excessive wear are to be avoided.

A.1.5.4 Bitumen paving and resin-bonded gravels

These surfaces can consist of porous or impermeable material. As the interstices in unsealed tar paving will eventually become blocked by fines, it is advisable for such surfaces to be laid following the same principles as those for impermeable surfaces, therefore its use within the RPA also needs to be restricted to the 20% RPA recommendation (**7.4.2.3**).

A.2 Avoiding damage to trees

A.2.1 General

Trees that have good health and stability are well adapted to their surroundings. Any development activity which affects the adaptation of trees to a site could be detrimental to their health, future growth and safety. Tree species differ in their ability to tolerate change, but all tend to become less tolerant after they have reached maturity or suffered previous damage or physiological stress. Planning and subsequent site management aims need to minimize the effect of change.

The part of a tree most susceptible to damage is the root system, which, because it is not immediately visible, is frequently ignored. Damage to, or death of, the root system affects the health, growth, life expectancy and safety of the entire tree. The effects of such damage might only become evident several years later. Damage can be the result of a number of minor but compounding factors that accumulate over time. Materials such as uncured concrete, diesel oil and vehicle washings can all damage roots and lead to adverse impacts on the tree.

Damage to the stem and branches of a tree is not usually sufficient to kill the tree directly, but can make it unsafe by affecting the dynamics and growth of the tree, or by initiating long-term decay. Such damage can also be disfiguring. The attachment of notice boards, cables and other utility apparatus can all damage trees, as can using trees as anchors for winching.

A.2.2 Extent and form of the root system

Within a short distance of the stem, the roots are highly branched, so as to form a network of small-diameter woody roots, which can extend radially for a distance much greater than the height of the tree, except where impeded by unfavourable conditions. All parts of this system bear a mass of fine, non-woody absorptive roots, typically concentrated within the uppermost 600 mm of the soil.

The root system does not generally show the symmetry seen in the branch system. The development of all roots is influenced by the availability of water, nutrients, oxygen and soil penetrability. As far as these conditions allow, the root system tends to develop sufficient volume and area to provide physical stability.

The uptake of water and mineral nutrients by the root system takes place via the fine non-woody roots (typically less than 0.5 mm diameter) and associated beneficial fungi (mycorrhizae). Their survival and functioning, which are essential for the health of the tree as a whole, depend on the maintenance of favourable soil conditions. The fine roots are short-lived, with the majority dying each winter and new ones developing in response to the needs of the tree.

All parts of the root system, but especially the fine roots, are vulnerable to damage. Once roots are damaged, water and nutrient uptake is restricted until new ones have grown. Mature trees recover slowly, if at all, from damage to their woody roots.

Annex B (informative) Trees and the planning system

Under the UK planning system, local authorities have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The potential effect of development on trees, whether statutorily protected (e.g. by a tree preservation order or by their inclusion within a conservation area) or not, is a material consideration that is taken into account in dealing with planning applications. Where trees are statutorily protected, it is important to contact the local planning authority and follow the appropriate procedures before undertaking any works that might affect the protected trees.

The nature and level of detail of information required to enable a local planning authority to properly consider the implications and effects of development proposals varies between stages and in relation to what is proposed. Table B.1 provides advice to both developers and local authorities on an appropriate amount of information. The term "minimum detail" is intended to reflect information that local authorities are expected to seek, whilst the term "additional information" identifies further details that might reasonably be sought, especially where any construction is proposed within the RPA.

Table B.1 Delivery of tree-related information into the planning system

Stage of process	Minimum detail	Additional information
Pre-application	Tree survey	Tree retention/removal plan (draft)
Planning application	Tree survey (in the absence of pre-application discussions) Tree retention/removal plan (finalized) Retained trees and RPAs shown on proposed layout Strategic hard and soft landscape design, including species and location of new tree planting Arboricultural impact assessment	Existing and proposed finished levels Tree protection plan Arboricultural method statement – heads of terms Details for all special engineering within the RPA and other relevant construction details
Reserved matters/ planning conditions	Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method Dimensioned tree protection plan Arboricultural method statement – detailed Schedule of works to retained trees, e.g. access facilitation pruning Detailed hard and soft landscape design	Arboricultural site monitoring schedule Tree and landscape management plan Post-construction remedial works Landscape maintenance schedule

Annex C (normative) Measurement of tree stems

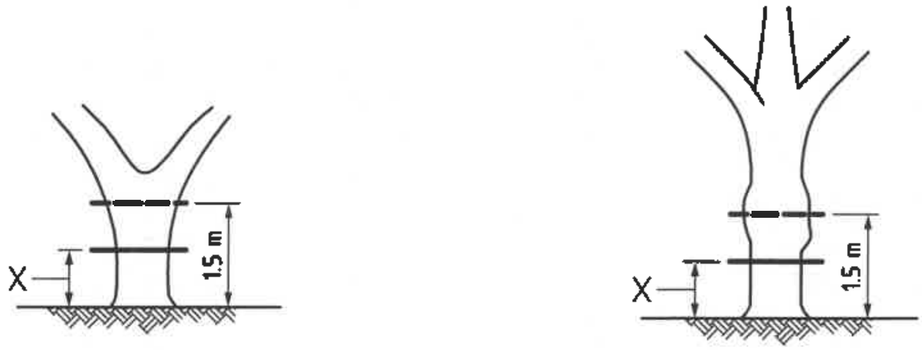
Diameters of single stem trees on level ground should be measured in accordance with Figure C.1a). Diameters of other commonly encountered tree stems should be measured in accordance with Figures C.1b) to C.1f).

NOTE The thick black line indicates where the measurement is taken.

Figure C.1 Measurement of tree stems

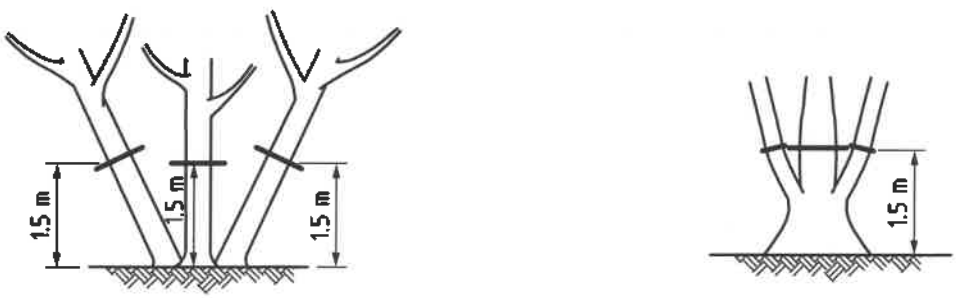
a) Stem diameter measured at 1.5 m above ground level

b) Measurement on sloping ground



c) Trees with low branching measured at narrowest point below the fork

d) Measurement of stem with irregular swelling made at the narrowest point below the swelling



e) Measurement of a multi-stemmed tree

f) Measurement of a tree with more than one stem at 1.5 m above ground level

Key

X Height varies

Annex D (normative) Root protection area

The RPAs given in Table D.1 should be used for single stem trees and the equivalent resultant combined stem diameter for multi-stemmed trees.

Table D.1 Root protection areas

Single stem diameter mm	Radius of nominal circle m	RPA m^2	Single stem diameter mm	Radius of nominal circle m	RPA m^2
75	0.90	3	675	8.10	206
100	1.20	5	700	8.40	222
125	1.50	7	725	8.70	238
150	1.80	10	750	9.00	255
175	2.10	14	775	9.30	272
200	2.40	18	800	9.60	290
225	2.70	23	825	9.90	308
250	3.00	28	850	10.20	327
275	3.30	34	875	10.50	346
300	3.60	41	900	10.80	366
325	3.90	48	925	11.10	387
350	4.20	55	950	11.40	408
375	4.50	64	975	11.70	430
400	4.80	72	1 000	12.00	452
425	5.10	81	1 025	12.30	475
450	5.40	92	1 050	12.60	499
475	5.70	102	1 075	12.90	519
500	6.00	113	1 100	13.20	547
525	6.30	124	1 125	13.50	573
550	6.60	137	1 150	13.80	598
575	6.90	150	1 175	14.10	625
600	7.20	163	1 200	14.40	652
625	7.50	177	1 225	14.70	679
650	7.80	191	1 250+	15.00	707

*NOTE These figures are derived from the calculations described in **4.6**.*

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1) In preparation. Title is provisional.

2) Printed copies of the full report are no longer available, but it can be downloaded at www.cabe.org.uk/publications/does-money-grow-on-trees [viewed 2012-03-26].

3) Available from TSO Bookshops or TSO Online Bookshop at www.tsoshop.co.uk/bookstore.asp [viewed 2012-03-26].

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Appendix 2

Arboricultural Assessment and Method Statement reference: 14281-AA8-CA

Tree Protection Plan reference: 14281-BT13a-f

Arboricultural assessment & method statement

Sandleford Park, Newbury

Chris Allder MSc HNDArb FArborA MICFor

9th October 2020 14281-AA8-CA

Site location and report purpose

Site location

This aerial image is provided courtesy of Google. The yellow line indicates the approximate site boundary and is illustrative only.

Report purpose

This arboricultural assessment report provides sufficient information for the Local Planning Authority (LPA) to consider the effect of the proposed development on local character from a tree perspective. It is fully compliant with the BS 5837 advice relating to the planning application stage of the process and it meets national standard planning application validation requirements.

More specifically, the development proposal is at Sandleford Park, Newbury.

This report includes:

- A **Tree protection plan** illustrating tree locations, categories, the location of the proposed development, and the proposed tree protection measures.
- An **Arboricultural assessment** (section 1 of the report) providing an analysis of the tree issues to assist the LPA in assessing the impact on local character.
- An **Arboricultural method statement** (section 2 of the report) describing how retained trees will be protected and managed during the development activity.

Site location and report purpose

- **Appendices** (**Appendix 1** –Background administrative information, and data collection; **Appendix 2** – Tree schedule and explanatory notes; and, **Appendix 3** – QR Codes for SGNs).
- A companion document to supplement the main report titled ***Manual for managing trees on development sites*** **(Version 1)**, which provides explanations of how retained trees will be managed on site in the form of Site Guidance Notes (SGNs) covering the relevant issues.

1: Arboricultural assessment

1.1 Table 1: Summary of trees affected and protected by the proposal

From my review of the constraints and the proposed layout, my assessment of the impact on trees, both during and after development, and those that need protection using special precautions, is summarised in Table 1:

	British Standard 5837 Category		
	A (High quality)	**B (Moderate quality)**	**C (Low quality)**
Remove	T34, T76, T199	T1, G16, G17, T18, T19, T35, G51, T63, T64, T65, T69, G110(part), T178, T179, T185, T186, T187	T2, H5(part), G6(part), H7, G36, G37, G47(part), H60, G68(part), W73(part), G108(part), H115(part), G117(part), H169(part), T180, T182, T183, H200(part), T218, T219, T220, G223, T225, T226, T227, T228, T230, T231, T232, T225, T226, T227, T228, G234(part), T246, G247, G248 (part)
Prune	None	None	None
Protect using special precautions See Notes below	None	None	None
Post development considerations	None	None	None

T = Tree; H = Hedge; G = Group; W = Woodland

Note on types of protection: All retained trees will be protected during development by using fencing, and only those requiring special precautions to limit the impact of encroachment are listed in Table 1.

Note on category U trees: Trees categorised as U (T61, T109, T116, T127, T151, T154, T172, T173, T184, T191 and T196) are in such poor condition that they have been assessed as needing management irrespective of any development proposals. Reduction of risk related to any category U trees will be a management decision and not caused by this proposal, so should not be considered a direct impact. Any works will be agreed with the project ecologist to protect important habitat.

1.2 The impact of tree removals on local character

My assessment of the impact of tree removals on local character is as follows:

Category A and B trees (T1, G16, G17, T18, T19, T34, T35, G51, T63, T64, T65, T69, T76, G110(part), T178, T179, T185, T186, T187 and T199):

Despite having the potential for long term retention, these trees make a limited contribution to local amenity because of the backdrop of large trees to be retained. These significant retained trees will buffer any loss to the extent that there will be no long-term impact on local amenity or character. Whilst their loss will be noticeable in the immediate vicinity in the short term, there will be no significant impact on local amenity character in the wider setting in the medium to long terms.

Category C trees (T2, H5(part), G6(part), H7, G36, G37, G47(part), H60, G68(part), W73(part), G108(part), H115(part), G117(part), H169(part), T180, T182, T183, H200(part), T218, T219, T220, G223, T225, T226, T227, T228, T230, T231, T232, G234(part), T246, and G248(part)):

None of these trees or hedges are sufficiently important to be worthy of influencing any layout. They are not important in the overall planning context and their loss should not influence the determination of this application.

1.3 The impact of tree pruning on local character

Other than pruning for normal maintenance, no trees will be pruned because of this development.

1.4 Special precautions to limit RPA encroachment impact

All the RPAs of retained trees will be protected and there will be no encroachment during the development activity.

1.5 Post development considerations

My assessment is that there will be no adverse impacts on retained trees once the development is completed and occupied.

1.6 Summary of impact on local character

All the high category woodlands will be retained and protected in this proposal. The majority of trees to be removed are well within the site, and close to retained trees that will buffer the initial impact, and their loss will have no significant impact on the present character of the area. The matter of adverse impacts on retained trees due to post-development pressures to fell or prune has been considered and I concluded that no further trees will be affected. There is plenty of space for tree planting and a comprehensive new tree planting scheme is included as part of the proposal. The size of these new trees and their future growth will significantly enhance the contribution of this site to local character and more than compensate for the loss of existing trees. The construction activity may affect further trees if appropriate protective measures are not taken. However, if adequate precautions to protect the retained trees are specified and implemented through the arboricultural method statement included in this report, the development proposal will have no long term detrimental impact on tree health or the contribution of trees to character in the wider setting. Indeed, the new sustainable planting proposals will increase the potential of the site to contribute to local character well beyond the short term.

For these reasons, I conclude that the proposed development would not cause an unacceptable or adverse impact on the long-term vitality of the retained trees, and therefore the character and appearance of the area.

2: Arboricultural method statement

2.1 Site Guidance Notes (SGNs)

This section of the report identifies which trees on this site will be protected and managed, and by what means. This site-specific summary is supplemented by more detailed explanations and descriptions of specific operations set out in the accompanying *Manual for managing trees on development sites*. That document is a compilation of 12 individual SGNs addressing the following tree protection and management issues that regularly arise in the construction phase of development:

- SGN1 *Monitoring tree protection* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn01?stage=Stage)
- SGN2 *Fencing protected trees* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn02?stage=Stage)
- SGN3 *Ground protection* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn03?stage=Stage)
- SGN4 *Pollution control* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn04?stage=Stage)
- SGN5 *Site cranes & piling rigs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn05?stage=Stage)
- SGN6 *Height restrictions* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn06?stage=Stage)
- SGN7 *Excavating in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn07?stage=Stage)
- SGN8 *Removing surfacing and structures in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn08?stage=Stage)
- SGN9 *Installing/upgrading surfacing in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn09?stage=Stage)
- SGN10 *Installing structures in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn10?stage=Stage)
- SGN11 *Installing services in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn11?stage=Stage)
- SGN12 *Landscaping in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn12?stage=Stage)

NOTE: Each individual SGN can be downloaded by using the links above and the QR Code links in Appendix 3.

2.2 Identification of areas to be protected

The tree protection plan shows the areas where protective measures are necessary. The fencing location is shown by the heavy black dashed lines, with the construction exclusion zone behind as the lighter black diagonal hatch.

2.3 Arboricultural supervision

An arboricultural consultant will be appointed to advise on the tree management for the site and to attend:

- a pre-commencement meeting before any work starts;
- regular supervision visits to oversee the agreed tree protection, as agreed at the pre-commencement meeting; and

- further supervision visits, as necessary, to oversee any unexpected works that could affect trees.

The detail of how the arboricultural supervision will be carried out is explained in SGN1 *Monitoring tree protection* in the accompanying Manual.

2.4 Table 2: Summary of the site operations requiring arboricultural input

For this site, arboricultural input will be needed for the following operations:

Brief operation summary	Trees affected	Location of detailed explanations
Pre-commencement meeting: Meeting on site with all parties to agree protective measures, as described in SGN1. <u>Will be carried out before any significant site works begin.</u>	All trees	SGN1 *Monitoring tree protection*
Tree felling and pruning: Contractor will carry out agreed works as described in Appendix 2. <u>Will be completed before any significant site works begin.</u>	Fell trees as numbered	Appendix 2
Installing fencing: Agreed tree protection measures will be installed and checked, as described in SGN2. <u>Will be completed before any significant site works begin.</u>	Fencing all retained trees	Tree protection plan, SGN2 *Fencing protected trees*
Pollution control near retained trees: Any pollution control measures identified during risk assessment will be installed as described in SGN4. <u>Will be completed before any potential pollutants arrive on site.</u>	All retained trees	SGN4 *Pollution control*
Operation of site cranes and piling rigs: Provision will be made to prevent site cranes and piling rigs damaging trees, as described in SGN5.	All retained trees	SGN5 *Site cranes & piling rigs*
Installing height restrictions: Provision will be made to prevent damage to low branches by high vehicles, as described in SGN6. <u>Will be installed before high vehicles arrive on site.</u>	All retained trees	SGN6 *Height restrictions*
Regular arboricultural supervision: Provision will be made to carry out and record agreed arboricultural supervision, as described in SGN1.	All retained trees	SGN1 *Monitoring tree protection*
Installing services in RPAs: These operations will be carried out with care, as described in SGN11.	All retained trees as appropriate	SGN11 *Installing services in RPAs*
Landscaping in RPAs: These operations will be carried out with care, as described in SGN12.	All retained trees	SGN12 *Landscaping in RPAs*
Removing tree protection: <u>Protection can only be removed when there is no risk of damage to retained trees, as described in SGN1.</u>	All retained trees	SGN1 *Monitoring tree protection*

The operations summarised in this table, and supplemented by the more detailed explanations set out in the SGNs and the rest of this document, form the arboricultural method statement for this site. The Site Manager will ensure that its details and any agreed amendments are known and understood by all site personnel. Copies of the agreed documents will be available on site. All personnel who could have an impact on trees will be briefed on the specific tree protection requirements as part of the site induction procedures. This requirement will be written into the site management documentation.

If unanticipated issues arise on site not referenced in the above explanations, further guidance on how to manage them can be found in the accompanying Manual.

2.5 Construction method statement (heads of terms summary)

A construction method statement is a description of how operations that may affect trees will be carried out to minimise any adverse impact on them. The details of how the site will be managed are construction and contractual matters that can only be finalised once the post-consent detailed planning begins. For that reason, at this stage in the planning process, as explained in clause 5.5.6 of BS 5837, it is normally sufficient to list a heads of terms summary of the issues requiring more detailed consideration once consent is issued. On this site, those issues are likely to include:

1. Preparation of a written site management protocol for dealing with tree issues, to be incorporated into formal site management procedures, and to specifically include induction training for all operatives related to tree protection.
2. The order of work on site, including demolition, site clearance and building work.
3. Erection and maintenance of tree protection measures.
4. Who will be responsible for protecting the trees on site.
5. Detailed proposals for inspecting and supervising the tree protection.
6. How accidents and emergencies involving trees will be managed, including accidental damage to roots and their treatment.
7. Details of facilitation pruning and access into site. What size vehicles will be used under canopies and will large machinery be lifted over trees.
8. The parking arrangements for workers and visitors.
9. A schedule of emergency contact numbers relating to trees.
10. Areas for loading and unloading of materials and storage of materials and plant.
11. Where site facilities will be located and when will they be installed.
12. How machinery and equipment (such as excavators, cranes and their loads, concrete pumps and piling rigs) will enter, move on, work on, and leave the site.
13. Pollution control to specifically consider chemical storage and wheel washing facilities in relation to trees.
14. Recycling and storage of waste in relation to trees.
15. Details of earthworks, grading and mounding and removal of spoil, including any planned lowering or raising of ground levels.
16. Precise services locations, including the method of excavation when near trees.
17. Crane location and zones of movement.
18. How and when any temporary surfacing will be laid and removed.
19. How post-construction impacts through compaction to soil near trees will be ameliorated.

Appendix 1: Background administrative information and data collection

A1.1 Table 3: Background administrative information

	Background administrative information
Report date & reference	9th October 2020; 14281-AA8-CA
Tree protection plan reference	BT13 a - f
Instructing client	Bloor Homes Limited
Instructions	Visit the site, assess the relevant trees, prepare a schedule of their details, describe the impact of the proposal on those trees and identify the tree protection issues in an arboricultural method statement confined to the heads of terms
Provided documents	Topographical survey, drawing number Topographical Survey.dwg received by email on 25th January 2018, and layout drawing number 180129-14-273-3A (PP02 RevA) Land Use and Access Plan received by email on 19th February 2018
Report author and credentials	Chris Allder is a Chartered Forester (www.charteredforesters.org) and a Fellow of the Arboricultural Association (www.trees.org.uk), and fully qualified to undertake the assessments in this report. Further details of his credentials can be found at www.barrelltreecare.co.uk/who-we-are.
Report limitations	• We have not checked if there is any statutory protection on the trees because this can delay the production of the report. If any tree works are proposed before a planning consent is given, then the possible existence of any statutory protection must be checked with the LPA. • This report does not consider ecological or archaeological issues, or any other matter beyond the assessment of the trees.
Technical references	In preparing the analysis in this report, we considered the guidance and advice in the following technical references: • Climate Change Act (2008) www.legislation.gov.uk/ukpga/2008/27/contents • Town and Country Planning Act 1990 www.legislation.gov.uk/ukpga/1990/8/contents • National Planning Policy Framework, published by the DCLG www.gov.uk/government/publications/national-planning-policy-framework--2 • BS 5837 (2012) *Trees in relation to design, demolition and construction – Recommendations*, BSI www.shop.bsigroup.com/ • BS 8545 (2014) *Trees: from nursery to independence in the landscape – Recommendations*, www.shop.bsigroup.com/ • BS 3998 (2010) *Tree work – Recommendations*, BSI www.shop.bsigroup.com/ • *Trees in the Townscape: A Guide for Decision Makers*, published by the Trees & Design Action Group http://www.tdag.org.uk/ • *Trees in Hard Landscapes: A Guide for Delivery*, published by the Trees & Design Action Group www.tdag.org.uk/ • National Joint Utilities Group (2007) Volume 4, Issue 2: *Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees* www.njug.org.uk/publications/

Appendix 1: Background administrative information and data collection

A1.2 Table 4: Data collection

	Data collection
Date of site visit	13th February 2018
People present during site visit	Chris Allder
Weather & visibility	Dull, breezy and drizzling, with average visibility
Limitations to observations	• The inspection of the trees for the purposes of assessing their condition and work requirements was made on the basis that they will be annually inspected in the future to identify any changes in condition and review the original recommendations. For these reasons, the tree assessment advice only remains valid for one year from the date that the trees were last inspected. • All observations were of a preliminary nature and did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level. • Observations of trees outside the site boundaries are confined to what was visible from within the site. • All dimensions were estimated unless otherwise indicated.
Tree Preservation Orders (TPOs), Conservation Areas, and tree categorisation	TPOs cannot always be reliably interpreted from the documentation to identify which trees are protected, especially as time passes and site conditions change from when they were originally made. It is common for TPO plans to be inaccurate and schedules often become out of date as trees die or are removed. Frequently, trees deteriorate and, although they may be technically protected by the TPO, are in such poor condition or causing such unreasonable inconvenience that their suitability for retention becomes questionable. In a planning context, if poor trees are assessed as unsuitable for retention, then it would be inappropriate to show them as a material constraint in development planning. For these reasons, although TPOs do need to be considered, they do not form the primary basis for tree categorisation. Poor quality trees assessed as not worthy of retention will be shown as such, irrespective of whether they are protected or not. Similarly, good quality trees that are not protected will still be shown as material constraints. The same rationale will be applied to Conservation Areas.
Tree location and numbering	Each tree, hedge, group, and woodland was inspected, and the numbering scheme is indicated on the tree protection plan. Where important trees were found on site that were not included on the provided plan, their approximate positions and canopy extents are indicated on the plan.
Recording of tree data	For each identified tree, hedge, group, and woodland the information collected was recorded on the tree schedule in Appendix 2 and the tree protection plan.
Compliance of data collection with BS 5837	The data collection is fully compliant with the advice in subsection 4.4.2 of BS 5837. When collecting this information, specific consideration was given to any low branches that may influence future use, age class, physiological condition, structural condition, and remaining contribution. Where appropriate, crown spreads were also noted where they differed from those shown on the provided land survey.
Calculation of RPAs	Following the recommendations in Table D1 of BS 5837, the diameter of each tree was rounded up to the next 2.5cm increment, with the radius of a nominal circle and the resultant RPA taken directly from that table. This information is listed for each tree in the tree schedule in Appendix 2.

Appendix 2: Tree schedule and explanatory notes

NOTE: Colour annotation is A & B trees with green background; C & U trees with blue background; trees to be removed in red text.

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
All retained trees & hedges								Crown lift to 3-4m over site as necessary. Clip to reform hedges as appropriate.		
T1	Oak	14	90	Mature	-	B	Ivy clad, veteran status on ATI, RPA needs to be modified to 13.5m	Fell	13.5	573
T2	Cherry	4	30	Maturing	-	C	Topped	Fell	3.6	41
T3	Oak	20	110	Mature	-	A	Previous pruning wounds from crown lifting, minor deadwood	-	13.2	547
T4	Oak	20	90	Mature	-	B	Previous pruning wounds from crown lifting, minor deadwood	-	10.8	366
H5	Leyland cypress	6	30	Maturing	-	C	High hedge	Fell part	3.6	41
G6	Elm, sycamore, thorn	4	20	Maturing	-	C	Dead elm, regenerated overgrown hedge	Fell part	2.4	18
H7	Leyland cypress	15	35	Mature	-	C	Dense line, overgrown hedge	Fell	4.2	55
T8	Sycamore	10	50	Mature	-	C	Lost top, significant deadwood	-	6	113
W9	Oak, ash, lime	20	80	Mature	-	B	Tall mature trees forming a linear shelter belt, evidence that there was an avenue of trees, now overgrown	-	9.6	290
G10	Hawthorn	3	30	Maturing	-	C	Remnant hedge, overgrown scrub	-	3.6	41

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T11	Oak	8	45	Mature	-	C	Suppressed, one-sided	-	5.4	92
T12	Oak	18	100	Mature	-	A	Twin stemmed at 5m, minor deadwood	-	12	452
W13	Alder, oak, sycamore, beech, birch	20	45	Mature	-	A	Brickkiln Copse. Mixed woodland of tall, mature trees with holly understorey, wet at southern end, some storm damage and windblown trees, mixed ground cover	-	5.4	92
T14	Ash	20	80	Mature	-	B	Twin stemmed at 6m, minor deadwood, one stem lost	-	9.6	290
G15	Alder, sycamore	18	40	Maturing	-	C	Dense group on woodland edge	-	4.8	72
G16	Oak, ash	18	80	Mature	-	B	-	Fell	9.6	290
G17	Ash, hazel	15	70	Mature	-	B	Remnant hedge line	Fell	8.4	222
T18	Ash	18	65	Mature	-	B	-	Fell	7.8	191
T19	Ash	15	100	Mature	-	B	-	Fell	12	452
T20	Oak	15	75	Mature	-	B	Three stems from base	-	9	254
T21	Oak	18	75	Mature	-	B	Twin stemmed from base, leaning	-	9	254
G22	Oak	15	40	Maturing	-	B	Younger trees, good future potential	-	4.8	72
T23	Oak	16	75	Mature	-	B	Significant basal deformation, old hedgerow tree	-	9	254
T24	Oak	16	60	Mature	-	B	Leaning over footpath	-	7.2	163
G25	Oak	18	75	Mature	-	B	One sided canopy, old trees	-	9	254

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
G26	Oak, ash	18	50	Mature	-	B	-	-	6	113
T27	Oak	22	80	Mature	-	A	Ivy clad	-	9.6	290
T28	Oak	25	120	Mature	-	A	Major limb failure, stem damage, ok	-	14.4	651
T29	Oak	25	110	Mature	-	B	Storm damage	-	13.2	547
G30	Ash, oak, holly	10	30	Maturing	-	C	Small, younger trees	-	3.6	41
T31	Oak	25	110	Mature	-	A	Minor limb failure, veteran status on ATI, RPA to be modified to 16.5m radius	-	16.5	855
G32	Oak	15	50	Mature	-	B	-	-	6	113
T33	Oak	18	100	Mature	-	A	Hedgerow tree, low vigour, veteran tree on ATI - RPA to be modified to 15m radius	-	15	707
T34	Oak	15	130	Over-mature	-	A	Veteran tree, significant decay, veteran tree on ATI - RPA to be modified to 19.5m	Fell subject to design and application by Park House School	19.5	1195
T35	Ash	20	80	Mature	-	B	Deadwood	Fell subject to design and application by Park House School	9.6	290
G36	Ash	10	30	Maturing	-	C	Small trees	Fell subject to design and application by Park House School	3.6	41
G37	Oak, holly, sycamore, ash	6	25	Maturing	-	C	Overgrown hedge and regenerating trees	Fell subject to design and application by Park House School	3	28
G38	Ash	10	30	Maturing	-	C	Linear group, formerly a hedge	-	3.6	41
G39	Oak	14	35	Mature	-	C	Multi stemmed hedgerow remnant trees	-	4.2	55

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T40	Oak	16	75	Mature	-	B	Twin stemmed at base, overgrown	-	9	254
G41	Oak, ash	15	60	Mature	-	C	In decline, significant deadwood	-	7.2	163
T42	Oak	18	60	Mature	-	B	Ivy clad	-	7.2	163
T43	Oak	20	70	Mature	-	B	Twin stemmed from base, leaning	-	8.4	222
T44	Oak	18	125	Mature	-	B	Multi stemmed from base	-	15	707
T45	Oak	20	150	Mature	-	B	Three stems from base	-	15	707
T46	Oak	18	110	Mature	-	A	Veteran potential	-	13.2	547
G47	Ash, thorn	14	50	Mature	-	C	Hedgerow remnant ash and undergrowth	Fell part	6	113
T48	Oak	18	50	Mature	-	A	Twin stemmed at 3m	-	6	113
T49	Oak	18	60	Mature	-	A	Twin stemmed 2m	-	7.2	163
T50	Oak	15	35	Maturing	-	B	Multi stemmed at 3m	-	4.2	55
G51	Ash, oak, thorn	14	40	Maturing	-	B	-	Fell	4.8	72
T52	Oak	12	70	Mature	-	B	Twin stemmed at 2m	-	8.4	222
T53	Oak	16	75	Mature	-	B	Twin stemmed at 1m	-	9	254
T54	Oak	16	82.5	Mature	-	B	Twin stemmed from base	-	9.9	308
W55	Oak, sycamore, holly, ash	20	50	Mature	-	A	Gorse Covert. Mixed deciduous woodland, holly understorey with bracken and grass floor, birch regeneration coming through	-	6	113
T56	Oak	18	70	Mature	-	A	-	-	8.4	222
T57	Oak	18	85	Mature	-	A	Deadwood throughout	-	10.2	327
T58	Larch	20	50	Mature	-	C	Leaning, suppressed	-	6	113

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T59	Oak	20	90	Mature	-	A	Some deadwood and epicormic growth	-	10.8	366
H60	Thorn, oak, beech	3	15	Maturing	-	C	Field hedge with occasional small trees	Fell	1.8	10
T61	Beech	22	120	Mature	-	U	Fallen, large old tree with Meripilus infection	Fell for management	14.4	651
W62	Oak, sycamore, ash	20	60	Mature	-	A	Dirty Ground Copse. Ancient Semi-natural Woodland. Mixed deciduous woodland with holly dominated understorey and some occasional regeneration	-	7.2	163
T63	Sycamore	10	30	Maturing	-	B	Good potential	Fell	3.6	41
T64	Oak	10	45	Maturing	-	B	-	Fell	5.4	92
T65	Oak	8	30	Maturing	-	B	-	Fell	3.6	41
G66	Oak	25	80	Mature	-	A	Woodland edge trees, tall	-	9.6	290
T67	Oak	18	60	Mature	-	B	Ivy clad, some dieback	-	7.2	163
G68	Hazel, thorn, goat willow, holly	4	32.5	Mature	-	C	Hedge, overgrown	Fell part	3.9	48
T69	Birch	15	60	Mature	-	B	Twin stemmed from base	Fell	7.2	163
T70	Oak	16	45	Mature	-	B	Ivy clad, end of overgrown hedge	-	5.4	92
T71	Crack willow	16	50	Mature	-	B	Woodland edge trees, tall	-	6	113
W72	Oak, ash, sycamore	25	70	Mature	-	A	Barn Copse. ASNW. Holly dominating understory, some regeneration	-	8.4	222

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
W73	Alder, willow, birch	15	30	Maturing	-	C	Wet, woodland area adjacent to rugby club, small poor trees of low quality	Fell part	3.6	41
T74	Oak	14	80	Mature	-	B	Some limb failures	-	9.6	290
G75	Thorn, hazel, sycamore	8	30	Maturing	-	C	Linear group	-	3.6	41
T76	Oak	18	90	Mature	-	A	Some deadwood, wet and marshy ground	Fell	10.8	366
T77	Oak	18	90	Mature	-	A	Open grown	-	10.8	366
T78	Oak	20	100	Mature	-	A	Some deadwood and limb failure	-	12	452
T79	Oak	22	100	Mature	-	A	Twin stemmed at 7m, minor deadwood	-	12	452
G80	Alder, oak, ash	20	67.5	Mature	-	B	Group in wet area, oaks on drier ground	-	8.1	206
T81	Oak	22	90	Mature	-	A	Twin stemmed at 10m	-	10.8	366
G82	Holly	5	40	Mature	-	C	Small trees	-	4.8	72
T83	Oak	20	75	Mature	-	A	Minor deadwood	-	9	254
T84	Oak	22	70	Mature	-	B	Dieback and in decline	-	8.4	222
T85	Sycamore	18	75	Maturing	-	B	Multi stemmed from base	-	9	254
T86	Sweet chestnut	22	85	Mature	-	B	Minor deadwood	-	10.2	327
T87	Oak	18	45	Mature	-	C	Suppressed and one sided	-	5.4	92
T88	Holly	5	30	Mature	-	C	-	-	3.6	41
G89	Holly, hawthorn	8	42.5	Mature	-	C	Multi stemmed from base, close grown	-	5.1	82
W90	Oak, sycamore, birch	25	80*	Mature	-	A	Slockett's Copse. ASNW. Mixed deciduous woodland, with holly dominated understorey	-	9.6	290

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T91	Oak	16	45	Mature	-	B	One sided due to adjacent willow	-	5.4	92
G92	Willow, thorn	6	25	Maturing	-	C	Overgrown hedge	-	3	28
T93	Oak	14	50	Mature	-	C	Lost top, in decline	-	6	113
G94	Oak, birch	14	40	Mature	-	B	-	-	4.8	72
G95	Ash, willow, thorn, birch	6	35	Mature	-	C	Leaning, shrub and small trees	-	4.2	55
G96	Willow, alder, oak	15	50	Mature	-	B	Linear group of good trees	-	6	113
W97	Oak, birch, sycamore, ash	25	80	Mature	-	A	High Wood. ASNW. Holly understorey	-	9.6	290
G98	Alder	16	60	Mature	-	C	Multi stemmed, in decline, significant deadwood, old	-	7.2	163
T99	Oak	14	60	Mature	-	B	Twin stemmed at 2m	-	7.2	163
T100	Oak	15	45	Mature	-	B	Twin stemmed at 6m	-	5.4	92
T101	Hawthorn	6	42.5	Mature	-	C	Small trees	-	5.1	82
T102	Oak	20	70	Mature	-	B	Twin stemmed from 5m	-	8.4	222
T103	Oak	18	50	Mature	-	B	Twin stemmed at 5m	-	6	113
T104	Oak	22	75	Mature	-	A	Minor deadwood	-	9	254
G105	Sycamore	8	25	Maturing	-	C	Growing over railings	-	3	28
T106	Sycamore	8	30	Maturing	-	C	Twin stemmed at 4m, tight fork union	-	3.6	41
T107	Hawthorn	8	50	Over-mature	-	C	Twin stemmed at base, old tree	-	6	113
G108	Thorn	6	30	Maturing	-	C	Overgrown hedge	Fell part	3.6	41
T109	Wild cherry	14	70	Mature	-	U	Dead, significant decay and canker	Fell for management	8.4	222
G110	Ash, sycamore	12	40	Maturing	-	B	Line of trees within hedge	Fell one tree	4.8	72
T111	Oak	20	90	Mature	-	B	Significant deadwood, potential veteran	-	10.8	366

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
W112	Oak, birch, sycamore	25	80	Mature	-	A	Crooks Copse. ASNW. Holly understorey	-	9.6	290
G113	Hawthorn	4	37.5	Mature	-	C	Small trees	-	4.5	64
T114	Oak	20	120	Mature	-	A	Deadwood present, overgrown	-	14.4	651
H115	Thorn, oak, ash	2	15	Maturing	-	C	Clipped hedge with occasional standard trees	Fell part	1.8	10
T116	Oak	12	90	Over-mature	-	U	Dead	Fell for management	10.8	366
G117	Thorn, ash, field maple, goat willow	2	20	Young	-	C	Clipped hedge, scrub and small trees	Fell part	1.8	10
T118	Oak	10	45*	Maturing	-	B	Roadside tree, wide open canopy	-	4.2	55
T119	Oak	10	50*	Maturing	-	B	Roadside tree, wide open canopy	-	4.2	55
G120	Oak, ash, hawthorn	25	125	Mature	-	B	Multi stemmed from base, evidence of Inonotus infection on ash, one dead ash stem close to oak	-	15	707
T121	Oak	18	90	Mature	-	A	Burrs on stem, veteran potential	-	10.8	366
T122	Oak	18	100	Mature	-	A	Some deadwood, veteran potential	-	12	452
T123	Ash	20	100	Mature	-	A	Twin stemmed at 4m, some deadwood	-	12	452
G124	Oak, ash	10	37.5	Maturing	-	B	Twin stemmed from base	-	4.5	64
T125	Oak	25	120	Mature	-	A	Some deadwood, off site	-	14.4	651
T126	Oak	25	90	Mature	-	A	Minor deadwood. Off site	-	10.8	366

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T127	Oak	25	150	Over-mature	-	U	Significant decay and deadwood, candidate for veteranisation. Veteran tree on ATI, modify RPA to 22.5m radius.	Fell or pollard to make safe	22.5	1590
T128	Oak	25	160	Over-mature	-	A	Veteran tree on ATI, RPA modified to 24m	-	24	1810
T129	Oak	16	90	Over-mature	-	C	Twin stemmed from base, significant decline and deadwood, candidate for veteranisation	-	10.8	366
T130	Oak	16	100	Over-mature	-	C	Deadwood and decline, possibility to pollard to retain as veteran	-	12	452
G131	Oak	14	50	Maturing	-	B	Good trees in group	-	6	113
T132	Oak	10	40	Maturing	-	B	-	-	4.8	72
T133	Oak	20	130	Over-mature	-	A	Deadwood and limb failure, veteran tree on ATI, modify RPA to 19.5m radius	-	19.5	1195
G134	Ash, hazel, thorn	12	37.5	Mature	-	C	Overgrown coppiced stools, and multi stemmed trees, former hedge, off-site	-	4.5	64
T135	Oak	20	80	Mature	-	A	Off-site	-	9.6	290
T136	Oak	18	70	Mature	-	B	Ivy clad, off site	-	8.4	222
T137	Ash	18	55	Mature	-	B	Off site	-	6.6	137
G138	Sycamore, horse chestnut	18	60	Mature	-	B	Behind old cow shed, ivy clad	-	7.2	163
G140	Sycamore, ash	10	25	Maturing	-	C	Roadside trees on edge of footpath	-	3	28

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
G141	Mixed trees	2	10	Young	-	C	New shelter belt plantation	-	1.2	5
T142	Oak	14	65	Mature	-	B	In decline, significant deadwood, potential veteran	-	7.8	191
T143	Oak	22	130	Over-mature	-	A	Large open canopy, re-trenching crown	-	15	707
G144	Ash	18	50	Mature	-	B	Two stems, deadwood throughout	-	6	113
T145	Oak	20	80	Mature	-	A	Large deadwood	-	9.6	290
T146	Oak	20	110	Over-mature	-	A	Beginning to re-trench, veteran potential	-	13.2	547
G147	Birch, oak, ash	6	20	Maturing	-	C	Declining trees	-	2.4	18
T148	Oak	22	110	Mature	-	A	Minor deadwood, good tree	-	13.2	547
T149	Oak	20	130	Over-mature	-	B	Significant deadwood, lost leader, pollard to retain	-	15	707
T150	Oak	25	110	Mature	-	A	Minor deadwood throughout	-	13.2	547
T151	Oak	20	90	Over-mature	-	U	Significant decay at base and stem, significant deadwood, next to roadside	Fell or pollard to make safe	10.8	366
T152	Oak	25	100	Mature	-	A	Deadwood throughout, roadside tree	-	12	452
T153	Oak	25	150	Over-mature	-	C	Significant decay and deadwood, pollard to retain	-	15	707
T154	Oak	20	100	Over-mature	-	U	Dead	Fell or pollard to make safe	12	452

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T155	Oak	25	140	Over-mature	-	A	Excellent tree	-	15	707
T156	Alder	10	40	Maturing	-	C	Twin stemmed tree at 1m	-	4.8	72
W157	Alder	20	75	Mature	-	B	Streamside woodland, linear shape	-	9	254
T158	Oak	20	120	Over-mature	-	A	Re-trenching crown	-	14.4	651
T159	Oak	18	130	Over-mature	-	B	Re-trenching crown	-	15	707
T160	Oak	20	120	Over-mature	-	A	Veteran	-	18	1018
W161	Oak, alder, sycamore	22	55	Mature	-	A	Waterleaze Copse. ASNW. Wet linear woodland, pond within, one rogue cedar, holly understorey	-	6.6	137
G162	Oak, sycamore	14	35	Maturing	-	B	Individuals and smaller regenerating trees	-	4.2	55
T163	Oak	22	80	Mature	-	A	Deadwood	-	9.6	290
T164	Oak	16	60	Mature	-	B	One sided canopy, old tree	-	7.2	163
G165	Oak, sycamore, birch, thorn	8	20	Young	-	C	Regeneration	-	2.4	18
T166	Oak	18	75	Over-mature	-	A	Veteran, significant deadwood, re-trenching crown	-	11.3	398
T167	Oak	12	55	Mature	-	B	Significant deadwood, stunted form	-	6.6	137
G168	Oak, birch, willow	10	25	Maturing	-	B	Good potential	-	3	28
H169	Thorn	4	15	Maturing	-	C	Hedge	Fell part	1.8	10
G170	Ash	16	37.5	Maturing	-	C	Multi stemmed from base, ivy clad	-	4.5	64

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
G171	Sycamore	8	20	Maturing	-	C	Small trees	-	2.4	18
T172	Sycamore	20	100	Over-mature	-	U	Moribund, significant deadwood and decay, fell or pollard	Fell or pollard to make safe	12	452
T173	Ash	20	90	Over-mature	-	U	Significant decay and deadwood	Fell or pollard to make safe	10.8	366
T174	Oak	20	90	Mature	-	B	Woodland edge, some deadwood	-	10.8	366
G175	Oak	8	30	Maturing	-	B	Potential	-	3.6	41
G176	Oak, ash, sycamore	20	90	Mature	-	B	Mixed size and age range	-	10.8	366
G177	Oak, ash, various	20	75	Mature	-	B	Linear group alongside road, not shown on topo	-	9	254
T178	Lime	18	70	Mature	-	B	Multi stemmed at 3m, minor deadwood, ivy clad	Fell	8.4	222
T179	Lime	18	65	Mature	-	B	Ivy clad, minor deadwood	Fell	7.8	191
T180	Lime	8	60	Mature	-	C	Small, suppressed, twin stemmed at 1.5m, ivy clad	Fell	7.2	163
H181	Red horse chestnut	5	20	Maturing	-	C	Small ornamental tree in front garden	-	2.4	18
T182	Hawthorn, horse chestnut, ash	2	15	Mature	-	C	Clipped boundary hedge	Fell	1.8	10
T183	Scots pine	8	40	Mature	-	C	Stunted, small and poorly formed	Fell	4.8	72
T184	Scots pine	20	80	Mature	-	U	Dead	Fell for management	9.6	290
T185	Lime	20	60	Mature	-	B	Ivy clad, narrow crown, minor deadwood	Fell	7.2	163
T186	Lime	20	60	Mature	-	B	-	Fell	7.2	163
T187	Lime	18	70	Mature	-	B	Ivy clad, narrow crown, minor deadwood	Fell	8.4	222

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T188	Lime	15	55	Mature	-	B	Ivy clad, minor deadwood	-	6.6	137
T189	Lime	16	70	Mature	-	B	Twin stemmed at 1m, minor deadwood	-	8.4	222
T190	Scots pine	20	65	Mature	-	B	Minor deadwood	-	7.8	191
T191	Horse chestnut	15	40	Mature	-	U	Advanced decline, significant dieback and deadwood	Fell for management	4.8	72
T192	Scots pine	15	40	Mature	-	C	Small, one sided	-	4.8	72
T193	Horse chestnut	15	50	Mature	-	B	Partially suppressed by adjacent trees	-	6	113
T194	Scots pine	18	40	Mature	-	B	One sided crown	-	4.8	72
T195	Turkey oak	20	70	Mature	-	B	Twin stemmed from base, leaning, overhanging road, one sided crown	-	8.4	222
T196	Scots pine	18	60	Mature	-	U	Twin stemmed at 5m, lost branches and large wounds, poor structure at fork	Fell for management	7.2	163
T197	Lime	20	60	Mature	-	B	Ivy clad, minor deadwood	-	7.2	163
T198	Leyland cypress	17	50	Maturing	-	B	Dense crown	-	6	113
T199	Turkey oak	22	90	Mature	-	A	Twin stemmed at 3m, leaning and overhanging road junction, minor deadwood	Fell	10.8	366
H200	Hawthorn, Turkey oak, beech, sycamore, yew, hazel, holly	2	15	Mature	-	C	Clipped boundary hedge	Fell part	1.8	10
T201	Beech	12	45	Mature	-	B	-	-	5.4	92

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
G202	Lawson cypress	10	60	Mature	-	C	Multi stemmed, ornamental planting, deadwood	-	7.2	163
T203	Yew	7	60	Mature	-	C	Small trees	-	7.2	163
H204	Leyland cypress	2.5	10	Maturing	-	C	Clipped hedge	-	1.2	5
H205	Leyland cypress	3	15	Maturing	-	C	Clipped hedge	-	1.8	10
T206	Scots pine	12	45	Maturing	-	C	Dense, ivy clad, roadside	-	5.4	92
T207	Leyland cypress	8	20	Maturing	-	C	Small	-	2.4	18
G208	Lawson cypress	14	45	Mature	-	C	Multi stemmed	-	5.4	92
T209	Sycamore	6	20	Maturing	-	C	-	-	2.4	18
T210	Atlantic cedar	5	25	Maturing	-	C	-	-	3	28
T211	Field maple	5	30	Maturing	-	C	Dense	-	3.6	41
T212	Scots pine	10	50	Mature	-	B	Leaning, minor deadwood	-	6	113
T213	Leyland cypress	12	40	Maturing	-	C	-	-	4.8	72
T214	Turkey oak	16	60	Mature	-	B	-	-	7.2	163
T215	Scots pine	16	65	Mature	-	B	-	-	7.8	191
T216	Scots pine	18	55	Mature	-	C	Limb failure, poor	-	6.6	137
T217	Plum	6	35	Mature	-	C	Small	-	4.2	55
T218	Field maple	6	25*	Maturing	-	C	Wire fence growing through the stem, shelter belt planting	Fell	3	28
T219	Field maple	6	20	Maturing	-	C	Amenity planting	Fell	2.4	18
T220	Ash	6	20	Maturing	-	C	Twin stemmed at 1.5m	Fell	2.4	18
T221	Ash	6	20	Maturing	-	C	-	Fell	2.4	18
T222	Oak	18	90	Mature	-	A	Ivy clad, roadside tree	-	10.8	366
G223	Ash	6	20	Maturing	-	C	-	Fell	2.4	18
T224	Oak	15	110	Over-mature	-	U	Poor, recent heavy pruning	-	13.2	547
T225	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T226	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
T227	Field maple	6	25	Maturing	-	C	-	Fell	3	28
T228	Ash	6	20	Maturing	-	C	-	Fell	2.4	18
T229	Oak	8	40	Maturing	-	C	Small, twin stemmed at 2m	-	4.8	72
T230	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
T231	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
T232	Ash	6	20	Maturing	-	C	Twin stemmed at 1.5m	Fell	2.4	18
T233	Oak	20	90	Mature	-	A	Twin stemmed at 3m	-	10.8	366
G234	Ash, field maple	6	20	Maturing	-	C	Many dense stems	Fell part	2.4	18
G235	Oak	12	60	Mature	-	C	Ivy clad, poor	-	7.2	163
T236	Field maple	8	25	Maturing	-	C	-	Fell	3	28
G237	Ash	6	20	Maturing	-	C	-	-	2.4	18
T238	Field maple	6	20	Maturing	-	C	-	-	2.4	18
T239	Field maple	6	25	Maturing	-	C	-	-	3	28
T240	Field maple	8	30	Maturing	-	C	Multi stemmed at 1m	-	3.6	41
T241	Field maple	6	25	Maturing	-	C	Twin stemmed at 1.5m	-	3	28
T242	Ash	7	20	Maturing	-	C	-	-	2.4	18
T243	Ash	6	20	Maturing	-	C	Twin stemmed at 0.5m	-	2.4	18
G244	Ash	7	20	Maturing	-	C	Poor	-	2.4	18
T 245	Ash	8	15	Maturing	-	C	Small	-	1.8	10
T246	Ash	8	15	Maturing	-	C	Small	Fell	1.8	10
T247	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
G248	Field maple, ash	6	20	Maturing	-	C	Dense	Fell part	2.4	18
G249	Field maple, ash	6	20	Maturing	-	C	Dense	-	2.4	18
T250	Fastigiate hornbeam	6	20	Maturing	-	C	Dense, multi stemmed	-	2.4	18
T251	Ash	6	20	Maturing	-	C	-	-	2.4	18
T252	Ash	6	20	Maturing	-	C	-	-	2.4	18
T253	Fastigiate hornbeam	6	40	Maturing	-	C	Dense, multi stemmed	-	4.8	72

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T254	Ash	6	20	Maturing	-	C	-	-	2.4	18
T255	Ash	6	20	Maturing	-	C	-	-	2.4	18
T256	Ash	6	20	Maturing	-	C	-	-	2.4	18
T257	Fastigiate hornbeam	5	40	Maturing	-	C	Dense, multi stemmed	-	4.8	72
T258	Ash	6	20	Maturing	-	C	-	-	2.4	18
T259	Ash	6	25	Maturing	-	C	-	-	3	28
T260	Ash	6	15	Maturing	-	C	Slender	-	1.8	10
T261	Fastigiate hornbeam	7	40	Maturing	-	C	Dense, multi stemmed	-	4.8	72
T262	Ash	6	25	Maturing	-	C	Twin stemmed at 2m	-	3	28
T263	Ash	6	20	Maturing	-	C	-	-	2.4	18
T264	Ash	6	20	Maturing	-	C	-	-	2.4	18
T265	Ash	6	20	Maturing	-	C	Twin stemmed at 0.5m	-	2.4	18
T266	Gingko	5	15	Young	-	C	Small	-	1.8	10
T267	Ash	7	20	Maturing	-	C	Twin stemmed at 2m	-	2.4	18
T268	Oak	8	42.5	Maturing	-	C	Two stems	-	5.1	82
T269	Ash	8	20	Maturing	-	C	Small, poor	-	2.4	18
G270	Hazel, cherry, ash, field maple	4	10	Young	-	C	Group	-	1.2	5
G271	Ash, field maple, hawthorn	4	20	Maturing	-	C	Dense	-	2.4	18
T272	Oak	20	80	Mature	-	B	Ivy clad	-	9.6	290
T273	Yew	8	60	Mature	-	B	-	-	7.2	163
G274	Leyland cypress	4	30	Maturing	-	C	Clipped and topped hedge	-	3.6	41
T275	Oak	20	75	Maturing	-	B	Ivy clad	-	9	254
T276	Oak	20	80	Maturing	-	B	Ivy clad	-	9.6	290
G277	Holly, cypress	6	20	Maturing	-	C	Behind wall	-	2.4	18
G278	Sycamore	18	50	Mature	-	B	Multi stemmed, ivy clad	-	6	113
T279	Scots pine	10	40	Maturing	-	B	-	-	4.8	72
T280	Oak	8	40	Maturing	-	B	Multi stemmed	-	4.8	72

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
G281	Scots pine	3	10	Young	-	C	Small	-	1.2	5
G282	Birch	4	10	Young	-	C	Small trees	-	1.2	5
G283	Ash, cherry, sycamore, birch	12	25	Maturing	-	B	Dense group	-	3	28
G284	Field Maple	5	20	Young	-	C	Small, poor	-	2.4	18
T285	Whitebeam	5	30	Maturing	-	C	-	-	3.6	41
T286	Cherry	4	10	Young	-	C	-	-	1.2	5

Appendix 2: Tree schedule and explanatory notes

Explanatory Notes

- **Abbreviations:**

G : Group
H : Hedge
T : Tree
W : Woodland

- **Botanical tree names:**

Alder	:	*Alnus glutinosa*
Ash	:	*Fraxinus excelsior*
Atlantic cedar	:	*Cedrus libani 'Atlantica'*
Beech	:	*Fagus sylvatica*
Birch	:	*Betula pendula*
Cherry	:	*Prunus* sp
Crack willow	:	*Salix fragilis*
Cypress	:	*Chamaecyparis/Cupressus* sp
Elm	:	*Ulmus* sp
Fastigiate hornbeam	:	*Carpinus betulus fastigiata*
Field maple	:	*Acer campestre*
Gingko	:	*Gingko biloba*
Goat willow	:	*Salix caprea*
Hawthorn	:	*Crataegus monogyna*
Hazel	:	*Corylus avellana*
Holly	:	*Ilex aquifolium*
Hornbeam	:	*Carpinus betulus*
Horse chestnut	:	*Aesculus hippocastanum*
Larch	:	*Larix* sp
Lawson cypress	:	*Chamaecyparis lawsoniana*
Leyland cypress	:	*X cuprocyparis leylandii*
Lime	:	*Tilia* sp
Oak	:	*Quercus robur*
Plum	:	*Prunus* sp
Red horse chestnut	:	*Aesculus x carnea*
Scots pine	:	*Pinus sylvestris*
Sweet chestnut	:	*Castanea sativa*
Sycamore	:	*Acer pseudoplatanus*
Thorn	:	*Crataegus* sp *or Prunus* sp
Turkey oak	:	*Quercus cerris*
Whitebeam	:	*Sorbus intermedia*
Wild cherry	:	*Prunus avium*
Willow	:	*Salix* sp
Yew	:	*Taxus baccata*

- **BS 5837 (2012) compliance:** All data has been collected based on the recommendations set out in subsection 4.4 of BS 5837.
- **Tree inspections and site limitations:** Each tree was subjected to a quick visual check level of inspection. Where there is restricted access to the base of a tree, its attributes are assessed from the nearest point of access. Climbing inspections are not carried out during this level of inspection and, if heavy ivy is present, tree condition is assessed from what can be seen from the ground. A separate note is recorded if further investigation may be required to clarify its status.
- **Crown spreads:** Crown spread dimensions are not listed in the tree schedule because they are illustrated on the land survey base to all the plans in this document. Where crown spreads of significant trees on site are found to deviate from those shown on the provided land survey, we have noted it in the text of the report and annotated it on our plans.

Appendix 2: Tree schedule and explanatory notes

- **Dimensions:** All dimensions are estimated unless annotated with a '*'.
- **Species:** Species identification is based on visual observations. Where there is some doubt over tree identity, sp is noted after the genus name to indicate that the species cannot be reliably identified at the time of the survey. Where there is more than one species in a group, only the most frequent are noted and not all the species present may be listed.
- **Height:** Height is estimated to provide a broad indication of the size of the tree.
- **Trunk diameter:** Trunk diameter is estimated or measured and recorded in 2.5cm increments as advised in BS 5837 Table D1. It is measured with a diameter tape unless access is restricted, direct measurement is not possible because of ivy on the trunk or the tree is assessed as low quality. The point of measurement and the adjustments for stem variations are as advised in Figure C1 of BS 5837.
- **Maturity:** In planning context, maturity provides a simplistic indication of a tree's ability to cope with change and its potential for further growth. For the purposes of this report, young indicates a potential to significantly increase in size and a high ability to cope with change, maturing indicates some potential to increase in size and a medium ability to cope with change, and mature indicates little potential to increase in size and limited ability to cope with change.
- **Low branches:** Any low branches that would not be feasible for removal during normal management and should be considered as a design constraint are noted here and explained in the notes.
- **Category:** Our assessment automatically considered tree physiological/structural condition (BS 5837, 4.4.2.5h), and so these are not listed separately in the schedule. Additionally, the category accounts for the remaining contribution (BS 5837, 4.4.2.5i) as greater than 40 years for A trees, greater than 20 years for B trees, at least 10 years for C trees and less than 10 years for U trees, so this is also not listed separately in the schedule. Category A, B and C trees are automatically listed as sub-category 1 unless otherwise stated.
- **Notes:** Only relevant features relating to physiological or structural condition and low branches that may help clarify the categorisation are recorded. If there are no notes, then the presumption should be that no relevant features were observed.
- **Tree works:** The recommended tree works are based on the quick visual check level of inspection and only intended to address significant hazards identified during that inspection. The following points should also be considered before carrying out any works:
  1. **Reporting during work operations:** In the context of the preliminary nature of the tree inspection, any defects that may affect tree safety discovered by the contractor when carrying out the work recommendations should be reported to the supervising officer. Modification to the schedule of works may be required because of these reports. The contractor should be specifically instructed on this point.
  2. **Implementation of works:** All tree works should be carried out to BS 3998 *Recommendations for Tree Work* as modified by more recent research. It is advisable to select a contractor from the local authority list and preferably one approved by the Arboricultural Association. Their Register of Contractors is available free from The Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire GL10 3DL; phone 01242 522152; website www.trees.org.uk.
  3. **Statutory wildlife obligations:** The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 provides statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions and advice from an ecologist must be obtained before undertaking any works that might constitute an offence.
  4. **Stumps:** Stumps to be removed within the RPAs of retained trees should be ground out with a stump grinder to minimise any disturbance unless otherwise authorised by the supervising officer.
- **Future tree safety inspections:** Due to the time that may elapse between the original survey and the start of development, all trees should be re-inspected as part of the standard risk management process before any works start on site. Our assessment of the trees was carried out on the basis that a re-inspection would be carried out within a year of the assessment visit and our advice on tree condition must be reviewed annually from the date of that visit.

Appendix 3: QR Codes for SGNs (Scan with reader to download)

SGN1 *Monitoring tree protection*	SGN2 *Fencing protected trees*	SGN3 *Ground protection*
SGN4 *Pollution control*	SGN5 *Site cranes & piling rigs*	SGN6 *Height restrictions*
SGN7 *Excavating in RPAs*	SGN8 *Removing surfacing and structures in RPAs*	SGN9 *Installing/upgrading surfacing in RPAs*
SGN10 *Installing structures in RPAs*	SGN11 *Installing services in RPAs*	SGN12 *Landscaping in RPAs*

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TREE CONSULTANCY

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Tree protection plan
Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

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Provided Plan Refs: Topographical Survey.dwg & 14.273 PP02 Rev I

Barrell Plan Ref: 14281-BT13 a

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Permission is granted to scale from this drawing for Local Authority Planning Approval purposes relating to tree protection measures only. Where applicable this drawing is to be read in conjunction with the arboricultural report.

www.barrelltreecare.co.uk

TX BS category A Trees of high quality

TX BS category B Trees of moderate quality

TX BS category C Trees of low quality

TX BS category U Trees unsuitable for retention

TX Trees to be removed

Estimated tree positions not included on original land survey and/or adjusted crown spreads

Protective barrier/fencing

Construction exclusion zone (CEZ)

Root protection area (RPA) boundaries for category A and B trees

KEY - to be read in conjunction with plans PP03 and PP04

Sandleford Park Application Boundary

Extent of Allocation

LAND USE

Proposed Development Footprint Residential

Proposed Development Footprint Elderly Residential

Local Centre Comprising of Flexible Mixed Uses (Use Classes A1 - A5, B1a, D1 and C3)

Maximum Extent of the Location of Mixed Uses within the Local Centre

Education Land

1. Proposed 2 Form Entry Primary School
2. Area of land safeguarded for expansion of Park House School
3. Proposed Primary School

Park House School (PHS) Expansion Land for 4G Adult Pitch

4G Pitch Car Parking & School Drop Off Area

Swings & Smiles - Specialist Care Facility

ACCESS

Proposed Access Points for 'All Traffic Modes'

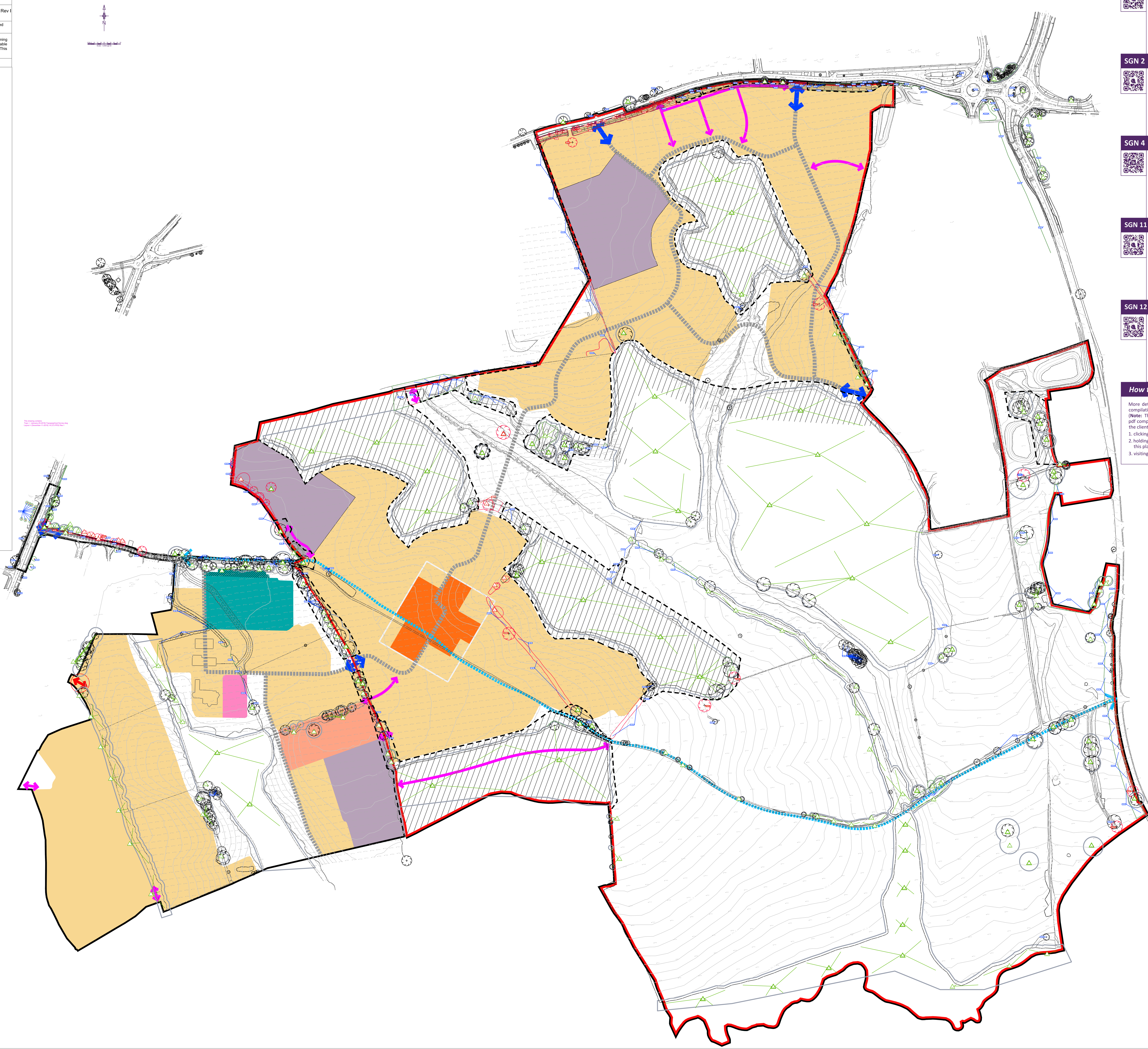
Proposed Main Access Road (Indicative alignment)

Existing Public Footpath Retained and upgraded as a shared footpath cycle link

Proposed Key Footpath/Cycle Links

Emergency Access

Indicative Access to School



SGN 1 *Monitoring tree protection*

Always:

- ✓ have a pre-commencement meeting with the tree consultant before development starts
- ✓ use the tree consultant to regularly check that protection remains fit for purpose
- ✓ use the tree consultant to supervise work in RPAs
- ✓ keep a written record of supervision

SGN 2 *Fencing protected trees*

Always:

- ✓ install protection before development starts
- ✓ make sure protection is fit for purpose, i.e. it prevents damage to trees and soil
- ✓ keep protection in place until there is no risk to trees
- ✓ get written permission to move or remove any protection

SGN 4 *Pollution control*

Always:

- ✓ keep toxic products away from RPAs

SGN 11 *Installing services in RPAs*

Always:

- ✓ use the tree consultant to supervise work in RPAs
- ✓ select the least damaging option when installing services, so prioritise trenchless, over broken trench over continuous trench
- ✓ hand-dig trenches if trenchless is not feasible

SGN 12 *Landscaping in RPAs*

Always:

- ✓ use the tree consultant to supervise work in RPAs
- ✓ avoid raising ground levels within 1m of the trunks of retained trees

How to use plan

More detailed guidance on each Site Guidance Note (SGN) can be found in a printed hard copy compilation of all the SGNs, issued to the Site Manager at the pre-commencement site meeting (**Note:** This should be retained on site throughout the duration of works). Additionally, an electronic pdf compilation of all the SGNs, was submitted with this drawing to the local planning authority and the client. Alternatively, a pdf of each SGN can be downloaded by:

1. clicking the image links in the electronic pdf version of this plan;
2. holding a mobile phone QR (Quick Response) code reader over the QR code in the paper version of this plan; or,
3. visiting our website at *https://www.barrelltreecare.co.uk/resources/technical-guidance*

Tree protection plan
Location of trees, categorisation & protection/management proposals at
Sandleford Park, Newbury

Provided Plan Refs: Topographical Survey.dwg & 14.273 PP02 Rev I	
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Tree protection plan

Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

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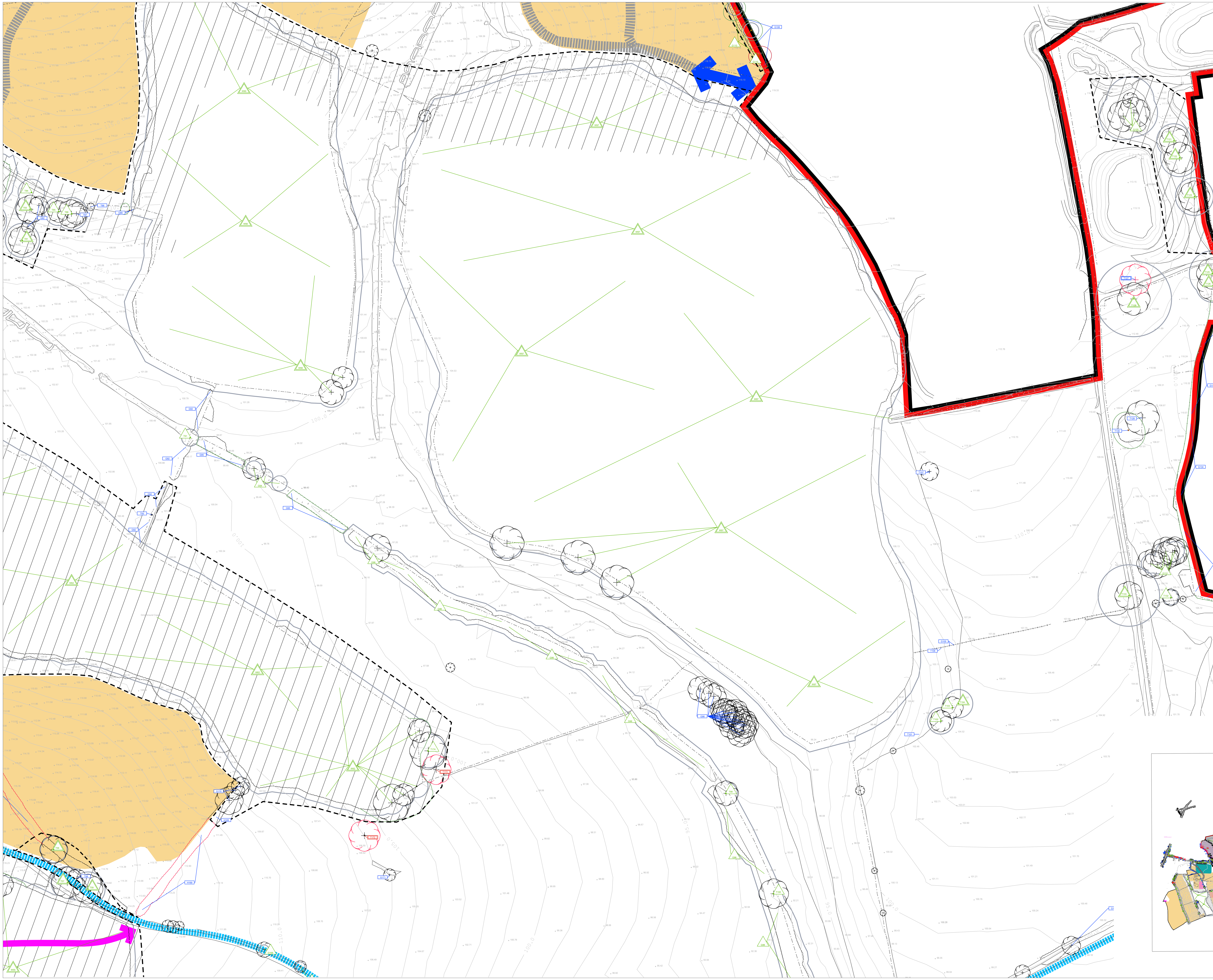
Topo = (January-25-2018) Topographical Survey.dwg
Layout = (December-11-2019) 14.273 PP02 Rev I



Tree protection plan
Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

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Tree protection plan

Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

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Appendix 3

Draft updated Arboricultural Assessment and Method Statement reference 14281-AA9-CA-DRAFTforInquiry

Updated Tree Protection Plan reference 14281-BT15a-f.

Arboricultural assessment & method statement

Sandleford Park, Newbury

barrell
TREE CONSULTANCY

Chris Allder MSc HNDArb FArborA MICFor

1st April 2021 14281-AA9-CA-DRAFTforInquiry

Site location and report purpose

Site location

This aerial image is provided courtesy of Google. The yellow line indicates the approximate site boundary and is illustrative only.

Report purpose

This arboricultural assessment report provides sufficient information for the Local Planning Authority (LPA) to consider the effect of the proposed development on local character from a tree perspective. It is fully compliant with the BS 5837 advice relating to the planning application stage of the process and it meets national standard planning application validation requirements.

More specifically, the development proposal is at Sandleford Park, Newbury.

This report includes:

- A **Tree protection plan** illustrating tree locations, categories, the location of the proposed development, and the proposed tree protection measures.
- An **Arboricultural assessment** (section 1 of the report) providing an analysis of the tree issues to assist the LPA in assessing the impact on local character.
- An **Arboricultural method statement** (section 2 of the report) describing how retained trees will be protected and managed during the development activity.

Site location and report purpose

- **Appendices** (**Appendix 1** –Background administrative information, and data collection; **Appendix 2** – Tree schedule and explanatory notes; and, **Appendix 3** – QR Codes for SGNs).
- A companion document to supplement the main report titled ***Manual for managing trees on development sites*** **(Version 1)**, which provides explanations of how retained trees will be managed on site in the form of Site Guidance Notes (SGNs) covering the relevant issues.

1: Arboricultural assessment

1.1 Table 1: Summary of trees affected and protected by the proposal

From my review of the constraints and the proposed layout, my assessment of the impact on trees, both during and after development, and those that need protection using special precautions, is summarised in Table 1:

	British Standard 5837 Category		
	A (High quality)	**B (Moderate quality)**	**C (Low quality)**
Remove	None	T63, T64, T65, T69	H5(part), G6(part), H7, T8, G10, G47(part), H60, G68(part), W73(part), G108(part), H115(part), G117(part), H169(part), T218, T219, T220, T221, G223, T225, T226, T227, T228, T230, T231, T232, G234(part), T236, T246, T247, G248 (part)
Prune	None	None	None
Protect using special precautions See Notes below	None	None	None
Post development considerations	None	None	None

T = Tree; H = Hedge; G = Group

Note on types of protection: All retained trees will be protected during development by using fencing, and only those requiring special precautions to limit the impact of encroachment are listed in Table 1.

Note on category U trees: Trees categorised as U (**T61, T109, T116, T127, T151, T154, T172, T173, T184, T191** and **T196**) are in such poor condition that they have been assessed as needing management irrespective of any development proposals. Reduction of risk related to any category U trees will be a management decision and not caused by this proposal, so should not be considered as a direct impact. Any works will be agreed with the project ecologist to protect important habitat.

1.2 The impact of tree removals on local character

My assessment of the impact of tree removals on local character is as follows:

Category A and B trees (T63, T64, T65, and T69):

Despite having the potential for long term retention, these trees make a limited contribution to local amenity because of the backdrop of large trees to be retained. These significant retained trees will buffer any loss to the extent that there will be no long-term impact on local amenity or character. Whilst their loss will be noticeable in the immediate vicinity in the short term, there will be no significant impact on local amenity character in the wider setting in the medium to long terms.

Category C trees (H5(part), G6(part), H7, T8, G10, G47(part), H60, G68(part), W73(part), G108(part), H115(part), G117(part), H169(part), T218, T219, T220, T221, G223, T225, T226, T227, T228, T230, T231, T232, T225, T226, T227, T228, G234(part), T236, T246, T247, and G248 (part)):

None of these trees or hedges are sufficiently important to be worthy of influencing any layout. They are not important in the overall planning context and their loss should not influence the determination of this application.

1: Arboricultural assessment

1.3 The impact of tree pruning on local character

Other than pruning for normal maintenance, no trees will be pruned because of this development.

1.4 Special precautions to limit RPA encroachment impact

All the RPAs of retained trees will be protected, and where there will be encroachment into the RPAs of important trees or woodlands in the form of new no-dig surfacing it would be feasible to install custom designed no-dig specification surfacing without causing any significant disturbance to the RPA. From our previous experience at installing such surfacing (www.barrelltreecare.co.uk/case-studies/SurfacingNearTrees.pdf), I am confident that this can be implemented without any long term detrimental impact on tree health, with the detail to be agreed as part of a planning condition. This surfacing solution is within the advice set out in BS 5837 (8.6) and would be appropriate in this situation. In summary, if the guidance set out in SGN 7 *Excavating in RPAs* and SGN 9 *Installing/upgrading surfacing in RPAs* is observed, I believe that the proposed works can be implemented without any long term detrimental impact on tree health, and therefore local character. All new surfacing must be installed before any construction access to prevent damage to the RPA from the construction activity.

1.5 Post development considerations

My assessment is that there will be no adverse impacts on retained trees once the development is completed and occupied.

1.6 Summary of impact on local character

All the high category woodlands will be retained and protected in this proposal. The majority of trees to be removed are well within the site, and close to retained trees that will buffer the initial impact, and their loss will have no significant impact on the present character of the area. The matter of adverse impacts on retained trees due to post-development pressures to fell or prune has been considered and I concluded that no further trees will be affected. There is plenty of space for tree planting and a comprehensive new tree planting scheme is included as part of the proposal. The size of these new trees and their future growth will significantly enhance the contribution of this site to local character and more than compensate for the loss of existing trees. The construction activity may affect further trees if appropriate protective measures are not taken. However, if adequate precautions to protect the retained trees are specified and implemented through the arboricultural method statement included in this report, the development proposal will have no long term detrimental impact on tree health or the contribution of trees to character in the wider setting. Indeed, the new sustainable planting proposals will increase the potential of the site to contribute to local character well beyond the short term.

For these reasons, I conclude that the proposed development would not cause an unacceptable or adverse impact on the long-term vitality of the retained trees, and therefore the character and appearance of the area.

2: Arboricultural method statement

2.1 Site Guidance Notes (SGNs)

This section of the report identifies which trees on this site will be protected and managed, and by what means. This site-specific summary is supplemented by more detailed explanations and descriptions of specific operations set out in the accompanying *Manual for managing trees on development sites*. That document is a compilation of 12 individual SGNs addressing the following tree protection and management issues that regularly arise in the construction phase of development:

- SGN1 *Monitoring tree protection* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn01?stage=Stage)
- SGN2 *Fencing protected trees* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn02?stage=Stage)
- SGN3 *Ground protection* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn03?stage=Stage)
- SGN4 *Pollution control* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn04?stage=Stage)
- SGN5 *Site cranes & piling rigs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn05?stage=Stage)
- SGN6 *Height restrictions* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn06?stage=Stage)
- SGN7 *Excavating in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn07?stage=Stage)
- SGN8 *Removing surfacing and structures in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn08?stage=Stage)
- SGN9 *Installing/upgrading surfacing in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn09?stage=Stage)
- SGN10 *Installing structures in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn10?stage=Stage)
- SGN11 *Installing services in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn11?stage=Stage)
- SGN12 *Landscaping in RPAs* (https://www.barrelltreecare.co.uk/resources/technical-guidance/sgn12?stage=Stage)

NOTE: Each individual SGN can be downloaded by using the links above and the QR Code links in Appendix 3.

2.2 Identification of areas to be protected

The tree protection plan shows the areas where protective measures are necessary. The fencing location is shown by the heavy black dashed lines, with the construction exclusion zone behind as the lighter black diagonal hatch.

2.3 Arboricultural supervision

An arboricultural consultant will be appointed to advise on the tree management for the site and to attend:

- a pre-commencement meeting before any work starts;
- regular supervision visits to oversee the agreed tree protection, as agreed at the pre-commencement meeting; and

- further supervision visits, as necessary, to oversee any unexpected works that could affect trees.

The detail of how the arboricultural supervision will be carried out is explained in SGN1 *Monitoring tree protection* in the accompanying Manual.

2.4 Table 2: Summary of the site operations requiring arboricultural input

For this site, arboricultural input will be needed for the following operations:

Brief operation summary	Trees affected	Location of detailed explanations
Pre-commencement meeting: Meeting on site with all parties to agree protective measures, as described in SGN1. Will be carried out before any significant site works begin.	All trees	SGN1 *Monitoring tree protection*
Tree felling and pruning: Contractor will carry out agreed works as described in Appendix 2. Will be completed before any significant site works begin.	Fell trees as numbered	Appendix 2
Installing fencing: Agreed tree protection measures will be installed and checked, as described in SGN2. Will be completed before any significant site works begin.	Fencing all retained trees	Tree protection plan, SGN2 *Fencing protected trees*
Pollution control near retained trees: Any pollution control measures identified during risk assessment will be installed as described in SGN4. Will be completed before any potential pollutants arrive on site.	All retained trees	SGN4 *Pollution control*
Operation of site cranes and piling rigs: Provision will be made to prevent site cranes and piling rigs damaging trees, as described in SGN5.	All retained trees	SGN5 *Site cranes & piling rigs*
Installing height restrictions: Provision will be made to prevent damage to low branches by high vehicles, as described in SGN6. Will be installed before high vehicles arrive on site.	All retained trees	SGN6 *Height restrictions*
Installing/upgrading surfacing in RPAs: These operations will be carried out as described in the SGN 9.	All retained trees as appropriate subject to detailed design	SGN 9 *Installing/upgrading surfacing in RPAs*
Regular arboricultural supervision: Provision will be made to carry out and record agreed arboricultural supervision, as described in SGN1.	All retained trees	SGN1 *Monitoring tree protection*
Installing services in RPAs: These operations will be carried out with care, as described in SGN11.	All retained trees as appropriate subject to detailed design	SGN11 *Installing services in RPAs*
Landscaping in RPAs: These operations will be carried out with care, as described in SGN12.	All retained trees	SGN12 *Landscaping in RPAs*
Removing tree protection: Protection can only be removed when there is no risk of damage to retained trees, as described in SGN1.	All retained trees	SGN1 *Monitoring tree protection*

2: Arboricultural method statement

The operations summarised in this table, and supplemented by the more detailed explanations set out in the SGNs and the rest of this document, form the arboricultural method statement for this site. The Site Manager will ensure that its details and any agreed amendments are known and understood by all site personnel. Copies of the agreed documents will be available on site. All personnel who could have an impact on trees will be briefed on the specific tree protection requirements as part of the site induction procedures. This requirement will be written into the site management documentation.

If unanticipated issues arise on site not referenced in the above explanations, further guidance on how to manage them can be found in the accompanying Manual.

2.5 Construction method statement (heads of terms summary)

A construction method statement is a description of how operations that may affect trees will be carried out to minimise any adverse impact on them. The details of how the site will be managed are construction and contractual matters that can only be finalised once the post-consent detailed planning begins. For that reason, at this stage in the planning process, as explained in clause 5.5.6 of BS 5837, it is normally sufficient to list a heads of terms summary of the issues requiring more detailed consideration once consent is issued. On this site, those issues are likely to include:

1. Preparation of a written site management protocol for dealing with tree issues, to be incorporated into formal site management procedures, and to specifically include induction training for all operatives related to tree protection.
2. The order of work on site, including demolition, site clearance and building work.
3. Erection and maintenance of tree protection measures.
4. Who will be responsible for protecting the trees on site.
5. Detailed proposals for inspecting and supervising the tree protection.
6. How accidents and emergencies involving trees will be managed, including accidental damage to roots and their treatment.
7. Details of facilitation pruning and access into site. What size vehicles will be used under canopies and will large machinery be lifted over trees.
8. The parking arrangements for workers and visitors.
9. A schedule of emergency contact numbers relating to trees.
10. Areas for loading and unloading of materials and storage of materials and plant.
11. Where site facilities will be located and when will they be installed.
12. How machinery and equipment (such as excavators, cranes and their loads, concrete pumps and piling rigs) will enter, move on, work on, and leave the site.
13. Pollution control to specifically consider chemical storage and wheel washing facilities in relation to trees.
14. Recycling and storage of waste in relation to trees.
15. Details of earthworks, grading and mounding and removal of spoil, including any planned lowering or raising of ground levels.
16. Precise services locations, including the method of excavation when near trees.
17. Crane location and zones of movement.
18. Details and precise cross-sections where no-dig surfacing is to be installed.
19. How and when any temporary surfacing will be laid and removed.
20. How post-construction impacts through compaction to soil near trees will be ameliorated.

Appendix 1: Background administrative information and data collection

A1.1 Table 3: Background administrative information

	Background administrative information
Report date & reference	1st April 2021; 14281-AA9-CA-DRAFTforInquiry
Tree protection plan reference	BT15 a - f
Instructing client	Bloor Homes Limited
Instructions	Visit the site, assess the relevant trees, prepare a schedule of their details, describe the impact of the proposal on those trees and identify the tree protection issues in an arboricultural method statement confined to the heads of terms
Provided documents	Topographical survey, drawing number **Topographical Survey.dwg** received by email on 25th January 2018, and layout drawing number **191211-14-273-3A (PP02 RevI) Land Use and Access Plan** received by email on 11th December 2021
Report author and credentials	Chris Allder is a Chartered Forester (www.charteredforesters.org) and a Registered Consultant and Fellow of the Arboricultural Association (www.trees.org.uk), and fully qualified to undertake the assessments in this report. Further details of his credentials can be found at www.barrelltreecare.co.uk/who-we-are.
Report limitations	This report does not consider ecological or archaeological issues, or any other matter beyond the assessment of the trees.
Technical references	In preparing the analysis in this report, we considered the guidance and advice in the following technical references: • Climate Change Act (2008) www.legislation.gov.uk/ukpga/2008/27/contents • Town and Country Planning Act 1990 www.legislation.gov.uk/ukpga/1990/8/contents • National Planning Policy Framework, published by the DCLG www.gov.uk/government/publications/national-planning-policy-framework--2 • BS 5837 (2012) *Trees in relation to design, demolition and construction – Recommendations*, BSI www.shop.bsigroup.com/ • BS 8545 (2014) *Trees: from nursery to independence in the landscape – Recommendations*, www.shop.bsigroup.com/ • BS 3998 (2010) *Tree work – Recommendations*, BSI www.shop.bsigroup.com/ • *Trees in the Townscape: A Guide for Decision Makers*, published by the Trees & Design Action Group http://www.tdag.org.uk/ • *Trees in Hard Landscapes: A Guide for Delivery*, published by the Trees & Design Action Group www.tdag.org.uk/ • National Joint Utilities Group (2007) Volume 4, Issue 2: *Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees* www.njug.org.uk/publications/

Appendix 1: Background administrative information and data collection

A1.2 Table 4: Data collection

	Data collection
Date of site visit	13th February 2018
People present during site visit	Chris Allder
Weather & visibility	Dull, breezy and drizzling, with average visibility
Limitations to observations	• The inspection of the trees for the purposes of assessing their condition and work requirements was made on the basis that they will be annually inspected in the future to identify any changes in condition and review the original recommendations. For these reasons, the tree assessment advice only remains valid for one year from the date that the trees were last inspected. • All observations were of a preliminary nature and did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level. • Observations of trees outside the site boundaries are confined to what was visible from within the site. • All dimensions were estimated unless otherwise indicated.
Tree Preservation Orders (TPOs), Conservation Areas, and tree categorisation	TPOs cannot always be reliably interpreted from the documentation to identify which trees are protected, especially as time passes and site conditions change from when they were originally made. It is common for TPO plans to be inaccurate and schedules often become out of date as trees die or are removed. Frequently, trees deteriorate and, although they may be technically protected by the TPO, are in such poor condition or causing such unreasonable inconvenience that their suitability for retention becomes questionable. In a planning context, if poor trees are assessed as unsuitable for retention, then it would be inappropriate to show them as a material constraint in development planning. For these reasons, although TPOs do need to be considered, they do not form the primary basis for tree categorisation. Poor quality trees assessed as not worthy of retention will be shown as such, irrespective of whether they are protected or not. Similarly, good quality trees that are not protected will still be shown as material constraints. The same rationale will be applied to Conservation Areas.
Tree location and numbering	Each tree, hedge, group, and woodland was inspected, and the numbering scheme is indicated on the tree protection plan. Where important trees were found on site that were not included on the provided plan, their approximate positions and canopy extents are indicated on the plan.
Recording of tree data	For each identified tree, hedge, group, and woodland the information collected was recorded on the tree schedule in Appendix 2 and the tree protection plan.
Compliance of data collection with BS 5837	The data collection is fully compliant with the advice in subsection 4.4.2 of BS 5837. When collecting this information, specific consideration was given to any low branches that may influence future use, age class, physiological condition, structural condition, and remaining contribution. Where appropriate, crown spreads were also noted where they differed from those shown on the provided land survey.
Calculation of RPAs	Following the recommendations in Table D1 of BS 5837, the diameter of each tree was rounded up to the next 2.5cm increment, with the radius of a nominal circle and the resultant RPA taken directly from that table. This information is listed for each tree in the tree schedule in Appendix 2.

Appendix 2: Tree schedule and explanatory notes

NOTE: Colour annotation is A & B trees with green background; C & U trees with blue background; trees to be removed in red text.

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
All retained trees & hedges								Crown lift to 3-4m over site as necessary. Clip to reform hedges as appropriate.		
T1	Oak	14	90	Mature	-	B	Ivy clad, veteran status on ATI, RPA needs to be modified to 13.5m	-	13.5	573
T2	Cherry	4	30	Maturing	-	C	Topped	-	3.6	41
T3	Oak	20	110	Mature	-	A	Previous pruning wounds from crown lifting, minor deadwood	-	13.2	547
T4	Oak	20	90	Mature	-	B	Previous pruning wounds from crown lifting, minor deadwood	-	10.8	366
H5	Leyland cypress	6	30	Maturing	-	C	High hedge	Fell part	3.6	41
G6	Elm, sycamore, thorn	4	20	Maturing	-	C	Dead elm, regenerated overgrown hedge	Fell part	2.4	18
H7	Leyland cypress	15	35	Mature	-	C	Dense line, overgrown hedge	Fell	4.2	55
T8	Sycamore	10	50	Mature	-	C	Lost top, significant deadwood	Fell	6	113
W9	Oak, ash, lime	20	80	Mature	-	B	Tall mature trees forming a linear shelter belt, evidence that there was an avenue of trees, now overgrown	-	9.6	290
G10	Hawthorn	3	30	Maturing	-	C	Remnant hedge, overgrown scrub	Fell	3.6	41

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T11	Oak	8	45	Mature	-	C	Suppressed, one-sided	-	5.4	92
T12	Oak	18	100	Mature	-	A	Twin stemmed at 5m, minor deadwood	-	12	452
W13	Alder, oak, sycamore, beech, birch	20	45	Mature	-	A	Brickkiln Copse. Mixed woodland of tall, mature trees with holly understorey, wet at southern end, some storm damage and windblown trees, mixed ground cover	-	5.4	92
T14	Ash	20	80	Mature	-	B	Twin stemmed at 6m, minor deadwood, one stem lost	-	9.6	290
G15	Alder, sycamore	18	40	Maturing	-	C	Dense group on woodland edge	-	4.8	72
G16	Oak, ash	18	80	Mature	-	B	-	-	9.6	290
G17	Ash, hazel	15	70	Mature	-	B	Remnant hedge line	-	8.4	222
T18	Ash	18	65	Mature	-	B	-	-	7.8	191
T19	Ash	15	100	Mature	-	B	-	-	12	452
T20	Oak	15	75	Mature	-	B	Three stems from base	-	9	254
T21	Oak	18	75	Mature	-	B	Twin stemmed from base, leaning	-	9	254
G22	Oak	15	40	Maturing	-	B	Younger trees, good future potential	-	4.8	72
T23	Oak	16	75	Mature	-	B	Significant basal deformation, old hedgerow tree	-	9	254
T24	Oak	16	60	Mature	-	B	Leaning over footpath	-	7.2	163
G25	Oak	18	75	Mature	-	B	One sided canopy, old trees	-	9	254

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
G26	Oak, ash	18	50	Mature	-	B	-	-	6	113
T27	Oak	22	80	Mature	-	A	Ivy clad	-	9.6	290
T28	Oak	25	120	Mature	-	A	Major limb failure, stem damage, ok	-	14.4	651
T29	Oak	25	110	Mature	-	B	Storm damage	-	13.2	547
G30	Ash, oak, holly	10	30	Maturing	-	C	Small, younger trees	-	3.6	41
T31	Oak	25	110	Mature	-	A	Minor limb failure, veteran status on ATI, RPA to be modified to 16.5m radius	-	16.5	855
G32	Oak	15	50	Mature	-	B	-	-	6	113
T33	Oak	18	100	Mature	-	A	Hedgerow tree, low vigour, veteran tree on ATI - RPA to be modified to 15m radius	-	15	707
T34	Oak	15	130	Over-mature	-	A	Veteran tree, significant decay, veteran tree on ATI - RPA to be modified to 19.5m	-	19.5	1195
T35	Ash	20	80	Mature	-	B	Deadwood	-	9.6	290
G36	Ash	10	30	Maturing	-	C	Small trees	-	3.6	41
G37	Oak, holly, sycamore, ash	6	25	Maturing	-	C	Overgrown hedge and regenerating trees	-	3	28
G38	Ash	10	30	Maturing	-	C	Linear group, formerly a hedge	-	3.6	41
G39	Oak	14	35	Mature	-	C	Multi stemmed hedgerow remnant trees	-	4.2	55

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T40	Oak	16	75	Mature	-	B	Twin stemmed at base, overgrown	-	9	254
G41	Oak, ash	15	60	Mature	-	C	In decline, significant deadwood	-	7.2	163
T42	Oak	18	60	Mature	-	B	Ivy clad	-	7.2	163
T43	Oak	20	70	Mature	-	B	Twin stemmed from base, leaning	-	8.4	222
T44	Oak	18	125	Mature	-	B	Multi stemmed from base	-	15	707
T45	Oak	20	150	Mature	-	B	Three stems from base	-	15	707
T46	Oak	18	110	Mature	-	A	Veteran potential	-	13.2	547
G47	Ash, thorn	14	50	Mature	-	C	Hedgerow remnant ash and undergrowth	Fell part	6	113
T48	Oak	18	50	Mature	-	A	Twin stemmed at 3m	-	6	113
T49	Oak	18	60	Mature	-	A	Twin stemmed 2m	-	7.2	163
T50	Oak	15	35	Maturing	-	B	Multi stemmed at 3m	-	4.2	55
G51	Ash, oak, thorn	14	40	Maturing	-	B	-	-	4.8	72
T52	Oak	12	70	Mature	-	B	Twin stemmed at 2m	-	8.4	222
T53	Oak	16	75	Mature	-	B	Twin stemmed at 1m	-	9	254
T54	Oak	16	82.5	Mature	-	B	Twin stemmed from base	-	9.9	308
W55	Oak, sycamore, holly, ash	20	50	Mature	-	A	Gorse Covert. Mixed deciduous woodland, holly understorey with bracken and grass floor, birch regeneration coming through	-	6	113
T56	Oak	18	70	Mature	-	A	-	-	8.4	222
T57	Oak	18	85	Mature	-	A	Deadwood throughout	-	10.2	327
T58	Larch	20	50	Mature	-	C	Leaning, suppressed	-	6	113

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T59	Oak	20	90	Mature	-	A	Some deadwood and epicormic growth	-	10.8	366
H60	Thorn, oak, beech	3	15	Maturing	-	C	Field hedge with occasional small trees	Fell	1.8	10
T61	Beech	22	120	Mature	-	U	Fallen, large old tree with Meripilus infection	Fell for management	14.4	651
W62	Oak, sycamore, ash	20	60	Mature	-	A	Dirty Ground Copse. Ancient Semi-natural Woodland. Mixed deciduous woodland with holly dominated understorey and some occasional regeneration	-	7.2	163
T63	Sycamore	10	30	Maturing	-	B	Good potential	Fell	3.6	41
T64	Oak	10	45	Maturing	-	B	-	Fell	5.4	92
T65	Oak	8	30	Maturing	-	B	-	Fell	3.6	41
G66	Oak	25	80	Mature	-	A	Woodland edge trees, tall	-	9.6	290
T67	Oak	18	60	Mature	-	B	Ivy clad, some dieback	-	7.2	163
G68	Hazel, thorn, goat willow, holly	4	32.5	Mature	-	C	Hedge, overgrown	Fell part	3.9	48
T69	Birch	15	60	Mature	-	B	Twin stemmed from base	Fell	7.2	163
T70	Oak	16	45	Mature	-	B	Ivy clad, end of overgrown hedge	-	5.4	92
T71	Crack willow	16	50	Mature	-	B	Woodland edge trees, tall	-	6	113
W72	Oak, ash, sycamore	25	70	Mature	-	A	Barn Copse. ASNW. Holly dominating understory, some regeneration	-	8.4	222

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
W73	Alder, willow, birch	15	30	Maturing	-	C	Wet, woodland area adjacent to rugby club, small poor trees of low quality	Fell part	3.6	41
T74	Oak	14	80	Mature	-	B	Some limb failures	-	9.6	290
G75	Thorn, hazel, sycamore	8	30	Maturing	-	C	Linear group	-	3.6	41
T76	Oak	18	90	Mature	-	A	Some deadwood, wet and marshy ground	-	10.8	366
T77	Oak	18	90	Mature	-	A	Open grown	-	10.8	366
T78	Oak	20	100	Mature	-	A	Some deadwood and limb failure	-	12	452
T79	Oak	22	100	Mature	-	A	Twin stemmed at 7m, minor deadwood	-	12	452
G80	Alder, oak, ash	20	67.5	Mature	-	B	Group in wet area, oaks on drier ground	-	8.1	206
T81	Oak	22	90	Mature	-	A	Twin stemmed at 10m	-	10.8	366
G82	Holly	5	40	Mature	-	C	Small trees	-	4.8	72
T83	Oak	20	75	Mature	-	A	Minor deadwood	-	9	254
T84	Oak	22	70	Mature	-	B	Dieback and in decline	-	8.4	222
T85	Sycamore	18	75	Maturing	-	B	Multi stemmed from base	-	9	254
T86	Sweet chestnut	22	85	Mature	-	B	Minor deadwood	-	10.2	327
T87	Oak	18	45	Mature	-	C	Suppressed and one sided	-	5.4	92
T88	Holly	5	30	Mature	-	C	-	-	3.6	41
G89	Holly, hawthorn	8	42.5	Mature	-	C	Multi stemmed from base, close grown	-	5.1	82
W90	Oak, sycamore, birch	25	80*	Mature	-	A	Slockett's Copse. ASNW. Mixed deciduous woodland, with holly dominated understorey	-	9.6	290

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T91	Oak	16	45	Mature	-	B	One sided due to adjacent willow	-	5.4	92
G92	Willow, thorn	6	25	Maturing	-	C	Overgrown hedge	-	3	28
T93	Oak	14	50	Mature	-	C	Lost top, in decline	-	6	113
G94	Oak, birch	14	40	Mature	-	B	-	-	4.8	72
G95	Ash, willow, thorn, birch	6	35	Mature	-	C	Leaning, shrub and small trees	-	4.2	55
G96	Willow, alder, oak	15	50	Mature	-	B	Linear group of good trees	-	6	113
W97	Oak, birch, sycamore, ash	25	80	Mature	-	A	High Wood. ASNW. Holly understorey	-	9.6	290
G98	Alder	16	60	Mature	-	C	Multi stemmed, in decline, significant deadwood, old	-	7.2	163
T99	Oak	14	60	Mature	-	B	Twin stemmed at 2m	-	7.2	163
T100	Oak	15	45	Mature	-	B	Twin stemmed at 6m	-	5.4	92
T101	Hawthorn	6	42.5	Mature	-	C	Small trees	-	5.1	82
T102	Oak	20	70	Mature	-	B	Twin stemmed from 5m	-	8.4	222
T103	Oak	18	50	Mature	-	B	Twin stemmed at 5m	-	6	113
T104	Oak	22	75	Mature	-	A	Minor deadwood	-	9	254
G105	Sycamore	8	25	Maturing	-	C	Growing over railings	-	3	28
T106	Sycamore	8	30	Maturing	-	C	Twin stemmed at 4m, tight fork union	-	3.6	41
T107	Hawthorn	8	50	Over-mature	-	C	Twin stemmed at base, old tree	-	6	113
G108	Thorn	6	30	Maturing	-	C	Overgrown hedge	Fell part	3.6	41
T109	Wild cherry	14	70	Mature	-	U	Dead, significant decay and canker	Fell for management	8.4	222
G110	Ash, sycamore	12	40	Maturing	-	B	Line of trees within hedge	-	4.8	72
T111	Oak	20	90	Mature	-	B	Significant deadwood, potential veteran	-	10.8	366

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
W112	Oak, birch, sycamore	25	80	Mature	-	A	Crooks Copse. ASNW. Holly understorey	-	9.6	290
G113	Hawthorn	4	37.5	Mature	-	C	Small trees	-	4.5	64
T114	Oak	20	120	Mature	-	A	Deadwood present, overgrown	-	14.4	651
H115	Thorn, oak, ash	2	15	Maturing	-	C	Clipped hedge with occasional standard trees	Fell part	1.8	10
T116	Oak	12	90	Over-mature	-	U	Dead	Fell for management	10.8	366
G117	Thorn, ash, field maple, goat willow	2	20	Young	-	C	Clipped hedge, scrub and small trees	Fell part	1.8	10
T118	Oak	10	45*	Maturing	-	B	Roadside tree, wide open canopy	-	4.2	55
T119	Oak	10	50*	Maturing	-	B	Roadside tree, wide open canopy	-	4.2	55
G120	Oak, ash, hawthorn	25	125	Mature	-	B	Multi stemmed from base, evidence of Inonotus infection on ash, one dead ash stem close to oak	-	15	707
T121	Oak	18	90	Mature	-	A	Burrs on stem, veteran potential	-	10.8	366
T122	Oak	18	100	Mature	-	A	Some deadwood, veteran potential	-	12	452
T123	Ash	20	100	Mature	-	A	Twin stemmed at 4m, some deadwood	-	12	452
G124	Oak, ash	10	37.5	Maturing	-	B	Twin stemmed from base	-	4.5	64
T125	Oak	25	120	Mature	-	A	Some deadwood, off site	-	14.4	651
T126	Oak	25	90	Mature	-	A	Minor deadwood. Off site	-	10.8	366

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T127	Oak	25	150	Over-mature	-	U	Significant decay and deadwood, candidate for veteranisation. Veteran tree on ATI, modify RPA to 22.5m radius.	Manage for safety in discussion with ecologist	22.5	1590
T128	Oak	25	160	Over-mature	-	A	Veteran tree on ATI, RPA modified to 24m	-	24	1810
T129	Oak	16	90	Over-mature	-	C	Twin stemmed from base, significant decline and deadwood, candidate for veteranisation	-	10.8	366
T130	Oak	16	100	Over-mature	-	C	Deadwood and decline, possibility to pollard to retain as veteran	-	12	452
G131	Oak	14	50	Maturing	-	B	Good trees in group	-	6	113
T132	Oak	10	40	Maturing	-	B	-	-	4.8	72
T133	Oak	20	130	Over-mature	-	A	Deadwood and limb failure, veteran tree on ATI, modify RPA to 19.5m radius	-	19.5	1195
G134	Ash, hazel, thorn	12	37.5	Mature	-	C	Overgrown coppiced stools, and multi stemmed trees, former hedge, off-site	-	4.5	64
T135	Oak	20	80	Mature	-	A	Off-site	-	9.6	290
T136	Oak	18	70	Mature	-	B	Ivy clad, off site	-	8.4	222
T137	Ash	18	55	Mature	-	B	Off site	-	6.6	137
G138	Sycamore, horse chestnut	18	60	Mature	-	B	Behind old cow shed, ivy clad	-	7.2	163
G140	Sycamore, ash	10	25	Maturing	-	C	Roadside trees on edge of footpath	-	3	28

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
G141	Mixed trees	2	10	Young	-	C	New shelter belt plantation	-	1.2	5
T142	Oak	14	65	Mature	-	B	In decline, significant deadwood, potential veteran	-	7.8	191
T143	Oak	22	130	Over-mature	-	A	Large open canopy, re-trenching crown	-	15	707
G144	Ash	18	50	Mature	-	B	Two stems, deadwood throughout	-	6	113
T145	Oak	20	80	Mature	-	A	Large deadwood	-	9.6	290
T146	Oak	20	110	Over-mature	-	A	Beginning to re-trench, veteran potential	-	13.2	547
G147	Birch, oak, ash	6	20	Maturing	-	C	Declining trees	-	2.4	18
T148	Oak	22	110	Mature	-	A	Minor deadwood, good tree	-	13.2	547
T149	Oak	20	130	Over-mature	-	B	Significant deadwood, lost leader, pollard to retain	-	15	707
T150	Oak	25	110	Mature	-	A	Minor deadwood throughout	-	13.2	547
T151	Oak	20	90	Over-mature	-	U	Significant decay at base and stem, significant deadwood, next to roadside	Fell or pollard to make safe	10.8	366
T152	Oak	25	100	Mature	-	A	Deadwood throughout, roadside tree	-	12	452
T153	Oak	25	150	Over-mature	-	C	Significant decay and deadwood, pollard to retain	-	15	707
T154	Oak	20	100	Over-mature	-	U	Dead	Fell or pollard to make safe	12	452

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T155	Oak	25	140	Over-mature	-	A	Excellent tree	-	15	707
T156	Alder	10	40	Maturing	-	C	Twin stemmed tree at 1m	-	4.8	72
W157	Alder	20	75	Mature	-	B	Streamside woodland, linear shape	-	9	254
T158	Oak	20	120	Over-mature	-	A	Re-trenching crown	-	14.4	651
T159	Oak	18	130	Over-mature	-	B	Re-trenching crown	-	15	707
T160	Oak	20	120	Over-mature	-	A	Veteran	-	18	1018
W161	Oak, alder, sycamore	22	55	Mature	-	A	Waterleaze Copse. ASNW. Wet linear woodland, pond within, one rogue cedar, holly understorey	-	6.6	137
G162	Oak, sycamore	14	35	Maturing	-	B	Individuals and smaller regenerating trees	-	4.2	55
T163	Oak	22	80	Mature	-	A	Deadwood	-	9.6	290
T164	Oak	16	60	Mature	-	B	One sided canopy, old tree	-	7.2	163
G165	Oak, sycamore, birch, thorn	8	20	Young	-	C	Regeneration	-	2.4	18
T166	Oak	18	75	Over-mature	-	A	Veteran, significant deadwood, re-trenching crown	-	11.3	398
T167	Oak	12	55	Mature	-	B	Significant deadwood, stunted form	-	6.6	137
G168	Oak, birch, willow	10	25	Maturing	-	B	Good potential	-	3	28
H169	Thorn	4	15	Maturing	-	C	Hedge	Fell part	1.8	10
G170	Ash	16	37.5	Maturing	-	C	Multi stemmed from base, ivy clad	-	4.5	64

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
G171	Sycamore	8	20	Maturing	-	C	Small trees	-	2.4	18
T172	Sycamore	20	100	Over-mature	-	U	Moribund, significant deadwood and decay, fell or pollard	Fell or pollard to make safe	12	452
T173	Ash	20	90	Over-mature	-	U	Significant decay and deadwood	Fell or pollard to make safe	10.8	366
T174	Oak	20	90	Mature	-	B	Woodland edge, some deadwood	-	10.8	366
G175	Oak	8	30	Maturing	-	B	Potential	-	3.6	41
G176	Oak, ash, sycamore	20	90	Mature	-	B	Mixed size and age range	-	10.8	366
G177	Oak, ash, various	20	75	Mature	-	B	Linear group alongside road, not shown on topo	-	9	254
T178	Lime	18	70	Mature	-	B	Multi stemmed at 3m, minor deadwood, ivy clad	-	8.4	222
T179	Lime	18	65	Mature	-	B	Ivy clad, minor deadwood	-	7.8	191
T180	Lime	8	60	Mature	-	C	Small, suppressed, twin stemmed at 1.5m, ivy clad	-	7.2	163
H181	Red horse chestnut	5	20	Maturing	-	C	Small ornamental tree in front garden	-	2.4	18
T182	Hawthorn, horse chestnut, ash	2	15	Mature	-	C	Clipped boundary hedge	-	1.8	10
T183	Scots pine	8	40	Mature	-	C	Stunted, small and poorly formed	-	4.8	72
T184	Scots pine	20	80	Mature	-	U	Dead	Fell for management	9.6	290
T185	Lime	20	60	Mature	-	B	Ivy clad, narrow crown, minor deadwood	-	7.2	163
T186	Lime	20	60	Mature	-	B	-	-	7.2	163

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T187	Lime	18	70	Mature	-	B	Ivy clad, narrow crown, minor deadwood	-	8.4	222
T188	Lime	15	55	Mature	-	B	Ivy clad, minor deadwood	-	6.6	137
T189	Lime	16	70	Mature	-	B	Twin stemmed at 1m, minor deadwood	-	8.4	222
T190	Scots pine	20	65	Mature	-	B	Minor deadwood	-	7.8	191
T191	Horse chestnut	15	40	Mature	-	U	Advanced decline, significant dieback and deadwood	Fell for management	4.8	72
T192	Scots pine	15	40	Mature	-	C	Small, one sided	-	4.8	72
T193	Horse chestnut	15	50	Mature	-	B	Partially suppressed by adjacent trees	-	6	113
T194	Scots pine	18	40	Mature	-	B	One sided crown	-	4.8	72
T195	Turkey oak	20	70	Mature	-	B	Twin stemmed from base, leaning, overhanging road, one sided crown	-	8.4	222
T196	Scots pine	18	60	Mature	-	U	Twin stemmed at 5m, lost branches and large wounds, poor structure at fork	Fell for management	7.2	163
T197	Lime	20	60	Mature	-	B	Ivy clad, minor deadwood	-	7.2	163
T198	Leyland cypress	17	50	Maturing	-	B	Dense crown	-	6	113
T199	Turkey oak	22	90	Mature	-	A	Twin stemmed at 3m, leaning and overhanging road junction, minor deadwood	-	10.8	366
H200	Hawthorn, Turkey oak, beech, sycamore, yew, hazel, holly	2	15	Mature	-	C	Clipped boundary hedge	-	1.8	10

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T201	Beech	12	45	Mature	-	B	-	-	5.4	92
G202	Lawson cypress	10	60	Mature	-	C	Multi stemmed, ornamental planting, deadwood	-	7.2	163
T203	Yew	7	60	Mature	-	C	Small trees	-	7.2	163
H204	Leyland cypress	2.5	10	Maturing	-	C	Clipped hedge	-	1.2	5
H205	Leyland cypress	3	15	Maturing	-	C	Clipped hedge	-	1.8	10
T206	Scots pine	12	45	Maturing	-	C	Dense, ivy clad, roadside	-	5.4	92
T207	Leyland cypress	8	20	Maturing	-	C	Small	-	2.4	18
G208	Lawson cypress	14	45	Mature	-	C	Multi stemmed	-	5.4	92
T209	Sycamore	6	20	Maturing	-	C	-	-	2.4	18
T210	Atlantic cedar	5	25	Maturing	-	C	-	-	3	28
T211	Field maple	5	30	Maturing	-	C	Dense	-	3.6	41
T212	Scots pine	10	50	Mature	-	B	Leaning, minor deadwood	-	6	113
T213	Leyland cypress	12	40	Maturing	-	C	-	-	4.8	72
T214	Turkey oak	16	60	Mature	-	B	-	-	7.2	163
T215	Scots pine	16	65	Mature	-	B	-	-	7.8	191
T216	Scots pine	18	55	Mature	-	C	Limb failure, poor	-	6.6	137
T217	Plum	6	35	Mature	-	C	Small	-	4.2	55
T218	Field maple	6	25*	Maturing	-	C	Wire fence growing through the stem, shelter belt planting	Fell	3	28
T219	Field maple	6	20	Maturing	-	C	Amenity planting	Fell	2.4	18
T220	Ash	6	20	Maturing	-	C	Twin stemmed at 1.5m	Fell	2.4	18
T221	Ash	6	20	Maturing	-	C	-	Fell	2.4	18
T222	Oak	18	90	Mature	-	A	Ivy clad, roadside tree	-	10.8	366
G223	Ash	6	20	Maturing	-	C	-	Fell	2.4	18
T224	Oak	15	110	Over-mature	-	U	Poor, recent heavy pruning	-	13.2	547

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T225	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
T226	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
T227	Field maple	6	25	Maturing	-	C	-	Fell	3	28
T228	Ash	6	20	Maturing	-	C	-	Fell	2.4	18
T229	Oak	8	40	Maturing	-	C	Small, twin stemmed at 2m	-	4.8	72
T230	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
T231	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
T232	Ash	6	20	Maturing	-	C	Twin stemmed at 1.5m	Fell	2.4	18
T233	Oak	20	90	Mature	-	A	Twin stemmed at 3m	-	10.8	366
G234	Ash, field maple	6	20	Maturing	-	C	Many dense stems	Fell part	2.4	18
G235	Oak	12	60	Mature	-	C	Ivy clad, poor	-	7.2	163
T236	Field maple	8	25	Maturing	-	C	-	Fell	3	28
G237	Ash	6	20	Maturing	-	C	-	-	2.4	18
T238	Field maple	6	20	Maturing	-	C	-	-	2.4	18
T239	Field maple	6	25	Maturing	-	C	-	-	3	28
T240	Field maple	8	30	Maturing	-	C	Multi stemmed at 1m	-	3.6	41
T241	Field maple	6	25	Maturing	-	C	Twin stemmed at 1.5m	-	3	28
T242	Ash	7	20	Maturing	-	C	-	-	2.4	18
T243	Ash	6	20	Maturing	-	C	Twin stemmed at 0.5m	-	2.4	18
G244	Ash	7	20	Maturing	-	C	Poor	-	2.4	18
T 245	Ash	8	15	Maturing	-	C	Small	-	1.8	10
T246	Ash	8	15	Maturing	-	C	Small	Fell	1.8	10
T247	Field maple	6	20	Maturing	-	C	-	Fell	2.4	18
G248	Field maple, ash	6	20	Maturing	-	C	Dense	Fell part	2.4	18
G249	Field maple, ash	6	20	Maturing	-	C	Dense	-	2.4	18
T250	Fastigiate hornbeam	6	20	Maturing	-	C	Dense, multi stemmed	-	2.4	18
T251	Ash	6	20	Maturing	-	C	-	-	2.4	18
T252	Ash	6	20	Maturing	-	C	-	-	2.4	18

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T253	Fastigiate hornbeam	6	40	Maturing	-	C	Dense, multi stemmed	-	4.8	72
T254	Ash	6	20	Maturing	-	C	-	-	2.4	18
T255	Ash	6	20	Maturing	-	C	-	-	2.4	18
T256	Ash	6	20	Maturing	-	C	-	-	2.4	18
T257	Fastigiate hornbeam	5	40	Maturing	-	C	Dense, multi stemmed	-	4.8	72
T258	Ash	6	20	Maturing	-	C	-	-	2.4	18
T259	Ash	6	25	Maturing	-	C	-	-	3	28
T260	Ash	6	15	Maturing	-	C	Slender	-	1.8	10
T261	Fastigiate hornbeam	7	40	Maturing	-	C	Dense, multi stemmed	-	4.8	72
T262	Ash	6	25	Maturing	-	C	Twin stemmed at 2m	-	3	28
T263	Ash	6	20	Maturing	-	C	-	-	2.4	18
T264	Ash	6	20	Maturing	-	C	-	-	2.4	18
T265	Ash	6	20	Maturing	-	C	Twin stemmed at 0.5m	-	2.4	18
T266	Gingko	5	15	Young	-	C	Small	-	1.8	10
T267	Ash	7	20	Maturing	-	C	Twin stemmed at 2m	-	2.4	18
T268	Oak	8	42.5	Maturing	-	C	Two stems	-	5.1	82
T269	Ash	8	20	Maturing	-	C	Small, poor	-	2.4	18
G270	Hazel, cherry, ash, field maple	4	10	Young	-	C	Group	-	1.2	5
G271	Ash, field maple, hawthorn	4	20	Maturing	-	C	Dense	-	2.4	18
T272	Oak	20	80	Mature	-	B	Ivy clad	-	9.6	290
T273	Yew	8	60	Mature	-	B	-	-	7.2	163
G274	Leyland cypress	4	30	Maturing	-	C	Clipped and topped hedge	-	3.6	41
T275	Oak	20	75	Maturing	-	B	Ivy clad	-	9	254
T276	Oak	20	80	Maturing	-	B	Ivy clad	-	9.6	290
G277	Holly, cypress	6	20	Maturing	-	C	Behind wall	-	2.4	18
G278	Sycamore	18	50	Mature	-	B	Multi stemmed, ivy clad	-	6	113
T279	Scots pine	10	40	Maturing	-	B	-	-	4.8	72

Appendix 2: Tree schedule and explanatory notes

Tree No	Species	Height (m)	Diameter (cm) @ 1.5m	Maturity	Low Branches	Category	Notes	Tree Works	RPA radius (m)	RPA area (m2)
T280	Oak	8	40	Maturing	-	B	Multi stemmed	-	4.8	72
G281	Scots pine	3	10	Young	-	C	Small	-	1.2	5
G282	Birch	4	10	Young	-	C	Small trees	-	1.2	5
G283	Ash, cherry, sycamore, birch	12	25	Maturing	-	B	Dense group	-	3	28
G284	Field Maple	5	20	Young	-	C	Small, poor	-	2.4	18
T285	Whitebeam	5	30	Maturing	-	C	-	-	3.6	41
T286	Cherry	4	10	Young	-	C	-	-	1.2	5

Appendix 2: Tree schedule and explanatory notes

Explanatory Notes

- **Abbreviations:**

G	:	Group
H	:	Hedge
T	:	Tree
W	:	Woodland

- **Botanical tree names:**

Alder	:	*Alnus glutinosa*
Ash	:	*Fraxinus excelsior*
Atlantic cedar	:	*Cedrus libani 'Atlantica'*
Beech	:	*Fagus sylvatica*
Birch	:	*Betula pendula*
Cherry	:	*Prunus* sp
Crack willow	:	*Salix fragilis*
Cypress	:	*Chamaecyparis/Cupressus* sp
Elm	:	*Ulmus* sp
Fastigiate hornbeam	:	*Carpinus betulus fastigiata*
Field maple	:	*Acer campestre*
Gingko	:	*Gingko biloba*
Goat willow	:	*Salix caprea*
Hawthorn	:	*Crataegus monogyna*
Hazel	:	*Corylus avellana*
Holly	:	*Ilex aquifolium*
Hornbeam	:	*Carpinus betulus*
Horse chestnut	:	*Aesculus hippocastanum*
Larch	:	*Larix* sp
Lawson cypress	:	*Chamaecyparis lawsoniana*
Leyland cypress	:	*X cuprocyparis leylandii*
Lime	:	*Tilia* sp
Oak	:	*Quercus robur*
Plum	:	*Prunus* sp
Red horse chestnut	:	*Aesculus x carnea*
Scots pine	:	*Pinus sylvestris*
Sweet chestnut	:	*Castanea sativa*
Sycamore	:	*Acer pseudoplatanus*
Thorn	:	*Crataegus* sp *or Prunus* sp
Turkey oak	:	*Quercus cerris*
Whitebeam	:	*Sorbus intermedia*
Wild cherry	:	*Prunus avium*
Willow	:	*Salix* sp
Yew	:	*Taxus baccata*

- **BS 5837 (2012) compliance:** All data has been collected based on the recommendations set out in subsection 4.4 of BS 5837.
- **Tree inspections and site limitations:** Each tree was subjected to a quick visual check level of inspection. Where there is restricted access to the base of a tree, its attributes are assessed from the nearest point of access. Climbing inspections are not carried out during this level of inspection and, if heavy ivy is present, tree condition is assessed from what can be seen from the ground. A separate note is recorded if further investigation may be required to clarify its status.
- **Crown spreads:** Crown spread dimensions are not listed in the tree schedule because they are illustrated on the land survey base to all the plans in this document. Where crown spreads of significant trees on site are found to deviate from those shown on the provided land survey, we have noted it in the text of the report and annotated it on our plans.

Appendix 2: Tree schedule and explanatory notes

- **Dimensions:** All dimensions are estimated unless annotated with a '*'.
- **Species:** Species identification is based on visual observations. Where there is some doubt over tree identity, sp is noted after the genus name to indicate that the species cannot be reliably identified at the time of the survey. Where there is more than one species in a group, only the most frequent are noted and not all the species present may be listed.
- **Height:** Height is estimated to provide a broad indication of the size of the tree.
- **Trunk diameter:** Trunk diameter is estimated or measured and recorded in 2.5cm increments as advised in BS 5837 Table D1. It is measured with a diameter tape unless access is restricted, direct measurement is not possible because of ivy on the trunk or the tree is assessed as low quality. The point of measurement and the adjustments for stem variations are as advised in Figure C1 of BS 5837.
- **Maturity:** In planning context, maturity provides a simplistic indication of a tree's ability to cope with change and its potential for further growth. For the purposes of this report, young indicates a potential to significantly increase in size and a high ability to cope with change, maturing indicates some potential to increase in size and a medium ability to cope with change, and mature indicates little potential to increase in size and limited ability to cope with change.
- **Low branches:** Any low branches that would not be feasible for removal during normal management and should be considered as a design constraint are noted here and explained in the notes.
- **Category:** Our assessment automatically considered tree physiological/structural condition (BS 5837, 4.4.2.5h), and so these are not listed separately in the schedule. Additionally, the category accounts for the remaining contribution (BS 5837, 4.4.2.5i) as greater than 40 years for A trees, greater than 20 years for B trees, at least 10 years for C trees and less than 10 years for U trees, so this is also not listed separately in the schedule. Category A, B and C trees are automatically listed as sub-category 1 unless otherwise stated.
- **Notes:** Only relevant features relating to physiological or structural condition and low branches that may help clarify the categorisation are recorded. If there are no notes, then the presumption should be that no relevant features were observed.
- **Tree works:** The recommended tree works are based on the quick visual check level of inspection and only intended to address significant hazards identified during that inspection. The following points should also be considered before carrying out any works:
    1. **Reporting during work operations:** In the context of the preliminary nature of the tree inspection, any defects that may affect tree safety discovered by the contractor when carrying out the work recommendations should be reported to the supervising officer. Modification to the schedule of works may be required because of these reports. The contractor should be specifically instructed on this point.
    2. **Implementation of works:** All tree works should be carried out to BS 3998 *Recommendations for Tree Work* as modified by more recent research. It is advisable to select a contractor from the local authority list and preferably one approved by the Arboricultural Association. Their Register of Contractors is available free from The Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire GL10 3DL; phone 01242 522152; website www.trees.org.uk.
    3. **Statutory wildlife obligations:** The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 provides statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions and advice from an ecologist must be obtained before undertaking any works that might constitute an offence.
    4. **Stumps:** Stumps to be removed within the RPAs of retained trees should be ground out with a stump grinder to minimise any disturbance unless otherwise authorised by the supervising officer.
- **Future tree safety inspections:** Due to the time that may elapse between the original survey and the start of development, all trees should be re-inspected as part of the standard risk management process before any works start on site. Our assessment of the trees was carried out on the basis that a re-inspection would be carried out within a year of the assessment visit and our advice on tree condition must be reviewed annually from the date of that visit.

Appendix 3: QR Codes for SGNs (Scan with reader to download)

SGN1 *Monitoring tree protection*	SGN2 *Fencing protected trees*	SGN3 *Ground protection*
SGN4 *Pollution control*	SGN5 *Site cranes & piling rigs*	SGN6 *Height restrictions*
SGN7 *Excavating in RPAs*	SGN8 *Removing surfacing and structures in RPAs*	SGN9 *Installing/upgrading surfacing in RPAs*
SGN10 *Installing structures in RPAs*	SGN11 *Installing services in RPAs*	SGN12 *Landscaping in RPAs*

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Tree protection plan
Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

barrell TREE CONSULTANCY

Barrell Plan Ref: 14281-BT15 a

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TX	BS category A	Trees of high quality
TX	BS category B	Trees of moderate quality
TX	BS category C	Trees of low quality
TX	BS category U	Trees unsuitable for retention
TX	Trees to be removed	

Estimated tree positions not included on original land survey and/or adjusted crown spreads

Protective barrier/fencing

Construction exclusion zone (CEZ)

Root protection area (RPA) boundaries for category A and B trees

KEY - to be read in conjunction with plans PP03 and PP04

Sandleford Park Application Boundary

Extent of Allocation

LAND USE

Proposed Development Footprint Residential

Proposed Development Footprint Elderly Residential

Local Centre Comprising of Flexible Mixed Uses (Use Classes A1 - A5, B1a, D1 and C3)

Maximum Extent of the Location of Mixed Uses within the Local Centre

Education Land

1. Proposed 2 Form Entry Primary School
2. Area of land safeguarded for expansion of Park House School
3. Proposed Primary School

Park House School (PHS) Expansion Land for 4G Adult Pitch

4G Pitch Car Parking & School Drop Off Area

Swings & Smiles - Specialist Care Facility

ACCESS

Proposed Access Points for 'All Traffic Modes'

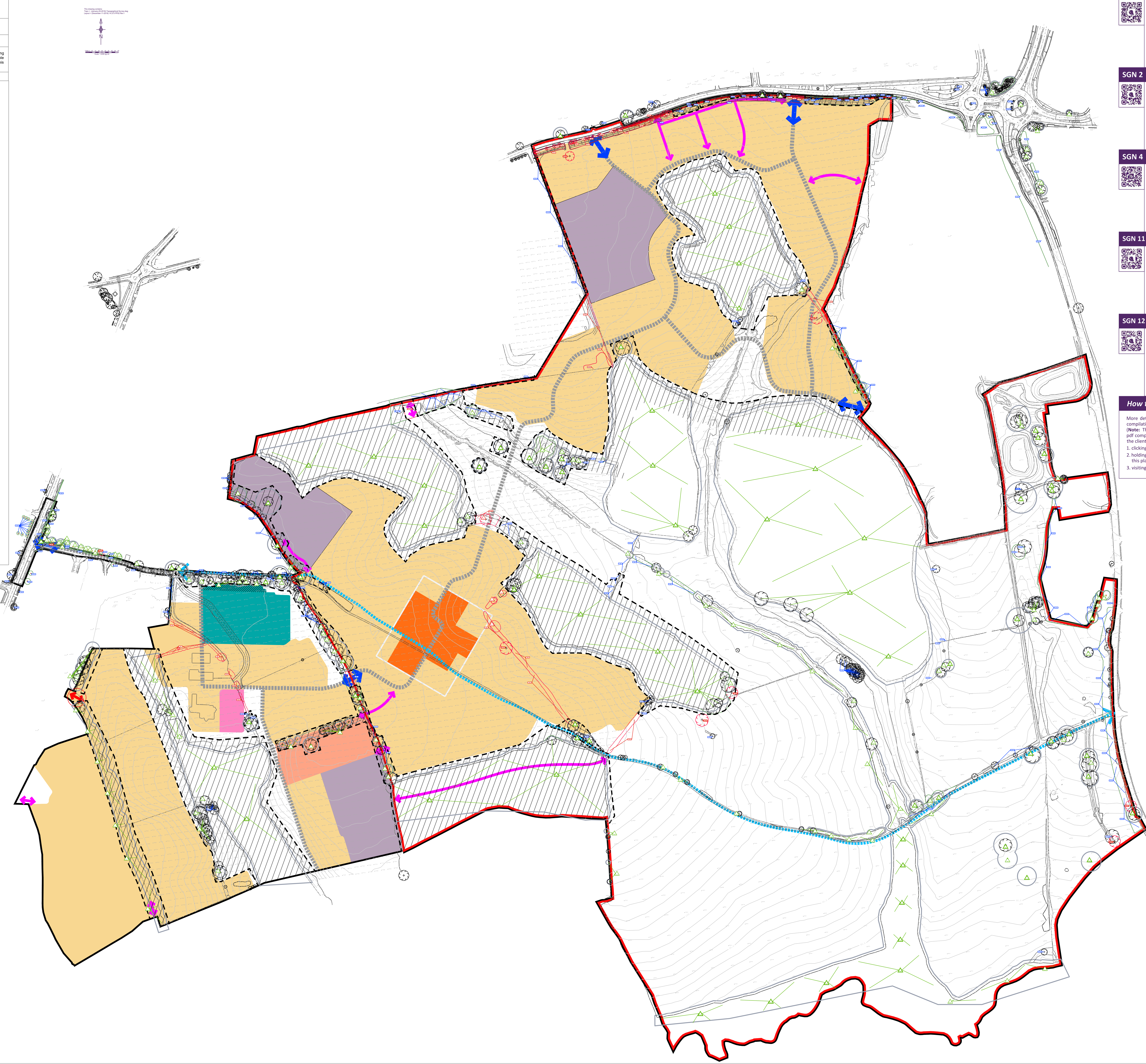
Proposed Main Access Road (Indicative alignment)

Existing Public Footpath Retained and upgraded as a shared footpath cycle link

Proposed Key Footpath/Cycle Links

Emergency Access

Indicative Access to School



SGN 1 *Monitoring tree protection*

Always:

- ✓ have a pre-commencement meeting with the tree consultant before development starts
- ✓ use the tree consultant to regularly check that protection remains fit for purpose
- ✓ use the tree consultant to supervise work in RPAs
- ✓ keep a written record of supervision

SGN 2 *Fencing protected trees*

Always:

- ✓ install protection before development starts
- ✓ make sure protection is fit for purpose, i.e. it prevents damage to trees and soil
- ✓ keep protection in place until there is no risk to trees
- ✓ get written permission to move or remove any protection

SGN 4 *Pollution control*

Always:

- ✓ keep toxic products away from RPAs

SGN 11 *Installing services in RPAs*

Always:

- ✓ use the tree consultant to supervise work in RPAs
- ✓ select the least damaging option when installing services, so prioritise trenchless, over broken trench over continuous trench
- ✓ hand-dig trenches if trenchless is not feasible

SGN 12 *Landscaping in RPAs*

Always:

- ✓ use the tree consultant to supervise work in RPAs
- ✓ avoid raising ground levels within 1m of the trunks of retained trees

How to use plan

More detailed guidance on each Site Guidance Note (SGN) can be found in a printed hard copy compilation of all the SGNs, issued to the Site Manager at the pre-commencement site meeting (**Note:** This should be retained on site throughout the duration of works). Additionally, an electronic pdf compilation of all the SGNs, was submitted with this drawing to the local planning authority and the client. Alternatively, a pdf of each SGN can be downloaded by:

1. clicking the image links in the electronic pdf version of this plan;
2. holding a mobile phone QR (Quick Response) code reader over the QR code in the paper version of this plan; or,
3. visiting our website at *https://www.barrelltreecare.co.uk/resources/technical-guidance*

Tree protection plan

Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

Barrell Plan Ref: 14281-BT15 b

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www.barrelltreecare.co.uk

Tree protection plan
Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

Barrell Plan Ref: 14281-BT15 c

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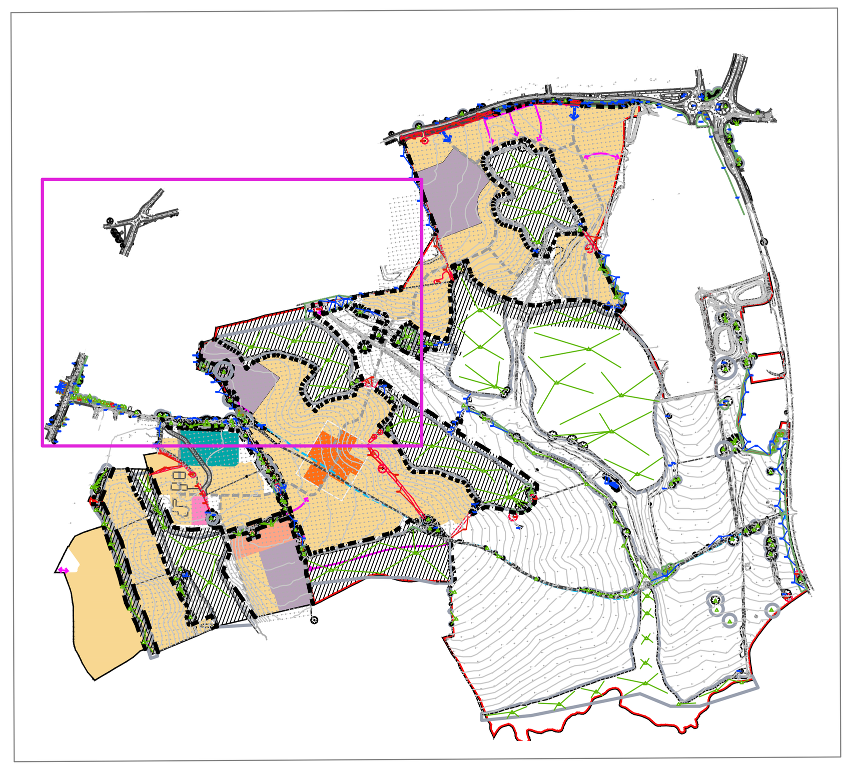

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Tree protection plan
Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

Barrell Plan Ref: 14281-BT15 e

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Tree protection plan
Location of trees, categorisation & protection/management proposals at Sandleford Park, Newbury

barrell TREE CONSULTANCY

Barrell Plan Ref: 14281-BT15 f

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Appendix 4

Consultation comments of LPA tree officer. Undated and unnamed.

Planning Application No: 20/01238/OUTMAJ

Proposal: **Outline planning permission for up to 1,000 new homes; an 80 extra care housing units (Use Class C3) as part of the affordable housing provision; a new 2 form entry primary school (D1); expansion land for Park House Academy School; a local centre to comprise flexible commercial floorspace (A1-A5 up to 2,150 sq m, B1a up to 200 sq m) and D1 use (up to 500sq m); the formation of new means of access onto Monks Lane; new open space including the laying out of a new country park; drainage infrastructure; walking and cycling infrastructure and other associated infrastructure works. Matters to be considered: Access.**

Address: **Sandleford Park, Newtown Road, Newtown, Newbury**

Documents Seen:

- Environmental Statement Non-Technical Summary
- Environmental Statement Vol. 3 Appendix G11a and G11b: Arboricultural Impact Appraisal and Method Statement Sandleford Park 10th January 2020 14281-AA7-CA by Chris Allder
- Strategic Landscape and Green Infrastructure Plan (drawing no. 04627.00005.16.632.13) ES VOL 2 Fig 4.3
- Country Park Phasing Plan (drawing no. 04627.00005.16.306.15) ES VOL 2 Fig 7.7
- Parameter Plan – Green Infrastructure Plan dated 03/02/2020 drawing no.: 14.273/PP03 Rev. G1 ES VOL 2 Fig 4.2
- SLR HISTORIC LANDSCAPE AND FEATURES – ES Vol. 2 Figure 7.5 (drawing no.04627.00005.16.605.0)
- BOYER Land Use and Access Plan Parameter Plan (drawing no. 14.273/PP02 Rev H1)
- BOYER Illustrative Layout DWG. No. 171 Job No. 14.273
- Vectos Eastern Site access 172985/A/07.1
- Vectos Western Site access 172985/A/08
- WYG Appendix F17: Woodland National Vegetation Classification Survey Report
- G8 – Schedule of Tree and Plant Species
- Sandleford Park Supplementary Planning Document March 2015
- Sandleford Park, Newbury ES Appendix G7 – LGIDMP
- Appendix I4 – Conservation Audit
- Air Quality Assessment January 2020

Observations

Since my previous comments on applications 16/03309/OUTMAJ, 18/00764/OUTMAJ and 18/00828/OUTMAJ two important documents both national and locally have to be considered:

- **National Planning Policy Framework February 2019**

  And the

- **West Berkshire Councils Environment Strategy 2020-2030**

<u>National Planning Policy Framework revised: February 2019</u>

The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced.

Section 175 c. states 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[58] and a suitable compensation strategy exists;

Footnote 58, defines exceptional reasons as follows: "For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat."

<u>West Berkshire Councils Environment Strategy 2020-2030</u>

• West Berkshire Council declared a Climate Emergency on 2nd July 2019. In doing so highlighted the fact that the Council, our partners and our local communities all needed to play their part in response.

• Strategic plan for West Berkshire, that aims to deliver carbon neutral by 2030.

The council's vision is to:

This strategy has a primary target of achieving carbon neutrality by 2030. Mitigation of the effects of climate change and the restoration and protection of our environment will have shaped our policy making and actions, as well as those of our partners, and will have made a significant impact on the district's carbon footprint. Our environmental assets will have been protected for future generations.

4.1 Key targets to deliver the Vision for the Environment

4.1.2 Carbon Neutrality will be achieved by a range of local energy generation and carbon sequestration

Examples will include solar and wind energy generation and tree planting.

6.1.5 West Berkshire council is Promoting:

- *Woodland creation;*
- *Street tree planting and management;*
- *Orchard planting;*

The Sandleford SPD section L4:

L4. Where possible, all important existing trees and hedgerows will be retained and integrated into the development. All areas of woodland including ancient woodland will be retained and protected.

a) Set backs from woodland - a 15m buffer zone will be provided from all woodland on the site.

This will be measured from the centre of the trunk of the trees on the edge of the woodland.

b) Use of set backs / buffer zones - development of roads or buildings will not be permitted within the buffer zones. They can be used for informal recreation and planting and informal footpaths. Services will only be permitted in buffer zones if they do not impact on root protection zones.

c) Relationship of residential properties to trees - residential properties will either front or side onto areas of ancient woodland and will be set back from the buffer zones to ensure that they receive sufficient light and do not put pressure to lop or fell the existing trees.

General Observations

This application is for Outline planning permission with Matters to be considered: **Access**

With the application at this stage I would expect full details should be submitted in relation to trees/hedges and proposed landscaping with regards to the new proposed accesses shown along Monks Lane.

This would include the location and amount of hedges to be removed, specific details on the loss of the trees and detailed replacement planting to mitigate for the loss of hedges/trees/shrubs.

As the planning proposal for remainder is outline, I would suggest general heads of terms in accordance with the British Standard 5837:2012 Trees in relation to design, demolition and construction Recommendations should be included in the Arboricultural Impact Assessment and Method statement, along with tree protection plans and locations for new planting.

The application includes the submission of an Arboricultural Impact Appraisal and Method Statement for Sandleford Park by Barrell Tree Consultancy written by Chris Alder dated 10th January 2020. This shows the trees that are within the development site and adjacent that could be impacted on by the proposal.

As far as I can find there are no specific details within the Arboricultural Assessment and Method Statement regarding the specific accesses shown on the Vectos access plans: Eastern Site access 172985/A/07.1, Western Site access 172985/A/08.

- **Monks Lane Access**
    - Western Site Access – Roundabout – significant amount of hedge loss, not shown on the Arboricultural Impact Assessment, no additional planting shown to compensate for loss of trees. The Arboricultural Assessment seems to confuse the access points and shows the Western Junction Access (the roundabout) as only removal of a small section of hedgerow. The scale on the plan also seems to be a bit different?
    - Eastern Site Access – A vast amount of hedgerow would be lost over and above what I believe has been shown, no additional tree/hedge planting shown. The Arboricultural Assessment shows approximately 250 metres of hedgerow to be removed though this is not exactly clear as the scale seems a bit different.

  The current hedgerow and trees are highly significant in visual terms as you drive down Monks Lane, the proposed removal of in excess of 250+ metres without adequate and substantial mitigation of replacement planting of tree and hedge species at this stage would be detrimental to the area – This in my view is unacceptable.

- **Ancient woodlands**

  Ancient woods are defined in the UK as areas that have been continuously wooded since 1600. Ancient woods have been used by humans for centuries, providing timber and grazing for livestock and can be subdivided into two types:

Ancient Semi-Natural Woodland (ASNW), which is composed of native trees and shrubs, though it may have been previously managed.

Plantations on Ancient Woodland Sites (PAWS), which were planted with (often non-native) broadleaved trees and conifers after the First and Second World Wars. PAWS are often less biodiverse than ASNW, but can retain some features of ancient woods.

Ancient woodland covers less than 3% of England's land mass.

This site has approximately 25 acres classed as ancient woodland (not PAWS), making it not only an important site locally but nationally.

The current proposal, though only outline at this stage proposes, new tree planting as shown on the Strategic Landscape Green Infrastructure. This will increase the area of planting between Waterlease and Gorse Covert plus the additional planting between Gorse Covert and Dirty Ground Copse. However in my opinion this does not go far enough to minimize the impact of the proposal of the Proposed 1 Form Entry Primary School on the western side which abuts the woodland within the 15m buffer zone. Further isolating Brick Kiln Copse from Gorse Covert.

The Design and Access statement states that the new planting on the site will reflect the 18th century planting as shown on the historic 1877 os map. I cannot find a copy of this map they are trying to emulate, however they have shown a 1882 map which does show a significant amount of more trees than they have shown around Waterleaze and Dirty Copse. Even the historic aerial photos of 1947 shown in the proposal show a vast increase in trees around Waterleaze up until as late as the maps in 1961. Their proposed new tree planting does not go far enough even in accordance with their own submission.

With West Berkshire Councils latest Environment Strategy following the Climate emergency there is a significant recognition that planting of trees will aide in the mitigation the effects of climate change.

By significantly increasing the planting on site and linking the existing ancient woodlands with large scale planting of locally native trees would be in line with the latest West Berkshire Council Environmental Strategy, plan and vision.

Impacts on the Ancient woodlands

The access Road plans show the primary main access road completely isolating Crooks Copse, this road is proposed to be between 13.8m wide and 15m wide as shown in the design and access plans. This is unacceptable due to the isolation of the ancient woodlands. This is not shown or reflected in the Arboricultural impact assessment.

The proposed ‘key cycle path/footpath’ through Gorse Covert running east west linking up with the proposed school will fragment the woodland. This is unacceptable

The Sandleford Park Supplementary Planning Document shows a greater ‘green’ boundary on the South-eastern side of Crooks Copse than shown on the Parameter Plans submitted on this application. Creating a ‘pinch point’ on the southern boundary nearly isolating the woodland.

The road called the ‘Crooks Copse Line’ south of Crooks Copse will cause further fragmentation and an ‘island effect’ of the woodland from the other ancient woodlands, not shown in the Sandleford SPD.

Future pressure will be increased on the ancient woodlands from:

- domestic pets,
- Recreation/ trampling,
- Health and Safety
- Drainage/Hydrology
- Air pollution

<u>Domestic Pets</u>

The potential impact of domestic cats has only been considered on the bird population but it has not been considered on other wildlife populations. The most biological diverse of the woodland is Crooks Copse and this is likely to have the greatest impact by domestic cats.

<u>Recreation/Trampling</u>

Increased recreation through woodlands has been shown and considered on existing footpaths, by adding ballast and creating sections of boardwalks along the wetter parts, but suggests this should be considered on future reserve matters. I disagree and consider this should be considered as part of the pressure on the ancient woodland.

The upgrading of the paths with grasscrete and including street lighting on the public right of way GREE/9/1 shown on the Transport Assessment under Table 8.1 says Improved surfacing and lighting of PROW GREE/9/1, this is also shown as an emergency access with a 3m offset. This is unacceptable and not shown on the lighting assessment or on the Ecological Mitigation Assessment, or Arboricultural Impact Assessment.

Health and Safety

The removal of dead/dying and diseased trees/branches over footpaths and close to property as a result of increased target area will result in the loss of valuable habitat for wildlife.

Drainage/Hydrology

The change in the drainage/hydrology on site is potentially likely to have an impact as the basins and conveyancing channels that will have to be cut into the existing ground, I understand this could lead to a diversion in the route of ground water flows. Impacts will need to be assessed by a drainage expert.

Even in their own Ecological mitigation management plan under section 3.2.1 they admit that the drainage has the potential to impact on the wet woodland.

Air Pollution

The air quality assessment considers there to be a high risk of environmental impact from dust on sites <20m from dust during and demolition, earthworks and construction. With the majority of the roads on the edge of the buffer zones at 15m there is a significant chance that the woodlands will be damaged as a result. The wind rose showing the majority of the wind coming from the south west with up to wind speeds of 20 knots this will blow the throughout the woodlands. Significant measures need to be considered to reduce the impact.

This is not even considered in the ecological mitigation management plan.

Buffer Zone

Although standing advice from Natural England recommends a buffer zone around ancient woodland of at least 15 metres to avoid root damage. Where assessment show other impacts are likely to extend beyond this distance, there is need for a greater buffer zone.

For example, the effect of dust from the construction of this development would result in direct impact on the ancient woodland habitats and must be avoided or compensated for if the need is judged to be truly exceptional; there is no appropriate mitigation for the loss of irreplaceable habitats.

The cumulative effect of factors increase the pressure on the ancient woodland as described have resulted in recent evidence supported by the Woodland Trust's publication; Planning for Ancient Woodland Planners' Manual for Ancient Woodland and Veteran Trees July 2019 and standing advice from the government.

Where assessment shows other impacts are likely to extend beyond the 15m distance, you're likely to need a greater buffer zone, as shown, dust, lighting, changes to hydrology, additional recreational points, predation from domestic pets and Health and Safety.

The proposed road to the south of Crooks Copse isolates the ancient woodland, and is not shown in the Sandleford SPD or the parameter plans.

This will increase isolation of natural habitats by increasing barriers to movement (Belisle & Clair 2002). And as a result raises serious concerns that would result in the destruction of semi-natural habitats and movement through corridors between ancient woodland fragments, and ancient woods and nearby semi-natural habitats.

The applicant ecological report suggests that Crooks Copse is the most species diverse woodland.

The Environmental Strategy; APPENDIX G7: LANDSCAPE AND GREEN INFRASTRUCTURE DESIGN AND MANAGEMENT PLAN

States the following:

9.0 Buffer Zones
Appropriate buffer zone widths and off-sets will be adopted between the interface of new development areas (including highway infrastructure serving them) and areas of retained woodland, trees and hedgerows, or habitat areas associated with protected species; for example:
- *15m buffer zone measured from outer line of trunks in ancient woodland blocks, with 10m buffer zones for other woodland areas;*
- *the root protection zones for individual trees, in accordance with BS 5837:2012;*
- *3m to 5m off-set from centreline of hedgerows to edge of road/footpath kerb or development fence line, where possible;*
- *30m buffer zones around three confirmed barn owl nest sites; with further buffers established around additional trees identified with particular features making them suitable for nesting barn owls; and*
- *15m buffer retained on both sides of all streams to retain existing assemblages of marshy grasslands and associated plants.*

The Arboricultural Impact Assessment submitted shows extensive removals of trees that do not match the information submitted on the Strategic Landscape Green Infrastructure Plan or the Combined Green Infrastructure Plan.

The Design and Access statement says: *To retain and enhance all important trees and hedgerows.*

It goes on to say: *all Ancient woodlands and local wildlife sites will be retained with a 15m buffer zone which will be only used for recreational purposes, amenity and soft planting.*

This is contradictory to what ES Vol. 3 - Appendix G7 - Section 9.0 which advises that: *the ancient woodland will have a 15metre buffer and the all other woodland will have 10metres*.

All of the woodlands within the redline boundary are deemed as a local wildlife site.

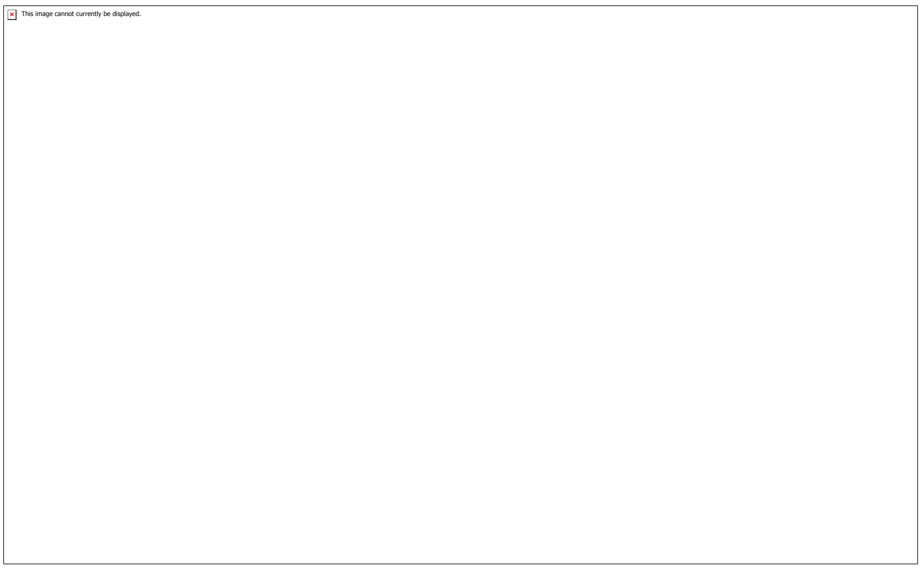
<u>Mitigation measures as shown on the landscaping proposal plans</u>

Significantly more woodland planting across the whole of the site will reduce future pressure, reduce the urban heat island effect and increase the resilience of the ancient woodlands to the impacts of climate change.

Without this mitigation measure the development is likely to result in deterioration of the ancient woodlands on site, failing to meet the policy objectives of the NPPF.

- **The Arboricultural Impact Assessment**

  The Arboricultural Assessment has assessed all the trees on site and categorised them in accordance with the BS5837:2012 guidance. There are a number of trees proposed to be removed:



Tree marked as T199 is a turkey oak and is on the junction of Andover Road and Warren Road, it is a highly significant tree clearly visible from surrounding areas and is covered by a TPO. Though this is not specific to this proposal, it is detailed within the Arboricultural information submitted by the applicant.

There are another 10 trees along the Warren Lane access proposed to be removed, these are all covered by a TPO. Though these are not specific to this proposal, it is detailed within the Arboricultural information submitted by the applicant.

T76 is graded as a 'A' tree under the BS5837 guideline, however the Arboricultural report suggests it should be felled, this is a large mature oak tree with a diameter at breast height of 90cm, there is no description as to the physiological/structural condition, however as it is rated an 'A' tree it is deemed to have at least 20 year life expectancy remaining. There does not seem to be a reason within the document as to why this tree is to be removed? This is unacceptable.

The tree marked as T34 is regarded by the applicants' arborist as a high quality tree 'A' grade tree, further details shown in their report says it as an over mature veteran tree with significant decay and is shown to be felled subject to design and an application by Park House.

In accordance with the Ancient Tree Forum this tree is classed as Ancient and shown on the map of ancient trees, their definition is:

How old is an ancient tree?

The exact age at which you'd call a tree ancient depends on the species of tree and other factors including the type of site where it's growing. A birch tree could be considered as ancient at 150 years old, for example, but an oak tree would not be thought of as ancient until it's at least 400 years old.

https://ati.woodlandtrust.org.uk/tree-search/?v=1752897&ml=map&z=15&nwLat=51.386731160090974&nwLng=-1.3507923283994416&seLat=51.369828740028325&seLng=-1.2958606877744416

The submitted Arboricultural Assessment states the following:

> *"1.2 The impact of tree removals on local character*
>
> *My assessment of the impact of tree removals on local character is as follows:*

Category A and B trees (T1, G16, G17, T18, T19, T34, T35, G51, T63, T64, T65, T69, T76, G110(part), T178, T179, T185, T186, T187 and T199):

Despite having the potential for long term retention, these trees make a limited contribution to local amenity because of the backdrop of large trees to be retained. These significant retained trees will buffer any loss to the extent that there will be no long-term impact on local amenity or character. Whilst their loss will be noticeable in the immediate vicinity in the short term, there will be no significant impact on local amenity character in the wider setting in the medium to long terms.

***Category C trees (T2, H5(part), G6(part), H7, G36, G37, G47(part), H60, G68(part), W73(part), G108(part), H115(part), G117(part), H169(part), T180, T182, T183, H200(part), T225, T226, T227,
T228, G234(part), T246, G248(part)):***

None of these trees or hedges are sufficiently important to be worthy of influencing any layout. They are not important in the overall planning context and their loss should not influence the determination of this application."

There is no time frame given in the 'short', 'medium' or 'long' term, this can mean so many different things to so many different people. In terms of trees and the impact to the wider environment I would suggest short term would be less than 5 years, medium term would be between 5 and 20 years and long term would be greater than 20 years.

In my view the loss of these trees and hedges would have a significant harmful/adverse impact both in the short term and medium term. Even by the long term trees planted now would only be semi-mature, even if the hedges would have started to establish and mature.

Trees with bat roosts confirmed, high and moderate potential are shown on the Arboricultural Impact Assessment to be removed? The Arboricultural Impact Assessment needs show what the latest proposals are or it makes unclear what tree works are intended to be carried out.

Summary

- In my view the proposed loss of trees, hedges and future pressure on the ancient woodlands in line with latest national and local government guidance is unacceptable.

- As a result of the proposed access hundreds of metres of hedging will be removed if this application is approved, with no detailed landscaping in place to mitigate against the proposed access points on Monks Lane.

- The Arboricultural Impact Assessment submitted shows extensive removal of trees that do not match the information submitted on the Strategic Landscape Green Infrastructure Plan or the Combined Green Infrastructure Plan.

- The Design and Access statement says*: To retain and enhance all important trees and hedgerows.*

- It goes on to say: *all Ancient woodlands and local wildlife sites will be retained with a 15m buffer zone which will be only used for recreational purposes, amenity and soft planting.*

- This is contradictory to what ES Vol. 3 - Appendix G7 - Section 9.0 which advises that the ancient woodland will have a 15metre buffer and the all other woodland will have 10metres. **All of the woodlands within the redline boundary are deemed as a local wildlife site**.

- Formal recreation zones within the 15m buffer zones going against the SPD.

- The proposed upgrade of footpath Green9/1 to an emergency access directly impacts Waterleaze Copse.

- The proposed road to the south of Crooks Copse isolates the ancient woodland, and not shown in the Sandleford SPD or the parameter plans.

- The parameter plans around and especially to the south of Crooks Copse show an increase of urban areas therefore causing a pinch point on the southern boundary.

- The change in the hydrology is potentially likely to have an impact as the basins and conveyancing channels will have to be cut into the existing ground, I understand this could lead to a diversion in the route of ground water flows. Impacts will need to be assessed by a drainage expert.

- Even in their own Ecological management plan they admit that the drainage has the potential to impact on the wet woodland.

- The potential impact of domestic cats has only been considered on bird population it has not been considered on other wildlife populations. And the most biological diverse of the woodland is Crooks Copse and this is likely to have the greatest impact by domestic cats.

- Trees with bat confirmed, high and moderate potential are shown on the Arboricultural Impact Assessment to be removed? Updated plans and assessment need to be shown.

- The proposed removal of an ancient tree marked as T34 is unacceptable.

Recommendation

The proposed development by virtue of its size and setting would result in the direct loss of irreplaceable trees. The loss of these trees is unacceptable and would have an adverse impact on the amenity and character of the area in which it is located.

The proposal currently put forward is in my view will cause deterioration of ancient woodlands and in accordance with the NPPF Section 175 c should be refused.

Reason for Refusal: The approval of the proposed development in terms of access along Monks Lane would be contrary to policies CS14, CS18 and CS19 of the West Berkshire Core Strategy and would therefore damaging to the objectives of these policies by virtue of the inadequate landscape provision.

Further objections as a result of future pressure on Ancient woodlands, loss of ancient and TPO'd trees and inadequate landscaping as a compensation strategy and it is not in accordance with the Sandleford SPD.

There are a significant amount of inconstancies throughout the application which need to be addressed.

Substantial increase in the tree and hedge planting to create new habitats, to join up the existing ancient woodland. This potentially will help reverse the historic fragmentation of this important historic site.

With significantly more woodland planting across the whole of the site this will reduce future pressure, reduce the urban heat island effect and increase the resilience of the ancient woodlands to the impacts of climate change and align more with West Berkshire Councils Environment Strategy 2020-2030

Increasing the buffer zones around all woodland to mitigate for the development unless it can demonstrated very clearly how a smaller buffer would suffice.

Appendix 5

NPPF Guidance. Ancient woodland, ancient trees and veteran trees: protecting them from development.

www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences#avoid-impacts-reduce-mitigate-impacts-and-compensate-as-a-last-resport

GOV.UK

1. Home (https://www.gov.uk/)
2. Protected sites and species (https://www.gov.uk/topic/planning-development/protected-sites-species)

Guidance

Ancient woodland, ancient trees and veteran trees: protecting them from development

What planning authorities should consider for developments affecting ancient woodland, ancient trees and veteran trees.

From:
Forestry Commission (https://www.gov.uk/government/organisations/forestry-commission) and Natural England (https://www.gov.uk/government/organisations/natural-england)
Published:
13 October 2014
Last updated:
5 November 2018,

Applies to:
England

Contents

Print this page

You should use this Natural England and Forestry Commission guidance (known as 'standing advice') to help you decide on development proposals affecting ancient woodland, ancient trees and veteran trees.

Standing advice is a 'material planning consideration'. This means you should take it into account when making decisions on planning applications. It replaces the need for each agency to give an individual response to planning consultations. It has the same authority as an individual response.

This guidance is also useful for decision-makers who are responsible for major infrastructure projects, such as road and rail schemes.

Natural England and the Forestry Commission will only provide bespoke advice as set out in the when to contact sections, or in exceptional circumstances.

Ancient woodland

Ancient woodland takes hundreds of years to establish and is defined as an irreplaceable habitat. It's important for its:

- wildlife (which include rare and threatened species)
- soils
- recreational value
- cultural, historical and landscape value

It's any area that's been wooded continuously since at least 1600 AD. It includes:

- ancient semi-natural woodland mainly made up of trees and shrubs native to the site, usually arising from natural regeneration
- plantations on ancient woodland sites - replanted with conifer or broadleaved trees that retain ancient woodland features, such as undisturbed soil, ground flora and fungi

They have equal protection in the National Planning Policy Framework (https://www.gov.uk/guidance/national-planning-policy-framework/11-conserving-and-enhancing-the-natural-environment#paragraph_118) (NPPF).

Other distinct forms of ancient woodland are:

- wood pastures identified as ancient
- historic parkland, which is protected as a heritage asset in the NPPF

Many of these do not appear on the Ancient Woodland Inventory because their low tree density did not register as woodland on historic maps.

You should give consideration to wood pasture identified as ancient in planning decisions in the same way as other ancient woodland.

'Wooded continuously' does not mean there's been a continuous tree cover across the whole site. Not all trees in the woodland have to be old. Open space, both temporary and permanent, is an important component of ancient woodlands.

Ancient and veteran trees

Ancient and veteran trees can be individual trees or groups of trees within wood pastures, historic parkland, hedgerows, orchards, parks or other areas. They are often found outside ancient woodlands. They are irreplaceable habitats with some or all of the following characteristics.

Ancient trees

An ancient tree is exceptionally valuable. Attributes can include its:

- great age
- size
- condition
- biodiversity value as a result of significant wood decay and the habitat created from the ageing process
- cultural and heritage value

Very few trees of any species become ancient.

Veteran trees

All ancient trees are veteran trees, but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. These features contribute to its biodiversity, cultural and heritage value.

Making decisions

When making planning decisions, you should consider:

- conserving and enhancing biodiversity
- reducing the level of impact of the proposed development on ancient woodland and ancient and veteran trees (see 'Avoid impacts, reduce impacts and compensate as a last resort')

You should make decisions on planning applications in line with paragraph 175C of the NPPF (https://www.gov.uk/government/publications/national-planning-policy-framework--2).

You should refuse planning permission if development will result in the loss or deterioration of ancient woodland, ancient trees and veteran trees unless:

- there are wholly exceptional reasons
- there's a suitable compensation strategy in place

Assess the impacts

You should use the following process to assess impacts on ancient woodland when making decisions on planning applications. The process also applies to:

- wood pastures identified as ancient
- ancient trees and veteran trees

Consult inventories

You can use the following inventories to help you decide whether a development will affect ancient woodland (including wood pastures identified as ancient) or ancient and veteran trees:

- Natural England's ancient woodland inventory - download the data (https://naturalengland-defra.opendata.arcgis.com/datasets/ancient-woodlands-england) or view it on the Magic map system (http://magic.gov.uk/MagicMap.aspx?chosenLayers=ancwoodIndex,bapdecIndex,orchardIndex,bapwoodIndex,backdropDIndex,backdropIndex,europeIndex,vmlBWIndex,25kBWIndex,50kBWIndex,250kBWIndex,miniscaleBWIndex,baseIndex&box=207763:417195:576753:592195&useDefaultbackgroundMapping=false) (zoom in to see local detail)
- ancient tree inventory (http://www.ancient-tree-hunt.org.uk/) (click on 'Tree search' and enter a postcode)
- wood pasture and parkland inventory (includes some ancient sites) (http://magic.gov.uk/MagicMap.aspx?chosenLayers=bapwoodIndex,backdropDIndex,backdropIndex,europeIndex,vmlBWIndex,25kBWIndex,50kBWIndex,250kBWIndex,miniscaleBWIndex,baseIndex&box=207763:417195:576753:592195&useDefaultbackgroundMapping=false) (zoom in to see local detail)

Ancient woodlands smaller than 2 hectares are unlikely to appear on these inventories. You should use this guidance for all ancient woodlands and ancient and veteran trees whether they're on the inventories or not. They are updated and reviewed from time to time.

You should contact Natural England if a site has evidence of ancient woodland on it and is not on the inventory.

Potential impacts

Development can affect ancient woodland, ancient and veteran trees, and the wildlife they support on the site or nearby. You can assess the potential impacts using this assessment guide (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/740503/FCNE_AWSA_AssessmentGuideFinalSept2018.pdf) to help you with planning decisions.

Direct impacts of development on ancient woodland or ancient and veteran trees include:

- damaging or destroying all or part of them (including their soils, ground flora or fungi)
- damaging roots and understorey (all the vegetation under the taller trees)
- damaging or compacting soil around the tree roots
- polluting the ground around them

- changing the water table or drainage of woodland or individual trees
- damaging archaeological features or heritage assets

Nearby development can also have an indirect impact on ancient woodland or ancient and veteran trees and the species they support. These can include:

- breaking up or destroying connections between woodlands and ancient or veteran trees
- reducing the amount of semi-natural habitats next to ancient woodland
- increasing the amount of pollution, including dust
- increasing disturbance to wildlife from additional traffic and visitors
- increasing light or air pollution
- increasing damaging activities like fly-tipping and the impact of domestic pets
- changing the landscape character of the area

Providing evidence

You and the developer should work together to make sure there's enough suitable evidence to make a decision. This may include fieldwork and historic maps.

You should include proposed mitigation and compensation measures.

You should ask developers for a tree survey and an ecological survey, where appropriate. The tree survey should be in accordance with guidance in British Standard BS 5837 'Trees in relation to demolition, design and development' (https://shop.bsigroup.com/ProductDetail/?pid=000000000030213642). Ecological surveys should follow guidance approved by the Chartered Institute of Ecology and Environmental Management (CIEEM) (http://www.cieem.net/).

Avoid impacts, reduce ('mitigate') impacts, and compensate as a last resort

You and the developer should identify ways to avoid negative effects on ancient woodland or ancient and veteran trees. This could include selecting an alternative site for development or redesigning the scheme.

You should decide on the weight given to ancient woodland and ancient and veteran trees in planning decisions on a case-by-case basis. You should do this by taking account of the NPPF and relevant development plan policies.

If you decide to grant planning permission that results in unavoidable loss or deterioration, you should use planning conditions or obligations to make sure the developer:

- avoids damage
- mitigates against damage
- compensates for loss or damage (use as a last resort)

Ancient woodland, ancient trees and veteran trees are irreplaceable. Consequently you should not consider proposed compensation measures as part of your assessment of the merits of the development proposal.

Existing condition of ancient woodland

A woodland in poor condition can be improved with good management and development proposals should enhance the condition of existing ancient woodland, where appropriate. Where a proposal involves the loss of ancient woodland, you should not take account of the existing condition of the ancient woodland when you assess the merits of the development proposal. Its existing condition is not a reason to give permission for development.

Mitigation measures

Mitigation measures will depend on the development but could include:

- improving the condition of the woodland
- putting up screening barriers to protect woodland or ancient and veteran trees from dust and pollution
- noise or light reduction measures
- protecting ancient and veteran trees by designing open space around them
- identifying and protecting trees that could become ancient and veteran trees in the future
- rerouting footpaths
- removing invasive species
- buffer zones

Use of buffer zones

A buffer zone's purpose is to protect ancient woodland and individual ancient or veteran trees. The size and type of buffer zone should vary depending on the scale, type and impact of the development.

For ancient woodlands, you should have a buffer zone of at least 15 metres to avoid root damage. Where assessment shows other impacts are likely to extend beyond this distance, you're likely to need a larger buffer zone. For example, the effect of air pollution from development that results in a significant increase in traffic.

A buffer zone around an ancient or veteran tree should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5m from the edge of the tree's canopy if that area is larger than 15 times the tree's diameter.

Where possible, a buffer zone should:

- contribute to wider ecological networks
- be part of the green infrastructure of the area

It should consist of semi-natural habitats such as:

- woodland
- a mix of scrub, grassland, heathland and wetland planting

You should plant buffer zones with local and appropriate native species.

You should consider if access is appropriate and can allow access to buffer zones if the habitat is not harmed by trampling.

You should avoid including gardens in buffer zones.

You should avoid sustainable drainage schemes unless:

- they respect root protection areas
- any change to the water table does not adversely affect ancient woodland or ancient and veteran trees

Compensation measures

Compensation measures are always a last resort. These measures can only partially compensate for loss or damage.

Compensation measures should be appropriate for the site and for the scale and nature of the impacts on it. A compensation strategy could include the following package of measures:

- planting new native woodland or wood pasture
- restoring or managing other ancient woodland, including plantations on ancient woodland sites, and wood pasture
- connecting woodland and ancient and veteran trees separated by development with green bridges, tunnels or hedgerows
- long-term management plans for new woodland and ancient woodland
- managing ancient and veteran trees
- planting individual trees that could become veteran and ancient trees in future
- monitoring the ecology of the site over an agreed period

Plant new native woodland

Establishing new trees and woodland is not a direct replacement for lost or damaged trees or woodland. You can accept large-scale woodland planting as a compensation measure alongside other measures. This could be on soil that has been moved from the destroyed area of ancient woodland ('soil translocation'). You cannot move an ancient woodland ecosystem because:

- it's not possible to replicate the same conditions at another site

- it's no longer an ancient woodland

New woodland creation can be effective where it links to and extends existing woodland, as long as it does not affect:

- other semi-natural habitats
- heritage features

Restore or improve ancient woodland

You can partially compensate for loss or damage of ancient woodland by improving:

- and restoring plantations on ancient woodland sites
- the management of nearby ancient woodland sites and connecting them better to semi-natural habitat
- the condition of important features of ancient woodland
- access for management purposes

You can partially compensate for loss or damage to wood pasture by restoring soils and pasture.

Management plans should follow the UK Forestry Standard (https://www.gov.uk/government/publications/the-uk-forestry-standard). You can monitor the ecology of the site, over an agreed period, to help you advise on management measures.

Compensate for the loss of ancient and veteran trees

You can partially compensate by planting:

- young trees of the same species with space around each one to develop an open crown
- new trees near to the trees they're replacing

As a last resort, you can manage nearby ancient and veteran trees (including dead and dying trees) to help prolong their life. You should get advice from a registered tree consultant ('arboriculturist') before carrying out work on veteran trees by contacting:

- the Arboricultural Association (https://www.trees.org.uk/Other-Pages/Contact-Us)
- the Institute of Chartered Foresters (https://www.charteredforesters.org/contact-us/)

Leave the intact hulk of the ancient or veteran tree where it is (preferably standing) to benefit invertebrates and fungi. If that's not possible, move it near other ancient and veteran trees or parkland in the area.

When to contact Natural England

Natural England is a statutory consultee (https://www.gov.uk/guidance/consultation-and-pre-decision-matters#Statutory-consultees) for proposals that affect any site of special scientific interest (http://designatedsites.naturalengland.org.uk/). For all other proposals that affect ancient woodland or ancient and veteran trees, you should use the guidance on this page.

Consultation service

Natural England
Electra Way
Crewe Business Park
Crewe
Cheshire
CW1 6GJ

Email consultations@naturalengland.org.uk

Telephone 0300 060 3900

When to contact the Forestry Commission

The Forestry Commission is a non-statutory consultee (https://www.gov.uk/guidance/consultation-and-pre-decision-matters#Non-statutory-consultees). You should use the guidance on this page. Contact your Forestry Commission England area office (https://www.gov.uk/government/organisations/forestry-commission/about/access-and-opening#area-offices) for individual advice that's not covered on this page.

Forestry Commission England Tree Health Team

620 Bristol Business Park
Coldharbour Lane
Bristol
BS16 1EJ

Telephone: 0300 067 4000

Further information

Policy and standards:

- Keepers of time: a statement of policy for England's ancient and native woodland (https://www.gov.uk/government/publications/keepers-of-time-a-statement-of-policy-for-englands-ancient-and-native-woodland)
- National Planning Policy Framework (https://www.gov.uk/government/publications/national-planning-policy-framework--2) - paragraphs 11 (footnote 6), 175c, 190
- The UK Forestry Standard (https://www.gov.uk/government/publications/the-uk-forestry-standard)

- BS 5837:2012 Trees in relation to design, demolition and construction. Recommendations (http://shop.bsigroup.com/en/ProductDetail/?pid=000000000030213642)
- BS 42020:2013 Biodiversity. Code of practice for planning and development (https://shop.bsigroup.com/ProductDetail?pid=000000000030258704)
- Managing ancient and native woodland in England (https://www.gov.uk/government/publications/managing-ancient-and-native-woodland-in-england)

Other useful information:

- Read H (2000). 'Veteran trees: a guide to good management' (http://publications.naturalengland.org.uk/publication/75035) Natural England
- Lonsdale D (Editor) (2013). 'Ancient and other veteran trees: further guidance on management' (http://ancienttreeforum.co.uk/wp-content/uploads/2015/02/ATF_book.pdf) The Tree Council
- Joint Nature Conservation Committee (2003). 'A habitats translocation policy for Britain' (https://webarchive.nationalarchives.gov.uk/20080718180931/http://www.jncc.gov.uk/pdf/habitats_policy.pdf)
- Corney PM and others (2008). 'Impacts of nearby development on the ecology of ancient woodland' (https://www.woodlandtrust.org.uk/publications/2008/10/impacts-of-nearby-development-on-ancient-woodland/) The Woodland Trust
- Ryan L (2012). 'Impacts of nearby development on ancient woodland - addendum' (https://www.woodlandtrust.org.uk/publications/2012/12/impacts-of-nearby-development-on-ancient-woodland-addendum/) The Woodland Trust
- Woodland Trust (2011). 'Ancient tree guide 3 – trees and development' (https://www.woodlandtrust.org.uk/publications/2011/12/ancient-trees-and-development/)

Published 13 October 2014
Last updated 5 November 2018 + show all updates

1. 5 November 2018
   This page has been updated to: align with the revised National Planning Policy Framework; give clearer guidance on taking account of the existing condition of ancient woodland; and give further guidance on mitigation measures, including the use of buffer zones.
2. 4 January 2018
   The advice on the appropriate size of buffer zones (under 'Mitigation measures') has changed. The last version suggested a 50 metre (m) zone to mitigate the effects of pollution and trampling. Following queries about the 50m zone, this text has been removed. Natural England and the Forestry Commission are reviewing the feedback they've received.
3. 27 November 2017

Republished as part of the biennial update.

4. 29 October 2015

   Added definitions of 'wooded continuously' and 'ancient wood-pastures', and clarified the rules about soil translocation in 'plant new native woodland'.

5. 3 August 2015

   Clarified the purpose of this standing advice.

6. 29 March 2015

   Guide fully updated for publication on GOV.UK after consulting with Natural England experts.

7. 30 January 2015

   Guidance temporarily removed, pending revisions.

8. 30 January 2015

   Guidance temporarily removed due to pending revisions.

9. 13 October 2014

   First published.

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Related content

- Planning applications affecting trees and woodland (https://www.gov.uk/guidance/planning-applications-affecting-trees-and-woodland)
- The UK Forestry Standard (https://www.gov.uk/government/publications/the-uk-forestry-standard)
- Keepers of time: a statement of policy for England's ancient and native woodland (https://www.gov.uk/government/publications/keepers-of-time-a-statement-of-policy-for-englands-ancient-and-native-woodland)
- How to benefit species and habitats biodiversity in your woodland (https://www.gov.uk/guidance/how-to-benefit-species-and-habitats-biodiversity-in-your-woodland)
- Managing ancient and native woodland in England (https://www.gov.uk/government/publications/managing-ancient-and-native-woodland-in-england)

Detailed guidance

- Protected sites and areas: how to review planning applications (https://www.gov.uk/guidance/protected-sites-and-areas-how-to-review-planning-applications)

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