



BS 5837:2012 Arboricultural Survey

Tarbock Green, Merseyside

Presented to Pegasus Group

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Delta-Simons Project No. 20-0008.03



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Report Details

Client	Pegasus Group
Report Title	BS 5837:2012 Arboricultural Survey
Site Address	Land to the North of Netherley Road, Tarbock Green, Prescot, Merseyside L35 1QE
Project No.	20-0008.03
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Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
1.	Final	9 th March 2020				
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Executive Summary

Purpose	Delta-Simons Environmental Consultants Ltd was instructed Pegasus Group ('the Client'), to undertake an Arboricultural Survey to BS 5837:2012 standard of an area of land to the north of Netherley Road, Tarbock Green, Prescott, Merseyside ('the Site'). The survey was undertaken on 13 th February 2020. The survey was undertaken to inform a planning application for the Site.
Current Site Status	The Site covers an area of approximately 0.7 ha and comprises an industrial unit with areas of hard standing and landscaping. A line of broadleaved trees defines the eastern boundary, while a group of young broadleaved trees is present at the southern boundary.
Proposed Development	The Site is proposed for 14 live/work units at the Site with associated hard and soft landscaping.
Results	A total of two trees, six tree groups and a woodland group were identified and assessed as part of the Tree Survey. The results of the desk search undertaken on 17/02/2020 on Knowsley Metropolitan Borough Council website indicated that no trees on-Site are covered by Tree Preservation Orders (TPOs), or are within a Conservation Area. However, adjacent to the western boundary, Brick Wall Covert is covered by Pex Hill, Cronton, Knowsley TPO No.1 -1969.
Recommendations	<u>Recommendation 1 (Adequate Tree Protection)</u> Those trees identified within the proposed development plan for retention will need to be adequately protected during any construction works. Measures to protect trees should follow the best practice principles set out in BS 5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the Root Protection Area (RPA) of individual trees to be retained should be marked out. Marking out should be completed by a competent person with arboricultural expertise. All trees that could be impacted should be protected by barriers or ground protection around the calculated RPA, and as indicated on the Tree Constraints Plan (TCP) produced in association with this Assessment. <u>Recommendation 2 - Bats (Low BRP Tree)</u> ▲ Should any works be required to the tree assessed as having low BRP (TG7), this should be completed under a method statement which could include a single dawn survey completed during the active bat season (April-October, inclusive) on the morning prior to the works being undertaken; or ▲ Alternatively, a licenced bat ecologist trained to use specialist tree climbing equipment could undertake a thorough inspection of the potential roost features immediately prior to works commencing.
This Tree and Hedgerow Survey Executive Summary is intended as a summary of the assessment of the Site based on information received by Delta-Simons at the time of production. This Executive Summary should be read in conjunction with the full Report.	

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1.0 Introduction

1.1 Purpose and Scope of the Survey

Delta-Simons Environmental Consultants Ltd was instructed by Pegasus Group (the 'Client') to undertake an Arboricultural Survey to BS 5837:2012 standard. The survey was undertaken of land to the north of Netherley Road, Tarbock Green, Prescot, Merseyside (hereafter referred to as 'the Site'). The survey was undertaken on 13th February 2020. The Site location and the area surveyed are shown in Figure 1. The survey was undertaken in order to inform a planning application for 14 live/work units at the Site.

The aims of the Arboricultural Survey were to:

- ▲ Identify the individual tree species present at the Site by means of visual inspection;
- ▲ To define the approximate age, condition and canopy spread of all individual mature trees identified and the value of these within the development;
- ▲ To identify any trees that present a risk to existing or proposed foundations or other structures that may be constructed on the Site and recommend actions to remove this risk; and
- ▲ Recommend tree management or mitigation measures where appropriate.

The Site location and the area surveyed are shown in Figure 1.

1.2 Site Description

The Site is centred at Ordnance Survey (OS) grid reference SJ 46251 87644, covers an area of approximately 0.7 ha and is located north of Netherley Road in Tarbock Green to the north of Halewood. The Site comprised an industrial unit with areas of hard standing and landscaping. A line of broadleaved trees defines the eastern boundary, while a group of young broadleaved trees is present at the southern boundary.

To the north lies areas of hard standing and self-set broadleaved trees and scrub, with an area of woodland further north named The Coppice. To the south beyond Netherley Road, the village hall and an arable field with boundary hedgerows are present. To the east is a riding school with associated buildings and grazed paddocks. To the west is a residential property and Brick Wall Covert, a broadleaved woodland.

The Site layout is shown in Figure 2.

1.3 Proposed Development

It is understood the proposed development will comprise 14 live/work units at the Site with associated hard and soft landscaping (see Drawing 1 - Condry Lofthouse Architects Drawing No.19-112-103 Oct 2019).

2.0 Legislation and Policy

Trees

Local planning authorities look upon trees as being highly beneficial to the locality. To ensure that any important specimens, or significant groups of trees are retained, they may place Tree Preservation Orders (TPOs) on them. In other situations, villages or whole districts may be classified as conservation areas. In these instances, certain trees in the designated area will be protected. When trees are protected, legal procedures must be followed before any work is carried out.

When trees are protected by Preservation Orders, no work should be carried out on them without prior written consent from the Local Planning Authority (LPA). Once an application is made, the Authority personnel must inspect the trees, and make a decision within a statutory eight-week period as to whether work can go ahead. If no decision is made within the eight-week period, the appellant can appeal to the Office of the Deputy Prime Minister for non-determination. If the Local Authority (LA) refuses the application the appellant still has the right to appeal.

If a tree protected by a Preservation Order is either killed or wilfully destroyed, the owners of the tree, and the contractor who did the work, can both be prosecuted. The fines for killing or wilfully destroying a tree can be high, i.e. the current maximum is £20,000 per tree, and there is an automatic requirement to re-plant. The current maximum for minor unlawful infringements, such as pruning, is £2,500.

Trees which are dead, dying, or dangerous are exempt from the legislation, although if such trees are removed, the onus on proving they fell into one of these categories lies with the tree owner. Whenever possible it is strongly recommended that the LA be given at least five days' notice before any work on such trees is carried out.

Trees in a conservation area that are already protected by a TPO are subject to the normal procedures and controls for any tree covered by such an Order.

Trees in a conservation area that are not protected by a TPO are protected by the provision in Section 211 of The Town and Country Planning Act (1990). These provisions require people to notify the LPA, using a 'section 211 notice', six weeks before carrying out certain works on such trees, unless an exception applies. The works may go ahead before the end of the six-week period if the LPA gives consent. This notice period gives the Authority an opportunity to consider whether to make an Order on the tree.

3.0 Methodology

The methodology set out below is a detailed summary of the suggested approach to tree assessment as described in British Standard 5837:2012. This Report has applied the methodology to all significant individual trees or groups of trees present at or near to the Site. Trees below 15 cm trunk diameter were generally excluded from the survey. All floral names follow the nomenclature of Stace (2010).

3.1 Trees

Trees have been broadly assessed based on guidance set out within the British Standard BS 5837:2012 Trees in Relation to Design, Development and Construction. This standard provides recommendations and guidance on the principles to be applied to achieve successful integration of development with trees, shrubs and hedgerows. Where development is to occur, the standard provides guidance on the approach needed to decide which trees are appropriate for retention, and the means for protecting these trees during the development (including demolition and construction works) and the means of incorporating trees into the developed landscape.

Trees on or adjacent to the Site have been divided into one of four categories (based on the cascade chart for tree quality assessment). These are classed as A, B, C or U (Section 4 of BS 5837) within Table 1. This gives an indication as to the tree's importance in relation to the Site, the local landscape and, also, the value and quality of the existing trees on-Site. This assists informal decisions concerning which trees should be removed or retained should development occur. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below).

Categories A, B and C cover trees that should be a material consideration in the development process, each with three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural (nature conservation) values. Category U trees may have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. In assigning trees to the A, B or C categories, the presence of any serious disease or tree-related hazard is taken into account. If the disease is considered fatal and/or irremediable, or likely to require sanitation for the protection of other trees it may be categorised as U with a recommendation for work or even removal, even if they are otherwise of considerable value.

Category (A): Trees whose retention is most desirable and are of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years) and may comprise:

- ▲ Trees which are particularly good examples of their species, especially rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue);
- ▲ Trees, or groups of trees, which provide a definite screening or softening effect to the locality in relation to views into or out of the Site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups); and
- ▲ Trees or groups of significant conservation, historical, commemorative or other value (e.g. Veteran or wood-pasture trees).

Category (B): Trees whose retention is considered desirable and are of moderate quality and value. These trees are considered to be in such a condition as to make a significant contribution (a minimum of 20 years) and may comprise:

- ▲ Trees that might be included in the high category but because of their numbers or slightly impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage), are downgraded in favour of the best individuals;
- ▲ Trees present in numbers such that they form distinct landscape features and attract a higher collective rating than they would as individuals. Individually these trees are not essential components of formal or semi-formal arboricultural features, or trees situated mainly internally to the Site and have little visual impact beyond the Site; and

- ▲ Trees with clearly identifiable conservation or other cultural benefits.

Category (C): Trees that could be retained but are considered to be of low quality and value. These trees are in an adequate condition to remain until new planting could be established (a minimum of ten years) or are young trees with a stem diameter below 150 mm and may comprise:

- ▲ Trees not qualifying in higher categories;
- ▲ Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value and or trees offering low or only temporary screening benefit; and
- ▲ Trees with very limited conservation or other cultural benefits.

Category (U): Trees that are considered to have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. These trees will be in such a condition that any existing value would be lost within 10 years and which should in the current context be ignored or removed for reasons of sound arboricultural management. Trees within this category are:

- ▲ 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;
- ▲ Trees that are dead or are showing signs of significant, immediate or irreversible overall decline; and
- ▲ 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.

Species have been recorded by common and scientific name. Height has been estimated in metres and stem diameter measured in centimetres unless impractical, taken at a height of 1.5 m from the base of the tree.

In the assessment particular consideration has been given to:

- a) The health, vigour and condition of each tree;
- b) The presence of any structural defects in each tree and its life expectancy;
- c) The size and form of each tree and its suitability within the context of the proposed scheme; and
- d) The location of each tree relative to existing Site features, e.g. its value as a screen or as a skyline feature.

Age class is assessed according to the age class categories referred to in BS 5837.

- Y: Young trees age less than 1/3 life expectancy;
- SM: Middle age trees 1/3 – 2/3 life expectancy;
- M: Mature trees over 2/3 life expectancy; and
- OM: Over mature – declining or moribund trees of low vigour.

The overall condition of any individual tree, or group of trees, has been referred to using one of the definitions listed below. A more detailed description of condition has been noted in the Tree Schedule:

- G **Good:** A sound tree or trees needing little, if any, attention;
- F **Fair:** A tree or trees with minor but rectifiable defects or in the early stages of stress, from which it may recover;
- P **Poor:** A tree or trees with major structural and physiological defects or stressed such that it would be very expensive and inappropriate to retain; and
- D **Dead:** A tree or trees no longer alive. However, this could also apply to those trees that are dying and will be unlikely to recover, or are becoming, or have become dangerous.

Major defects or diseases and relevant observations have also been recorded. Dead wood has been defined as the following:

Twigs and small branch material	-	Up to 5 cm in diameter.
Minor dead wood	-	5 cm to 10 cm in diameter.
Major dead wood	-	10 cm in diameter and above.

The survey was completed from ground level only. Aerial inspections were not undertaken. Evaluations of tree conditions given within this assessment apply to the date of survey and cannot be assumed to remain unchanged, and it may be necessary to review these within 24 months, in accordance with good arboricultural practice.

3.2 Potential for Protected Species

Potential bat roost locations are described within this Report using the methodology recommended by the Bat Conservation Trust (BCT), see Collins (ed, 2016) in references (Appendix B). Each tree of significant size assessed within this survey has also been assessed for its potential to provide roosting opportunities for bats (see Appendix C).

3.3 Tree Plans and Tree Schedules

The extent and positions of significant individual trees or groups of trees on or adjacent to the Site are shown on the Arboricultural Survey Plan (Figure 2). The Root Protection Areas (RPA) of the key trees of value identified for, or recommended for, retention have been marked within the Constraints Plan (Figure 3) using the RPAs provided in the Tree Schedule within Table 1.

A summary that includes the trees identified on or near to the Site is included in this Report detailing information on each group of trees, which is summarised in Table 1. Within the summary table maximum RPAs (m²) for estimated tree diameters have been included where appropriate, as well as a calculated corresponding radius of the circle for that RPA. The RPAs are formulated as described below and assist when designing layouts in relation to trees.

3.4 Root Protection Area

Below ground constraints to development are represented by the root plate around a tree, which needs protecting in order for the tree to be incorporated into a proposed scheme without adverse harm to the tree or structural integrity of any proposed foundation structures.

This area is illustrated by the RPA and is calculated according to the formula set out in BS 5837: (2012). This area is equivalent to a circle with a radius 12 x the stem diameter for single stem trees or the basal diameter for trees with more than one stem arising less than 1.5 m above ground level.

$$\text{RPA (m}^2\text{)} = (\text{stem diameter (mm)} \times 12 / 1000)^2 \times 3.142$$

This figure should be capped to 707 m², that is, equivalent to a circle with a radius of 15 m, or a square with approximately 26 m sides

Taken from Table 2: Calculating the RPA, BS 5837 (2005).

3.5 Limitations to the Survey

The Site boundary along the north-western extent of the Site was not defined on the ground at the time of the survey. There were no further limitations regarding access at the time of the survey.

4.0 Results

4.1 Desk Study

The results of the desk search undertaken on 17/02/2020 on the Knowsley Metropolitan Borough Council website, indicates that no trees on-Site are covered by Tree Preservation Orders (TPOs), or are within a Conservation Area. However, adjacent to the western boundary, Brick Wall Covert is covered by Pex Hill, Cronton, Knowsley TPO No.1 -1969.

4.2 Survey Details

The tree inspection took the form of a walkover inspection completed by Peter Morrell TechArbA on 13th February 2020. Each individual mature, semi-mature or young tree of significance that could be impacted upon by any proposed development was identified and visually inspected and classified. The trees identified during the survey at the Site have been individually noted and identified within this Report and are shown in the Tree Survey Plan within Figure 2, and within the Photograph Section of this Report (Appendix D).

4.3 Mature, Semi-Mature and Young Trees

A total of two Trees (T), six Tree Groups (TG) and a Woodland Group (WG) have been identified and assessed as part of the tree survey. With the exception of two tree groups and part of a group, the remainder of tree groups and individual trees were outside the Site boundary.

4.3.1 Species and their Arrangement in the Landscape

There are a limited range of tree species on, and immediately adjacent to, the Site, with no dominant species. Lombardy poplar *Populus nigra* var. '*Italica*', sycamore *Acer pseudoplatanus*, dog wood *Cornus sanguinea*, ash *Fraxinus excelsior*, pedunculate oak *Quercus robur*, cherry *Prunus* sp., Leyland cypress x *Cupressocyparis leylandii*, goat willow *Salix caprea*, crack willow *Salix fragilis*, common alder *Alnus glutinosa*, Norway maple *Acer platanoides* and silver birch *Betula pendula* are present in multiple numbers.

The trees at the Site are placed within a formal planting bay in the centre of the Site and within a screening tree group at the southern boundary of the Site. The remainder of the trees surveyed were adjacent to the northern, eastern and western boundaries of the site.

4.3.2 Height and Significance in the Landscape

Tree group TG8, a linear group of mature Lombardy poplar standing up to a height of 22 m, is highly prominent in the wider landscape due to its height and the generally level surrounding area and is placed within Category B. While TG7 is of a lesser height, its prominence within the local landscape is high, by its position adjacent to Netherley Road and provides a screen to the Site, as such, it is also placed within Category B. Tree T5 and TG3 are both highly visible when viewed from Netherley Road and have canopies that extend into the Site.

The remainder of the off-Site trees are less visible from outside of the Site, positioned behind either the aforementioned trees or buildings, resulting in restricted views of these trees within the wider landscape.

If retained, these trees will require protection measures to ensure no impact occurs as a result of any re-development.

4.3.3 Age and Condition

The two tree groups TG6 and TG7 and part-tree of group TG2 on Site, are a mixture of young and semi-mature trees.

The semi-mature self-set trees within TG2 show no signs of maintenance, as do the trees within TG7. Both groups have trees that vary in condition and quality. The majority of trees within TG7 display phototropic growth due to dense planting, and a failing crack willow within this group supported lifted bark. Tree group TG5, comprising dogwood has been both coppiced and pollarded. Tree groups TG3 and TG8, together with T4 and T5 support canopies that extend into the Site. Several trees within TG8 display extensive horse damage to bark on their eastern extent and have scattered deadwood within the canopies.

4.3.4 Environmental Condition

Given the Site's current industrial use and the semi-mature age of the majority of trees, it is surmised that limited damage to the root system of on-Site trees has likely been sustained through recent on-Site working practices.

The majority of trees on-Site and immediately adjacent to the Site are not in an exposed position, having been protected from prevailing winds by the surrounding buildings or trees. However, any trees located in an exposed position display no signs of an adverse effect from wind.

Groundwater conditions are not assessed to be a significant factor in the present or future growth or health of trees since the Site appears to be well drained and this situation will probably improve further following completion of any development.

4.3.5 Bat Roost Potential

A single crack willow within TG7 was assessed as having low BRP as it supported lifted bark that can provide roosting opportunities for bats.

4.4 Tree Schedule

Table 1 – BS 5837:2012 Tree Schedule

Tree No.	Tree Species		Measurements				Crown (m)					Tree Condition								Management
	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Average Height	N	E	S	W	Roots	Stem	Crown	Comments	Structural	Life Expectancy (yrs)	Category	RPA (m)	Works
TG1	Goat willow Silver birch Cherry	<i>Salix caprea</i> <i>Betula pendula</i> <i>Prunus sp.</i>	Y	Av 7	M S	Av 100	0	1	1	1	1	No obvious damage	Multi-stemmed at base. Vertical	Open, spreading canopies, read as one.	Self-set group of trees	F	>40	C2	1.2	
TG2	Ash Sycamore Goat willow	<i>Fraxinus excelsior</i> <i>Acer pseudoplatanus</i> <i>Salix caprea</i>	Y/ SM	Av 15	M S	Av 300	0	5	5	5	5	No obvious damage	Multiple stems at base.	Loosely scattered group of trees with canopies that read as one. Minor deadwood.	Self-set group of trees. Several trees on bunds	F	20-40	C2	3.6	
TG3	Leyland cypress	<i>x Cupressocyparis leylandii</i>	SM	Av 15	1	Est 800	1	4	4	4	4	Unable to access due to access	Single stems, vertical.	Linear group of trees with conical canopies that read as one.	Appears one central tree has been lost leaving a gap. Young ash self-set tree growing within group	F	20-40	B2	4.8	
T4	Ash	<i>Fraxinus excelsior</i>	Y	9	1	Est 200	5	3	5	1	3	Unable to access due to access	Single stem, vertical.	Unbalanced, impacted by T5	Ivy clad stem	F	20-40	C2	2.4	
T5	Pedunculate oak	<i>Quercus robur</i>	M	13	1	Est 800	2	8	10	14	8	Unable to access due to access	Single stem, vertical with twist.	Large spreading canopy. Scattered deadwood and rot holes present.	Ivy clad stem. Low BRP	F	>40	B2	9.6	
TG6	Dog wood	<i>Cornus sanguinea</i>	SM	Av 5	M S	Av 100	0	3	3	3	3	No obvious damage	Multiple stems from base. Coppiced at base and 2 m.	Canopies read as one.		F	10-20	C0	1.2	
TG7	Norway maple Common alder Crack willow Goat willow Cherry	<i>Acer platanoides</i> <i>Alnus glutinosa</i> <i>Salix fragilis</i> <i>Salix caprea</i> <i>Prunus sp.</i>	Y	AV 12	1	Av 300	3	4	4	4	4	No obvious damage	Single and multiple stems, vertical	Canopies read as one. Phototropic growth due to dense planting	Trees vary in condition and quality. Lifted bark on crack willow – Low BRP	F	20-40	B2	3.6	Would benefit from selective thinning

Tree No.	Tree Species		Measurements				Crown (m)					Tree Condition								Management
	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Average Height	N	E	S	W	Roots	Stem	Crown	Comments	Structural	Life Expectancy (yrs)	Category	RPA (m)	Works
TG8	Lombardy poplar Ash	<i>Populus nigra</i> var. ' <i>Italica</i> ' <i>Fraxinus excelsior</i>	M	Av 26	1	Av 850	4	3	3	3	3	Eastern side within stables area heavily poached	Single stems, vertical. Several stems have extensive bark damage due to horses	Columnar canopies read with scattered deadwood present.	Linear boundary group in varying degrees of health. Occasional self-set ash interspersed within the group.	F	20-40	B2	10.2	
WG1	Pedunculate oak	<i>Quercus robur</i>	SM	Av 20	1	Est Av 800	6	10	10	10	10	Unable to access due to access	S ingle stems, vertical.	Mutually shared open, spreading canopies. Scattered deadwood present.	Several ivy clad. Trees vary in condition and quality.	F	>40	B2	9.6	

Table 2 – Key to Tree Schedule

Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
MS – Multi-stemmed	Y - Young	G – Good	A – High	< = less than
Ht - Height in metres	SM – Semi-Mature	F – Fair	B – Moderate	~ = approximately
Stem – Stem Diameter at 1.5m in mm	EM – Early-mature	P – Poor	C – Low	> = greater than
Crown – Crown spread in metres	M – Mature	D – Dead	R – Trees for Removal	
TD - Trunk division (height in metres)	OM – Over-mature Est Yrs – estimate of years remaining (>40 years; 20 –40 years; <20 years)		Sub-categories: 1 = mainly arboricultural values 2 = mainly landscape values 3 = mainly cultural values.	

5.0 Tree Management

5.1 Arboricultural Assessment

On or adjacent to the northern, eastern and western boundaries of the Site are a number of tree groups and individual trees that could be impacted by any proposed re-development. It may be possible to retain and incorporate certain trees and tree groups currently present within the Site into the landscaping scheme of the proposals.

It appears limited recent management has taken place to the trees present on-Site and a number of young trees showed signs of phototropic growth due to lack of thinning, whilst horse damage has been sustained to trees adjacent to the eastern boundary. Consideration should be given to undertaking thinning works to promote healthy growth and extend the life of the trees. The majority of on-Site trees appear to be in fair condition. To ensure that the root areas and canopy extremities of the individual trees and the tree groups that may be retained are not damaged, a Constraints Plan has been prepared to show the locations where protective fencing should be erected for any trees selected for retention (see Figure 3). Any tree surgery required is best carried out towards the conclusion of the development so that, if necessary, any known root damage can be corrected by the appropriate crown thinning to restore root /shoot balance.

One crack willow supported features that could provide roosting opportunities for bats.

It is considered that the Site would benefit from further deciduous tree planting along the southern boundary to provide additional screening and to complement retained trees. Protective fencing should be placed around horse damaged trees adjacent to the Site to prevent further damage, or consideration given to their removal and replacement with a more suitable species.

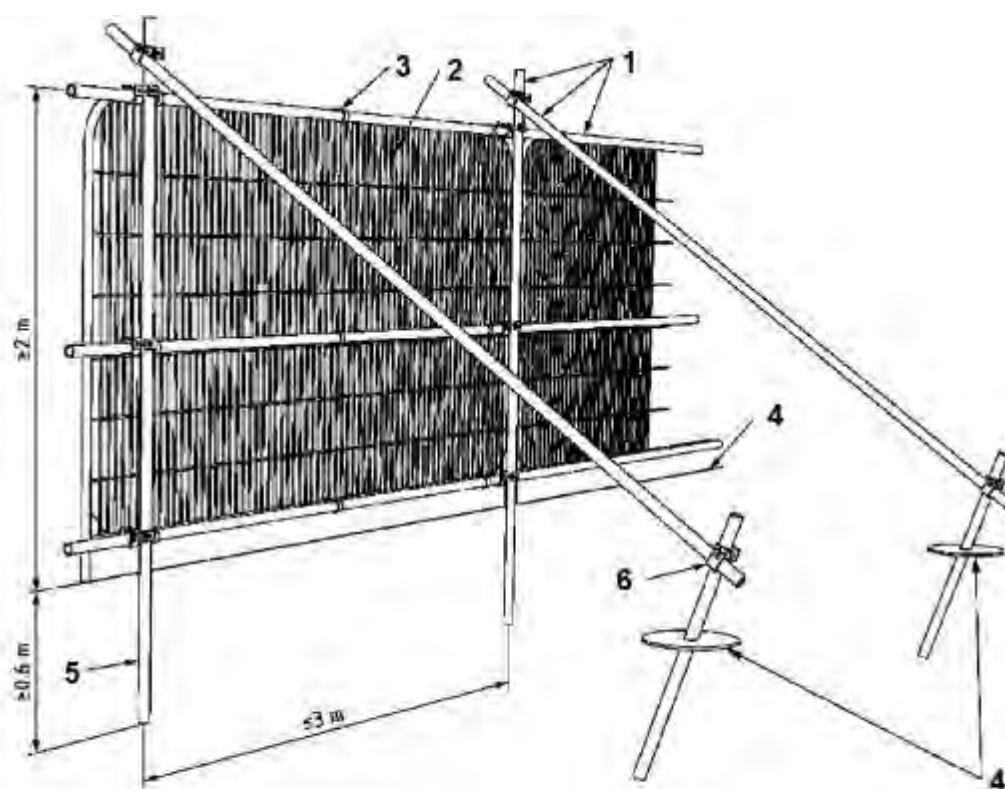
5.2 Recommendations

Recommendation 1 (Adequate Tree Protection)

Those trees identified within any development plan in proximity to the construction works will need to be adequately protected during any approved works. As a general rule, measures to protect trees should follow the best practice principles set out in BS5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the RPAs of individual trees to be retained should be marked out using the distances provided in the Table 1. Marking out should be completed by a person with arboricultural or horticultural expertise as individual trees will have root zones that may be affected by local conditions and allowances would need to be made to accommodate this.

The best practice principles have been broadly summarised below:

- ▲ All trees retained adjacent to the Site should be protected by barriers or ground protection around the calculated RPA and as indicated on any Tree Constraints Plan (TCP) that may be produced in association with the assessment;
- ▲ Any fencing required should be erected prior to commencement of construction and before demolition including erection of any temporary structures. Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor;
- ▲ Arrangements should be made for an arboriculturalist to supervise works and tree protection where trees are particularly vulnerable or sited close to access points;
- ▲ Pre-development works may be undertaken prior to the installation of fencing with the agreement of the local planning authority;



1. Standard scaffold poles
2. Heavy Gauge 2m tall galvanised tube and weld mesh infill panels
3. Panels secured to uprights and cross members with wire ties
4. Ground Level
5. Uprights driven into ground until secure (up to 0.6m)
6. Standard scaffold clamps

- ▲ All tree works should follow best practice procedures as set out in BS 3998 (2010). All trees should be maintained in good condition on-Site and be inspected annually (where overall condition requires) or every two years and after any major storm events, with safety a priority;
- ▲ Fencing should be clearly visible and suitable for the location, type and proximity of construction activity;
- ▲ It may be appropriate on some sites to use temporary site offices as components of the protection barriers;
- ▲ Where it has been agreed and shown on a Tree Protection Plan, construction access may take place within the RPA if suitable ground protection measures are in place (e.g. existing surfaced car park areas). In other areas this may comprise single scaffold boards over a compressible layer laid onto geo-textile materials for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and may require the use of proprietary protection systems;
- ▲ Once areas around trees have been protected by fencing, any works on the remaining Site area may be commenced providing activities do not impinge on protected areas. Notices should be placed on fencing to indicate that operations are not permitted within the fenced area;
- ▲ Wide or tall loads etc should not come into contact with retained trees. Banksman should supervise transit of vehicles, jibs, booms etc where this is in close proximity to retained trees;
- ▲ Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10 m of a tree bole. No concrete mixing should be done within 10 m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree;

- ▲ No fires should be lit where flames are anticipated to extend to within 5 m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire;
- ▲ Notice boards, telephone cables or other services should not be attached to any part of a retained tree;
- ▲ Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment, as part of construction works, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within the RPA fencing, it is best advised that appropriate, but limited, tree surgery be carried out beforehand to remove any obvious problem branches. This is classed as 'Facilitation Pruning' within BS 5837 (2012). Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist;
- ▲ It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery, as described above, to firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact;
- ▲ In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, upon completion of development; and
- ▲ All of the above precautionary measures should be applied to minimise the effect of any damage to long-term tree health and safety.

Recommendation 2 (Bats) - Low BRP Tree (TG7)

Any proposed felling or management works to the tree assessed as having low BRP should be completed under a method statement which could include a single dawn survey completed during the active bat season (April-October, inclusive) on the morning prior to the works being undertaken; or

Alternatively, a licenced bat ecologist trained to use specialist tree climbing equipment could undertake a thorough inspection of the potential roost features immediately prior to works commencing.

6.0 Disclaimer

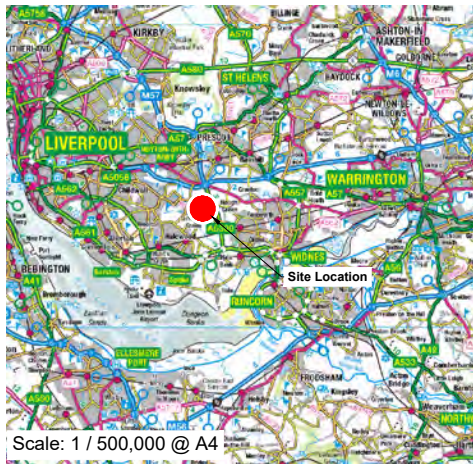
The recommendations contained in this Report represent Delta-Simons' professional opinions, based upon the information referred to in Sections 1.0 and 3.0 of this Report, exercising the duty of care required of an experienced Environmental Consultant.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed as defined in Section 1.1 of this Report. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Drawing 1 – Proposed Development Plan



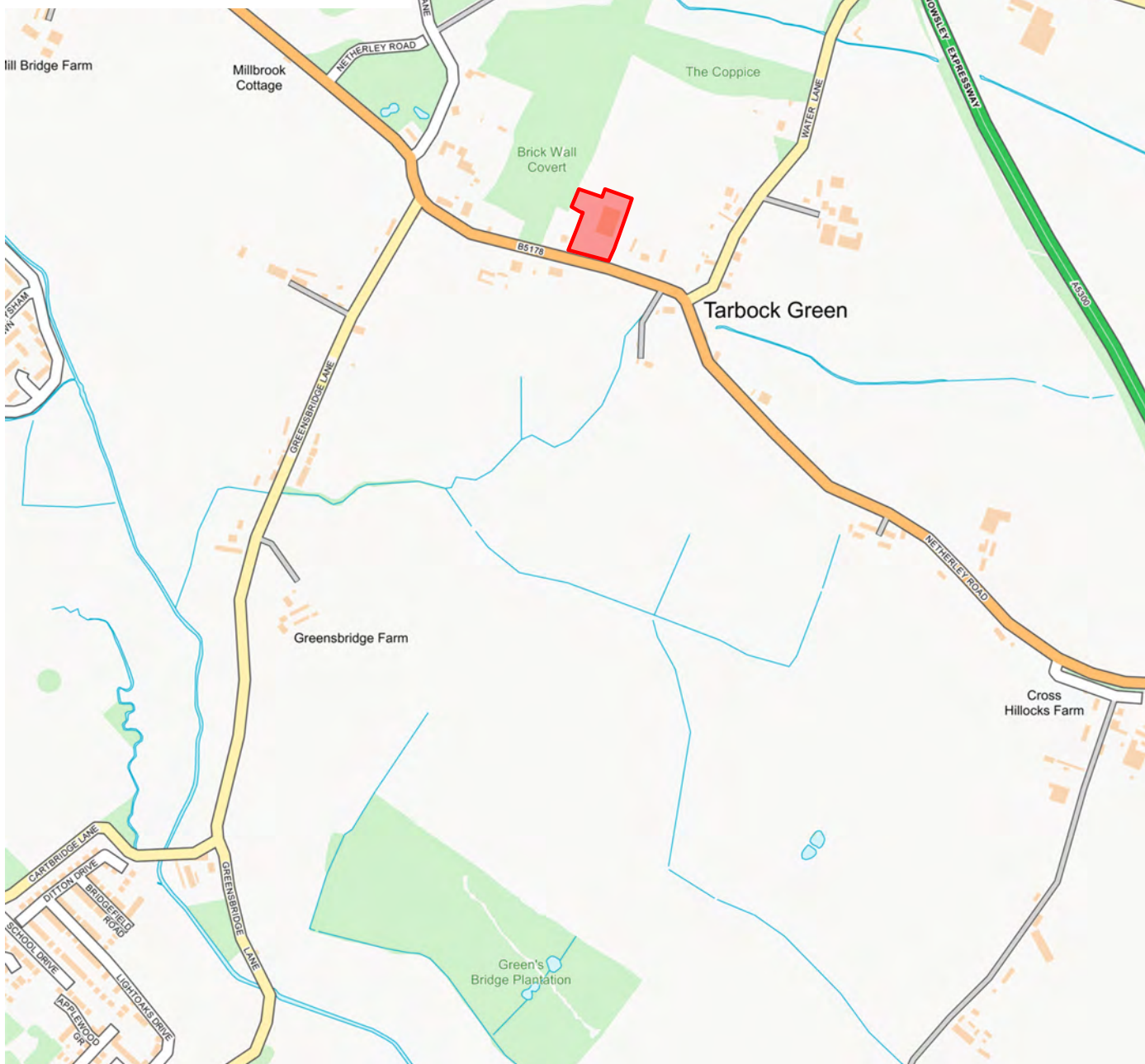
Figure 1 – Site Location Map



LEGEND

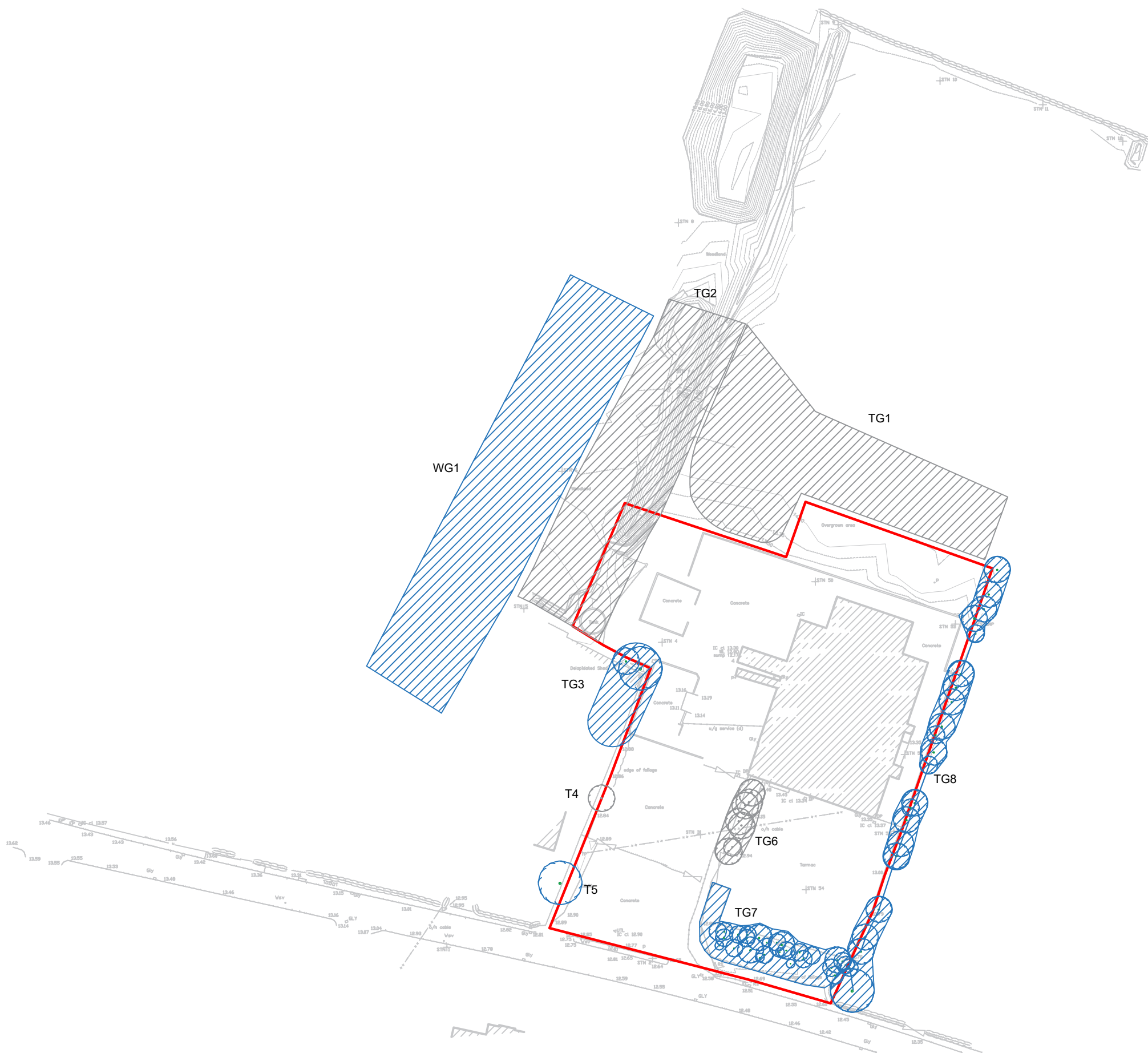


Site Boundary



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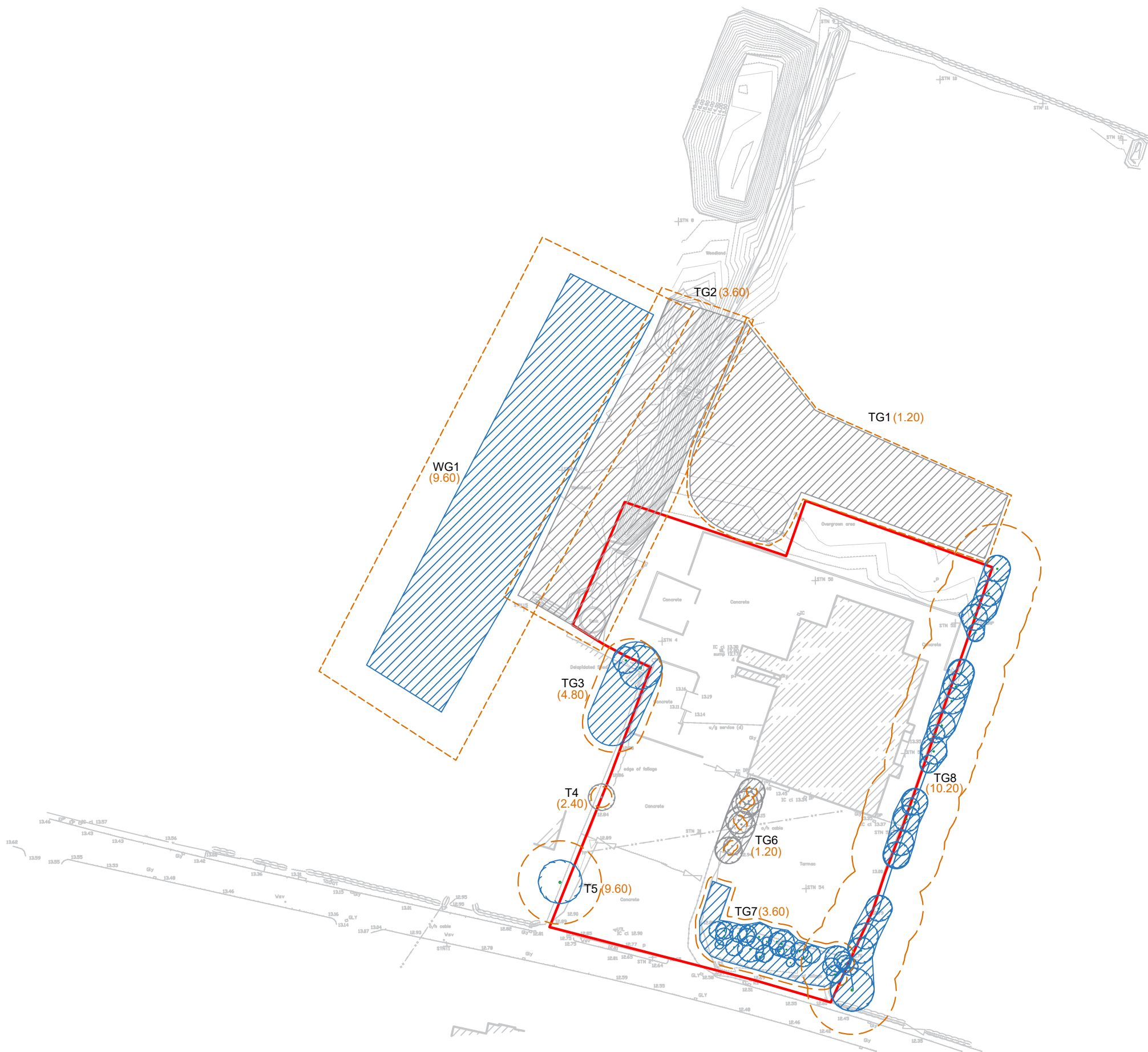
Figure 2 – Tree Survey



LEGEND		
	Site Boundary	
	Tx/TGx	Category A: High value retention most desirable
	Tx/TGx	Category B: Moderate value retention desirable
	Tx/TGx	Category C: Lower value could be retained
	Tx/TGx	Category U: For removal

Site Plan Provided by Client

Figure 3 – Tree Constraints Plan



LEGEND	
	Site Boundary
	Category A: High value retention most desirable Tx/TGx
	Category B: Moderate value retention desirable Tx/TGx
	Category C: Lower value could be retained Tx/TGx
	Category U: For removal Tx/TGx
	RPA: Root Protection Area (m)

Site Plan Provided by Client

Appendix A – References

References

Collins, J. (ed.) (2016) Bat surveys for Professional Ecologists: Good practice guidelines (3rd edition). The Bat Conservation Trust, London.

Stace, C. (2010). *New Flora of the British Isles 3rd edition*. University Press, Cambridge.

BSI Publication BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations.

BSI Publication BS 5837:2005 Trees in Relation to Construction - Recommendations.

The Hedgerow Regulations 1997, HMSO

Appendix B – Guidance on Assessing the Potential Suitability of Development Sites to Support Bats

Guidance on Assessing the Potential Suitability of Development Sites to Support Bats

(adapted from Collins, J. (ed)).

Suitability	Description	
	Roosting	Commuting and Foraging
Negligible	An inspected structure or tree which is considered to have no features of importance for roosting bats. No further constraints apply to the method or timing of proposed works.	Negligible habitat features on-Site to support commuting or foraging bats
Low	A structure with at least one or more features suitable to support opportunistic individual bats. However, inadequate space, shelter, protection and conditions, and the low suitability of surrounding habitats means that it is unlikely to be used as a maternity or hibernation roost site. A tree of adequate age and stature to support potential roosting features, however, either no features, or only features of limited potential recorded from the ground.	Habitat with potential to support low numbers of commuting bats due to its quality and connectivity. For example, a gappy hedgerow or unvegetated stream that is isolated from the surrounding landscape. Alternatively, suitable but isolated habitats suitable to support low numbers of foraging bats such as a lone tree or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that are of adequate size, shelter and protection, with suitable conditions and surrounding habitat to support a bat roost not of high conservation status (with respect to roost type not individual species conservation status).	Linear habitat continuity connecting to the wider landscape offering potential to support commuting bats, such as rows of trees and scrub or linked back gardens. Habitat such as trees, scrub, grassland or a waterbody with connectivity to the wider landscape offering foraging opportunities for bats.
High	A structure or tree with one or more potential roost sites that are suitable for use by large numbers of bats on a regular basis and for long periods of time due to their size, shelter, protection, conditions and the surrounding habitat.	Continuous high-quality habitat with strong connectivity to the wider landscape that is likely to be used by commuting bats on a regular basis, such as flowing waterbodies, hedgerows, rows of trees and woodland edges. High quality habitat with strong connectivity to the wider landscape that is likely to be regularly used by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to, and connected to, known roost sites

Appendix C – Site Photographs

Site Photographs



Photograph 1 – Tree Group (TG)1



Photograph 2 – TG2



Photograph 3 – TG3



Photograph 4 – Tree (T)4



Photograph 5 – T5



Photograph 6 – TG6



Photograph 7 – TG7



Photograph 8 – TG8



Photograph 9 – Woodland Group 1