

# PRE-DEVELOPMENT TREE CONSTRAINTS ASSESSMENT

## EDHILL AVENUE, SOUTH SHIELDS

**R04  
May 2016**

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Job No. 4358						

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## A SUMMARY

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E<sup>3</sup> Ecology Ltd was commissioned by CEAD Ltd. to undertake a pre-development Tree Constraints Assessment (TCA) for trees within and surrounding a site along Edhill Avenue, South Shields.

Current site proposals include the construction of a two storey apartment block and two bungalows with associated hard and soft landscaping.

Survey was undertaken on the 21<sup>st</sup> September 2015 and comprised a thorough inspection of the trees within the site to inform the TCA. This assessment places trees into categories of retention as recommended by the prescriptions of British Standard (BS) 5837:2012: 'Trees in relation to design, demolition and construction - Recommendations'.

One early-mature tree within the site boundary was surveyed and reference tagged with a numbered aluminium disc. The dimensions were estimated of eight trees growing within properties adjacent to the site boundary which will potentially be affected by any development within the site.

Two characteristic groups of trees of moderate to high ecological and landscape value growing outside but adjacent to the site boundary were assessed as a whole (table 3).

All trees that will potentially be impacted upon as a consequence of the development, including trees in property adjacent to the site boundary, should have a Construction Exclusion Zone (CEZ) implemented around their root plate areas or root protection measures as specified in a Tree Protection Plan (TPP), following production of detailed scale development plans.

Consultation with South Tyneside Council in October 2015, highlighted that the trees are not within a Conservation Area, but that currently all of the trees within the property to the north of the site boundary which may be affected by the proposed development are protected by area Tree Preservation Order (TPO) number 155 (Appendix 5). All trees served with TPO's are protected under the Town and Country Planning Act 1990 (as amended) and the Town and Country (Tree Preservation) (England) Regulations 2012 (Appendix 6), which should be considered when preparing the final development layout.

For the purposes of this survey, each significant tree was assigned a category of retention in accordance with BS5837:2012 (Appendix 2: Tree quality assessment) and an estimated safe use life expectancy (SULE) in the context of a future development.

In summary:

- Three trees were category 'A',
- Two trees were category 'B',
- Three were category 'C' and
- One was category 'U'.

Root Protection Areas (RPAs) were calculated for each tree. These dimensions should be used to inform the positions of buildings, associated landscaping, hard standing and access routes in the final landscape plan and the prescriptions of the TPP.

Overall, within the context of the surrounding area, the trees within and surrounding the site are currently assessed as being of moderate to high landscape, amenity and ecological value. This is in terms of providing screening from the surrounding areas, and providing important wildlife linkages and nesting and foraging habitat for any wildlife that would be found within or commuting through the site.

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From a general management, hazard assessment and health and safety perspective, all of the trees surveyed were assessed as being in good physiological and structural condition. Details of individual trees are included in the Arboricultural Implications Assessment (AIA) in appendix 1.

Potential impacts of the proposed development without appropriate mitigation are:

- Loss of an early-mature tree (tree T1) that is an ecological, amenity and landscape asset of moderate value to the site and surroundings.
- Damage to the roots and crowns of protected trees adjacent to the site boundary through the incorrect placement of site materials or parking of plant/ site machinery.
- Damage to the roots and crowns of protected trees through the movement of general site plant machinery.
- Long term damage to the crowns of protected trees if pruning works are carried out at the incorrect time of year, by an inexperienced arboricultural contractor.
- Damage to trees in the long term through lack of chemical pollution control (diesel spillage, tarmac residues, use of petro chemicals etc.) during the development phase.
- Works to or removal of an early-mature tree with a moderate risk of supporting nesting birds during the bird breeding season (March to August inclusive).

Key mitigation and enhancement measures are likely to include:

- Replace tree T1 with two medium size species trees (such as *Sorbus* spp) that will not cause future issues for the development.
- All works to tree T1 and branches overhanging the site boundary from neighbouring trees are to be carried out to the prescriptions specified in an arboricultural method statement, by an approved and experienced arboricultural contractor working to BS-3998:2010.
- All works on site are to be undertaken in accordance with a TPP with working methods.
- As there is limited space within the site, adequate measures should be designed to protect the roots of the retained tree within its root plate area (see TPP) and the roots and crowns of trees in adjacent properties from the movement of high clearance site plant machinery.
- Barrier fencing must prohibit construction works in the areas between the barriers and the trunk of the tree. Barriers are to be installed prior to any preliminary construction or preparation works.
- All tree works are to be undertaken outside the bird breeding season (March-August inclusive) unless a checking survey is undertaken by an appropriately qualified ecologist and active nests are found to be absent.
- Strict control on the use of polluting chemicals within the site to comply with the Pollution prevention and Control Act 1999, according to Environment Agency Pollution Prevention Guidelines, PPG 1<sup>1</sup> and PPG 6<sup>2</sup>.
- The adoption of horticultural good practice (e.g. no, or low, use of residual pesticides) especially if the stump of a felled tree is to be treated. If necessary, the stump should be decimated with a stump grinder to prevent further damage to neighbouring trees being retained (rather than removed using a bulldozer).
- Species to be planted within the site should include a combination of native flowering, fruit and seed bearing species with a high biodiversity index, to attract a broad range of invertebrates, foraging birds and foraging mammals. Species could include: wild cherry, rowan, hazel, crab apple, field maple and bird cherry.
- New plantings should be chosen so as to not present future root conflict and shading issues for the new buildings.

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<sup>1</sup> Environment Agency, 2013. 'Basic good environmental practices, PPG1: Prevent pollution'.

<sup>2</sup> Environment Agency, 2014. 'Construction and demolition sites, PPG6: Prevent pollution'.

- **Mitigation measures, such as root protection barriers are to be checked by the project Arborist prior to commencement of demolition or construction works.**

*E<sup>3</sup> Ecology Ltd accepts no responsibility for injury that may occur as a result of incorrectly interpreting this report. Trees are living organisms whose health and condition can change rapidly as a result of environmental changes. All trees, even healthy ones, are at risk from unpredictable climatic and man-made events. The assessment of risk for these trees is based upon factors evident at the time of the inspection, the potential an individual tree has for survival, and the interpretation of those factors by the inspector. The health, condition and safety of these trees should be checked on a basis commensurate with the level of risk as specified in this report.*

*If works are not likely to start within 12 months of this report, it is recommended that an updating survey is undertaken to ascertain any changes which may have occurred to trees surveyed, where failure to carry out the prescribed works within the specified time frames has occurred.*

If you are assessing this report for a local planning authority and have any difficulties interpreting plans and figures from a scanned version of the report, E<sup>3</sup> Ecology Ltd would be happy to email a PDF copy to you. Please contact us on 01434 230982.

## B INTRODUCTION

E<sup>3</sup> Ecology Ltd was commissioned by CEAD Ltd. to undertake a pre-development TCA for trees within and surrounding a site on Edhill Avenue, South Shields.

The site is located south of Simonside, South Tyneside at an approximate central grid reference of NZ 35027 64069. The site location is illustrated below in Figures 1 and 2.

Figure 1- Map of site and surrounding area.  
©Crown copyright and database Reproduced under licence from Ordnance Survey (2015)

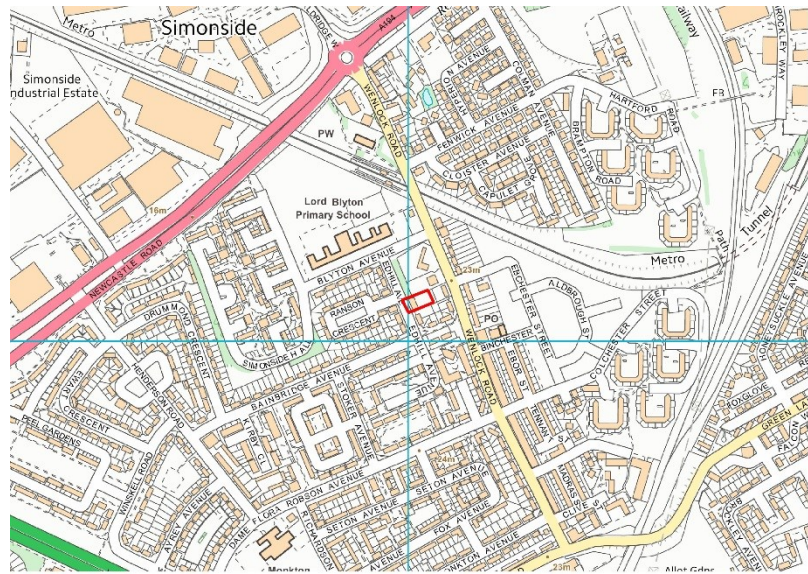
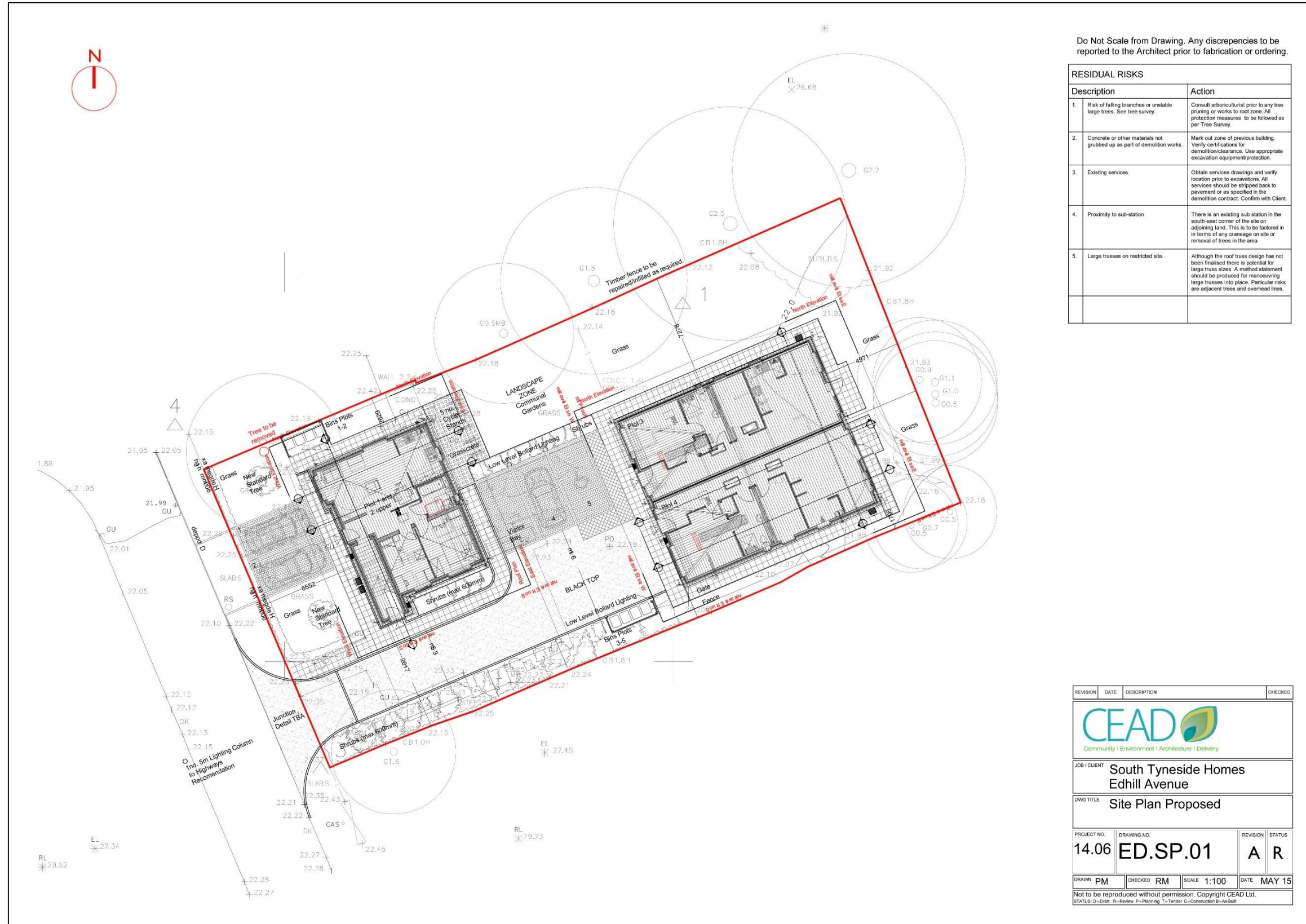


Figure 2 – Aerial photograph of the site location showing individual trees within the context of the land surrounding the site. Reproduced under licence from Google Earth Pro. (2015)



**B.1 Details of the proposed works on site**

Figure 3. Current development plans for the site. CEAD: 14.06/EA.SP.01/A/ May 2015.



Do Not Scale from Drawing. Any discrepancies to be reported to the Architect prior to fabrication or ordering.

RESIDUAL RISKS	
Description	Action
1. Risk of falling branches or unstable large trees. See tree survey.	Consult arboriculturist prior to any tree pruning or works to root zone. All protection measures to be followed as per Tree Survey.
2. Concrete or other materials not grubbed up as part of demolition works.	Mark out zone of previous building. Verify certifications for demolition/clearance. Use appropriate excavation equipment/protection.
3. Existing services.	Obtain services drawings and verify location prior to excavations. All services should be stripped back to pavement or as specified in the demolition contract. Confirm with Client.
4. Proximity to sub-station	There is an existing sub station in the south-east corner of the site on adjoining land. This is to be factored in in terms of any craneage on site or removal of trees in the area.
5. Large trusses on restricted site.	Although the roof truss design has not been finalised there is potential for large truss sizes. A method statement should be produced for manoeuvring large trusses into place. Particular risks are adjacent trees and overhead lines.


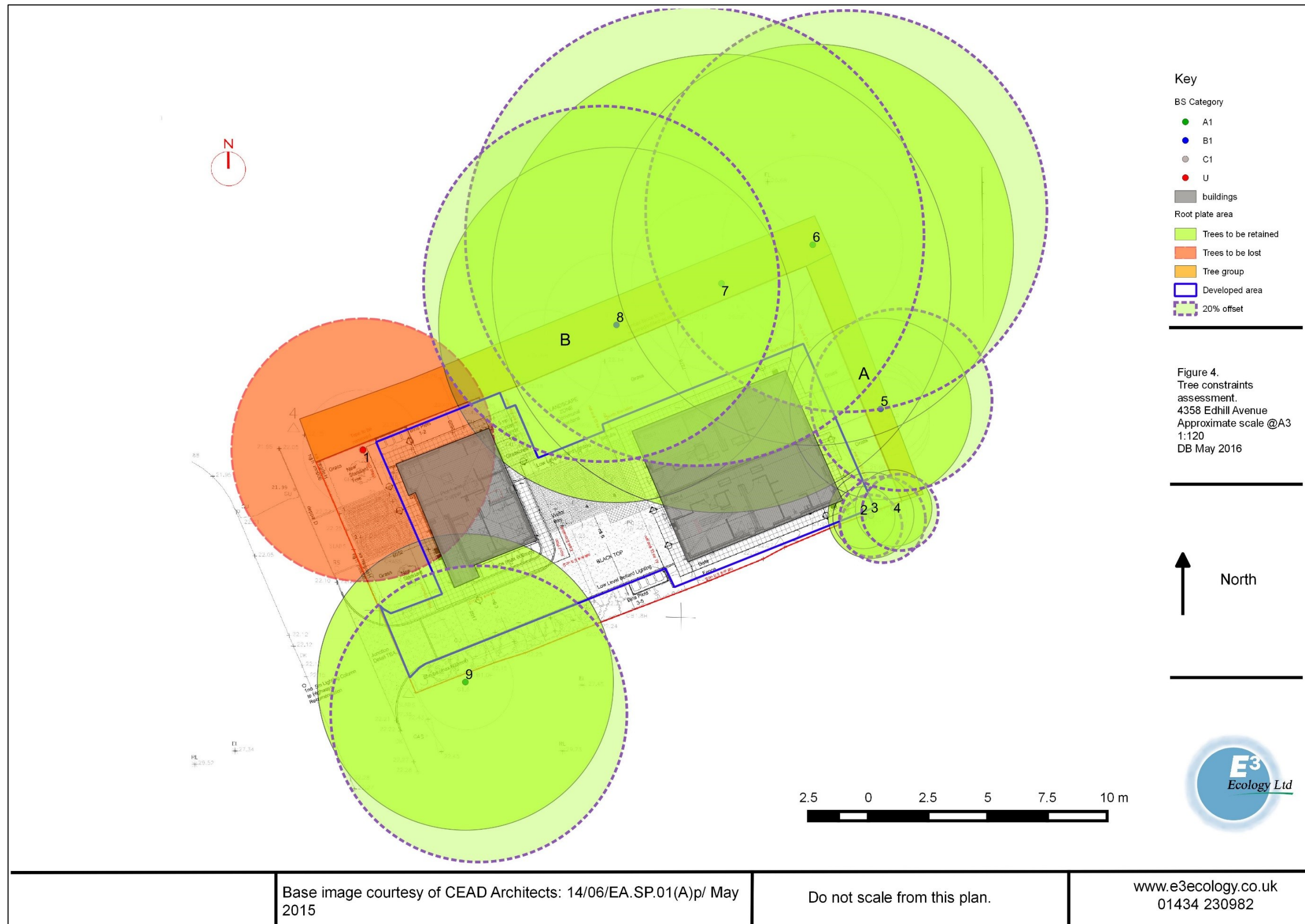
REVISION	DATE	DESCRIPTION	CHECKED
 Community   Environment   Architecture   Delivery			
JOB / CLIENT		South Tyneside Homes Edhill Avenue	
DWG TITLE		Site Plan Proposed	
PROJECT NO.	DRAWING NO.	REVISION	STATUS
14.06	ED.SP.01	A	R
DRAWN	CHECKED	SCALE	DATE
PM	RM	1:100	MAY 15
Not to be reproduced without permission. Copyright CEAD Ltd.			
STATUS: D-Draft R-Review P-Planning T-Tender C-Construction B-As-Built			



Figure 4 illustrates the locations of surveyed trees around the site with estimated root plate areas.



## C METHODOLOGY

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### C.1 Land survey

The site is currently surrounded by a close boarded fence. There is a single category 'B' early mature wild cherry to the front of the site within the boundary. The remainder of the site is dominated by poor semi-improved grassland, with areas of tall ruderal and weed species. There are two Category 'A' early mature ash trees outside the northern site boundary which form part of two belts of trees growing around the site. These trees are most likely survivors of a former landuse, and form part of a small block of mixed woodland to the rear of private gardens to the north of the site.

### C.2 Inspection

Site visits were undertaken on the 21<sup>st</sup> September 2015. All observations were carried out from ground level using the Visual Tree Assessment (VTA) method (Mattheck, C and Breoler, H., 2010).

Prescriptions for proposed works on the trees were assigned according to the guidelines in BS 3998:2010: 'Recommendations for tree work' and BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' from which arboricultural method statements (AMS) an AIA and TPP can be designed.

Young trees and dead trees with a stem diameter of less than 150mm were not tagged (except specific notable trees of high value). If young trees are to be removed, they can easily be transplanted around the site and incorporated into the overall landscape design. If they are to be retained a CEZ should be implemented around them as specified in an AIA and TPP once development proposals have been finalised.

Root Protection Areas (RPAs) were calculated for each tree to allow a TPP to be created where conflicts with any aspect of a future development may occur (a scale diagram should be provided in an annexed AIA/TPP report). These are stated within the TCA schedule in m<sup>2</sup> as a circle centred on the centre of each stem, or in metres as a radius from the centre of each stem.

- Each tree selected was identified and assigned a reference number on the plan. An aluminium reference tag was attached to each tree with a zinc nail.
- Diameters of trees were taken with a diameter at breast height (DBH) tape at 1.5m above adjacent ground level. Heights were calculated using a Clinometer at intervals of 10m from the tree, depending on accessibility and visibility of the canopy and the height.
- The crown radius was estimated to the nearest 0.5m along the cardinal points (North, East South, and West) and the crown clearance calculated as the nearest point of the crown to ground level.
- Age class, Safe Use Life Expectancy (SULE) (Appendix 3) and physical condition of the trees were assessed subjectively by the Inspector in order to designate a category of retention of each tree in accordance with the criteria specified within BS5837:2012 (Table 1 and Appendix 2).

### C.3 Rationale

- These techniques identify the quality and value of the tree stock (in a non-fiscal, ecological and landscape sense).
- This allows an informed decision to be made concerning which trees are to be removed or retained during the development stages.

- It also provides an estimate as to how long each tree can be expected to remain on site with an acceptable degree of safety; which is particularly important from a landscape design perspective.
- Management recommendations are made primarily if:
  - a tree is assessed to be potentially hazardous in the short term,
  - if there are hazardous features or defects that could easily be remediated through targeted management, or
  - if the growth form of certain individual trees, within an amenity context, has become detrimental to the natural growth of neighbouring trees.

**The timeframe for works or re-inspection is influenced by the urgency of the work required for health and or the seasonality of the survey.**

## D SURVEY RESULTS AND ANALYSIS

For the detailed results, please see 'Appendix H: Results', summaries of the survey results are shown below in tables 1, 2 & 3 and within figure 4.




Common Name	Taxonomical nomenclature	Number
Ash	<i>Fraxinus excelsior</i>	5
Sycamore	<i>Acer pseudoplatanus</i>	2
Wild cherry	<i>Prunus avium</i>	1
Japanese cherry	<i>Prunus kanzan</i>	1




Category	Definition	Number
<b>A1</b>	Those of high arboricultural quality and value with a remaining life expectancy of >40years	3
<b>B1</b>	<b>Mainly arboricultural qualities.</b> Those of moderate arboricultural quality and value with a remaining life expectancy of >20 years	2
<b>C1</b>	<b>Mainly arboricultural qualities.</b> Those of low arboricultural quality and value with a remaining life expectancy of >10years or young trees with a stem Ø below 150mm.	3
<b>U</b>	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	1

Two characteristic habitat groups within the site were surveyed as a whole (table 3):

Group	Description
<b>A</b>	Group of trees outside but directly adjacent to the site boundary fence. Two semi-mature hawthorn <i>Crataegus monogyna</i> and a multi-stemmed sycamore <i>Acer pseudoplatanus</i> (surveyed separately – see above).
<b>B</b>	Group of self-seeded and maiden trees in garden adjoining site boundary. Species present include sycamore, ash <i>Fraxinus excelsior</i> , hawthorn, wych elm <i>Ulmus glabra</i> and wild cherry <i>Prunus avium</i> .

**D.1 Plates and discussion**

Description/ group reference/ discussion	Plates
<p>Plate 1. View of the site entrance from Edhill Avenue showing tree T1 and tree T9 in the background.</p>	
<p>Plate 2. Tree T2 has had a severe crown lift on the Eastern elevation due to its proximity to the two storey building that was formerly there. Demolition of the building will most likely have caused damage to a large proportion of the rooting structure on the eastern side.</p>	
<p>Plate 3. Trees outside the northern boundary are growing adjacent to the close boarded fence. The combined canopy spread dominates this side of the site. Although this will not directly impact on the level of sunlight reaching the site, the northern elevations of buildings within this corner will be dark and potentially damp. All of these trees are protected by area TPO 155</p>	

<p>Plate 4. The crowns of Tree T6 and T7 dominate the northern boundary of the site. End pruning of branches overhanging the site boundary would temporarily provide vertical space for this section of the site, but would need periodic re-pruning.</p>	
<p>Plate 5. Ash trees T2 – T4 and trees within group A are unlikely to be impacted upon significantly by the proposed development.</p>	
<p>Plate 6. The roots of tree T9 are likely to have been damaged during demolition of the former building. Despite this, at the time of survey, the tree appeared to be flourishing. The proportion of this trees roots that will be within the site, will need to be considered when finalising plans for creation of hardstanding areas.</p>	

## E RECOMMENDATIONS

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### E.1 Tree Constraints Assessment

The Tree Constraints Assessment and calculations for the tree protection plan were formulated through calculation of the minimum area to be left undisturbed around each retained tree, based on the diameter of their stems. These are design tools which show the below ground constraints represented by the root plate area, and the above ground constraints trees pose by virtue of their size and position.

This arbitrary calculation is used in conjunction with an assessment of the ground conditions, including the slope, soil type, proximity of other trees, proximity of impermeable barriers and soil moisture content. Either factor can influence the orientation and spread of the root plate in real terms so occasionally, where space between a development and a tree is limited, minimal ground excavations such as the digging of 500mm X 500mm X 900mm pits, or excavation with an air-spade within the calculated RPA, may be used to determine the actual position of the roots.

Figure 4 shows the position of the trees on site, their categories of retention and estimated root plate areas as a calculation of twelve times the diameter at breast height (150mm from level ground adjacent to the bole). This can be used in conjunction with the finalised development layout, to create a scale TPP. This will enable any works prescribed to be carried out to the correct designated tree and for exclusion barriers to be erected in the correct positions to ensure that damage to tree roots and low hanging crowns is avoided.

A 20% offset of root plate areas into rooting medium in the surrounding properties is shown within figure 4. This illustrates the potential for surveyed trees to grow compensatory absorptive roots in viable soil, free of foundation development within a site where space is limited and root loss/ damage is unavoidable. Within a site of this nature piled or raft foundations would be preferable to a trench or slab foundation.

Pinch points and the percentage of the proposed development to impinge on the roots of trees are also illustrated in figure (data in table 4.).

<b>Table 4. Root impingement (%)</b>			
Tree number	Root plate area m <sup>2</sup>	Root impingement m <sup>2</sup>	Percentage of roots to be impacted upon (%)
1 – 4 (not significant)	N/A	N/A	N/A
5	46.3	1.4	3
6	221.7	11	5
7	289.5	42	15
8	173.9	27	16
9	122.3	22	18

## E.2 Impact assessment

A detailed impact assessment cannot be completed until full development proposals are known, however, potential impacts of the proposed development without appropriate mitigation are:

- Loss of an early-mature tree (tree T1) that is an ecological, amenity and landscape asset of moderate value to the site and surroundings.
- Damage to the roots and crowns of protected trees adjacent to the site boundary through the incorrect placement of site materials or parking of plant/ site machinery.
- Damage to the roots and crowns of protected trees through the movement of general site plant machinery.
- Long term damage to the crowns of protected trees if pruning works are carried out at the incorrect time of year, by an inexperienced arboricultural contractor.
- Damage to trees in the long term through lack of chemical pollution control (diesel spillage, tarmac residues, use of petro chemicals etc.) during the development phase.
- Works to or removal of an early-mature tree with a moderate risk of supporting nesting birds during the bird breeding season (March to August inclusive).

## E.3 Mitigation and recommendations

Key mitigation and enhancement measures are likely to include:

- Replace tree T1 with two medium size species trees (such as Sorbus spp) that will not cause future issues for the development.
- All works to tree T1 and branches overhanging the site boundary from neighbouring trees are to be carried out to the prescriptions specified in an arboricultural method statement, by an approved and experienced arboricultural contractor working to BS-3998:2010.
- All works on site are to be undertaken in accordance with a TPP with working methods.
- As there is limited space within the site, adequate measures should be designed to protect the roots of the retained tree within its root plate area (see TPP) and the roots and crowns of trees in adjacent properties from the movement of high clearance site plant machinery.
- Barrier fencing must prohibit construction works in the areas between the barriers and the trunk of the tree. Barriers are to be installed prior to any preliminary construction or preparation works.
- All tree works are to be undertaken outside the bird breeding season (March-August inclusive) unless a checking survey is undertaken by an appropriately qualified ecologist and active nests are found to be absent.
- Strict control on the use of polluting chemicals within the site to comply with the Pollution prevention and Control Act 1999, according to Environment Agency Pollution Prevention Guidelines, PPG 1<sup>3</sup> and PPG 6<sup>4</sup>.
- The adoption of horticultural good practice (e.g. no, or low, use of residual pesticides) especially if the stump of a felled tree is to be treated. If necessary, the stump should be decimated with a stump grinder to prevent further damage to neighbouring trees being retained (rather than removed using a bulldozer).
- Species to be planted within the site should include a combination of native flowering, fruit and seed bearing species with a high biodiversity index, to attract a broad range of invertebrates, foraging birds and foraging mammals. Species could include: wild cherry, rowan, hazel, crab apple, field maple and bird cherry.

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<sup>3</sup> Environment Agency, 2013. 'Basic good environmental practices, PPG1: Prevent pollution'.

<sup>4</sup> Environment Agency, 2014. 'Construction and demolition sites, PPG6: Prevent pollution'.



- New plantings should be chosen so as to not present future root conflict and shading issues for the new buildings.
- **Mitigation measures, such as root protection barriers are to be checked by the project Arborist prior to commencement of demolition or construction works.**

## F GLOSSARY OF TERMS

**Absorptive roots:** Non-woody, short-lived roots, generally having a diameter of less than one millimetre, the primary function of which is the uptake of water and nutrients.

**Adaptive growth:** Wood formation around the tree to help maintain a uniform distribution of mechanical stress.

**Adventitious roots:** Roots that develop other than at their normal positions of origin (see epicormic).

**Bark:** All the tissues of a woody plant lying outside the vascular cambium (including the phloem, cortex and periderm).

**Bole:** The main stem of a tree below its first major branch

**Branch bark ridge:** The raised arc of branch tissues that forms within the acute angle between a branch and its parent stem.

**Branch collar:** A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem.

**Canker:** A clearly defined patch of dead and sunken or malformed bark.

**Canker rot:** A disease in which the causal fungus gives rise to both a bark canker and to decay in the underlying wood.

**Cambium:** Layer of dividing cells producing xylem (woody tissue) internally, and phloem (bark) tissue externally.

**Chlorosis:** Abnormal yellow or yellow/green coloration of normally green foliage.

**Compartmentalisation:** The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and or active defences acting at the boundary of the affected region.

**Conservation area:** These are designated areas of architectural or historical interest, in which there are special procedures for planning applications and a requirement that tree work cannot generally be undertaken unless notice (currently 6 weeks) has been given to the local authority.

**DBH (Diameter at Breast Height):** Stem diameter at a height of 1.5m from the adjacent level ground.

**Dieback:** The death of parts of a woody plant, starting at shoot tips or root tips.

**Epicormic shoot:** A shoot having developed from a dormant or adventitious bud and not having developed from a first year shoot.

**Fruit body:** A general term for any kind of fungal, spore bearing structure.

**Girdling roots:** A girdled stem, branch or shoot is encircled by a band of dead, dying, missing or

constricted bark. The distal part then usually dies.

**Hazard beam:** An upward curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting.

**Included bark (Ingrown bark):** Bark of adjacent parts of a tree (usually forks or acutely joined branches) which are in face to face contact.

**Occluded/occlusion:** The process whereby a wound is progressively closed by the formation of wood and new bark around it.

**Reaction wood:** This forms when part of a woody plant is subject to mechanical stress and helps to bring parts of a plant into an optimum position. This stress may be the result of gravity, wind exposure, buildup, soil movement, etc. The reaction wood is not externally visible, although asymmetric growth is a reliable indicator.

**Target:** a structure or feature underneath or near the tree which could be damaged if the tree was to fail. For example a building, path or playground.

**Torsional ribs:** These form when the tree is under helical load (twisted), usually by a prevailing wind, which in essence tightens the vertical structure of the main stem. Ribs form where the tree is attempting to stabilise the growth to by strengthening these sections of the stem with reaction wood. This can eventually lead to shearing of the stem along these lines of weakness either through the normal production of annual growth rings, or the loss of neighbouring trees providing shelter to wind from other directions.

**Tree Preservation Order:** An order made by a local authority, whereby the authority's consent is generally required for the cutting down, topping or lopping of specified trees.

## G REFERENCES

BS5837:2012. '*Trees in relation to design, demolition and construction – Recommendations*'

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## H APPENDIX 1: DETAILED RESULTS

Key:

Arboricultural implications assessment						
<b>Key</b>				<b>Age class</b>		
<b>St dia:</b>	Stem diameter in mm 1.5m from adjacent ground level			<b>Y- Young</b>		
<b>Cr Rad:</b>	Estimated crown radius to compass points (m) North, East, South, West.			<b>SM-</b> semi-mature (1st 1/3 of life expectancy)		
<b>Cr clearance:</b>	Crown clearance in metres (lowest point from the ground)			<b>EM</b> - early mature		
<b>Est cont:</b>	Estimated remaining contribution in years			<b>M</b> - Mature (final 1/3 of life expectancy)		
<b>Rad RPA:</b>	Radial root protection area in sq metres from stem area			<b>OM</b> -Over Mature(beyond life-expectancy/declining naturally)		
<b>RP</b>	Reinspection period (months)	<b>Time frame:</b> Timing of proposed works		<b>V</b> - Veteran (of great age and potential conservation value)		
<b>Condition:</b>	<b>P</b> - Physiological (Poor= significant ill health, Fair= symptoms of ill health that can be remediated, Good= No significant health problems)					
	<b>S</b> - Structural (Poor= significant weakness, Fair= symptoms of weakness that can be remediated, Good= 'normal' structure)					
<b>BS cat:</b>	British Standard (5837:2012) tree quality category of retention: U- removal A(1-3)- high quality value B(1-3)-moderate quality value C(1-3)- low quality value					
<b>Phenological stage (tree ref):</b>	<b>D</b> = dormant,	<b>I</b> = in bud,	<b>L</b> = in leaf	<b>F</b> = flowering	<b>Fr</b> = Fruiting	<b>LD</b> = Leaf drop <b>Nwr</b> - No Work Required

For multi-stemmed trees the RPA is calculated from the square root of the (combined stem diameters) <sup>2</sup>

Tree ref. No.	Tag Number	English Name	Scientific Name	Phenological Stage	Height (m)	St dia. at 1.5m (mm)	Cr Rad.(m) N	Cr Rad.(m)E	Cr Rad.(m) S	Cr Rad.(m) W	Cr. Clearance (m)	Age (yrs)	Est cont	Physiological Structure (+ve/ -ve features)	Structural condition (+ve/ -ve features)	Management recommendations Nwr: No work required	Time frame (months)	RP	RPA (m <sup>2</sup> ) / root incursion (m <sup>2</sup> )	RPA Radius (m) / 20% offset(m)	BS cat
T1	1554	Wild cherry	<i>Prunus avium</i>	Leaf	9.1	465	5	5	5	5	2	EM	20+	Good	Fair. Crown lifted on the northern elevation. Tree outside site boundary fence.	Remove tree to facilitate the proposed development	6	0	97.83	5.6/1.1	U
T2	0	Common Ash	<i>Fraxinus excelsior</i>	Fruit	7.8	110	1	3	2	3	3	SM	20+	Good	Good. Group of three trees forming a contiguous group. Outside site boundary.	Nwr	0	36	5.47	1.3/0.3	C1
T3	0	Common Ash	<i>Fraxinus excelsior</i>	Fruit	8.1	150	1	3	1	4	2	SM	20+	Good	Good. Self-seeded. See above.	Nwr	0	36	10.18	1.8/0.4	C1

T4	0	Common Ash	<i>Fraxinus excelsior</i>	Fruit	8	140	2	3	1	3	2	SM	20+	Good	Good. Self-seeded. See above.	Nwr	0	36	8.87	1.7/0.3	C1
T5	0	Sycamore	<i>Acer pseudoplatanus</i>	Leaf	11	320	10	8	8	8	3	EM	20+	Good	Good	Tree outside site boundary. Quadruple leaders, asymmetric growth to the north.	0	36	46.33 / 1.4	3.8/0.8	B1
T6 TPO 155	0	Common Ash	<i>Fraxinus excelsior</i>	Fruit	14	700	7	10	5	7	2	EM	20+	Good	Good	Tree outside but adjacent to the site boundary fence.	0	36	221.7 / 11	8.4/1.7	A1
T7 TPO 155	0	Common Ash	<i>Fraxinus excelsior</i>	Fruit	15	800	8	10	10	10	5	EM	40+	Good	Good	Tree growing adjacent to, but outside the site boundary.	0	36	289.5 / 42	9.6/1.9	A1

T8 TPO 155	0	Sycamore	<i>Acer pseudoplatanus</i>	Fruit	14	620	6	6	5	6	4	EM	40+	Good	Good	Tree outside but adjacent to site boundary.	0	36	173.9 / 27	7.4 / 1.5	B1
T9	0	Japanese Kanzan Cherry	<i>Prunus 'Kanzan'</i>	Leaf	7.8	520	4	7	7	5	2	EM	20+	Good	Good	Growing in neighbouring property to the site. Majority of root growth will be in site due north and eastern half being hardstanding.	0	0	122.3 / 22	6.2 / 1.2	A1

## I APPENDIX 2: TREE QUALITY ASSESSMENT

Figure BS 5837: 2012 Cascade chart for tree quality assessment		
Category and definition	Criteria	Identification
<b>Category U (Trees unsuitable for retention)</b>		
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 (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning).	<b>Dark Red</b>
	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. For example habitat reinstatement may be appropriate (e.g. U category tree used as a bat roost: installation of bat box in nearby tree)	
<b>Category A. (Trees considered for retention)</b>		
Those of high quality with an estimated remaining life expectancy of at least 40 years	<b>1. Mainly arboricultural qualities</b> - Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/ or principle trees within an avenue)	<b>Light green</b>
	<b>2. Mainly landscape qualities</b> - Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	
	<b>3. Mainly cultural values, including conservation</b> - Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	



<b>Category B. (Trees considered for retention)</b>		
<b>Those of moderate quality</b> with an estimated remaining life expectancy of at least 20 years	<b>1. Mainly arboricultural qualities-</b> 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 minor 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	<b>Mid blue</b>
	<b>2. Mainly landscape qualities-</b> Trees present in numbers, usually 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.	
	<b>3. Mainly cultural values, including conservation</b> – Trees with material conservation or other cultural value	
<b>Category C (Trees considered for retention)</b>		
<b>Those of low quality</b> with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	<b>1. Mainly arboricultural qualities-</b> Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	<b>Grey</b>
	<b>2. Mainly landscape qualities-</b> Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary/ transient landscape benefits.	
	<b>3. Mainly cultural values, including conservation</b> – Trees with no material conservation or cultural value	
NOTE: Whilst Category C trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation.		

## J APPENDIX 3: SAFE USE LIFE EXPECTANCY (SULE)

(TREE AZ:©Barrell Tree care, 2001)

	1	2	3	4	5
	Long SULE	Medium SULE	Short SULE	Remove	Small, Young or regularly clipped
	<i>Trees that appear to be retainable at the time of assessment for more than 40 years with an acceptable level of risk</i>	<i>Trees that appear to be retainable at the time of assessment for 15 to 40 years with an acceptable level of risk</i>	<i>Trees that appear to be retainable at the time of assessment for 5 to 15 years with an acceptable level of risk</i>	<i>Trees that should be removed within the next 5 years</i>	<i>Trees that can be reliably transplanted or replaced</i>
<b>A</b>	Structurally sound trees located in positions that can accommodate future growth	Trees that may only live for between 15 to 40 more years	Trees that may only live for between 5 and 15 more years	Dead trees	Small trees less than 5 metres in height
<b>B</b>	Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery	Trees that may live for more than 40 years but would need to be removed for the safe development of more suitable individuals	Trees that may live for more than 15 years, but would need to be removed for the safe development of more suitable individuals	Dying or suppressed and declining trees through disease or inhospitable conditions	Young trees less than 15 years old but over 5m in height
<b>C</b>	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention	Trees that may live for more than 40 years, but should be removed during the course of normal management for safety or nuisance reasons	Trees that may live for more than 15 years, but should be removed during the course of normal management for safety or nuisance reasons	Dangerous trees through instability or recent loss of adjacent trees	Trees that have been regularly pruned to artificially control growth
<b>D</b>		Storm damaged or defective trees that could be made suitable for retention in the medium term by remedial work	Storm damaged or defective trees that require substantial remedial work and are only suitable for retention in the short term	Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form	
<b>E</b>				Damaged trees that are clearly not safe to retain	
<b>F</b>				Trees that will become dangerous after removal of other trees for reasons given in A – E	

## **K APPENDIX 4: CREATION OF A TREE PROTECTION PLAN**

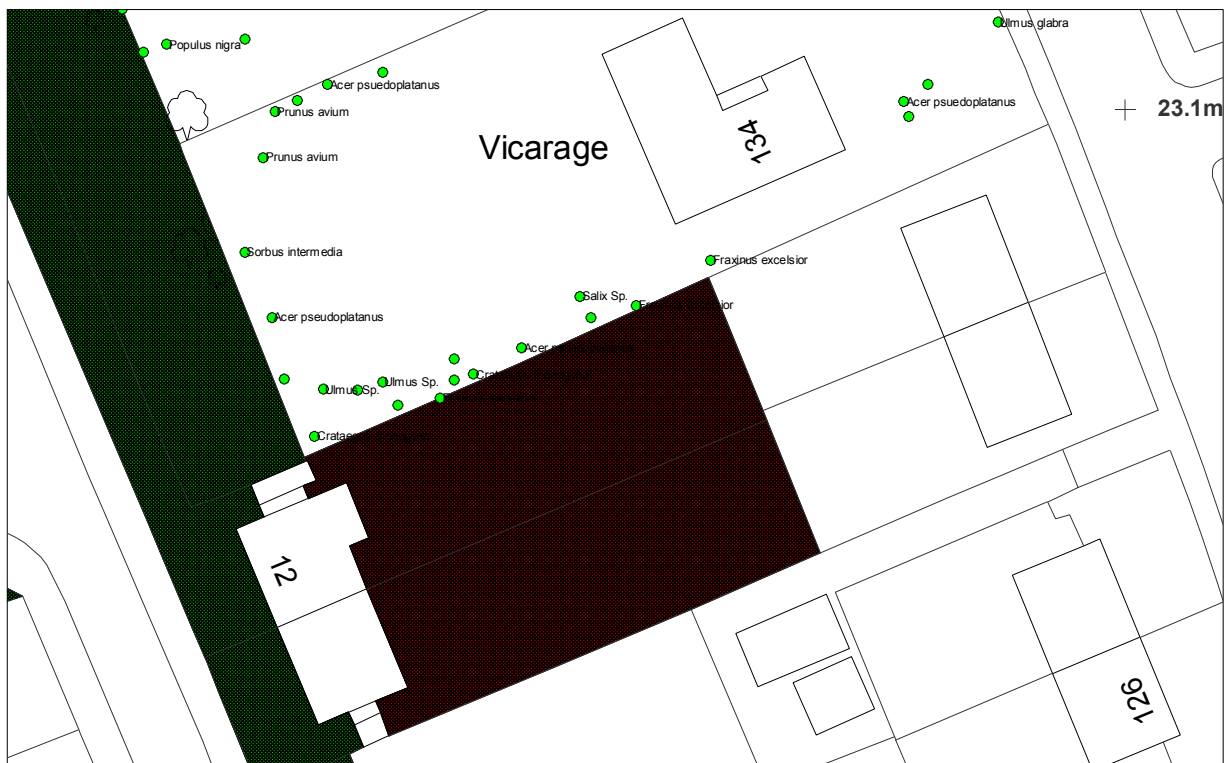
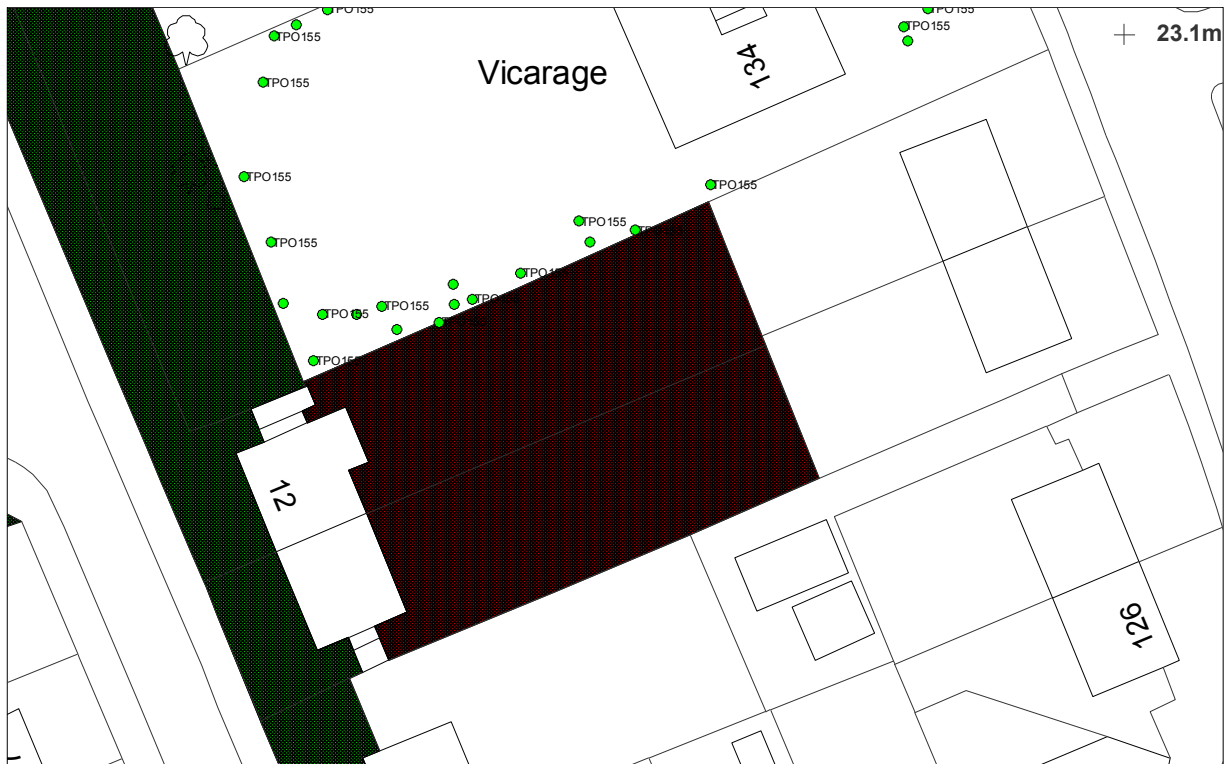
The following factors are to be taken into consideration once development designs are available to provide adequate protection for the root system:

- The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and presence of other trees;
- The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. the presence of roads, structures and underground services);
- The soil type and structure;
- Topography and drainage;
- Where any significant part of a tree's crown overhangs the provisional position of tree protection barriers, these parts may sustain damage during the construction period. In such cases, it may be necessary to increase the extent of the tree protection barriers to contain and thereby protect the spread of the crown. This can be mitigated by facilitation (branch end) pruning.

For practical reasons and in the context of the larger trees it is recommended that the area to be protected be capped at 707m<sup>2</sup>, with a radius of 15m or a square with approximately 26m sides. Values stated in Appendix 1 are the absolute values as calculated for that tree and remain as guidance as to the actual root protection zone.

# L APPENDIX 5: GENERAL LEGISLATION

## Area Tree Preservation Order 155



## **L.1 Trees and the law**

### **L.1.1 General**

Trees in any location may be protected by legislation. Where development is proposed, additional legal protection may be appropriate and can be enforced by the local authority. Attention is drawn to legal controls and liabilities under common law for consideration at the earliest stages of potential site development.

### **L.1.2 Legal protection for trees**

The Town and Country Planning Act 1990 (as amended) and the Town and Country (Tree Preservation) (England) Regulations 2012 requires that, except in certain circumstances, “no work shall be carried out which will affect trees over a certain size which are situated in conservation areas”. Six weeks’ notice of intent has to be given to the local authority before the work is carried out. This provides an opportunity for the local authority to make a tree preservation order (TPO), under this Act, to protect the trees.

Tree preservation orders allow for trees to be protected either as individuals, groups, areas or woodlands. The orders have the effect of preventing the cutting down, topping, lopping, uprooting, willful damage or willful destruction of trees, except in certain circumstances, other than with consent of the local authority.

Even when no specific legal protection exists, it may be necessary to obtain a felling licence. These apply if the volume of timber exceeds specified amounts; site clearance, even of small areas, before detailed planning permission has been granted could exceed the felling licence quota. The Forestry Commission, under the Forestry Act 1967 (as amended) administers felling licenses.

### **L.1.3 Legal protection for trees on development sites**

Section 197 of the Town and Country Planning Act 1990 states “it shall be the duty of the local planning authority to ensure, whenever it is appropriate, that in granting planning permission for any development adequate provision is made, by the imposition of conditions, for the preservation or planting of trees”. It also states that “it shall be the duty of the local planning authority to make such orders under section 198 [of the Act] as appear to the authority to be necessary in connection with the grant of such permission.”

It is usually appropriate for a tree preservation order to be placed on trees that are in amenity situation and structurally sound. The effect of proposed development on trees protected by tree preservation order ranks as a material consideration, which should be considered by the local authority, when determining a planning application under section 70 of the Town and Country Planning Act 1990.

Where a tree preservation order exists prior to planning permission being granted it should not normally be a block to effective use of a site. It serves to deter damage to or clearance of trees prior to planning permission being granted and provides a means of enforcing their protection during development work.

When planning permission is granted, planning conditions may be imposed to provide for the erection of protective fencing and other measures for ensuring the well-being of trees during development.

**NOTE It is considered inappropriate for planning conditions to be used to provide long-term protection to trees when tree preservation orders are available as a specific provision for this purpose.**

Where circumstances require it, local authorities should apply a planning condition requiring the developer to appoint an arboriculturist to oversee the project. This person has a duty to monitor and confirm the implementation and maintenance of tree protection measures, as agreed with the local authority. Planning conditions may be imposed requiring tree planting to be undertaken as part of a project, and a tree preservation order can be made to apply to such trees once they have been planted so as to achieve their long term protection.

The consent of the local authority is not needed to carry out work on trees required to enable a person to implement a planning permission. Felling etc. cannot be said to be required when planning permission has been given on an outline application only, nor when development is exempt from planning control.

#### L.1.4 Enforcement of protection during development

- The effectiveness of measures to protect trees and ensure their healthy survival through development depends on co-operation between site owners, developers, contractors, arboriculturists and local authorities.
- If the local authority considers that there has been a breach of planning conditions that provide for the protection of trees, it can serve an “enforcement notice”; if necessary this can be followed by a “stop notice” (Town and Country Planning Act 1990, sections 172, 183, 184);
- *Planning policy guidance note 18*
- *Enforcing planning control* [19]; *DoE Circular 10/97— Enforcing planning control: Legislative provisions and procedural requirements*). When considering the need for such enforcement, local authorities should consider that trees can be damaged very easily and that survival of trees is most likely to be achieved by maintenance of protection at all times.

## L.2 Common law claims and litigation concerning trees

### L.3.1 General

Problems caused by trees on development sites can result in disputes giving rise to common law claims and litigation. Such problems are particularly likely where trees grow across boundaries between properties and cause damage to the property of a third party. For instance, root activity can affect structures other than those on the development site. The crowns, stems and roots of trees may have structural weaknesses, which if they fail, could result in damage to property or injury to people. Leaves and fruit falling from trees, obstruction of light and problems of poisonous plants have all been considered by the courts. Legal advice should be sought where trees may become a problem.

Careful planning and design should minimize the possibility of litigation after completion of the development.

### L.3.2 Planting adjacent to boundaries

Problems with trees on or close to boundaries have resulted in litigation on many occasions, and the rights and responsibilities of tree owners and their neighbors are, in this respect, well

documented in law. The government has published guidance on high hedges (*Hedge height and light loss* — ODPM, 2002) which advises on reasonable standards for evergreen hedges in domestic gardens. Careful consideration of new planting to anticipate both the likely encroachment of roots or overhang of branches of the fully grown tree relative to the site boundary can prevent potential future conflict, while the possibility of direct mechanical damage to boundary fences and walls can be avoided by allowing room for growth and movement.

## **M APPENDIX 6: PROTECTED SPECIES AND TREES**

### **M.1 Wildlife and Habitat Considerations**

Paragraph 47 of Planning Policy Guidance Note 9: Nature Conservation [18] states that “the presence of a protected species is a material consideration when a local planning authority is considering a development proposal which, if carried out, would be likely to result in harm to the species or its habitat”.

Where bats are found to be present consultation needs to be carried out with the Statutory Nature Conservation Organization i.e. Natural England.

### **M.2 Bats in trees**

Trees provide habitat for bats in the form of roost sites, maternity roost sites and hibernacula. As a habitat, trees provide foraging for bats, being a medium for invertebrates, and provide three dimensional feeding corridors to and from roosting sites.

The following should be considered when carrying out any works to the trees.

All bat species are specially protected under the Conservation of Habitats and Species Regulations (2010) and under Schedule 5 of the Wildlife and Countryside Act of (1981) (as amended).

As a result it is illegal to:

- Deliberately kill, injure or capture bats.
- Deliberately or recklessly disturb bats.
- Deliberately or recklessly obstruct access to a bat roost.
- Damage or destroy a bat roost.

Fines of up to £5000 *per bat* affected and confiscation of vehicles used can be imposed for deliberate or reckless disturbance of bats or damage to a roost site.

If works risk recklessly harming bats then the police can order all construction/renovation work to cease until the issue is properly addressed.

If bats are found at any time during the work E3 Ecology (01434 230982) should be contacted immediately.

### **M.3 Nesting/ Breeding Birds**

Habitats on site are likely to provide a suitable nesting and foraging resource for birds.

- The early mature to mature trees on site are almost all suitable as nest sites.
- Ornamental planting in conjunction with the trees may provide foraging opportunities in the form of berries and invertebrates.

Under the provisions of the Wildlife and Countryside Act of (1981) (as amended) it is illegal to knowingly disturb any nesting bird during the breeding season.

### **M.4 Nesting/ breeding mammals**

Trees provide vital nesting sites for native arboreal mammals, with a contiguous canopy providing an aerial highway to and from foraging sites, providing cover from predators. These factors need to be considered in any landscape design.



Red squirrel are protected under the provisions of the Wildlife and Countryside Act of (1981) (as amended).