BARNES associates ltd
SURVEY MANAGE IMPROVE

The Old Forge, Horsefair
Boroughbridge YO51 9AA
T 01423 322 371
E info@barnesassociates.co.uk
W barnesassociates.co.uk
Company Number 10438116
Registered in England and Wales

Pre-Development BS5837 Tree Survey

Site: Land off Northmoor View, Birmington.

On Behalf of: Vistry Homes.

Date: 07/10/2020

Reference: BA10077TS

AA Registered CONSULTANT trees.org.uk

CAS

Chartered Institute of Horticulture

BALI REGISTERED

Landscape Institute Registered Practice

VALIDATION STATEMENT FOR LPA REGISTRATION

This report contains the supporting tree information outlining the current state of the significant trees on and neighbouring the site.

For Local Planning Authority (LPA) validation purposes, this report contains the following:

- A full **Arboricultural Assessment** (tree survey) compliant to the requirements of *BS5837:(2012) Trees In relation to design, demolition and construction – Recommendations.* Undertaken by a qualified arboriculturalist. (Tree Assessment)

- A plan with a north point showing tree survey information, including BS5837 categories.

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ARBORICULTURAL ASSESSMENT

A full tree survey compliant to the requirements of BS5837:(2012) Trees In relation to design, demolition and construction – Recommendations. Undertaken by a qualified arboriculturalist. (Tree Assessment).

This arboricultural assessment includes general information on tree condition, value and management, in addition to detailing the notional root protection area outlined within BS3837:2012.

The purpose of this Report - This is an arboricultural assessment describing the trees on and near the proposed development site, what the impact of the development proposal on those trees will be and how any adverse impacts will be mitigated.

Its purpose is to provide sufficient tree information for the LPA to assess the impact of the proposal on local character as part of the process of determining the planning application, more detailed reasons relating to the protection of retained trees can be reviewed in this report.

Report Contents - The report includes: -

- a **tree assessment and tree survey plan** which is prepared in line with the guidelines set out in BS BS5837:*(2012) Trees In relation to design, demolition and construction – Recommendations.*

Background Administrative Information - All the trees that could be affected were inspected and their details are discussed in the schedule of information, which is included in appendix C in line with BS5837:2012.

Based on this information, guidance is provided on the constraints these trees impose on the use of the site. This submission proposal is a result of these consultations and has evolved, taking full account of the tree constraints.

Risk Assessment. I have undertaken a tree survey to identify the general nature of the trees and their relationship with significant targets. The level of detail with which the trees are assessed was informed by their relationship with targets. Large trees adjacent to higher-value targets requiring closer assessment than smaller trees adjacent to a lower value target.

The trees are assumed to offer a **Broadly Acceptable Risk** at which point the risk is already **'As Low as Reasonably Practicable' (ALARP)**. Overall, the risk offered by some of the trees is within the boundaries of tolerability that might ordinarily be applied by a reasonable and informed landowner.

Legislative Protection. Chesterfield Borough Council does not have an interactive mapping of tree preservation orders therefore no attempt has been made to source this information. Conservation Area plans appear to show that the site is outside of the Birmington Conservation area however this would need to be confirmed prior to any tree works.

In general, the protection of trees is a duty of the LPA under the Town and Country Planning act 1990 and aims to encourage rational discussion and consideration of trees within the design process. The following guidelines are proposed to encourage rational discussion and consideration of trees within the design process. The legislation indicates that protection should be used to protect healthy trees that are likely to have a reasonable safe useful life expectancy. Generally, those classified with a condition rating of (A) Excellent & (B) Good are worthy of a TPO. Those classified (C) Fair are generally poorer and therefore unlikely to qualify for a TPO on grounds of poor appearance, management issues or unlikely to have a sufficient safe life expectancy. Those trees classified (U) are Unsuitable for retention, generally contain structural defects, have a short safe, useful life expectancy or are dangerous and therefore would not qualify for a TPO as indicated within the legislation.

The presence of a TPO should be expected upon development sites for the above reasons. It can however only be regarded as a material consideration, as can any other tree or significant natural feature, within the planning process and cannot be used as a means of preventing development. Any trees protected or otherwise, which are located on or close to the site can be expected to be regarded as a material consideration or offer a design constraint within the development process.

Soils. The soils on site appear to be arable with evidence of cropping within the last 2 years. An assessment of the information at http://www.landis.org.uk/soilscapes show the soils to the north of the site to be a mixture of 'Freely draining slightly acid loamy soils' (East) and 'Slowly permeable seasonally wet acid loamy and clayey soils' (West).

The Government geographical mapping information website 'Magic-Map' http://www.magic.gov.uk/ shows that the site is not covered by any tree specific designations.

Visual Assessment of Trees. The trees have been assessed from ground level only in line with the guidelines outlined in British Standard BS5837:2012. This provides information for the retention and protection of trees upon development sites. Information upon the trees is in the Tree Schedule in appendix C.

The photograph below shows G1 and H2 in location.

General Site Issues. Whilst on-site a range of general arboricultural issues were seen which have the potential to affect the development of trees and may result in future problems or which again could result in elevated management costs for the site in the future.

G1 and H2 are growing close to the boundary and appear to have had very little management to date with H2 an informal hedge which left unmanaged will only broaden in height and width. G1 and H2 will in the future require cyclic crown lifting over the footpath to maintain clearance.

G3 (Ash) borders the scrapyard where the boundary fence is in places tied to the trees where the stems have included the razor and barbed wire. This wire is likely to cause problems to the trees in the future and it is advised that the fence is rebuilt to support itself and the trees 'untied' and any metalwork removed.

The photograph below shows G3 fence to tree proximity.

T4-T15 are predominantly Ash trees growing on the northern border between neighbouring properties. The tree forms suggest that most if not all of these trees have been historically 'topped' or coppiced, alluding to them being old hedgerow trees that have been allowed to mature individually due to lack of maintenance. The trees that have evidence of previous reductions at hedge height and are at a slightly greater risk of failing at the unions as the regrowth has naturally weak attachment points.

<u>The photograph below shows T10-T15 in a location close to the boundary.</u>

T17 (Ash) is growing on the border between the land and the neighbouring properties. The appearance of the tree suggests a history of pruning back to the boundary as the trees canopy is bias to the south with no inspection possible of the northern stem. If this tree is to be retained it will require 'restoration' pruning to remove some of the end weight to the south in an attempt to balance the crown slightly.

<u>The photograph below shows the southern bias of T17 canopy.</u>

H19-H21 are boundary hedges to the neighbouring properties of various sizes and species. These hedges, on the whole, have been well maintained by the residents and in most cases only require the southern edge to be formalised.

The photograph below shows an example of the hedges on the northern and eastern boundary.

Please do not hesitate to contact me should you require any additional information or clarification of any of the points below.

General Tree Works. The trees require management to improve their condition. General works are detailed within the tree schedule in appendix C. This work is required regardless of the development proposals and should ideally be undertaken within the next 12 months.

These works should be viewed in isolation to the development proposal in planning terms.

Tree constraints. Typically, trees can offer constraints to potential layouts. Ideally, the requirements of the trees and the proposal should be considered at the design stage. I have included a general guide to potential tree constraints in appendix D.

In general, the proposed site changes should, wherever possible, be located outside the minimum Root Protection Area (RPA) indicated by the magenta circle/ Cyan dashed line on the Site Plan BA10077TS in appendix H.

In addition to this, to help avoid future conflict, it is worthwhile locating higher use elements of the building outside the current and potentially the forecasted canopy shade areas, again these areas are indicated on the Site Plan BA10077TS in appendix H.

General Risks to Trees. The development process does have the potential to both damage existing trees and compromise tree planting opportunities through the severance of roots or changes to the soil levels, volume or structure. I have included a general guide to potential tree damage in appendix F.

Protection of Trees. The potential for conflicts between a proposal and the existing trees may exist. However, often these foreseeable risks can

be defended through the adoption of tree protection to help protect the Root Protection Area and maintain sufficient space to enable the confident retention of trees. Tree protection requires a combination of protective fencing, ground protection, and the adoption of building design, materials and techniques that can sustain normal growth, further details included in appendix G.

Ideally, a detailed appraisal of the potential impacts of a scheme should be discussed within an **Arboricultural Implication Assessment (AIA)**, once the development becomes better defined to detail the likely effects and protection requirements.

Conclusions. In general, the trees are in good to fair condition considering their location and past management.

Retained trees need to be considered as part of any site changes and protected from the potentially negative effects of alterations or construction.
Considering the relative size of the site and its past management, I conclude that a proposal to develop this site should be relatively straightforward, providing the protection requirements are detailed within an Arboricultural Impact Assessment and trees are acknowledged and appropriate protection methods are conditioned

Matt Metcalfe FdSc Arboriculture
Professional member Arboricultural Association
VALID Tree Risk Validator

APPENDICES

APPENDIX A - TERMS OF REFERENCE

The Terms of Reference. This report is based upon a ground base assessment and is based upon the Visual Tree Assessment (VTA) methodology, as devised by Mattheck (1993) in addition to Hazard Evaluation devised by Matheny & Clark (1993). Guidance is also taken from Lonsdale (1999) Principles of Tree Hazard Assessment and Management. The format of the survey follows the guidelines of British Standard BS5837:2012 'Trees in relation to design, demolition & construction - Recommendations' & The ISA Tree Risk Assessment Manual (2013).

Tree Categorization. To help understand the value of the trees both on the site and in relation to the wider area the trees have been assessed in line with the guidelines in BS5837:2012 Section 3.5 Tree categorization method. Which suggests that trees should be categorized using the criteria shown in Table 1 (BS5837), which is included on the Plan BA10077TS in Appendix H.

Tree Risk - Target evaluation. To enable a balanced approach to the site assessment I undertook an initial assessment of the associated risks on-site to identify areas of high public access, areas where trees are within striking range of valuable or fragile structures or high human occupancy locations. Targets are broadly zoned in the 'Target' ranges based on the levels of occupation, population and value. Target areas are assumed high as a result of the level of public access.

Risk Assessment. The assessment follows the general principles of Risk Assessment; Risk assessment is important to reduce the risk of injury to people, property damage or disruption of services. **The International Society of Arboriculture (ISA)** Tree Risk Assessment Methodology takes a qualitative rather than a quantitative approach to risk assessment. The system uses matrices to compare the likelihood of failure of a tree or tree part, the likelihood of impacting the target and the potential consequences of failure.

Visual Assessment of Trees. The trees have been assessed from ground level only in line with the guidelines outlined in British Standard BS5837:2012. This provides information for the retention and protection of trees upon development sites. Information upon the trees is located in the Tree Schedule in Appendix C.

General Tree Works. The trees require management to improve their condition. General works are detailed within the tree schedule in Appendix C. This work is required regardless of the development proposals and should ideally be undertaken within the next 12 months. These works should be viewed in isolation to the development proposal in planning terms.

Tree Protection. To help reduce the potential impact of site changes BS5837:2012 recommends in Section 3.7 that a **Root Protection Area (RPA)** which is a protected area based upon the Root Protection Area - a point equivalent to 12 times the trunk diameter or by ensuring the effects of site changes such as excessive root severance or compaction can be controlled. This is included as a layout design tool. This indicates the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. The Root Protection Area for each tree is plotted as a magenta circle on the plan BA10077TS included as Appendix J.

Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area is included. This modification to the shape of the Root Protection Area reflects a soundly based arboricultural assessment of likely root distribution. This has been included as a dashed cyan line on the plan BA10077TS included as Appendix J.

Ideally, this area should remain free from soil disturbance whenever possible. Tree protection should revolve around the need to prevent compaction or excavation within the soil profile or significant changes to the existing soil levels close to retained trees. Appropriate site organisation and management are essential following the adage of '***Prevention is better than Cure***'. Unfortunately, tree damage can easily occur and although it is costly to repair, it comes with few guarantees.

APPENDIX A – CONSULTANT BRIEF QUALIFICATIONS AND EXPERIENCE

Mr Ian Barnes - Director
RCArbor.A, F.Arbor.A, C.Hort, CEnv,
Arboricultural Association Registered Consultant, Fellow Arboricultural Association, Chartered Horticulturalist, Chartered Environmentalist.
Professional member Consulting Arborist Society.
HND Arboriculture,NDHt/Arb, Tech.Cert (ArborA), ISA TRAQ Qualified, QTRA Licensed

Ian has been in the horticulture and Arboricultural industry since 1985, he has experience in commercial horticulture, local authority and highway authority tree surveying. He has been a commercial Arboricultural climber. He ran in partnership a tree and landscape contracting business for over 15 years. He has been a full time Arboricultural consultant since 2007. His main area of works are trees and development (BS5837) and advanced tree assessments using various advanced techniques. He is also director of a hi-tech arborist/ landscape equipment and training company Tree Diagnostics Ltd providing training in advanced assessments.

Mrs Sue Barnes- Director
CMLI, F.Arbor.A, C.Hort, CEnv, MBALI
Chartered Landscape Architect, Fellow Arboricultural Association, Chartered Horticulturalist, Chartered Environmentalist, Registered Designer BALI
FdSc Arboriculture, NDHt/Arb
Professional Member Consulting Arborist Society, Affiliate member RIBA,

Sue has been in the horticulture / Arboricultural industry since 1986. She has experience in amenity parks and gardens and she has been a head gardener for local health authority. In partnership she ran a tree and landscape design and build company for 15 years, she has been a tree and landscape consultant full time since 2007. Her main area of works are detailed planting design and Arboricultural and landscape management.

Mr Matt Metcalfe - Consulting Arborist:
M.Arbor.A
Professional member of the Arboriculture Association, City and Guilds NPTC assessor/ Instructor
FdSc Arboriculture, National Diploma in Arboriculture, Level 5 Certificate in Education.
VALID Tree Risk Licenced.

Practical experience:
Matt has worked in the Arboricultural Industry since 2000. Firstly, as a climbing arborist in both the public and private sector. He became a teacher at a land-based college in York in 2009 where he taught Arboriculture at level 2/3 and then course manager in Arborist apprenticeships and internal verifier. He became a City and Guilds NPTC Assessor in 2012, in ground based and aerial Arboriculture and NPTC City and Guilds Instructor/Assessor in land-based industries. In 2018 he became a fulltime consulting arborist and provides advanced tree assessment training assistance and is a trained tree risk assessor.

APPENDIX C – TREE SCHEDULE & EXPLANATORY NOTES

The following survey has been prepared from a visual assessment taken from ground level without any detailed investigation. Observations are based upon the body language of the trees and any visual indicators present at the time of inspection. This survey should be regarded as a preliminary overview; ongoing inspections will be required as specified individually. In most situations the health, condition and safety of trees should be checked on a cyclic basis, alternating between early and late seasons to ensure a full picture of tree health is established. Inspections should only be carried out by a suitably qualified arborist.

Similarly, numerous potential defects may not be detectable dependent upon timing of inspection, in particular, wood decay fungi, which may only occasionally produce external fructifications annually (rather than perennially), or may not provide external symptoms until an advanced state is achieved.

Reasonable risk management generally aims to provide a tree that can be regarded stable in a normal / foreseeable, regularly experienced storm events i.e. force 10 storms. The level of risk offered by the tree will be significantly greater as the wind speed that the tree is exposed to increases beyond this level. Additionally the threat from aerial parts i.e. Tight unions may remain even following works, although failures of such parts are likely to be limited to small diameter branches and to periods of extreme weather.

As an arborist, I am a tree specialist and use my knowledge, education, training and experience to examine trees, recommend measures to enhance their beauty and health, and attempt to reduce the risk of living near trees. As a client, you may choose to accept or disregard these recommendations, or seek additional advice.

As an arborist I cannot detect every condition that could possibly lead to a tree or limb failure. Trees are living organisms that may fail in many ways, some of which we do not fully understand.

Conditions are often hidden within the tree and below the ground. As arborists, we cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Sometimes trees may appear "healthy," but may be structurally unsound. Likewise remedial treatment, like any medicine, cannot be guaranteed.

Treatment, pruning and removal of trees may involve considerations beyond the arboricultural perspective, such as property boundaries and ownership, disputes between neighbours, planning issues, sight lines, landlord-tenant matters etc. Arborists cannot take such issues into account unless complete and accurate information is given to them. Likewise, as an arborist I cannot accept any responsibility for the authorization r non-authorization of any recommended treatment or remedial measure.

Furthermore, certain trees are borderline cases as to whether they should remain or be removed. If conditions change a tree may need further monitoring in the future to determine its health and structure. Trees can be managed, but they cannot be controlled, and to live near a tree is to accept some degree of risk.

Mathematical abbreviations: > = Greater than, < = Less than.

Measurements / estimates: All dimensions are estimates unless otherwise indicated. Measurements taken with a tape or clinometer are indicated with a '#'. Less reliable estimated dimensions are indicated with a '?'.

Tree number: Numbered Tag attached to each stem usually on the inside face of the stem at roughly 2.5 metres. Were the number is followed by a C this demotes that the tag refers to a compartment or group.

Name: Tree species are detailed by their common name.

Age: I record the age as an estimate of the tree likely span for guidance only i.e:

Y	**Young** - Recently established/planted tree.
EM	**Early Mature -** An established tree in the first third of its likely expected life span
SM	**Semi Mature -** Fully established and growing with high vigour
M	**Mature -** The middle one third of its likely expected life span
OM	**Over Mature -** The later one third of its likely expected life span with sign of canopy retrenchment.
V	**Veteran -** An aged example of the species, typically with defects & *conservation value*
S	**Senescent -** Beyond its expected Life span possible of historical interest or in a state of decline.

Height: I estimate height to the nearest metre to the mean height.

Height to underside: I estimate height to the nearest half metre to the mean underside of the canopy.

First significant Branch: I estimate height & orientation of large branches below the underside of the canopy.

Diameter: These figures relate to a measurement of the stem at 1.5m above ground level recorded in millimetres, measured with a rounded down diameter tape. Figures prefixed with MS denote trees or shrubs with multiple stems.

No. Stems: I record the number of significant stems that compose the tree.

Canopy (N S E W): I estimate the distance of the canopy radius to the nearest metre to provide a mean distance of separation between the stem and the outer canopy.

Vitality: Is a personal assessment of the tree's growth rate in the current season, in comparison to other trees within the locality, region and an indicator of the tree likely response to site change.

Dead	A dead or very low vitality tree
Poor	A tree in noticeable poor state
Fair	A tree of lower vitality
Good	A tree of high vitality

Safe Life: Is a personal assessment of the trees likely expected remaining safe life span in years, assuming the site management continues as it is at present or the tree is protected from significant environmental change. Trees can reverse even serious decline and the expected safe life can be significantly improved following changes / improvements to site management and following remedial works.

40 +	Good vitality a tree a tree with high potential.
20 +	Normal vitality a tree in good health.
10 +	Early reduction in vitality / reducing foliage cover.
10 <	Marked decline / reduced foliage cover.
5 <	Serious decline or very low vitality tree.
1 <	A dead or almost dead tree with very low vitality tree

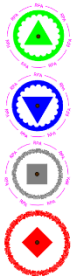
Category: Assess in line with Table 1 BS5837 – copied below.

Table 1 – BS5837:2012	Cascade chart for tree quality assessment			
Category and definition	**Criteria (including subcategories where appropriate)**			**Identification on plan**
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value, which it might be desirable to preserve; see **4.5.7**.*			Red on Plan
1 Mainly arboricultural qualities		**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Green on Plan
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	Blue on Plan
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	Grey on Plan

NOTE Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150 mm should be considered for relocation.

Symbol Guide.

BS5837 - Condition Rating Colour Code



A - High Quality Tree

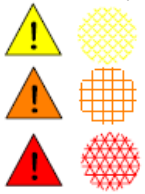
B - Moderate Quality Tree

C - Low Quality Tree

U - Unsuitable for Retention

Qualitative Tree Risk Assessment

International Society of Arboriculture (ISA), Tree Risk Assessment Qualification (TRAQ). The risk of harm is arranged into bands differentiated by coloured text within the tree schedule and detailed below. The colours represent the following risk bands of indices:



Moderate Risk Tree

High Risk Tree

Extreme Risk Tree

Comments / Observations: General comments referring to tree health, structure and condition.

Management Options: Comments detailing remedial works required improving immediate safety or improve the management of the tree.

Tree Risk Assessment: The International Society of Arboriculture (ISA) Tree Risk Assessment Qualification (TRAQ) takes a qualitative rather than quantitative approach to risk assessment. It uses matrices to compare the likelihood of failure of a tree or tree part, the likelihood that it will impact the target and the potential consequences of failure. Unless stated otherwise the risk assessment assumes the risk offered over the next year.

Matrix 1. Likelihood of failure

Likelihood of failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk Rating matrix

Likelihood of failure & impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate.	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

Root Protection Area (RPA):

Minimum RPA – Root Protection Area: Minimum distance in metres of position of protective fencing in line with section 4.6 BS5837:2012. In order to avoid damage to the roots or rooting environment of retained trees, an area equivalent to a circle with a radius 12 times the stem diameter.

Root Protection Area (Radius) (M) – RPA given in metres from the centre of the stem.

Root Protection Area (Area) (M^2) – The ideal total area for the RPA given in metres squared.

Est Pos	TAG No.	Species	Age	Height (m)	Canopy Underside (m)	Canopy Radius (m)				Vitality	Safe Life	Category	Diameter @ 1.5m (mm)	No. Stems	Observations / Comments	Recommendations	Risk Assessment	Minimum RPA (Radius)	Minimum RPA (Area) (m^2)
						North	South	East	West										
Est Pos	G1	Ash Goat Willow Norway Spruce Wild Cherry Sycamore Hybrid Poplar	E M	14	0	4	4	4	4	Fair	10+	C2	200	1	Growing within the hedge. Growing next to the footpath. A typical group for the area. A diverse range of species within the group.		Low	2.4	18.1
Est Pos	H2	Hawthorn Elder	M	12	0	3	3	3	3	Fair	10+	C2	150	1	A poor condition hedge which is lacking management.		Low	1.8	10.18
Est Pos	G3	Ash Silver Birch	E M	14	2	4	4	4	4	Fair	10+	C2	200	1	Growing as part of a group. Growing next to the fence. stake & tie still attached. Impact wounding visible on the stem. Wire included in the stem.		Low	2.4	18.1
Est Pos	T4	Ash (Fraxinus excelsior)	M	12	3	5	3	5	5	Fair	10+	C2	200, 200, 100, 200	4	Growing as part of a group. Multiple stemmed close to ground level. Crossing and rubbing main leaders visible throughout the canopy. Crossing and rubbing branches visible throughout the canopy.		Low	4.33	58.91
	T5	Ash (Fraxinus excelsior)	M	12	3	5	5	3	3	Fair	10+	C2	250,300	2	Growing as part of a group. Multiple stemmed close to ground level.		Low	4.69	69.11
	T6	Ash (Fraxinus excelsior)	E M	12	4	3	3	3	3	Good	20+	B2	200	1	Growing as part of a group. Single stem.		Low	2.4	18.1
	T7	Ash (Fraxinus excelsior)	M	12	3	5	5	3	4	Fair	10+	C2	250, 200, 200, 100	4	Growing as part of a group. Multiple stemmed close to ground level.		Low	4.69	69.11

Est Pos	TAG No.	Species	Age	Height (m)	Canopy Underside (m)	Canopy Radius (m)				Vitality	Safe Life	Category	Diameter @ 1.5m (mm)	No. Stems	Observations / Comments	Recommendations	Risk Assessment	Minimum RPA (Radius)	Minimum RPA (Area) (m^2)
						North	South	East	West										
Est Pos	G8	Hawthorn Privet	M	6	0	2	2	2	2	Fair	10+	C2	100	1	A typical group for the area.		Low	1.2	4.52
	T9	Goat Willow (Salix caprea)	M	6	0	3	3	3	3	Fair	10+	C3	100,100,75,75	4	A poorly developing tree. Limited safe life expected due to multi attachment points at the base.		Low	2.12	14.12
	T10	Ash (Fraxinus excelsior)	EM	12	3	1	3	3	3	Good	20+	B2	250	1	Growing as part of a group. Single stem. Biforked below the canopy open union. Significant asymmetry to the canopy.		Low	3	28.28
	T11	Ash (Fraxinus excelsior)	EM	10	2	2	2	2	2	Fair	10+	C3	100	1	Growing as part of a group. Single stem. Crown distorted due to group pressure. Retention will cause damage to neighbouring trees. This tree is unsuitable to its location.	Remove the tree.	Low	1.2	4.52
	T12	Ash (Fraxinus excelsior)	EM	12	3	3	3	3	3	Fair	10+	C2	300	1	Growing as part of a group. Single stem. Biforked below the canopy open union. Significant included union visible.		Low	3.6	40.72
	T13	Ash (Fraxinus excelsior)	EM	10	2	2	2	2	2	Fair	10+	C3	100	1	Growing as part of a group. Single stem. Crown distorted due to group pressure. Retention will cause damage to neighbouring trees. This tree is unsuitable to its location.	Remove the tree.	Low	1.2	4.52

Est Pos	TAG No.	Species	Age	Height (m)	Canopy Underside (m)	Canopy Radius (m)				Vitality	Safe Life	Category	Diameter @ 1.5m (mm)	No. Stems	Observations / Comments	Recommendations	Risk Assessment	Minimum RPA (Radius)	Minimum RPA (Area) (m^2)
						North	South	East	West										
	T14	Ash (Fraxinus excelsior)	M	12	2	3	3	3	3	Fair	10+	C2	250,100	2	Growing as part of a group. Biforked close to ground level. A typical example of the species.		Low	3.23	32.78
	T15	Ash (Fraxinus excelsior)	M	12	2	3	3	3	3	Fair	10+	C2	350, 150, 200	3	Growing as part of a group. Biforked close to ground level. A typical example of the species.		Low	5.16	83.66
Est Pos	G16	Ash Elder	M	6	1	2	2	2	2	Fair	10+	C3	100	1	Growing next to neighbouring land. Suspected self-seeded trees of little value.		Low	1.2	4.52
	T17	Ash (Fraxinus excelsior)	M	16	6	1	3	5	3	Fair	10+	C1	300	1	Growing on the boundary. Single stem. A significant imbalance is visible within the canopy. The tree has historically been pruning to clear neighbouring land.		Low	3.6	40.72
Est Pos	G18	Wild Cherry (Prunus avium)	E M	5	1	2	2	2	2	Fair	10+	C2	200	1	Growing on neighbouring land.		Low	2.4	18.1
Est Pos	H19	Leyland Cypress Common Alder Hawthorn	M	2	0	1.5	1.5	1.5	1.5	Fair	10+	C2	75	1	A poorly developing hedge requiring management.	Trim and tidy sides and top.	Low	0.9	2.55
Est Pos	H20	Holly Box Hawthorn	M	1.5	0	2	2	2	2	Fair	10+	C2	75	1	A formal well-maintained screen.	Maintain at current height and spread.	Low	0.9	2.55

Est Pos	TAG No.	Species	Age	Height (m)	Canopy Underside (m)	Canopy Radius (m)				Vitality	Safe Life	Category	Diameter @ 1.5m (mm)	No. Stems	Observations / Comments	Recommendations	Risk Assessment	Minimum RPA (Radius)	Minimum RPA (Area) (m^2)
						North	South	East	West										
Est Pos	H21	Holly Box Hawthorn	M	1.5	0	2	2	2	2	Fair	10+	C2	75	1	A formal well-maintained screen.	Maintain at current height and spread.	Low	0.9	2.55

APPENDIX D - TREE CONSTRAINTS

Legal constraints. Trees can be protected by planning legislation in several ways. These include being located within a National Park or on a Site of Special Scientific Interest, located within the grounds of a listed building, conservation area or by being subject to a current Planning condition. In general, the main type of protection for trees adopted by the Local Planning Authority (LPA) on potential development sites is the Tree Preservation Order (TPO).

The protection of trees is a duty of the LPA under the Town and Country Planning act 1990 and aims to encourage rational discussion and consideration of trees within the design process. The following guidelines are proposed to encourage rational discussion and consideration of trees within the design process. Legislation indicates that protection should be used to protect healthy trees that are likely to have a reasonable safe useful life expectancy. Generally, those classified with a condition rating of (A) Excellent & (B) Good are worthy of a TPO. Those classified (C) Fair are generally poorer and therefore unlikely to qualify for a TPO on grounds of poor appearance, management issues or unlikely to have a sufficient safe life expectancy. Those trees classified (U) are Unsuitable for retention, generally contain structural defects, have a short safe useful life expectancy or are dangerous and therefore would not qualify for a TPO as indicated within the legislation.

The presence of a TPO should be expected upon development sites for the above reasons. It can however only be regarded as a material consideration, as can any other tree or significant natural feature, within the planning process, and cannot be used as a means of preventing development. Any trees protected or otherwise, which are located on or close to the site can be expected to be regarded as a material consideration or offer a design constraint within the development process.

General Constraints posed by existing trees. The constraints imposed by trees, both above and below ground should inform the site layout design, although it is recognized that the competing needs of development mean that trees are only one factor requiring consideration.

Certain trees are of such importance and sensitivity as to be major constraints on development or to justify its substantial modification. However, care should be taken to avoid misplaced tree retention; attempts to retain too many or unsuitable trees on a site can result in excessive pressure on the trees during demolition or construction work, or post-completion demands for their removal.

Our tree survey schedule in Appendix C and the tree survey plan BA10077TS in Appendix H includes the relevant constraint information, plotted around each of the categories A, B and C trees and included information on shading and the minimum Root Protection Area (RPA), in addition to a suggested limit for construction.

Typically, development should endeavour to retain category A & B trees and category C trees where they can be either improved and included in low risk areas or help improve biodiversity.

Ideally, structures should be located outside areas of shading and the recommended construction limit (Minimum Root Protection Areas plus an additional 2 metres) of trees to be retained should inform the development. However, in some cases the existing site layout has impacted on the trees in particular when existing structures or hard-surfacing extend or have been installed in the root protection areas. To help understand this I have colour coded the principal Structures, Hard Surfacing, Services, Earthworks and areas of High water content on the tree survey plan BA10077TS in Appendix H.

However, where there is an overriding justification for construction within the RPA, technical solutions might be available that prevent damage to the tree(s). If operations within the RPA are proposed additional information can be provided to demonstrate that the tree(s) can remain viable and offer mitigation measures such as but not limited to, improvements to the soil environment that is to be used by the tree for growth.

APPENDIX E - DESIGN CONSIDERATIONS

Care is needed regarding the retention of large, M, over-M or veteran trees which become enclosed within the new development. Where such trees are retained, adequate space should be allowed for their long-term physical retention and future maintenance. However, such retentions are seen as beneficial, helping to contribute to climate change resilience, amongst other benefits of habit and biodiversity. Achieving successful integration of large species trees requires careful consideration at the conceptual and design stages and specialist arboricultural input.

Design Considerations. To enable a realistic assessment of the probable impacts of any proposed development on the trees, and vice versa which should take into account the characteristics and condition of the trees. To maximize the probability of successful tree retention, the following factors are taken into account.

- **Shading of Buildings**. This can be a problem, particularly where there are rooms, which require natural light.
- **Shading of Open Spaces & Gardens**. Sitting normally requires direct sunlight for at least for part of the day. However, *shading can be desirable to reduce glare or excessive solar heating, or to provide for comfort during hot weather.*
- **Privacy and screening**. The retention of trees helps to reduce overlooking by neighbours or to mitigate undesirable views, such as busy roads, railway lines or industrial premises.
- **Direct damage**. Below ground, damage to structures can occur because of incremental root and stem growth. In addition above ground damage can occur to trees and structures by the continuous whipping of branches against the fabric of a building. Therefore this needs to be considered to avoid the need for frequent remedial pruning or other maintenance.
- **Future pressure for removal**. The relationship of buildings to large trees can cause apprehension to occupiers or users of nearby buildings or spaces, resulting in pressure for the removal of the trees. Buildings and other structures should be sited to allow adequate space for a tree's natural development, with due consideration given to its predicted height and canopy spread.
- **Seasonal nuisance**. Trees are naturally growing and shedding organisms. Leaves of some species can cause problems, particularly in the autumn, by blocking gullies and gutters. Fruit can cause slippery patches or accumulations of honeydew, which can be damaging to surfaces, these aspects, should also considered.

In general, developments close to trees needs to maintain the site and particularly the soils close to the current prevailing conditions and avoid significant changes. However, a development is achievable providing the 8 key points listed below can be incorporated into the proposal's design:-

1. **Available Space,** The proposal should consider the available space both now and in the future and avoid the need to remove large diameter branches and stems whilst providing sufficient space for future growth.

2. **Foundations,** the proposal will need to offer support to the structures with the need for minimal excavation to avoid tree root severance, typically a pile and beam or partial cantilever solution could be considered following the advice of a structural engineer.

3. **The Building,** particularly the underside of the proposal will need to be above the current soil level to avoid compaction, excavation and ensure continued soil hydration and aeration. Typically, either a timber frame or block and beam can be adopted to achieve this relatively simply.

4. **Ground Protection,** needs to be a principal theme running throughout the proposal with the current ground being protected from, Excavation, Cultivation or Compaction and should remain wherever possible close to its current condition. This can be significantly simplified through the adoption of timber frame construction avoiding the need for potentially damaging heavy weights and potential noxious material such as concrete blocks, bricks and chemicals such as cements to be used near trees.

5. **Services** for the proposal should be located outside the Root Protection Area to avoid the need for excavation. Where new services are required within the Root Protection Area, these should adopt low impact methods of installation such as moling. Ideally, existing site utilities should be either isolated and retained in situ where they extend into the RPA or recycled or upgraded where this can be done without excavation.

6. **Hard surfacing** will typically be required unless it can be substituted for decking or above ground walkways. Hard surfacing will need to be installed without the need for excavation and should be porous to allow continued soil hydration and aeration. Typically, either a porous paving system or gravel supported by a NO-dig foundations such as Cell-Web can be adopted to achieve this.

7. **Building use,** within the proposal, available light should help inform the building design, layout and its use. Ideally, windows and views should be directed away from trees and toward open areas. In addition, the use of secondary or passive light through light reflecting tubes should be considered to help reduce the negative aspects of large trees.

8. **Building maintenance** will be required, particularly where canopies of trees extend close to or above the roofline, this can cause maintenance difficulties due to leaf and organic matter build up in the gutters and down pipes. This problem needs to be designed out as far as possible by the addition of filters in the gutters to restrict the access to leaves and small twigs.

The design should take account of the effects of any tree loss required to implement the design, and any potentially damaging activities proposed near retained trees. This might include the removal of existing structures and hard surfacing, the installation of new hard surfacing, the installation of services.

APPENDIX F - RISKS TO TREES DURING CONSTRUCTION

The following operations are all very damaging to trees, I have included a poster that demonstrates these points, and this might be useful for full circulation:

Compaction of the soil - Compaction will destroy the soil structure by removing the spaces between soil particles preventing the uptake of oxygen and nutrients. Compaction is caused by storage of materials, including bricks, soil, gravel and cement, and even a single vehicle movement will cause damage. Compacted ground will also damage soil drainage, which may then become waterlogged.

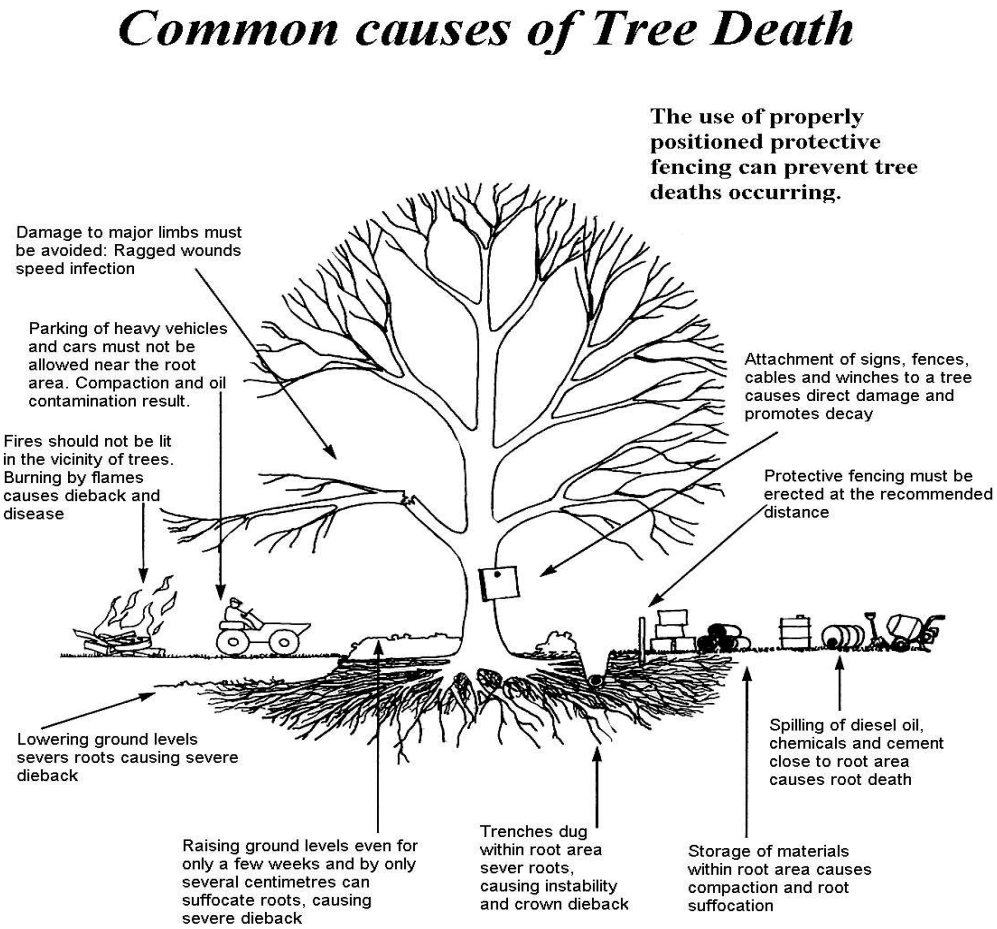
Excavations - any excavations close to the tree are likely to cause root severance. The closer excavations occur to the tree the more severe the damage. Root severance will lead to loss of vigour of the tree, reduce uptake of water and nutrients, allow access for decay organisms and increase likelihood of wind throw.

Ground level changes - both reduction and raising of soil levels will be detrimental even if this is only by a few centimetres. Reducing ground levels will sever roots, and can increase the drainage of a site thereby reducing water availability. Raising ground levels will cause compaction, suffocate roots and damage fibrous roots.

Impact damage - this can be caused by machinery - including torn branches and damage to bark and trunks. This will lead to entry for decay organisms and reduced vigour.

Soil contamination - this can be caused by spillage of oil, fuel and chemicals and mixing cement or other materials. Allow for sloping ground – keeping toxic material downhill from trees and aim to store them 10m from the Protected Zone to allow for leaching through the soil.

Fires - both the intense heat and direct flame will damage the trees causing loss and damage to both major roots and fibrous roots. Intense heat will damage the trees vascular system under the bark even if the bark does not appear burnt.



APPENDIX G - TREE PROTECTION

Protection of retained trees. The successful retention of trees depends on the quality of the protection and the administrative procedures to ensure those protective measures remain in place while there is a risk of damage. An effective means of doing this is through an arboricultural method statement that can be specifically referred to in a planning condition. An arboricultural method statement for this site should ideally be agreed. Implementation of a method statement will allow all the retained trees to survive without any adverse impact and allow them to continue to contribute to local amenity and character.

Limiting Threats to Trees. To help reduce the potential impact of site changes BS5837:2012 recommends in Section 3.7 that a **Root Protection Area (RPA)** is included as a layout design tool. This protected area is based upon the Root Protection Area - a point equivalent to 12 times the trunk diameter. This indicates the minimum area around a tree deemed to contain sufficient roots and rooting volume to sustain the tree's viability, though ideally the offset shown as the Construction Limit should be adopted to provide additional space and enable trees to thrive.

Tree Protection: where retained trees need to be protected this is most easily achieved by establishing a **Construction Exclusion Zone (CEZ)** as part of a **Tree Protection Zone (TPZ)** to protect the roots and aerial parts as recommended in BS5837:2012 – further details upon request. Within this area, retained trees need to be protected from the effects of site changes and in particular excessive root severance, soil level changes or soil compaction.

Appropriate site organisation and management are essential following the adage of '***Prevention is better than Cure***'. Unfortunately, tree damage can easily occur and although it is costly to repair, it comes with few guarantees.

Inside the exclusion area of the fencing, the following actions need to be avoided:-

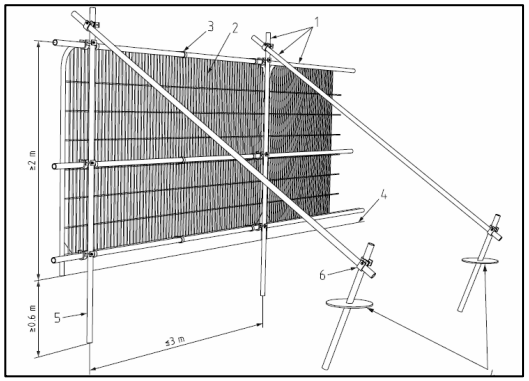
- **No linear mechanical excavation whatsoever.**
- **No excavation by any other means without arboricultural site monitoring.**
- **No hand digging without a written Method Statement having first been approved in writing by the consulting arboriculturist.**
- **No lowering of levels for any purpose (except removal of grass sward by hand).**
- **No construction of a sealed hard surface (except where agreed with the arborist)**
- **No storage of plant or materials.**
- **No storage or handling of any chemical, including cement washings.**
- **No vehicular access.**
- **No fire lighting.**

In addition to the above, further precautions are necessary adjacent to trees:-

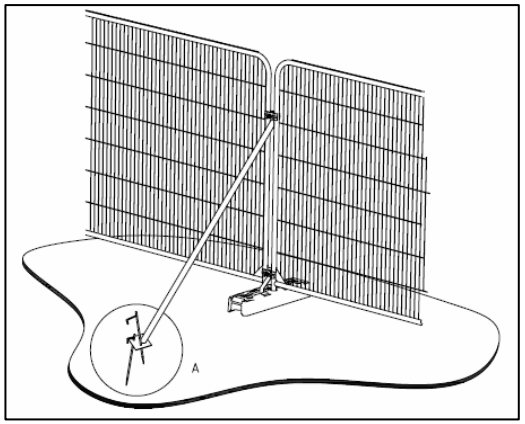
- **A 10m separation distance shall be observed between any tree and substances injurious to tree health, including fuel, oil, bitumen, cement (including cement washings), builders' sand, concrete mixing and other chemicals.**
- **No fire shall to be lit such that flames come within 5m of tree foliage; this shall be taken to mean a fire separation distance of 20m from any tree's canopy.**

Protective Fencing: Based on tree survey data, **Root Protection Area (RPA)** have been calculated for the trees identified for retention and included in the tree schedule in Appendix C. The RPA's are designed to protect at least a functional minimum of tree root mass in order to ensure that the trees survive the construction process. Tree protection will need to be installed following the initial tree works and before the onset of any demolition or ground works. The RPA should remain in position for the whole of the construction and demolition phase.

Type 1 Tree Protection Fencing (TPF1), which is suitable for areas of high intensity development, shall comprise of interlocked Heras panels, or similar, well-braced to resist impacts by attachment to a scaffold framework that has been set firmly driven into the ground and braced as shown opposite.



Type 2 Tree Protection Fencing (TPF2), is to be erected as a temporary barrier to protect areas designated for later construction within TPZ, shall consist of Heras panels mounted on rubber/concrete 'boots' which shall be pinned into the ground



using 450mm steel pins and/or clamped to adjacent Type 1 TPF.

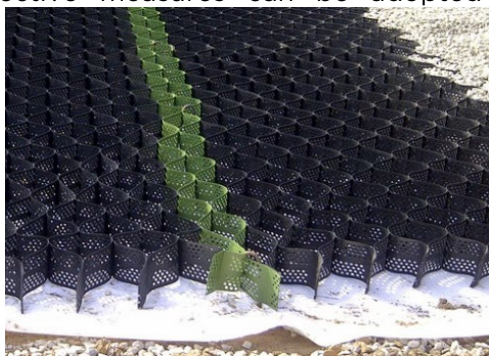
Type 3 Tree Protection Fencing (TPF3), is to be erected as a visual barrier to protect areas designated for no or later construction and typically consists of a visual barrier such as stock fencing, post and rail, Chestnut Pale fencing or Orange Extruded Netting, supported on ground pins as shown aboveopposite.

Signage: To inform site personnel of the purpose of the fencing and to underline the importance of the Construction Exclusion Zone, information notices such as the example shown opposite should be fixed to the fencing.

Ground Protection (Temporary): Access across the RPA, if this is required this can be achieved for the duration of the development phase in such a way, which will reduce the potential negative effects of compaction.

For pedestrian movements, which are expected to be limited on this site, a single thickness of scaffold boards placed either on top of a driven scaffold frame, to form a suspended walkway as detailed in the image opposite can be used. Alternatively, this could be positioned on top of a compression-resistant layer, laid onto a geotextile membrane. If pedestrian-operated plant or heavy plant is expected to enter the Root Protection Area, bespoke methods will need to be agreed.

Ground Protection (Permanent): The creation of Hard Surfacing within or close to trees offers a risk to trees through compaction, excavation, soil level changes or contamination and this needs to be avoided or appropriately defended as indicated opposite so that underlying soils can continue to allow the ingress of water and exchange of gas between the soil and the atmosphere. Protective measures can be adopted successfully to help retain trees. This information ideally needs to be outlined within an **Arboricultural Method Statement** post approval.



To counter the risk offered by hard surfacing, methods which avoid excavation and maintain the existing soil levels need to be adopted within the Root Protection Area by using a porous sub-base, which allows the support of a permanent porous surface. A Sub-base is to be formed using cellular confinement system such as Geosynthetics ***Cellweb*** (below left) which needs to be installed using NO-fines granular fill as shown opposite or by using bridging methods such as **ArborRaft** shown right.

Substituting traditional compacted stone infill with ArborRaft or Cellweb a suspended pavement foundation sub-bases, will reduce the need for excavation and limit the weight of material build up and enable the formation of porous hard surfacing, which limits compaction of root zone within RPA.

It is essential that all kerbing is non-invasive, substitute cast concrete Kerb's for **EverEdge 'Titan'** galvanised steel landscape edging (shown opposite) within the Root Protection Area and should be located to avoid impact with significant rooting. Where wet cast concrete needs to be used this needs to be installed behind the edging and needs to be protected by adopting an impermeable geo-textile to avoid soil contamination.

Tree Survey Plan – BA10077TS (A1 Plan Attached)

Tree Surveys & Condition Reports

Tree Health & Safety Reports

Tree Risk Assessments

Tree Population Site Inventories

Estate Tree Management

Woodland Management

Tree Work Specification & Tenders

Insurance & Mortgage Reports

Decay Detection & Mapping

Wind load & Stability Assessments

Development Site Tree Reports to BS5837

Arboricultural Implication Assessments (AIA)

Arboricultural Method Statements (AMS)

Construction Exclusion Zone Management

Tree Protection Plan Design

Tree Valuation & Replacement Costing

TPO Objections & Appeals

Tree planting Schemes

Landscape visual impact assessment

Landscape architecture

BARNES associates ltd

SURVEY MANAGE IMPROVE

The Old Forge, Horsefair
Boroughbridge YO51 9AA
T 01423 322 371
E info@barnesassociates.co.uk
W barnesassociates.co.uk

Company Number 10438116
Registered in England and Wales