

Tree survey to BS5837 (2012): Constraints, impacts and Protection measures

1 – 2 Ark Cottages, Etchinghill, Kent CT 18 8DE

Summary

This report arises from a proposal to extend the off-road parking at 1–2 Ark Cottages.

The site is in a Conservation Area but no trees within influencing distance of the proposal are protected by Tree preservation order.

One tree of low retention value is to be lost to the proposal, T5 Common ash.

The proposed parking area encroaches into two Root protection areas (RPAs), those of the early-mature T6 Beech and the large T8 Common ash. The impacts on these trees are minor provided that the excavation for the new surface does not exceed 10cm depth.

An edge restraint for the edge of the surface nearest these two trees is desirable, and by constructing it early in the site works it will also serve to exclude traffic from the inner RPAs of T6 and T8. If this advice is followed tree protection fencing will not be necessary. I make two suggestions for the design of the edge restraint, large stones (as are already used in the vicinity of T2–T4), or sleepers secured in position by pins.

The existing surface has a wearing course of gravel and is in good condition. I recommend the same design for the extended surface.

I conclude with guidance for the demolition of the garage and for the treatment of roots encountered within RPAs.

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1. Objectives

To survey the trees within influencing distance of the proposed development at 1–2 Ark Cottages.

To describe the tree-related constraints to development.

To discuss these constraints in relation to the extant design and to make recommendations as appropriate.

2. Preamble

There are several stages in the procedure recommended in BS 5837 (2012): *Trees in relation to design, demolition and construction – Recommendations*.

1. *Tree Survey and assessment of trees' conservation value.*
2. *Tree Constraints Plan.*
3. *Arboricultural Impact Assessment.*
4. *Tree Protection Plan.*
5. *Arboricultural Method Statement.*

Any constraints to development identified in (2) are discussed in relation to the context in (3) to arrive at practical recommendations. Where appropriate, specific measures to avoid damage to trees during site works are set out in (4) and (5).

Trees were surveyed according to the precepts and procedures of Lonsdale (2006) and Mattheck & Breloer (1998).

The technical terms I use in this report are italicized in the text and defined in the glossary (Appendix I).

3. Scope

I visited the site on 30 November 2019. I inspected the trees with the aid of a *sounding mallet*.

Measurements were by tape for (i) horizontal distance and (ii) tree diameter, and by inclinometer as appropriate for (iii) tree height.

4. Abbreviations and units

Dimensions are in metres (m) or centimetres, area is in square metres (m²).

G	Group
F&HDC	Folkestone & Hythe District Council
RPA	<i>Root protection area</i> (see glossary)
T	Tree

5. Plans and design

The proposed design is shown on *Proposed block plan*, Dwg. KBC/19/141/006, dated 29 November 2019, by Kent Building Control Ltd.

The *Tree position plan* is a derivative of the *Proposed block plan*. I have used my discretion to plot the position of some trees and believe that I have done this with satisfactory accuracy for the purpose.

6. Planning, wildlife and miscellaneous constraints

6.1. Statutory constraints

The site is within the Etchinghill Conservation Area (shaded pink), while the nearest TPO trees are circled in green.

The site is also in the Kent Downs Area of Outstanding Natural Beauty.

Works to trees at 1–2 Ark Cottages ordinarily require prior notification to F&HDC, and trees are material considerations in the planning process whether protected or not.

The site is in the Kent Downs Area of Outstanding Natural Beauty. This is not a statutory constraint although it does (on relatively dark sites) increase sensitivity in relation to night lighting.

6.2. Wildlife constraints

Native wildlife is protected primarily under *The Wildlife and Countryside Act 1981* (as amended). The level of protection varies with species. Note that protection may include reckless as well as intentional harm, so that ignorance resulting in injury to some protected species is not a defence.

Animal species with a high level of protection (which are also ‘European protected species’) include all species of *bats*.

No native bird may be disturbed at its nest, which means that works to trees or hedges which contain nests should not be undertaken during the *nesting season*.

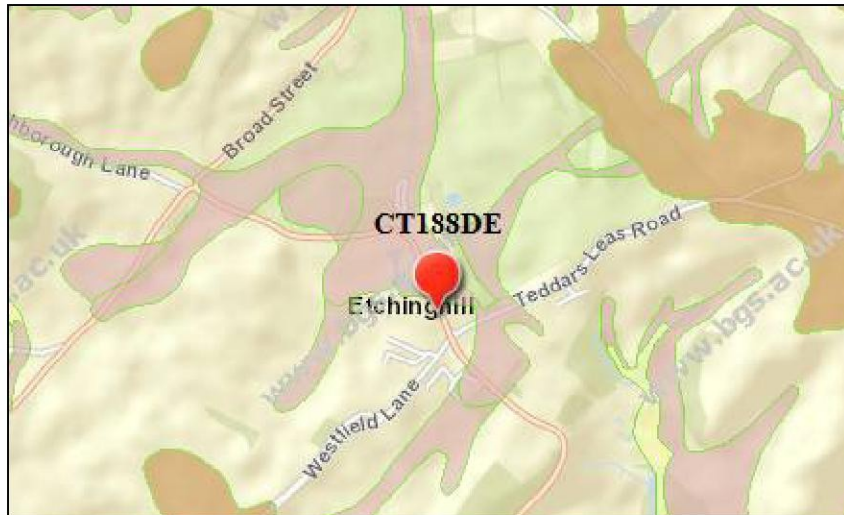
6.3. Miscellaneous constraints

Outdoor lighting. It is good practice to minimize obtrusive outdoor lighting, particularly in otherwise dark areas by following the guidance in ILP (2011). If bats are in the vicinity additional guidance is given in BCT/ILP (2009). See *light pollution*.

7. Site description

The site consists of the existing parking area on the north side of the cottages, surfaced in pea gravel in good condition, and part of the garden area to the rear, largely consisting of garden sheds.

7.1. Geology and soil



Courtesy Geology of Britain Viewer

Geology & soil

The site is on chalk bedrock.

The map shows that the site is marginal for superficial deposits of 'head', silt and gravel.

8. Introduction to Tree survey

This section consists of four parts:

- (i) The *Scheme for retention value* reproduced from BS 5837 (2012).
- (ii) *Notes* give further details of the survey method.
- (iii) The *Tree survey schedule* describes the trees surveyed in numbered sequence, classifies them according to conservation value and gives their RPA radius.
- (iv) The trees' positions are shown on the *Tree position plan*.

Parts (i), (ii) and (iii) are in Appendix II. Part (iv) is in Section 9 *Tree constraints and impacts*.

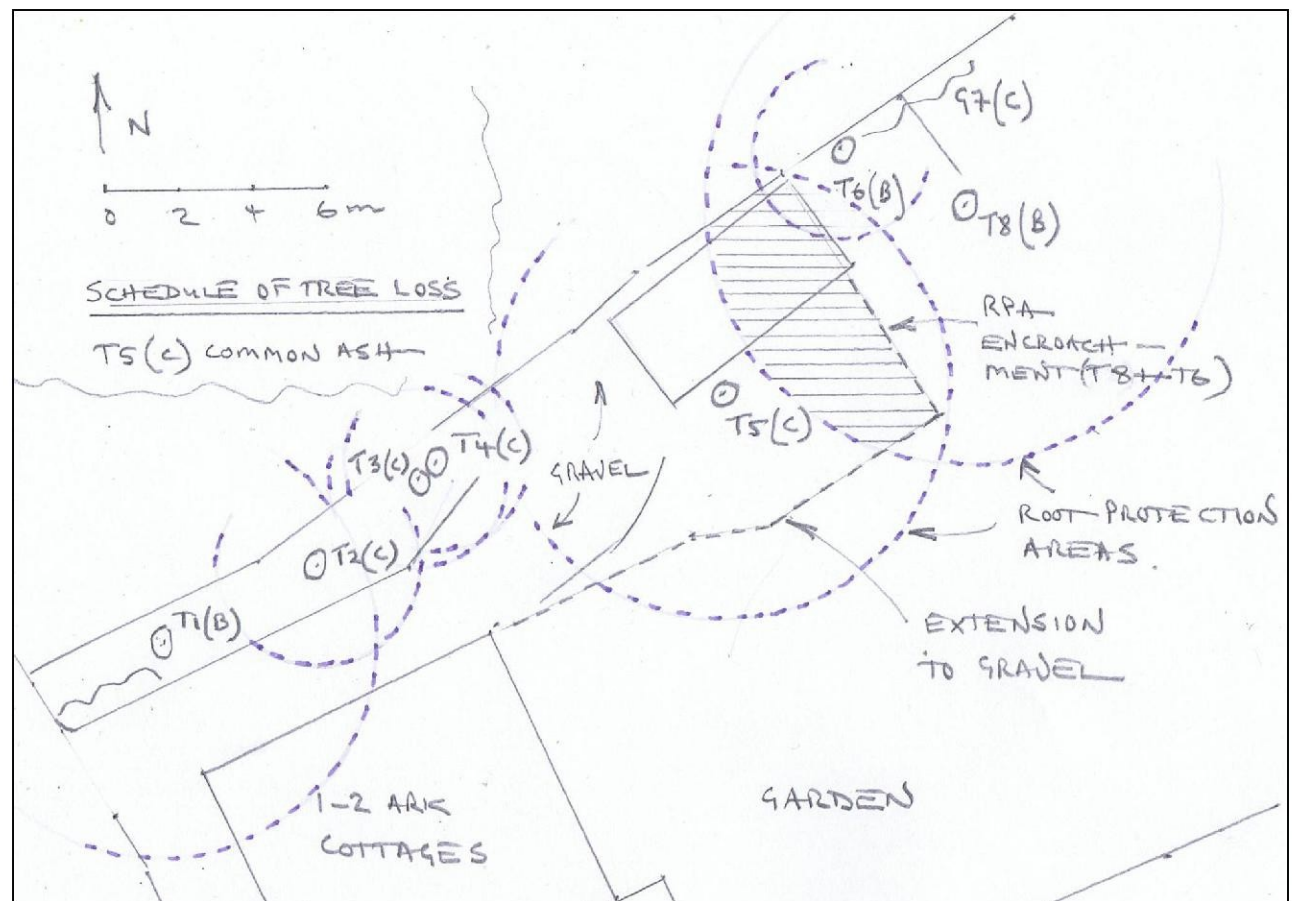
The presence of profuse ivy prevents a full inspection for *tree risk* as it may obscure structural defects that would otherwise be visible.

8.1. Perspective on retention value

I largely conform to the BS 5837 (2012) scheme in this report. I note that the common ash, including those pollarded in recent years (T1 and T5), are largely free of *chalara die-back*.

9. Tree constraints and impacts

9.1. Tree position and constraints plan



On the plan above, solid lines are existing, dashed lines are proposed. The existing gravel drive leading to the garage and outbuildings is to be extended to the north-east, and widened to the south.

9.2. Loss of trees

Tree	Reason
T5 (C) Common ash	Within footprint of proposed car parking area

Impacts

The loss of this tree is not a significant constraint to the proposal.

9.3. Encroachment into Root protection areas (RPAs)

Tree	RPA (m ²)	Encroachment (m ²)	(%)	Nearest Approach	Reason
T6	15	0.8	5	1.5m	Proposed parking area
T8 (B) Common ash	145	26	18	3.6m	Proposed parking area

Impacts

The impacts of these RPA area encroachments depend on the depth of excavation for the proposed parking area.

The existing gravel surface is in good condition, and I suggest that a small part be excavated to discover its thickness and structure. Broadly the gravel will either have been compacted directly into the clay soil or into a base course of (for instance) sub-base to give a surface somewhat deeper but with a higher load-bearing capacity. The structure of the existing surface (whatever it proves to be) can then be replicated over the proposed extension to the parking area in confidence that it is adequate.

Two conditions are to be observed:

(i) The vegetation and topsoil is to be removed (it is relatively compressible).

(ii) The permissible depth of excavation is 10cm below the existing ground surface, allowing underlying roots to persist. This might involve building the surface up slightly from the existing ground level.

In addition, I recommend edge restraint at the north-east edge of the proposed parking area but not a conventional kerb (which requires a relatively deep excavation to be fixed in position). Instead, by reference to the edging of the existing gravel surface in the vicinity of T2–T4, I suggest large stones placed on the ground surface (or sunk no deeper than 10cm), or sleepers positioned similarly and kept in place with pins (welding rods or similar).

The existing surface is not very permeable and could easily be softened if poorly drained. A camber or cross-fall would help to avoid low spots.

10. Tree protection and methods

10.1. Tree works *to comply with BS 3998 Tree work*

T5 Common ash

Fell and grind stump

Reason: In conflict with the proposed extension of the parking area.

This tree work is to be done before any other site works. The cavity at height 3m is to be checked for occupation as a bat roost.

10.2. Demolition of outbuildings

The outbuildings are light structures that can be demolished by hand. It would also be preferable to break up the garage slab with a hand breaker, avoiding the use of a machine. However, if this is not practicable the machine should operate by *pull-back*, with an assistant to ensure that any roots directly under the slab are not pulled up (this tends to cause woody roots to shatter, causing more damage than is necessary). See next section.

10.3. Excavation within RPAs

The north-east edge of the proposed parking area (nearest T6 Beech and T8 Common ash, an 8m length), is to be dug with hand tools.

Any woody roots exposed are to be severed cleanly with secateurs or a pruning saw. Cross-cut roots or broken roots of whatever size are not to be allowed to dry out. If necessary they should be covered with damp hessian or a membrane.

10.4. Edge restraint, north-east edge of proposed parking area

An edge restraint at the north-east edge of the proposed parking area, if constructed before the main excavation, would serve as an effective tree protection measure for T6 Beech and T8 Common for the remainder of the excavation and other site works.

11. References

BCT/ILP (2009). *Bats and lighting in the UK*. Bats in the built environment series. Version 3. Bat Conservation Trust, 250 Kennington Lane, Lambeth, London SE11 5RD; and Institution of Lighting Professionals, Regent House, Regent Place, Rugby CV21 2PN. Downloaded from www.theilp.org.uk/resources/free-resources/

BS 3998 (2010). *Tree work – Recommendations*. British Standards Institution, London.

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www.gov.uk/government/uploads/system/uploads/attachment_data/file/228832/9780108508547.pdf

12. Copyright and limitations

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APPENDIX I: DEFINITION OF TERMS USED IN THIS REPORT

Bats: All bats are European protected species, so that it is an offence to kill or injure a bat, whether deliberately or recklessly, to damage or destroy a roost site even if it is unoccupied, or to disturb a bat while it is occupying a roost. Potential roost sites in trees include: voids created by woodpeckers and decay; fissures and crevices caused by injury or structural failure, including open or partly closed cracks and storm damage; loose dead bark separated from the underlying wood; and the pockets created by the intertwining stems of rank ivy (if greater in diameter than about 40mm). These features are associated with large and veteran trees but also occur in smaller and younger trees.

Before carrying out any tree work it is good practice to assess the trees concerned for their potential to contain bat roosts. If there is potential, a bat survey by a licensed surveyor should be carried out.

Chalara die-back of ash: A fungal pathogen of ashes (*Fraxinus* spp.), including common ash (*F. excelsior*). North American and European species are more or less susceptible while Asian *Fraxinus* species have higher resistance (or tolerance), suggesting that the disease originated in Asia.

In Europe the disease is an alien invasive species. It was first noted in Poland in 1992 and has since caused serious losses, so far killing most of the ash trees in Europe. It was discovered in Britain on imported plants in June 2012 (but is thought to have arrived on the wind before then), and has since spread rapidly.

Chalara inhabits ash leaf litter. The fruiting bodies arise on the mid-rib of fallen leaves in the late spring and summer of the year after leaf fall (and may arise in subsequent years). The spores are dispersed by wind and infect new leaves in early summer.

Symptoms include the crinkling and wilting of the leaflets in late summer with associated brown-black discoloration of the midrib, die-back of shoots and twigs, and cankers overlying wood discoloured grey-brown. Diseased leaves fall prematurely.

Young trees are most susceptible, and may be killed in one season. Large trees can survive initial attacks, dying back and regrowing from dormant buds, but are likely to be killed eventually after some years of annual re-infection or continued growth of the fungus in the sapwood.

Geology of Britain viewer: An online service of the British Geological Survey. The solid geology and superficial sediments, at 1:50,000 or smaller scales, can be viewed for any postcode or map reference in the UK. <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Light pollution: Obtrusive light, which may be over-illumination, skyglow, light trespass (when light spills beyond the boundary of the area being lit), light clutter or glare (RCEP, 2009). It can be annoying, obscures the night sky, is harmful to wildlife and is often wasteful. Lighting wastes energy if it is too bright, poorly directed, emits over a wider range of wavelengths than is necessary or is not really needed. There is no legislation requiring an outdoor area to be lit, while planning policy guidance is given at www.gov.uk/guidance/light-pollution

Lighting should be kept to a functional minimum through good design, and if possible it should be turned off for part of the night. Lighting and shiny surfaces should be avoided near bodies of water or sensitive wildlife sites, and relatively dark areas should be conserved.

As many as a third of all flying insects are fatally attracted to artificial light, especially if it contains some blue and ultra-violet wavelengths and is a single source in an otherwise dark area. Those insects that lay eggs in water are also mistakenly attracted to light reflected from shiny surfaces such as cars and solar panels.

Illuminating a bat roost is an offence under the *Wildlife and Countryside Act 1981* if it disturbs the bat/s. The bats may be slow to emerge at dusk, affecting their feeding and social behaviour, or they may abandon the roost altogether (BCT/ILP, 2009).

Maturity: Young or juvenile trees have not yet reached $\frac{1}{3}$ of their expected mature height. They are generally growing vigorously and have high apical dominance. Early-mature trees are between $\frac{1}{3}$ and $\frac{2}{3}$ of expected mature height.

Mature trees are close to their full height and crown size, these dimensions being determined by species and site factors. The crowns of mature trees tend to become rounded, especially in broadleaves (like oak and beech). Crown size continues to increase slowly although total leaf area (and total water use) remain relatively constant as shoots in the inner part of the crown become suppressed and die.

Late-mature trees are still close to their full height and crown size while main-stem diameter (which by now is large) increases more slowly. Accumulated *deadwood* and defects in the aerial part are likely to be evident if the tree is unmanaged. Senescence ('verging on or characteristic of old age') is associated with a decrease in crown volume. The main stem continues to increase in diameter, as it does throughout the life of the tree, but at a progressively decreasing rate.

Narrow fork: Where a stem divides into two at a narrow (acute) angle, as when two branches are co-dominant and close to the vertical and in multi-stem trees. The union is structurally imperfect but does not necessarily constitute a defect.

Nesting season: Conventionally from 1 March to 31 July, although subject to variation from year to year depending on the weather.

Pull back: The removal of a hard surface by a machine working backwards, pulling the broken pieces onto the remaining surface and avoiding any traffic on the newly exposed soil that would otherwise cause soil compaction or soil poaching.

Root Protection Area (RPA): The circular area around the base of a tree, expressed in m², that contains sufficient rooting volume to ensure the future well-being of the tree in the event of nearby soil disturbance (as on a development site). RPA radius is the radius of the circle in m. The RPA is a common constraint to development where space is limited.

Tree risk: The risk that a tree causes damage or injury if it (or part of it) suffers structural failure. Tree risk is a composite of several variables. A hazard has the capacity to cause harm, which may be more or less serious depending on the magnitude of the hazard (for instance the weight of a branch and the height from which it would fall). Probability is the chance that a hazard eventuates, and is influenced by the loading at potential points of structural failure, the nature of any structural defects, the extent and effectiveness of any compensatory growth, and site factors. A target is anything within range of a hazard, i.e. within the target area, that could suffer injury or damage if the hazard eventuated. Tree risk comprises (hazard magnitude × probability × target value × occupancy).

Wildlife and Countryside Act 1981: The main Act giving protection to wildlife and supplemented by other Acts including the Countryside and Rights of Way Act 2000. The Act makes it an offence to kill or injure any wild bird (excluding game birds), damage or destroy the nest of any wild bird while being built or in use, or take eggs.

APPENDIX II: TREE SURVEY

(i) Scheme for retention value

A: High quality and value, anticipated retention span at least 40 years.

1. Arboricultural value 2. Landscape value 3. Cultural/conservation value

B: Moderate quality and value, anticipated retention span at least 20 years.

1. Arboricultural value 2. Landscape value 3. Cultural/conservation value

C: Low quality and value, anticipated retention span at least 10 years. Not to be retained where they represent a significant constraint to the development.

U: Undersize (below 15cm diameter) or valueless (any existing value lost within 10 years).

(ii) Notes

Note 1: The scheme above is a guide; conservation value relies on subjective assessments which are often debatable. See Section 8.1 *Perspective on retention value*.

Note 2: 'Crown radius' noted in the *Tree Survey Schedule* is the horizontal distance the crown extends from the trunk of the tree. Where one radius is given either the crown is symmetrical or the given radius is that extending towards the interior of the site (generally the most relevant).

Note 3: Trunk diameter was measured 1.5m above the ground unless otherwise stated.

APPENDIX II continued. Tree Survey Schedule – The Ark, Etchingill, CT18 8DE. Surveyed November 2019.

Tree/ Group	Species	Diam (cm)	Ht. (m)	Crown radius (m)	Head- room (m)	Value	RPA radius (m)	Comments	
T1	Common ash (<i>Fraxinus excelsior</i>)	48	11	4	6-8	B	5.8	<i>Mature</i> , ivy to 2/3 height. Topped two or three years ago at 8m, regrowth satisfactory. Stubs of old coppice shoots at base.	
								T2, T3, T4 among boundary shrubbery, which gives a dense screen to height 3m, pleasing aspect.	
T2	Leyland cypress (× <i>Hesperotropsis leylandii</i>)	21	7	4	3-4	C	2.5	Juvenile. 2m from stone edging of gravel hardstanding.	
T3	Bay (<i>Laurus nobilis</i>)	19	7	2	2.5	C	2.3	Juvenile.	
T4	Leyland cypress	19	9	2	5	C	2.3	Juvenile.	
T5	Common ash	51	10	0.5	3-6	C	6.1	Late-mature. Topped at height 8m two or three years ago. Regrowth satisfactory. Triple-stem from height 3m, with very large stubs occluded and one deep cavity.	
T6	Beech (<i>Fagus sylvatica</i>)	18	6	to 5	2	B	2.2	Juvenile. Top lost owing to competition from G7 and T8. Crown most extensive on other south-west (road) side.	
G7	Leyland cypress	10-15	8	2	4	C	1.8	Juvenile. Vigour lessened by T8.	
T8	Common ash	3x30-35	20	6	6	B	6.8	Triple-stem from ground level, dimension at ground level up to 1m. Ivy to height 6m. Forks at base <i>narrow</i> but undefective. No perceptible sign of <i>chalara die-back</i> .	

T=tree; G=group; Diam=diameter; Ht=height; RPA=root protection area; MS=multistem; GL=ground level.