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ARBORICULTURAL IMPACT ASSESSMENT SURVEY & REPORT

Greenhill Road, Otford

Report Reference: BG21.258.2

August, 2021

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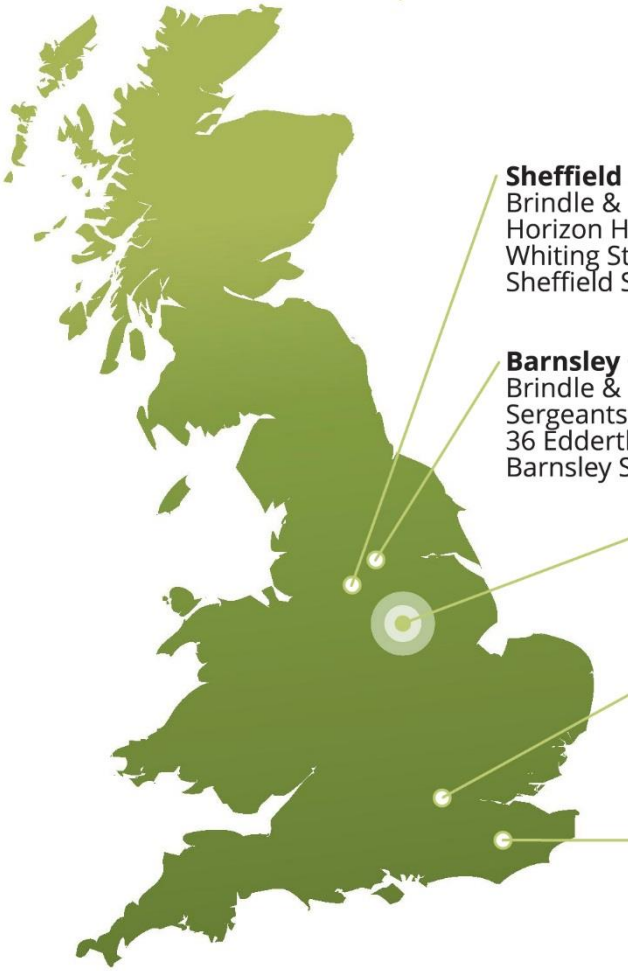

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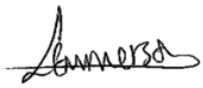
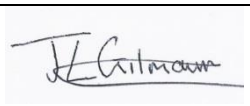
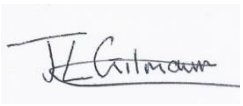
1st Check by	Laura Emmerson		01/09/2021
2nd Check by	Joe Gilmour		08/09/2021
Issued by (PDF)	Joe Gilmour		13/09/2021
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Contents

1 Summary

1.1 Brindle & Green were commissioned by Willow Town & Country Planning (c/o Emma Gregson) to undertake an arboricultural survey at 3 Greenhill Road, Otford, Kent. This report summarises any potential arboricultural impacts and outlines a Tree Protection Plan in relation to an outline planning application for the development of two detached properties approximately 3500 square feet in size. Design plans are provided within Appendix 4 of this report. The survey was carried out on the 12th of August 2021.

1.2 This report is concerned with trees that have the possibility to be impacted as a result of development proposals at 3 Greenhill Road, Otford, Kent. This includes trees within the site boundary as well as any outside the boundary that may be impacted by the development and any subsequent post development activity.

1.3 Use of the Sevenoaks District Council 'Sevenoaks District Planning Map' software confirmed that there were no Tree Preservation Orders (TPOs) relevant to the project site, nor was the site located within a Conservation Area (CA).

1.4 The report and accompanying tree survey schedule are produced in accordance with the guiding principles of British Standard BS5837:2012 *'Trees in Relation to Design Demolition and Construction - Recommendations'.*

1.5 Multiple trees have been identified as impacting the proposed development. T1 – T7, T13, and T17, all mature orchard apple, and T14, a mature common pear, are recommended for removal due to significant conflict with the two proposed dwellings and associated outbuilding. T10, a mature common elder, T11, a semi-mature European plum, T15, a mature European plum, and T18, a dead *Malus* sp., are recommended for removal due to their low quality and condition as Category U individuals. Partial removal is required from H1 on the southern boundary to facilitate the construction of the proposed access road. A Tree Protection Plan, complete with removal recommendations and mitigation measures has been proposed for the development. The proposed mitigation will be the use of CEZs and temporary ground protection. The Tree Protection Plan can be seen in Appendix 2 of this report.

Arboricultural Considerations	Recommendations	Timing
Arboricultural	Exclusion fencing should be placed to protect trees to be retained where applicable.	Pre-construction secured as condition of planning.
Replanting/ Planting	Replanting with a mix of native and ornamental species.	Post Construction.
Felling/Clearance	Any felling/shrub removal should be completed outside of the breeding bird season or under ecological supervision.	Between October - February (or March – September under supervision).
CEZ's & Root protection	Construction Exclusion Zones and ground protection should be implemented before the commencement of works to ensure that no damage is sustained to trees aimed at retention.	Pre-Construction

2 Introduction

2.1 The purpose of this survey was to provide an assessment of trees which may be impacted by development proposals at 3 Greenhill Road, Otford, Kent. A tree survey schedule compliant with the guiding principles of British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations' is contained within this report and all survey data is recorded in this schedule.

2.2 The red line boundary is approximately 0.26 hectares in extent and comprises an area of residential garden associated with 3 Greenhill Road. The northern, eastern, and southern boundaries consist of low quality, mixed species hedgerows, with adjacent residential properties to the north and east. The southern boundary acts as a screen between the on-site property and Greenhill Road. There is no physical western boundary and the site is connected to the residential garden of a neighbouring property, with some mature trees straddling the ownership boundary line. The site contains scattered fruiting trees, including orchard apple and common pear, that have reached late maturity and are of varying condition and health. A large, mature sycamore lies off-site, partly within the southern hedgerow, with a large canopy spread that overhangs into the survey site. The southern hedgerow is slightly disjunct to allow for the access driveway to the property from Greenhill Road. The site is located within the village of Otford in the Sevenoaks district of Kent, approximately three miles north of Sevenoaks. The site is the subject of an outline planning application for the development of two detached properties approximately 3500 square feet in size. Design plans are provided within Appendix 4 of this report.

2.3 Results and recommendations contained within this report have been prepared by an experienced arboriculturist and are therefore the view of Brindle & Green Limited. The survey is based on information provided by our client, the development proposals, and the results of the desk study and our survey of the site. This report pertains to this information only.

3 Methodology

3.1 The survey was undertaken in accordance with the guiding principles of British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations.' Information recorded during the survey. Information recorded in the survey includes:

3.1.1 **Species** – the species identification is based on visual observations and the common English name of what the trees appeared to be is listed. In the case of groups only the principal species are recorded, other minor species may be omitted.

3.1.2 **Tree Height** – are estimated in metres. Estimated mature heights are given in brackets. In the case of groups, the mean current height is recorded.

3.1.3 **Crown Height** – the height to the lowest branch is estimated in metres. In the case of groups of trees minimum crown height was recorded.

3.1.4 **Trunk Diameters** – measured at 1.5 metres above ground and recorded in millimetres to the nearest 10mm. However, in accordance with British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations.' where the trunk of any tree divides below 1.5 metres it is considered a multi-stemmed tree and an average is recorded. In the case of groups of trees, the maximum diameter was recorded.

3.1.5 **Crown Spread** – was recorded in metres along each of the cardinal points. In the case of groups of trees the maximum peripheral spread was recorded.

3.1.6 **Life Stage** – recorded as follows:

NP: **Newly planted** – a tree within 3 years after planting

Y: **Young**– a tree within its first one third of life expectancy

SM: **Semi-mature** – a tree within its second third of life expectancy

M: **Mature** – a tree in its final one third of life expectancy

V: **Veteran** - a tree with habitat features such as wounds or decay. A veteran may be a young tree with a relatively small girth in contrast to an ancient tree, but

bearing the 'scars' of age such as decay in the trunk, branches or roots, fungal fruiting bodies, or dead wood.

A: **Ancient** – a tree that has passed beyond maturity and is old, or aged, in comparison with other trees of the same species and is of interest biologically, aesthetically or culturally because of its age, size and condition.

3.1.7 **The Condition of Trees -** is based upon a preliminary assessment categorised thus:

Good
Fair
Poor
Very Poor/Dead

In the case of groups, the category awarded is that typical of the group.

3.1.8 **Preliminary Recommendations –** works required regardless of development proposals.

3.1.9 **Life Expectancy –** estimated; i.e. given as follows which corresponds with Table 1 of British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations.' - <10, 10+, 20+, 40+.

3.1.10 **BS 5837:2012 Tree Category:**

Cascade Chart for Tree Quality Assessment (see BS5837:2012 for full reference)			
Trees Unsuitable For Retention			
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 for the 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		
Subcategory	1. Mainly Arboriculture 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)
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 40years; 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
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 150mm	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

3.1.11 **Root Protection Area** - The root protection areas (RPA's) are calculated and recorded in the Tree Survey Schedule where it is expressed both in linear and square metres; it is at this distance/around this area that the tree protective barriers should be erected around any trees to be retained. Where construction is proposed within these areas, special techniques should be employed, and general guidance is therefore provided herein.

3.1.12 **Limitations** - Significant trees included within the plan provided were plotted using a Trimble TDC100 handheld device. Normal error of 1-2m can be experienced using this device however, care was taken to make sure the most accurate reading possible at the time of survey was taken.

4 Arboricultural Impact Assessment

4.1 Presence of Tree Preservation Orders (TPO's) or Conservation Areas (CA's) or Other Regulatory Protection

4.1.1 Use of the Sevenoaks District Council 'Sevenoaks District Planning Map' software confirmed that there were no Tree Preservation Orders (TPOs) relevant to the project site, nor was the site located within a Conservation Area (CA).

4.2 Potential Incompatibilities Between the Layout and the Trees Proposed for Retention

4.2.1 Severing just one of a tree's major roots during careless excavation for construction or services can cause the loss of up to 20 per cent of the root system; this undermines the tree's ability to absorb water and leaves it unstable in high winds. In general, 80-90 per cent of all tree roots are found in the top 600mm of soil and almost 99 per cent of the tree's total root length occurs within the topmost 1m of soil, with some variations depending on soil porosity. The undoubted nuisance that fine root systems create for the development of specific sites must be weighed against the importance that they play in soil stabilisation on sloping ground (acting in a similar way to geotextile matting).

4.2.2 The impact of the development on tree roots without mitigation, is likely to cause compaction of the soil and reduction in soil aeration, thus preventing the uptake of nutrients. This can ultimately cause root death and may result in the premature loss of the tree.

4.2.3 Two Construction Exclusion Zones (CEZ) are to be established prior to the commencement of any works onsite.

- CEZ1 will protect T8, a Category B mature orchard apple, T9, a Category C semi-mature common walnut, and T12, a Category C mature orchard apple. The exclusion fencing will run from the northern boundary, east of T12, to the western boundary just south of T8, protecting the entire RPA of the retained trees whilst leaving sufficient room for construction. Whilst there is no physical boundary to the west to connect to the exclusion fencing, care should be taken not to enter the fenced off area or encroach into the RPA of any retained trees. A boundary hedgerow and trees are to be planted

along the western boundary; the exclusion fencing is to be removed prior to these soft landscaping works.

- CEZ2 will protect T16, a mature orchard apple towards the eastern boundary. The exclusion fencing will join to the eastern boundary to the north and south of T16, protecting as much of the RPA of the retained tree as possible whilst leaving sufficient room for construction of the proposed garden room. Due to the close proximity of the garden room to T16, the exclusion fencing will run partially through the RPA of T16, under the canopy. The remaining RPA unprotected by the exclusion fencing will be protected by an area of temporary ground protection. Care should be taken to avoid damaging the section of the canopy of T16 outside of the exclusion fencing.

  CEZs are always to be afforded protection and will be protected by fencing. No equipment or machinery will be stored within CEZs, nor will vehicles or personnel enter these areas. Ground levels will not be changed within CEZs and existing vegetation will be left undisturbed. The indicative locations of the CEZs can be seen on the Tree Protection Plan in Appendix 2; the precise fencing location may require minor adjustment onsite, due to local site conditions, but is not expected to differ from that shown on the Tree Protection Plan.

4.2.4 Plans show overlap of approximately 8% of the Root Protection Area (RPA) of T20 with the proposed new access road and hardstanding for one dwelling. This degree of overlap with the rooting area of T20 is considered suitable without the requirement of permanent ground protection (3D cellular confinement systems, e.g., Terram Geocells) where the overlap occurs.

4.2.5 As mentioned in Section 4.2.3, temporary ground protection will be installed to protect the remaining RPA of T16 unprotected by CEZ2. Care should be taken to avoid damage to the section of the canopy of T16 outside of CEZ2, located above the area of temporary ground protection. As per British Standards recommendations, the temporary ground protection will comprise a single thickness of scaffold boards placed onto a 100mm layer of woodchip, laid on a geotextile membrane. This will protect the roots of from pedestrian movements in the RPA during construction. Heavier plant (exceeding 2 tonnes) requires an alternative system to accommodate the load, which must be discussed with the project arboriculturist. The proposed locations of the exclusion fencing and temporary ground protection can be seen on the Tree Protection Plan in Appendix 2.

4.2.6 There is no requirement for specialist foundations to be installed to facilitate the development.

4.3 The Working and Access Space Needed for Construction

4.3.1 Construction vehicles will use the existing and proposed access roads from Greenhill Road. Partial removal is required from H1 to facilitate the proposed access road.

4.3.2 Access into exclusion zones is strictly prohibited without prior amendments to the mitigation proposed. Similarly, building materials must also be stored outside of the CEZs to avoid soil compaction or physical damage.

4.4 Trees proposed for removal and justification to facilitate the development.

4.4.1 T1 – T7, T13, and T17, nine Category C mature orchard apple, are recommended for removal due to significant conflict with the proposed dwellings and central boundary hedgerow. T14, a Category C mature common pear, is recommended for removal due to significant conflict with the proposed outbuilding. Each of T1, T2, and T4 - T7 are of an overall fair condition with past pruning wounds that have typically failed to occlude. T3 is of poorer condition, showing advanced signs of decline including major deadwood with only one stem producing foliage – the northern and western canopy is entirely consistent of deadwood. T3 also exhibits heavy ivy and significant epicormic growth. T2, T3, and T5 – T7 show visual indications of significant burr knots throughout the stem and crown, which are often caused by environmental conditions and can lead to structural weakness. T13 is in a declining condition, with a large bracket fungus (potentially *Inonotus hispidus*) to the lower southern stem at the base of a 1m wound. T13 also exhibits significant burr knots similar to T2, T3, and T5 – T7, as well as a large wound to the eastern stem that has failed to occlude with a pocket of decay. T17 is of a fair overall condition with a well-rounded crown displaying good form. However, T17 exhibits extensive pruning throughout the canopy with a deep decay cavity to the lower stem. T17 also exhibits basal girdling and moderate deadwood within the crown. T14 is of an overall advanced declining condition with large amounts of moderate deadwood and small pruning wounds throughout. T10, a mature common elder, T11, a semi-mature European plum, and T15, a mature European plum, are recommended for removal due to their low quality and condition as Category U individuals. Each of these individuals demonstrates various signs of advanced decline, such as major

deadwood and reduced foliage throughout the crown, branch failures, and decay. T18, a dead *Malus* sp., is also recommended for removal. Partial removal is required from H1, a Category C hedgerow on the southern boundary, to facilitate the construction of the new access road.

4.5 Mitigatory Replanting/planting

4.5.1 To increase the amenity and arboricultural value of the site, the development should incorporate new planting within the scheme to offset proposed removals. Current development plans outline new planting both within the residential gardens and within the proposed boundary hedgerows, providing visual amenity and arboricultural value to the site. Replanting should use high quality stock of mix of native and ornamental species to provide ecological, landscape and aesthetic value to the scheme. Stock selection should be discussed with a qualified arboricultural consultant to ensure appropriate trees are selected for the space available. To ensure the site is replanted appropriately a robust landscape strategy will be developed.

4.6 Proximity of Trees to Structures – the Default Position – Development Outside of the RPA or Technical Solutions Where There is an Overriding Justification

4.6.1 Stout fencing and CEZs must be put in place before the commencement of works to protect retained trees. Where applicable, the ecotone/shrubbery between the tree and the proposed fencing location may need to be cut back and reduced to incorporate the fencing (Appendix 2). All fencing should be implemented before the commencement of building works and stay intact for the duration. Regular checks of the stout fencing should be carried out to ensure it remains intact. See Appendix 2 for the proposed location of exclusion fencing.

4.6.2 Overall, the processes of construction are highly unlikely to have a detrimental effect upon the health of the retained trees, assuming recommendations made in this report are always adhered to by the contractors e.g., the positioning of a stout fence between the retained trees and construction activities prior to the commencement of works.

4.7 Shading – Buildings and Open space, Privacy and Screening, Direct Damage, Future Pressure for Removal and Seasonal Nuisance

4.7.1 Shading will have minimal impact on the proposed dwellings. A shading plan for all trees surveyed can be seen in Appendix 2.

4.7.2 The impact of trees on buildings and vice versa and allowance for future growth have all been considered in the siting of the proposed plans. Tree size, future growth and light/shading have received due attention and are not considered to be an issue.

4.8 Installation of services

4.8.1 A plan of service routes is not yet currently available. Any underground services already existing on site should be utilised where possible to avoid further disturbance of RPAs. If underground services are to be installed during the establishment of the main access, they are to follow the access into the site (following the roads). If underground services are to be installed this way, then the likelihood of negatively impacting trees is kept to a minimum. Service trenches should be laid at the greatest distance from the trees as possible. Section 7.7 of BS5837:2012's guidance on services suggests re-routing into an RPA should be avoided when at all possible. If plans were to change and services were to infringe on root protection areas, effort should be taken to lay them using trenchless 'no dig' methods in order to avoid cutting major roots. Modifications to the alignment should also be made to avoid adverse effects on tree growth and soil stability. Services near existing trees and potential new planting should be ducted when possible for future maintenance. Grouping services will also minimise future disturbance where applicable.

4.9 Facilitative pruning works

4.9.1 There is no requirement for facilitative pruning works within the site. Any appointed contractor must carry out tree works according to BS3998(2010) 'Recommendations for Tree Work'.

5 Conclusion

5.1 T1 – T7, T13, and T17, nine mature orchard apple, and T14, a mature common pear, are recommended for removal due to significant conflict with the two proposed dwellings and associated outbuilding. T10, a mature common elder, T11, a semi-mature European plum, T15, a mature European plum, and T18, a dead *Malus* sp., are recommended for removal due to their low quality and condition as Category U individuals. Partial removal is required from H1 to facilitate the construction of the proposed access road on the southern boundary. All other trees identified within this report should be retained and protected as outlined via CEZs and temporary ground protection.

5.2 Felling will take place outside of the breeding bird season (March-September) to prevent disturbance. Alternatively, this may be completed under ecological supervision/ reasonable avoidance measures.

5.3 The Tree Protection Plan is subject to discussion and we endeavour to produce a pragmatic approach to the subsequent Arboricultural Method Statement and final tree retention plan.

5.4 Due to the nature of the development, it is unlikely there will be any major impacts on trees with higher landscape and amenity values if CEZs and temporary ground protection are established. Fencing should be placed prior to any construction works and can be removed after the works are completed. Appendix 3 provides details of the fencing requirements for construction exclusion zones.

Appendix 1: Tree Survey Schedule

Tree ID	Common Name	Maturity	Height and direction of first significant branch (m)	Height (m)	No. of Stems	Calculated Stem Diameter (mm)	Radius of Nominal Circle (m)	RPA**(m2)	Crown Spread (m)				Crown Height (m)				Crown	Stem	Basal Area	BS5837 Category	Subcategories	Life Expectancy	Phys Condition	Comment
									N	E	S	W	N	E	S	W								
T1	Orchard Apple	Mature	W 1	2.5	6	263	3.2	31.3	2.5	2	2	2.5	1.5	1.5	1.5	1.5	Fair	Fair	N/A	C	1 Arboricultural Values	10 to 20 yrs	Fair	Stem diameter measurements were not taken at 1.5m due to inaccessible shape of stems. Ivy to the stems. Significant pruning with regrowth. Wounds failed to occlude. Possible wound paint used. Fairly unremarkable.
T2	Orchard Apple	Mature	NE 1.5	4	4	356	4.3	57.3	2.5	3.5	3	3.5	3	2	2	2.5	Fair	Fair	Good	C	1 Arboricultural Values	10 to 20 yrs	Fair	Pruning wounds partially occluded. Significant amounts of epicormic growth. Visual indications of prolific burr knots - typically caused by environmental conditions and can lead to structural weakness and damage.
T3	Orchard Apple	Mature	S 1.5	3.5	4	348	4.2	54.8	2	2.5	2	1.5	1.5	1.5	1.5	2	Poor	Ivy	Fair	C	N/A	<10 yrs	Decline	Advanced decline with major deadwood, only one stem producing foliage. Heavy ivy and significant epicormic growth. Significant pruning wounds. Premature leaf dieback. Prolific burr knots similar to T2. North and west canopy entirely deadwood. To be removed.
T4	Orchard Apple	Mature	S 1.5	4	4	367	4.4	60.9	2.5	3.5	3.5	3	2.5	1.5	1.5	1.2	Fair	Ivy	Good	C	1 Arboricultural Values	10 to 20 yrs	Fair	Heavy ivy to stem. Moderate deadwood to the north-west and north-east.

Tree ID	Common Name	Maturity	Height and direction of first significant branch (m)	Height (m)	No. of Stems	Calculated Stem Diameter (mm)	Radius of Nominal Circle (m)	RPA**(m2)	Crown Spread (m)				Crown Height (m)				Crown	Stem	Basal Area	BS5837 Category	Subcategories	Life Expectancy	Phys Condition	Comment
									N	E	S	W	N	E	S	W								
																								Epicormic growth. Past pruning wounds maximum 130mm, failed to occlude to the north. Remove if required.
T5	Orchard Apple	Mature	NW 2	3.5	4	243	2.9	26.7	1.5	2.5	2.5	2.5	2.5	2.5	2	2	Fair	Fair	Fair	C	N/A	10 to 20 yrs	Fair	Unremarkable. Fairly sparce crown. Moderate deadwood. Past pruning failed to fully occlude in certain instances. Visual indications of burr knots throughout.
T6	Orchard Apple	Mature	N 1.5	3.5	4	298	3.6	40.2	2	3	3.5	2.5	2	2	2	2.5	Fair	Fair	Fair	C	1 Arboricultural Values	10 to 20 yrs	Fair	Epicormic growth. Significant burr knots as with other surveyed apple trees. Large pruning wound to the north west failed to occlude with signs of decay. Fair overall condition.
T7	Orchard Apple	Mature	SE 1.5	4	4	366	4.4	60.6	3	3.5	3	4	2	2	1.5	1.5	Fair	Ivy	Fair	C	1 Arboricultural Values	10 to 20 yrs	Fair	Significant amounts of past pruning wounds in the crown. Epicormic growth. Ivy to the stem. Visual indications of significant burr knots.
T8	Orchard Apple	Mature	E 1.5	3.5	5	478	5.7	103.4	5	4	3.5	5	1.5	1.5	1.5	1	Good	Good	Good	B	1 Arboricultural Values	20 to 40 yrs	Good	Good example of species. Epicormic growth. Large pruning wounds but the tree seems to be coping well. Three visible pruning wounds that have small pockets of

Tree ID	Common Name	Maturity	Height and direction of first significant branch (m)	Height (m)	No. of Stems	Calculated Stem Diameter (mm)	Radius of Nominal Circle (m)	RPA**(m2)	Crown Spread (m)				Crown Height (m)				Crown	Stem	Basal Area	BS5837 Category	Subcategories	Life Expectancy	Phys Condition	Comment
									N	E	S	W	N	E	S	W								
																								decay to the lower stem. Significant value, should be protected and retained. Straddles boundary.
T9	Common Walnut	Semi-mature	SW 1.5	4	2	187	2.2	15.8	4	4.5	4.5	4.5	1.5	0	1	0	Fair	Fair	Fair	C	1 Arboricultural Values	10 to 20 yrs	Fair	Compression fork at 1m with included bark. Overhangs neighbouring plots to the north and west. Overall fair, unremarkable condition.
T10	Common Elder	Mature	NW 1	5	1	117	1.4	6.2	1	1	1	1.5	2	2	1.5	1.5	Poor	Poor	N/A	U	N/A	<10 yrs	Decline	Advanced decline. Crown predominantly deadwood. Base obscured by bramble. To remove.
T11	European Plum	Semi-mature	NA	2.5	1	95	1.1	4.1	1	1	1	1	2	1.5	1.5	1.5	Poor	Poor	Poor	U	N/A	<10 yrs	Decline	Advanced decline. Minimal foliage remaining in crown. Helical fracture. Interior brown rot. Pruning wounds. To remove.
T12	Orchard Apple	Mature	E 1.5	5.5	1	360	4.3	58.6	3	3	3.5	4.5	2.5	2.5	2.5	2.5	Fair	Fair	Good	C	1 Arboricultural Values	10 to 20 yrs	Fair	Overall stem lean to the east. Major deadwood to the north east comprising an entire limb with loss of bark and complete hollowing. Pruning wounds throughout, some of which have failed to fully occlude with small cavities of decay. Epicormic growth. Mechanical damage at base from strimming.

Tree ID	Common Name	Maturity	Height and direction of first significant branch (m)	Height (m)	No. of Stems	Calculated Stem Diameter (mm)	Radius of Nominal Circle (m)	RPA**(m2)	Crown Spread (m)				Crown Height (m)				Crown	Stem	Basal Area	BS5837 Category	Subcategories	Life Expectancy	Phys Condition	Comment
									N	E	S	W	N	E	S	W								
T13	Orchard Apple	Mature	S 1.5	3.5	4	273	3.3	33.7	2	2.5	2.5	2	1.5	2	2	1.5	Fair	Poor	Poor	C	N/A	<10 yrs	Decline	Large bracket fungus (potentially *Inonotus hispidus*) to lower southern stem at approximately 0.15m, at the base of a 1m wound to the south of the stem. Numerous burr knots. Epicormic growth. Large wound at 1.5m east failed to occlude with pocket of decay.
T14	Common Pear	Mature	SE 1.5	6.5	1	308	3.7	42.9	3.5	4.5	3.5	4.5	1.5	1.5	2	1.5	Poor	Fair	Fair	C	N/A	<10 yrs	Decline	Large amounts of moderate deadwood. Advanced decline. Small pruning wounds but no other obvious signs of decline.
T15	European Plum	Mature	S 1.5	4.5	1	274	3.3	34.0	2	2	2	2	1.5	2	1.5	2	Poor	Poor	Fair	U	N/A	<10 yrs	Decline	Major deadwood. Significant decline. Failure of a branch to the north at 1.5m with decay. Significant decay of a branch to the west. Gummosis. Potential woodpecker holes beginning to form west 2m. Ivy. Remove.
T16	Orchard Apple	Mature	S 1.5	5.5	7	441	5.3	88.0	4	3.5	4	4	2.5	2.5	2	2.5	Fair	Fair	Fair	C	1 Arboricultural Values	10 to 20 yrs	Fair	Major deadwood with one dead stem. Old historic pruning wounds fully occluded and others failed to occlude with decay, most

Tree ID	Common Name	Maturity	Height and direction of first significant branch (m)	Height (m)	No. of Stems	Calculated Stem Diameter (mm)	Radius of Nominal Circle (m)	RPA**(m2)	Crown Spread (m)				Crown Height (m)				Crown	Stem	Basal Area	BS5837 Category	Subcategories	Life Expectancy	Phys Condition	Comment
									N	E	S	W	N	E	S	W								
																								notably north-east at 1.2m.
T17	Orchard Apple	Mature	SW 2	4.5	1	270	3.2	33.0	2.5	3	3.5	3.5	2.5	2.5	1.5	1.5	Fair	Fair	Fair	C	1 Arboricultural Values	10 to 20 yrs	Fair	Fair overall quality. Retain if possible. Nice form, well rounded crown. Extensive pruning. Small 7cm deep decay cavity at south-east extent of lower stem. Some form of basal girdling. Some moderate deadwood.
T18	*Malus* sp.	Dead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	U	N/A	<10 yrs	Dead	Dead tree to be removed, potentially *Malus* sp.
T19	Common Hawthorn	Semi-mature	NW 1.5	7.5	3	287	3.4	37.3	2.5	1.5	2.5	2.5	3	2.5	2.5	3	Poor	Fair	Fair	C	N/A	<10 yrs	Decline	Off site. Close proximity to hedgerow. Two stems with compression forks as stems divide with included bark. Epicormic growth. Dead ivy. Damage to the base. Advanced crown decline. Tall, drawn form.
T20	Sycamore	Mature	SW 6	13	1	607	7.3	166.7	6.5	6	8	8	3.5	3.5	4	2.5	Good	Fair	Fair	B	1 Arboricultural Values;2 Landscape Values	20 to 40 yrs	Fair	Dead ivy to the stem. Large pruning wound to the eastern aspect of the stem starting to occlude. Lots of vertical fissures to the bark. Bark peel to the northern aspect of the lower stem. Good shape and form in crown. Slight bulge in the stem south with

Tree ID	Common Name	Maturity	Height and direction of first significant branch (m)	Height (m)	No. of Stems	Calculated Stem Diameter (mm)	Radius of Nominal Circle (m)	RPA**(m2)	Crown Spread (m)				Crown Height (m)				Crown	Stem	Basal Area	BS5837 Category	Subcategories	Life Expectancy	Phys Condition	Comment
									N	E	S	W	N	E	S	W								
																								stem lean. Moderate deadwood.

*RPA = The minimum distance, measured from the tree's trunk, at which tree protective barriers should be erected.

**RPA = The minimum area in M^2 around which tree protective barriers should be erected.

#Access restricted, inspection limited, dimensions limited.

Key: **Life Stage** – recorded as follows:

NP: Newly planted – a tree within 3 years after planting
Y: Young– a tree within its first one third of life expectancy
SM: Semi-mature – a tree within its second third of life expectancy
M: Mature – a tree in its final one third of life expectancy
V: Veteran - a tree with habitat features such as wounds or decay. A veteran may be a young tree with a relatively small girth in contrast to an ancient tree but bearing the 'scars' of age such as decay in the trunk, branches or roots, fungal fruiting bodies, or dead wood.
A: Ancient – a tree that has passed beyond maturity and is old, or aged, in comparison with other trees of the same species and is of interest biologically, aesthetically or culturally because of its age, size and condition

Group ID	Species	BS5837 Category	Description/Comments
G1	Norway Maple, Common Ash, Common Hazel, Leyland Cypress, *Prunus* sp., *Malus* sp., Buddleia, Common Elder, Dog Rose, Field Maple, Common Hawthorn, Irish Yew, Lilac, Hornbeam	C	Low quality boundary group acting as a boundary between the site and the neighbouring garden. Category C. Becomes predominantly field maple and hawthorn hedge towards the southern boundary.
H1	Dogwood, Norway Maple, Common Hawthorn, Cherry Laurel, Ivy, Common Holly, Privet, Sycamore	C	Low quality hedgerow providing a boundary between the property and Greenhill Road. Maximum height 3.5m, average height 1.5m. Category C. Disjunct due to driveway.
H2	Privet, Dog Rose, Common Hawthorn, Norway Maple, Ivy, Common Hazel, Sycamore	C	Boundary hedgerow to the north of the property. Category C. Approximately 1.5m average height. Heavy ivy.

Appendix 2: Tree Plans & Tree protection Plan

Job reference: BG21.258

Project Title: 3 Greenhill Road, Otford

Drawing Title: Tree and Group Locations with Quality Assessment

Drawn by: HR

Date: 16/08/2021

Legend:

- Category A Tree Canopy Spread & Group Locations
- Category B Tree Canopy Spread & Group Location
- Category C Tree Canopy Spread & Group Locations
- Category U Tree Canopy Spread & Group Locations

Brindle & Green Ecological Consultants Ltd
ARBORICULTURALISTS FOR BUSINESS
www.brindlegreen.co.uk
TEL: 0800 222 9105

brindle& green arboriculture

Job reference: BG21.258

Project Title: 3 Greenhill Road, Otford

Drawing Title: Tree and Group Locations with Quality Assessment (Plans Overlaid)

Drawn by: HR

Date: 16/08/2021

Legend:

- Category A Tree Canopy Spread & Group Locations
- Category B Tree Canopy Spread & Group Location
- Category C Tree Canopy Spread & Group Locations
- Category U Tree Canopy Spread & Group Locations

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Job reference: BG21.258

Project Title: 3 Greenhill Road, Otford

Drawing Title: Shade Plans

Drawn by: HR

Date: 16/08/2021

Legend:

Current Shading

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Job reference: BG21.258

Project Title: 3 Greenhill Road, Otford

Drawing Title: Shade Plans (Plans Overlaid)

Drawn by: HR

Date: 16/08/2021

Legend:

Current Shading

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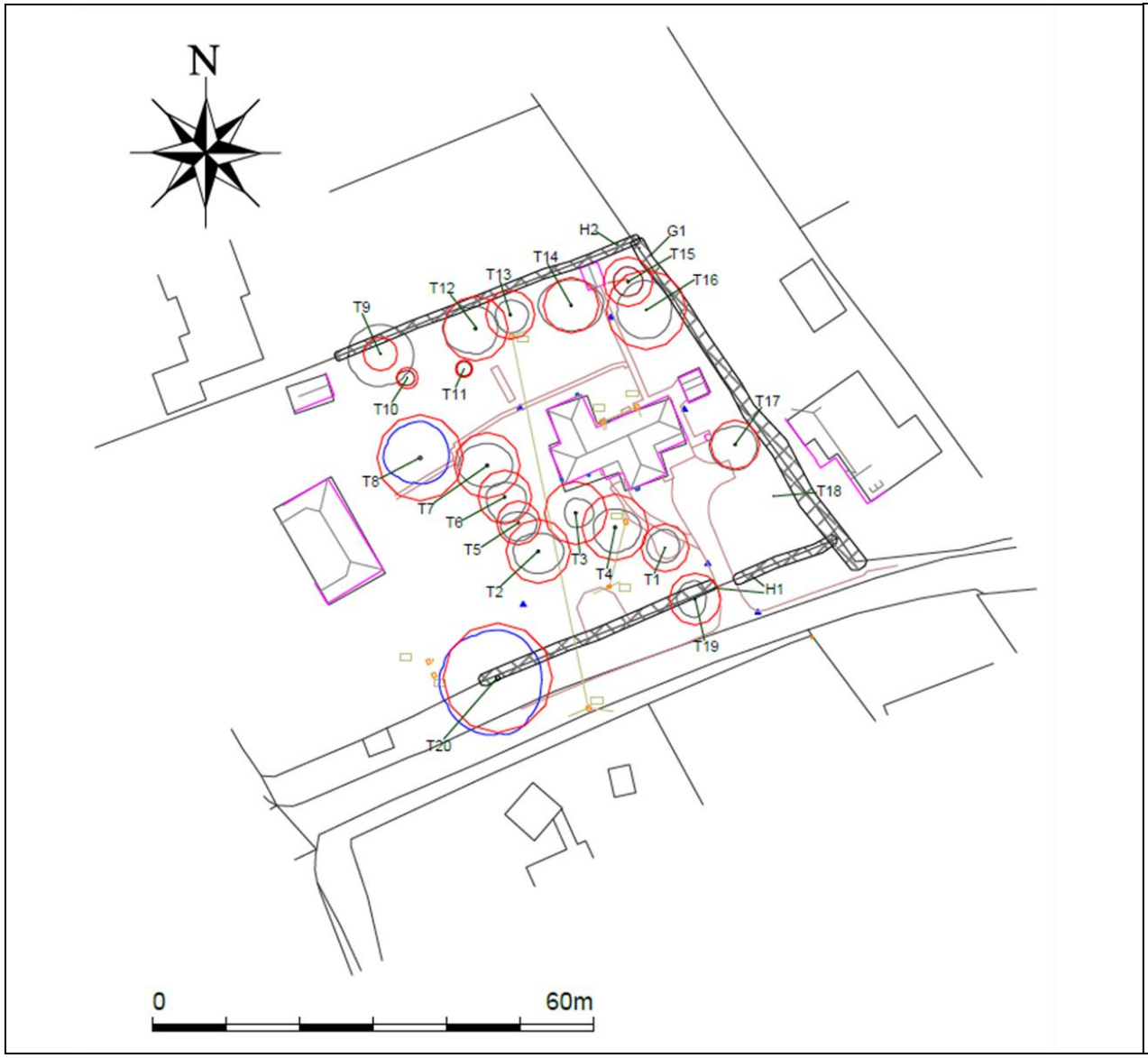

Job reference: BG21.258

Project Title: 3 Greenhill Road, Otford

Drawing Title: Root Protection Areas

Drawn by: HR

Date: 16/08/2021

Legend:

- Root Protection Area (RPA)
- Category A Tree Canopy Spread
- Category B Tree Canopy Spread
- Category C Tree Canopy Spread
- Category U Tree Canopy Spread

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Job reference: BG21.258

Project Title: 3 Greenhill Road, Otford

Drawing Title: Root Protection Areas (Plans Overlaid)

Drawn by: HR

Date: 16/08/2021

Legend:

- Root Protection Area (RPA)
- Category A Tree Canopy Spread
- Category B Tree Canopy Spread
- Category C Tree Canopy Spread
- Category U Tree Canopy Spread

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Job reference: BG21.258

Project Title: 3 Greenhill Road, Otford

Drawing Title: Tree Protection Plan

Drawn by: HR

Date: 18/08/2021

Legend:

Suggested Location of Exclusion Fencing

Trees Suitable for Removal

Location of Temporary Ground Protection

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Job reference: BG21.258

Project Title: 3 Greenhill Road, Otford

Drawing Title: Tree Protection Plan (Plans Overlaid)

Drawn by: HR

Date: 18/08/2021

Legend:

Suggested Location of Exclusion Fencing

Trees Suitable for Removal

Location of Temporary Ground Protection

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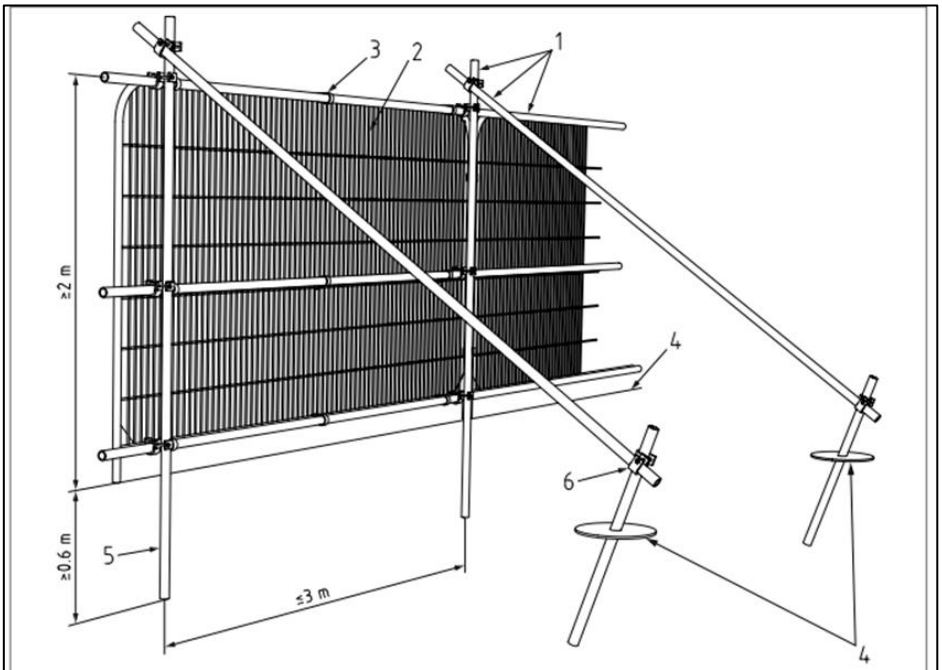
Appendix 3: Tree Retention General Guidance

1. **Below Ground Constraints** to achieve any development, various construction activities are required and great care and consideration needs to be given as to how such activity can proceed whilst avoiding damage to retained trees.

1.1. In order to avoid damage to their roots, trees should be protected using protective barriers as are detailed in British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations' and as illustrated in Figures 1 and 3. Such barriers should be erected around the RPA prior to the commencement of the demolition/construction activity; it must remain in situ and intact until completion. The area within these barriers should, with some exceptions be considered sacrosanct, and no work should be permitted within them. In an effort to ensure any tree protective barriers remain during construction, it is further advised that they carry signage as per Figure 2 and that the Site Agent is briefed accordingly.

1.2. Tree Protective Barriers should also be erected, prior to the commencement of construction, around those areas identified for soft landscaping/tree planting so as to protect the soil from compaction and denaturing. Correct setting out of the barriers and ground protection should be confirmed on site by the project arboriculturist prior to the commencement of any other operations on site.

1.3. Where space is required within the RPA to facilitate the erection of scaffold this may be satisfactorily achieved incorporating ground protection within the scaffold structure as illustrated in Figure 3 above.



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 1 – Tree Protection Barrier

British Standard 5837, (2012),), *'Trees in Relation to Construction: Recommendations', Page 20*

Figure 2 - Barrier Notice

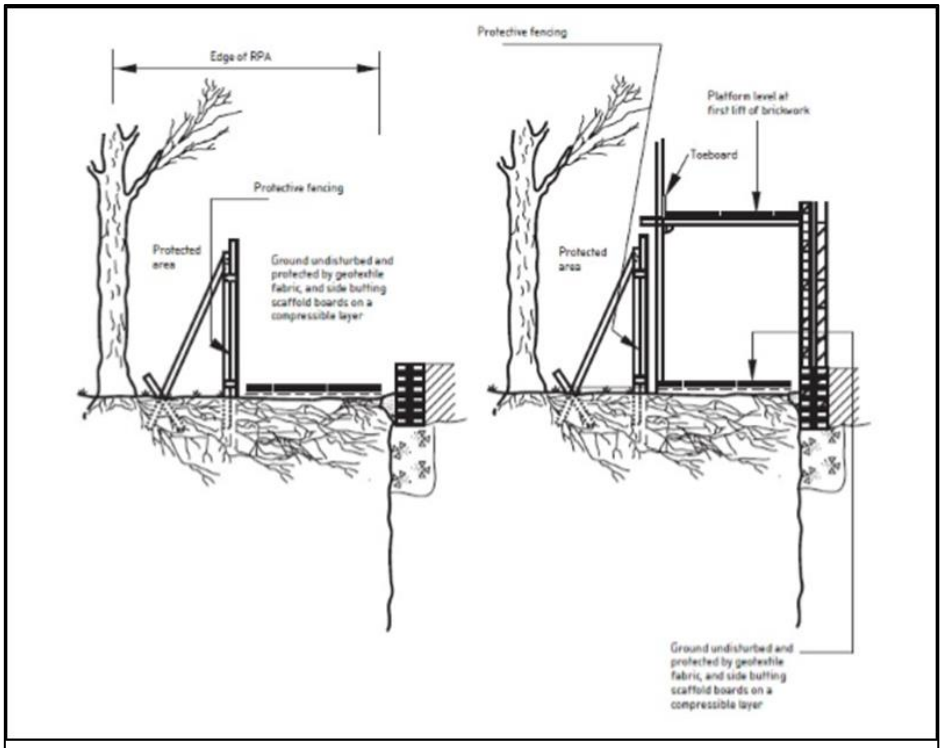


Figure 3 – Adapted Barrier Incorporating Temporary Ground Protection

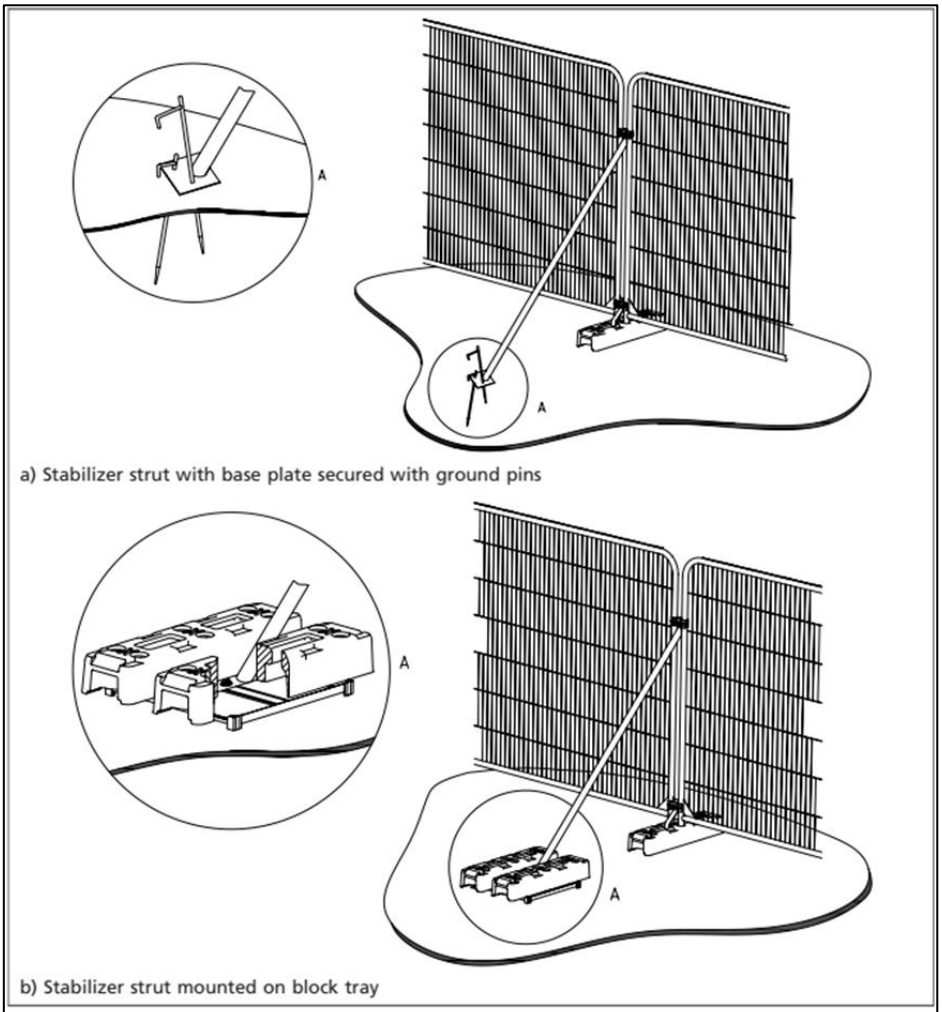


Figure 4 - Examples of above-ground stabilizing systems
British Standard 5837, (2012), *'Trees in Relation to Construction: Recommendations', Page 21*

2. **Above Ground Constraints**: Consideration must also be given to the aerial parts of the tree in relation to any construction; particularly residential buildings. Conflict frequently arises where dwellings are placed close to trees giving rise to concerns relating to shade, falling debris such as leaves and twigs and from apprehension arising from a perceived threat of tree failure. These concerns can often be overcome, in part at least, by carefully ensuring adequate useable garden space is provided and is not dominated by trees and that principal windows face away from trees; in some instances it may be appropriate to locate glazed panels into the roof structure. The LPA are likely to resist any proposal that results in built structures close to trees or that makes inadequate provision for their future growth. Usually, and particularly in the case of immature trees, the distances required to avoid conflict will be greater than

those expressed as the RPA. It is however, equally important to note that issues arising from shade are often overstated and that some shade is not only tolerable but may be beneficial. It is also important to bear in mind that different tree species cast different shade patterns depending upon juxtaposition, size, habit, canopy density, evergreen/deciduous. The following guidance is given by the Building Research Establishment (BRE): "Tree locations are … important; deciduous species are best because they are leafless when solar gains are most valuable, while providing some shade in summer." (BR380 Page 69) Deciduous trees give shade in summer but allow access to sunlight in winter." (BR 209 page 22). "The question of whether trees aforementioned should be included in the (solar gain*) calculation depends upon the type of shade they produce. Normally, trees and shrubs need not be included, partly because their shapes are impossible to predict, and partly because the dappled shade of a tree is more pleasant than the deep shadow of a building. This applies especially to deciduous trees." (BR209 page 13).

3. ARBORICULTURALLY ACCEPTABLE CONSTRUCTION METHODS WITHIN RPA

3.1. Foundations: in order to maximise a sites development potential, it may be possible to employ special foundation design such as mini/micro pile and suspended beam or a cantilevered foundation. These designs enable construction within the RPA as they limit excavation to a minimum. The location of any mini piles would need to be flexible so as to avoid damage to major roots and the necessary excavation for the piles may need to be carried out by hand; the piles should be sleeved so as to contain concrete which contains 'tree-toxic' chemicals. In these circumstances a suspended floor slab will need to be incorporated and the void beneath should be externally vented so as not to inhibit gaseous exchange, in some instances i.e. where more than 20% of the RPA is to be covered, there will need to be provision for the redistribution of rainwater beneath the slab. Where pile foundations are to be employed, consideration needs to be given to the selection of the type of piling rig so as to avoid conflict with low, overhanging tree branches.

3.2. **Hard Surfacing - New:** It is permissible to construct hard surfacing for drives and paths within the RPA; however, it can have implications for tree roots. These implications can often be overcome and/or minimised by employing a 'no-dig' construction (see Appendix 3) methods. These techniques result in structures which are load bearing and negate the need for deep excavation.

Any final surface must be porous so as to permit gaseous exchange and moisture percolation. Further advice of a structural engineer must be sought to design the final specification in accordance with these parameters, with the final design being agreed with a Chartered Arboriculturist.

3.3. **Hard Surfacing - Existing**: Where hard surfacing exists within the area defined as the RPA, it is acceptable to erect protective barriers at the extent of that hard surface, since the surface itself will afford protection to any tree roots beneath. However, where is proposed to remove/regrade existing hard surfacing care must be taken to avoid collision between overhanging tree branches and passing construction traffic. It is advised that to minimise root disturbance the existing surface is broken and gathered for disposal using hand operated tools, any backfilling must utilise top quality top soil laid at approximately 50mm deep with a composted bark mulch laid over that to a maximum depth of 75mm; in the long term this approach brings a positive arboricultural impact.

3.4. **Temporary Site Accommodation** – Note 2 Page 20 of BS 5837 (2012) advises that in some circumstances it is appropriate to use site cabins as components of the tree protective barriers where they can serve as an effective means of protecting the soil from many of the construction related activities. Further advice of a Chartered Arboriculturist should be sought should this matter be of relevance or advantageous.

3.5. **Temporary Ground Protection** - In some instances it may be advantageous to work within the RPA e.g. access a site, either for pedestrians or machinery. BS5837 (2012) acknowledges this as a possibility and systems which dissipate any load applied, thus avoiding soil compaction and denaturing, are to be used, also new temporary ground protection could comprise one of the following:

A) For pedestrian movements only, a single thickness of scaffold boards should be 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.

B) For pedestrian operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards could be placed on top of a compression resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile.

C) For wheeled or tracked construction traffic exceeding 2t gross weight, an alternative system (e.g. pre-cast reinforced concrete slabs) could be employed.

D) An engineer should be consulted regarding the design of a temporary access with the final specification being agreed with a Chartered Arboriculturist.

4. OTHER CONSIDERATIONS

4.1. Trees Subject to Statutory Controls: No attempt has been made to establish the existence of any statutory controls; the following is given as guidance. Trees and hedgerows can be subject to statutory control and severe penalties can result from unauthorised works or damage. It is recommended that prior to commencement of any tree works the Local Planning Authority (LPA) are contacted. When proposing to do works to trees within a Conservation Area, with some exceptions, eg the implementation of works directly necessary to implement a full planning permission, six weeks written notice must be given to the LPA, this notice need not take any form other than a written specification of what is proposed and a plan illustrating the position of the tree(s). This notice is often referred to as a Section 211 Notice. Many LPA's prefer that their standard pro-forma is submitted to ensure the necessary detail is included in the notice; whilst such cannot be strictly required it can assist in a speedy outcome.

4.1.1. Having received the notice the LPA has essentially only one of two options at its disposal i.e.:

- Impose a TPO in respect of those trees/some of those trees subject to the notice. This prevents any works being carried out without the express, written consent of the LPA,

Or

- Do nothing. It is considered best practice for an LPA to acknowledge receipt of the notice but there is no obligation for it to do so. After six weeks of serving the notice the tree owner may proceed with the works detailed in the Section 211 Notice. The LPA cannot, in response to a Section 211 Notice, issue a conditional consent. TPO's are made in the interests of preserving amenity, usually taken to mean public visual amenity. Trees

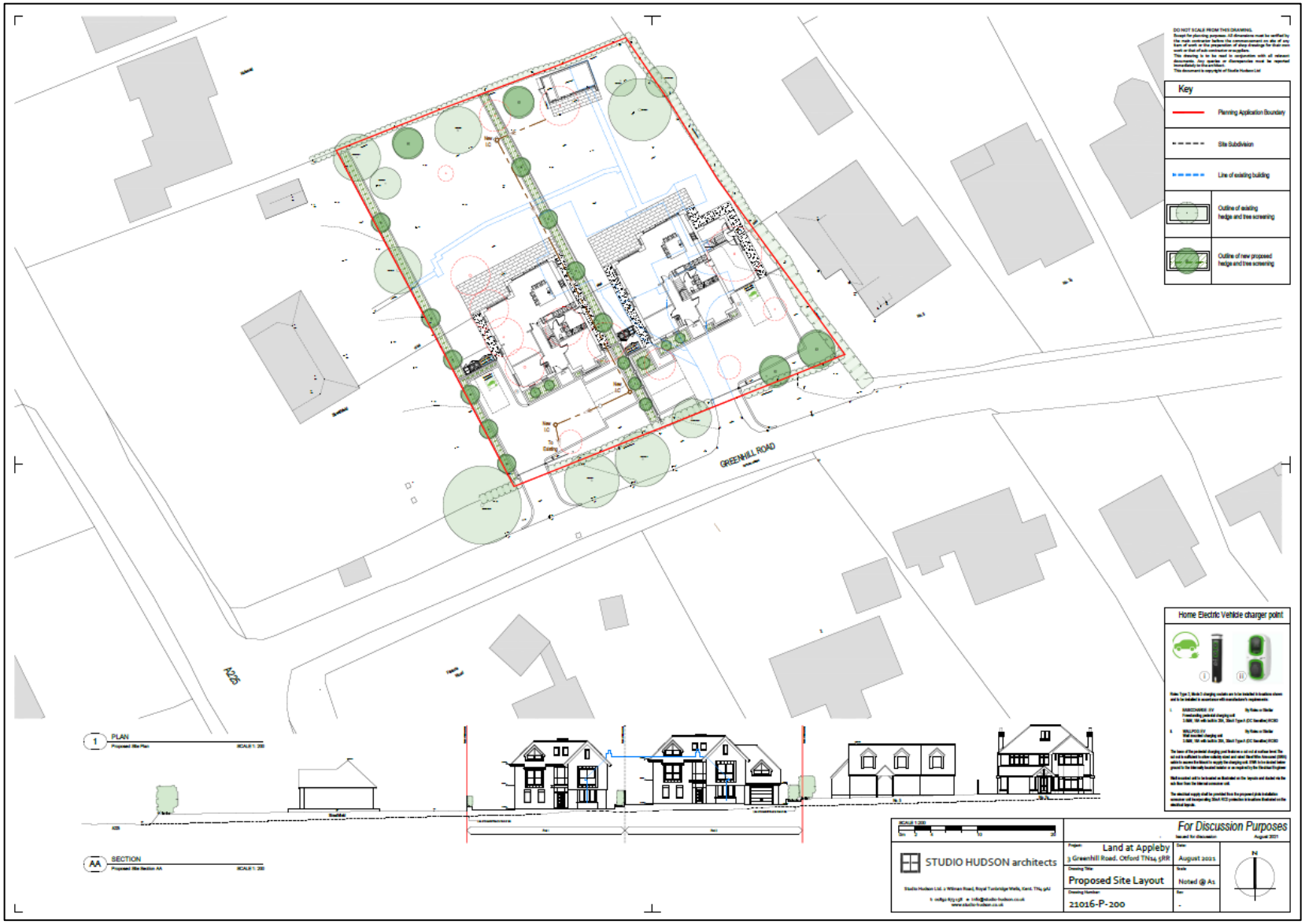
largely removed from public view and which have little visual impact are not usually made the subject of a TPO. The written consent of the LPA must be obtained prior to undertaking works to trees subject to TPO unless, as with trees in Conservation Areas, certain exemptions apply. With regard to trees subject to TPO's it is a requirement that a standardized application form is used; this form is available from the LPA. Where trees are protected Brindle & Green Limited are happy to act as the client's agent, liaising as necessary with the LPA and producing the written submissions/notices/applications as required.

4.2. **Trees and Wildlife**: Trees play host to nesting birds many of which are protected by law. All British bat species are also protected and can be found in trees. Great care needs to be taken to avoid disturbance and consideration should be given to the timing of tree works in order to avoid disturbance. Where the presence of protected species is suspected, Natural England should be contacted for advice.

4.3. **Implementation of Tree Works**: Guidance on hiring an Arborist is available from Brindle & Green Ltd. Also, the Arboricultural Association's Register of Contractors is available free from Ullenwood Court, Ullenwood, Cheltenham, Gloucestershire, GL53 9QS (Telephone 01242 522152 , www.trees.org.uk). Any appointed contractor should carry out all tree works to BS 3998 (2010) 'Recommendations for Tree Work.'

4.4. **New Planting**: It is possible that any planning permission issued will carry a condition requiring new tree planting, particularly in instances where a proposal involves the removal of trees. Further advice is available upon request.

Appendix 4: Proposed Plans


Key
Planning Application Boundary
Site Subdivision
Line of existing building
Outline of existing hedge and tree screening
Outline of new proposed hedge and tree screening
GREENHILL ROAD
A225
Home Electric Vehicle charger point
1 PLAN
AA SECTION
STUDIO HUDSON architects
For Discussion Purposes
Land at Appleby
3 Greenhill Road, Otford TN14 5RR
August 2021
Proposed Site Layout
Noted @ A1
21016-P-200