



Elite Ecology

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**Unit 7 EFI Industrial Estate,
Merthyr Tydfil**



BS5837:2012 Tree Survey and Arboricultural Impact Assessment

March 2021



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BS5837:2012 Tree Survey and Arboricultural Impact Assessment

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0. Executive Summary

- 0.1** This report has been prepared at the request of Mr. Chris Marshall (Proprietor). Elite Ecology were commissioned to undertake a BS5837:2012 Tree Survey and Arboricultural Impact Assessment at the site located at Unit 7, EFI Industrial Estate, Merthyr Tydfil, CF47 8RB. (Central OS Grid Reference: SO 03842 07124). This survey effort involved both a desktop study and field survey being undertaken.
- 0.2** The survey records all trees within the site and any that may be impacted by the development proposals within or outside of the site boundary. The survey records a number of parameters including, species, crown/ canopy spread and root protection areas (RPA).
- 0.3** Throughout this report "RPA" is used to refer to "root protection area". The RPA of any given tree is the area of ground around that tree which should not be disturbed by excavation, compaction, changes in level and/or any other construction/ demolition processes. The extent of the RPA is calculated in accordance with the BS5837 (2012) guidelines and is an important part of the methodologies described in this report.
- 0.4** In total the survey recorded one group of trees. These were native and non-native broadleaf and specimens. The age class ranges from **young** to **mature** and the general overall condition was thought to be **good**.
- 0.5** This report details the arboricultural impacts and offers a range of protection measures that should be put in place prior to any works being started as well as construction methodologies that should be adopted. These measures will prevent accidental damage and other adverse effects on retained trees.

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1. Introduction

1.1 Report rationale

This report has been prepared at the request of Mr. Chris Marshall (Proprietor). Elite Ecology were commissioned to undertake a BS5837:2012 Tree Survey and Arboricultural Impact Assessment at the site located at Unit 7, EFI Industrial Estate, Merthyr Tydfil, CF47 8RB. (Central OS Grid Reference: SO 03842 07124). This survey effort involved both a desktop study and field survey being undertaken.

Elite Ecology is a multi-disciplinary ecological and arboricultural consultancy practice which operates nationwide for its clients on a multitude of ecological and arboricultural projects since 2015. The author of this document Mr. David Whitehead is a time served climbing arborist and arboriculturist with twenty years of experience within the arboricultural industry, and is currently qualified to QCF level 4, HNC Arboriculture, and is further studying towards QCF level 5, FdSc Arboriculture. The overseer of this document, Mr. Richard Millington, is a Senior Ecologist, and is currently qualified to QCF level 6, BSc (Hons) in Ecology and Conservation Management.

1.2 Purpose

This report was carried out in accordance with BS5837 (2012) "*Trees in relation to design, demolition and construction*". The purpose of this report is to provide an analysis of the impact that the development proposals will incur on the trees and local amenity, and, the potential impacts of the trees on the proposals.

The report provides professional advice and recommendations in order to ease any conflicts and to help devise a suitable proposal that considers the tree population at the site.

1.3 Site description

The site at EFI industrial estate is an expanse of mainly unused ground situated south of the main industrial estate, and north of the river Taff. The area measures approximately 3584 m². The site has two access points, one at its north-west corner, and another, approximately 70m east of the first, upon the northern boundary. The site contains a large group of trees on its southern side which exist upon the steeply sloped river embankment. The site contains a rock face feature along its eastern edge some several meters in height, this contains various vegetation and small trees growing from crevices and cracks along its face and at its summit. The surface of the site appears to of undergone recent changes by way of levelling and the introduction of various aggregates.

1.3.1 Root Barriers

No root barriers were observed.

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1.3.2 Soils

A search of the Landis.org.uk national soils database describes the soil in this area as slowly permeable seasonally wet acid loamy and clayey soils. The soil here has the potential to be of a shrinkable nature.

The planting of new trees, and the presence of already existing trees in shrinkable soils proposes a problem to recently developed structures, as the new, and current trees can exasperate seasonal climatic conditions and effectively dehydrate the soil through water uptake, this causes the soil to shrink and can lead to ground movement/ subsidence, thus effecting recently laid paving/ surfaces and foundations.

No in-depth soil analysis was undertaken, and no samples were taken or studied.

1.3.3 Topography and Levels

The site within its boundaries is flat and level. At the southern boundary exists a steeply sloping, heavily wooded embankment leading down approximately 15-20m to the river Taff. Along the eastern boundary there exists a rock face measuring some several meters in height.

1.3.4 Tree Preservation Orders and Conservation Areas

A search of the local authority interactive planning map has revealed that all trees at the site, and the entire site itself, exist within the Cyfarthfa, Merthyr Tydfil conservation area, and all trees at the site are protected.

Any advice given in this report is strictly advisory and does not overrule, bypass or otherwise in any way grant the client permission to carry out works on any of the trees included within the survey. Trees that are protected by TPO (tree preservation order), or are within a conservation area and are therefore protected by a "blanket" TPO **require the express permission of the local district authority and/or their acting tree officer before any works may be carried out on them.**

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Figure 1: An aerial image showing the location and survey area at Unit 7 EFI Industrial Estate, Merthyr Tydfil.



1.4 Current Proposals

The current proposals are to construct a residential dwelling at the site, with hard surfacing access.

2. Survey Methodology

The pre-development survey and assessment of the trees on site was undertaken in accordance with the British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations' (BS5837:2012).

These assessments were made from ground level only and is based on a visual inspection of the trees within the area. No invasive investigations, no tissue samples and no soil samples were gathered from this survey effort. This survey aimed to examine external features of the trees. Any growing conditions were noted down, with any obvious signs of physical and/or structure defects are recorded (this includes deadwood, die-back or any signs of decay).

In accordance with the aforementioned recommendations, the tree survey included all specimens that are within the site boundary with a diameter at breast height (DBH) of 75mm or above.

This DBH is then used to calculate the Root Protection Area (RPA) of the specimens on site. The RPA represents the minimum area around each tree that must be left undisturbed to ensure their survival. The majority of the tree roots are found in the top 600mm of soil, with most of the nutrient absorbing fine roots found within the top 100mm. The morphology of the roots is influenced by the presence of other site factors (such as roads, structures), soil type, topography and drainage. Where no RPA is identified in the table above, the canopy line should be treated as the RPA (this typically applies to small trees).

A topographical survey has been undertaken on the site prior to the field survey.

The field survey obtained numerous factors about the trees. The equipment used to gain measurements were a diameter tape, a laser measure and a clinometer. The information collected on the trees is as follows:

- Tree Number/Group Reference
- Species
- Height
- Branch Spread
- Height of First Significant Branch
- Age Class
- Physiological and Structural Condition
- Estimated Remaining Contribution (Years)
- Management Recommendations
- Notes

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2.1 Tree Categorisation

Trees are graded in accordance with the Cascade Chart for Tree Quality Assessment. The purpose of the categorisation is to identify the value of the existing trees, allowing for informed decisions to be made in order to comply with BS5837:2012. These categories are **A**, **B**, **C** and **U**. Trees categorised as **U** have sound reasons for removal. Trees that fall within categories **A**, **B** and **C** should be considered for retention. The categories are as follows:

➤ **Category A:**

Trees that are of high quality, with an estimated remaining life span of at least forty 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.

Trees, groups or woodlands of particular visual importance as arboriculture and/or landscape features.

Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture).

Trees in this category will be shown **light green** on the Tree Survey Plan.

➤ **Category B:**

Trees of moderate quality, with an estimated remaining life span of at least twenty years.

Trees that might be included within **Category A**, but have been downgraded due to impaired condition, such that they are unlikely for retention beyond forty years.

Trees that do not contain the special quality necessary to be classified as **Category A**.

Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals.

Trees occurring in collectives, but situated to contribute little to the local visual amenity of the area.

Trees with material consideration or other cultural value.

Trees in this category will be shown **mid-blue** on the Tree Survey Plan.

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➤ **Category C:**

Trees that are of low quality with an estimated life span of at least ten years, or young trees with a stem diameter below 150mm.

Trees of limited merit and impaired condition so as to not be classified at a higher category.

Trees present in groups or woodlands that are significantly greater collectively within the landscape.

Trees that offer minimal or temporary landscape benefits.

Trees with no material conservation or other cultural value.

Trees in this category will be shown **grey** on the Tree Survey Plan.

➤ **Category U:**

Trees that are in a condition where they cannot be realistically retained as living trees for longer than ten years.

Trees that have a serious, irremediable, structural defect that their loss would be due to collapse. This includes specimens that will not be viable following the removal of further **Category U** trees.

Trees that are dead or are showing signs of significant, immediate and irreversible decline.

Trees infected with pathogens or diseases that are harming the specimen itself, or is at risk of infecting nearby trees.

Trees that are of very low quality that are suppressing other nearby trees of higher landscape or ecological value.

Trees in this category will be shown **dark red** on the Tree Survey Plan.

2.2 Life Stages

All of the trees are separated into five life stages. These are as follows:

- **Young (Y)** – Newly planted or early established trees that are less than 150mm. These can easily be replaced.
- **Semi Mature (SM)** – Tree within the first quarter of its life span. Increasing in height and spread.
- **Early Mature (EM)** – Tree within the second quarter of its life span. Usually increasing in height and spread.
- **Mature (M)** – Tree within the third quarter of its life span. Usually at full height expectancy.
- **Over Mature (OM)** – Trees within the final quarter of its life span, or those that have exceeded their life expectancy. These can be in decline.

2.3 Physiological and Structural Condition

These conditions are categorised as either **good, fair, poor** or **dead**.

An assessment of a tree's physiological condition is defined as:

- **Good** – A fully functioning biological system showing expectant vitality for the species (i.e. normal bud growth, leaf size, crown density and wound closure).
- **Fair** – A fully functioning biological system showing below average vitality for the species (i.e. reduced bud growth, smaller leaf size, lower crown density and reduced wound closure).
- **Poor** – A limited biological system showing physiological decline, disease or significantly below average vitality (i.e. limited bud growth, small and chlorotic leaves, low crown density and limited wound closure).
- **Dead** – Those trees marked **Dead** have no visible foliage and brown cell structure under young bark.

An assessment of a tree's structural condition is defined as:

- **Good** – No significant structural defects.
- **Fair** – Structural defects that could be alleviated through remedial tree surgery or arboricultural management practices.
- **Poor** – Structural defects which cannot be alleviated through tree surgery or arboricultural management practices.
- **Dead** – Those trees marked **Dead** have no visible foliage and brown cell structure under young bark.

3. Results

The field survey at the site assessed the individual condition and value of a number of trees forming one group. The values in the table include the largest measurements and the mean category/classification of the trees.

Tree No.	Species	Tree Category (U/A/B/C)	Life Stage (Y/SM/EM/M/OM)	Condition (Good/Fair/Poor/Dead)	Number of Stems	Height (m)	Branch Spread (m)				Lowest Significant First Branch (m)	Stem at Breast Height (mm)	Life Expectancy (years*)	Root Protection Area (m ²)	Root Protection Radius (m)	Observations
							N	E	S	W						
G1	Mixed species woodland/ shelter belt. Common Alder (<i>Alnus glutinosa</i>) Common Ash (<i>Fraxinus excelsior</i>)	B	SM - EM	Fair- Good	-	10-18	-	-	-	-	-	300 avg	20+	-	3.6	Parameter RPA to be implemented on the north side.

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	Silver Birch (<i>Betula pendula</i>) Common Hawthorn (<i>Crataegus monogyna</i>) Grey Willow (<i>Salix cinerea</i>) Goat Willow (<i>Salix caprea</i>) Grey Poplar (<i>Populus × canescens</i>)															
TOTALS	Category		Life		Condition		NOTES:									
	Grading		Stages				Parameter RPA to be implemented on the northern side.									
	A	0	Y	-	GOOD	-										
	B	1	SM	-	FAIR	-										
	C	0	EM	-	POOR	-										
	U	0	M	-	DEAD	-										
			OM	-												

4. Summary of Results

The field survey found the following information about the trees located on the survey site and within the sphere of influence:

4.1 Species Composition

In total, seven tree species were identified on and around the survey site. The trees identified were:

- **G1:** Common Alder (*Alnus glutinosa*)
- **G1:** Common Ash (*Fraxinus excelsior*)
- **G1:** Common Hawthorn (*Crataegus monogyna*)
- **G1:** Grey Willow (*Salix cinerea*)
- **G1:** Goat Willow (*Salix caprea*)
- **G1:** Grey Poplar (*Populus × canescens*)
- **G1:** Silver Birch (*Betula pendula*)

4.2 Tree Survey Findings

4.2.1 Life Stage

On site there was one group of trees. The life stage for the main body of this group was found to range from **semi-mature** to **early-mature**.

4.2.2 Condition

On site there was one group of trees. The general average condition for the main body of this group was found to range from **fair** to **good**, with a minority of trees being **dead** or showing decline.

4.2.3 Category Grading

On site there was one group of trees. This has been categorised as a **Category B** group of trees, existing within a conservation area.

5. Recommendations

5.1 General Condition and Observations

Currently there exists no clear boundary on the southern side of the site, and no clear separation between the site and the natural habitat beyond which is currently a protected conservation area. Surface level activities with machinery, are currently taking place, levelling the area and adding surface material/ aggregates. With no clear boundary in place this has led to such material, in places, being pushed to the slope edge and partially falling down it. A portion of the RPA's of the group of trees here has been covered and thus altered the surface levels. Some trees along this edge are exhibiting signs of decline, with some having died and are now existing as standing deadwood.

5.2 Structural Condition

Trees are multi-cellular living organisms and can be subject to rapid change over short periods of time. All observations were accurate at the time of survey. The general structural integrity of all trees is thought to be good at this time with no major cracks, fractures, breaks, cavities, or weaknesses were observed on the majority of trees within the group. A minority of the trees along the northern edge contain large amounts of dead or dying material.

5.3 Physiological Condition

The detection of disease, infection, and infestation are subject to seasonal and climatic conditions. Some fungus, insect infestation and diseases are only apparent when they are in season and may be easily undetected at certain other times of the year.

At the time of survey, no major signs of disease, pathogen, fungal bodies, or insect infestation were observed on these trees.

6. Arboricultural Impact Assessment (AIA)

6.1 Development Proposals

The Current proposals are to construct a residential dwelling at the site, with hard surfacing access.

6.2 Development Impacts

Current proposals fall outside of any root protection areas and do not pose any risk to the trees existing upon the river embankment. However, due to the lack of a clearly defined boundary, no barrier and retainer, between the site and river embankment the trees are currently at risk of having their RPA's further overlaid and disturbed.

6.2.1 Root Protection Areas

The RPA has been calculated in accordance with BS5837 recommendations.

The average stem diameter, taken from the tree line at the riverbank top (300mm) has been used to calculate a parameter RPA of 3.6m. Should this be implemented, then the trees at the site are not thought to be at any risk. However, the lack of a clear boundary is currently allowing aggregate and surface material to be pushed over and upon the current calculated RPA which has the potential to cause detriment.

6.2.2 Ground Level Changes around Trees

Ground level changes are already taking place around the RPA of the subject group.

Designers should strive to not impact or effect ground levels around or within the RPA areas of retained trees. It is important that the existing ground level around any trees to be retained remains the same. This is because the critical root mass essential for the tree/s survival (the fine hair feeding roots) is usually found to exist within the top 100mm of topsoil. Should additional earth or material be pushed or laid over the top of the RPA then this critical root mass will no longer exist at its chosen ground level, soils become dehydrated, fungal and microorganism activity changes and this is known to have a detrimental effect on the feeding roots and consequently cause post development decline of the tree/s.

6.2.3 Access Facilitation Pruning

Currently there is no conflict between the canopies of the subject trees and the proposals.

6.2.4 Tree Removals

No removals are necessary.

6.2.5 Tree Retention

All trees can be retained.

6.2.6 Amenity and Area Impacts

There are no foreseeable amenity or area impacts.

6.2.7 Spatial Relationship of Trees and Post Development Pressure

There are no spatial conflicts expected in the future.

6.2.8 Installation of Utilities

Currently there are no plans to route services or utilities through the RPA's of any of the retained trees. Should this change at a later stage of the project, proposals should be submitted to the local authority tree officer for approval.

As guidance only, the routing of any services through the RPA of any of the retained trees should be in accordance with BS5837: 2012 clause 7.7.2 and NJUG guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees.

6.3 Impact Summary

Current surface works are thought to have impacted the subject trees via overlaying and disturbing their RPA. Providing that the recommendations are followed, there is no further impacts foreseen.

7. Recommendations

7.1 Tree Work Recommendations

No tree works are recommended for the site.

7.1.1 Remedial Tree Works

No remedial tree works are recommended.

7.1.2 Tree Removal/Felling

No removals are recommended.

7.2 Root Protection Measures

It is recommended that a permanent barrier/ fence line be erected along the line of the RPA shown in the tree constraints drawing. It is also recommended that this include a solid retaining barrier such as kerb stones or similar material to retain any surface material/ aggregate.

It is recommended that all aggregate material currently existing within the proposed RPA is carefully removed with an excavator, using the method statement provided as guidance.

7.2.1 Protective Barriers

It is essential that barriers/fencing is erected around the root protection areas/ zones of the trees, as shown on the tree protection drawing. These barriers are represented as red coloured lines on the drawing.

7.2.2 Protective Barriers Specification

It is recommended that a sturdy type fencing product be used around the root protection of the site. It is thought that a steel framed, wire weld meshed fencing similar to or equivalent to "Heras" style fencing will be sufficient in these areas of the site. The below diagrams have been shown to provide a good example of this.

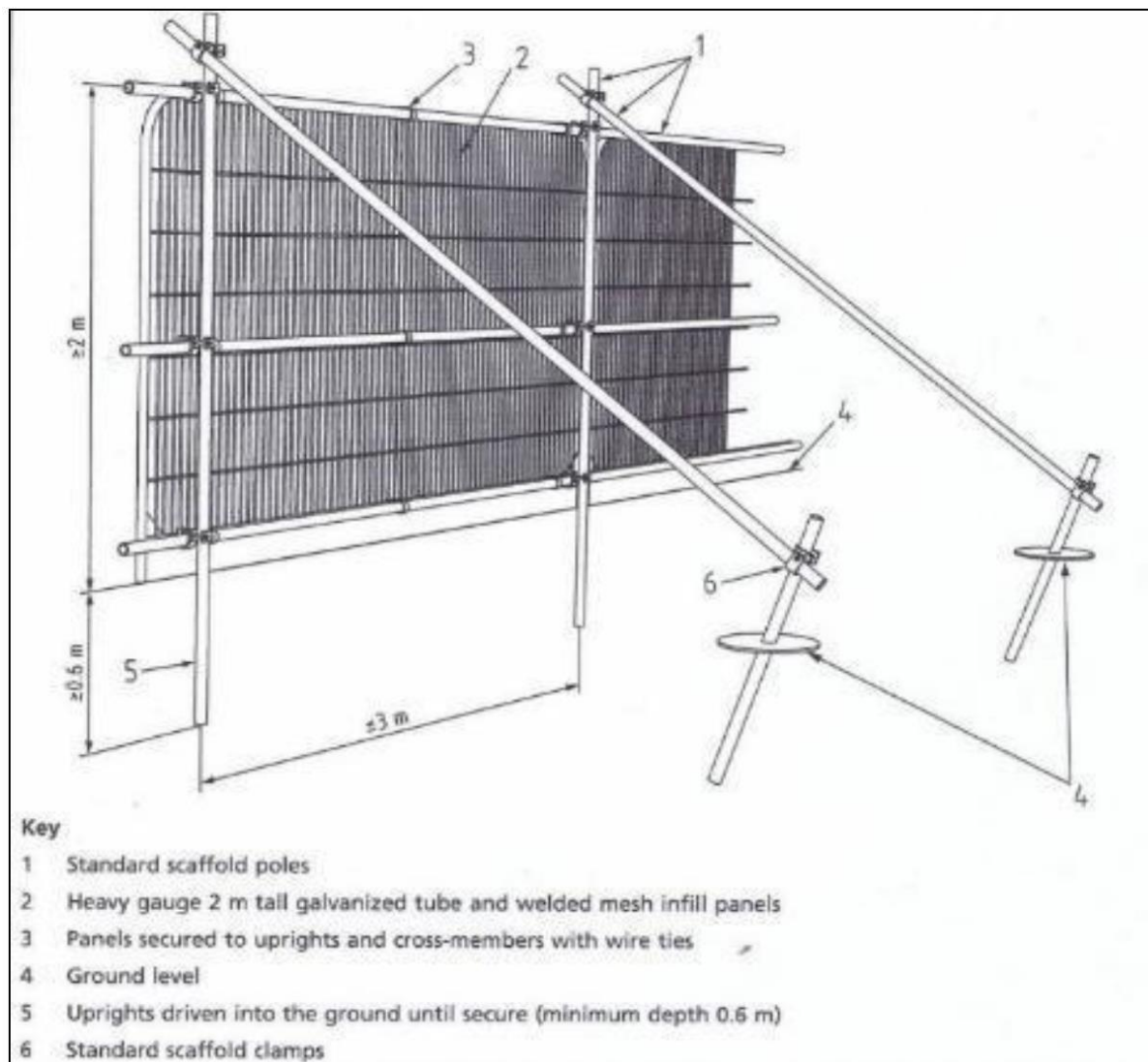
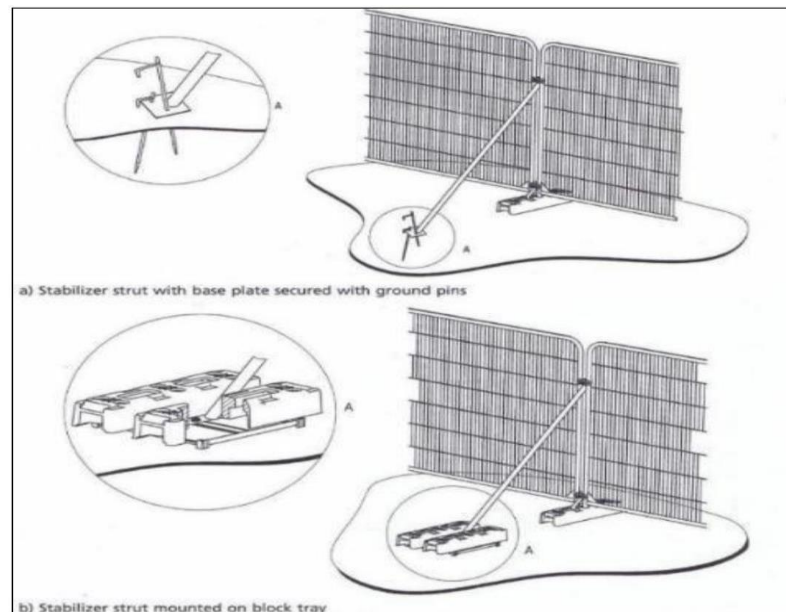
Figure 3: A diagram of the tree root protection barrier.

Figure 4: A diagram of the alternative tree root protection barrier.

7.2.2 Appropriate Signage

Appropriate signage is important and necessary and should be attached to the protective fencing in such a way as to be clear and visible.

Figure 5: An example of a notice to be attached to the fencing.

7.3 Prohibited Activities within or close to the RPA

Regardless of circumstances, the following activities are prohibited:

- a) No fires should be lit on the site within 10m of the nearest section of tree canopy for any retained tree. This is prevalent for all trees located on site and adjacent to the proposal site.
- b) No equipment, signage, fencing shall be attached to or be supported by any retained tree on or adjacent to the application site.
- c) There will be no temporary access into the root protection areas (RPA's) unless written approval from the local planning authority (LPA) has been obtained.
- d) No mixing of cement, dispensing of fuels or chemicals is to occur within 10m of the tree stem for any retained tree. This is prevalent for all trees located on site and adjacent to the proposal site.
- e) No soakaways are to be routed within the RPA of any retained tree that is on or adjacent to the site.
- f) No topsoil, excavation or reprofiling works are to be undertaken within the RPA of any retained tree that is on or adjacent to the application site.
- g) No storage of materials is to occur within the RPA of any retained tree on or adjacent to the site. This includes, but is not limited to, topsoil and building materials.
- h) No variations to any approved tree protection schemes shall be carried out without obtaining the prior written approval of the district planning authority.

7.4 Recommendation Summary

In summary, it is recommended that a sturdy, permanent barrier/ fence line be installed at the site along the parameter of the specified RPA as shown in the tree constraints drawing. Suitable signage should be placed within the RPA area to prevent future intrusion and disturbance.

All surface/ aggregate material currently existing within the RPA should be carefully removed with an excavator, following the method statement provided as guidance.

8. Other Considerations

8.1 Felling Licences

Tree felling in the United Kingdom is controlled by the Forestry Commission under the Forestry Act 1967. In a calendar quarter (three months), up to 5m³ can be felled without requiring a felling licence providing that no more than 2m³ are to be sold. If any felling proposed does not meet the aforementioned criteria, then a felling licence will be required. It is worth noting that some types of felling are exempt, such as the removal of deceased trees, or ones that are dying, dangerous or causing a nuisance.

8.2 Trees Outside of the Property

If works are recommended to be undertaken on trees that fall outside of the client/applicant's land, the full co-operation and liaison with these tree owners is necessary. Implications of not cooperating requires additional legal interpretation that are beyond the remit of this report. Under Common Law, branches from trees on adjacent properties that extend over boundaries can be pruned back to the boundary line without the permission of the owners.

8.3 Implementation of Tree Work

When appointing a tree contractor, only suitably qualified and experienced companies should be used. Always ensure that the contractor carries adequate insurance. The contractor should carry out all tree works to BS 3998:2010 *Recommendations for Tree Work*, as modified by more recent research findings.

8.4 Wildlife

All operations need to take into account the presence and/or potential presence of any wildlife at the site.

8.4.1 Bats

All trees with potential roosting features (PRF's) need to be assessed by a licenced bat surveyor. All bats and their roosts are protected by the legal framework within the United Kingdom. It is an offence to kill, injure or disturb a bat and to destroy or damage any place that is used for shelter by a bat.

8.4.2 Birds

All breeding birds are protected by law within the United Kingdom. Therefore, any tree removal should take place outside of the breeding bird season (March to August inclusive). If this cannot be achieved, a suitably qualified and experienced ecologist is required to inspect for any nests. If an active nest is located, an exclusion zone will then be implemented around this feature until any chicks have fledged the nest.

9. Arboricultural Method Statement (AMS)

9.1 The use of the Arboricultural Method Statement/s

The Arboricultural Method Statement should be read in conjunction with the tree protection drawing that is provided within the appendixes.

9.2 Pre-Commencement Meeting

It is advised that a pre-commencement site meeting is held with contractors who are responsible for operating machinery and vehicles on site. The meeting will firstly highlight the potential damages that can be caused when operating machinery within close proximity to the crowns, stems and root protection areas of protected trees, but thereafter emphasise the importance of careful manoeuvring of machinery and vehicles close to these protected areas. The use of “banksmen” as guides for machinery and vehicle drivers is also to be strongly recommended and implemented. The meeting will also highlight the importance of the root protection areas and the rules surrounding such as set out in section 6.2 (prohibited activities within or close to the root protection area).

9.3 The Erection of Protective Barriers and Fences

Prior to any demolition, or construction activities commencing, the recommended and suitable protection barriers should be erected and set out around the root protection areas as shown in the tree protection plan. Checks should be made to ensure that these have been suitably erected and are of sufficient construction to provide the necessary protection from the demolition and construction activities. These protective fences should not be removed until construction is fully complete.

9.4 Tree Works

Any tree works/ tree removals, access facilitation pruning etc, should be carried out by a suitably competent and qualified arborist and in accordance with BS3998 tree work recommendations. Suitable specific method statements should be provided by the arboricultural contractors.

9.4.1 Pre-Commencement considerations for Tree Works

It is strongly advised that prior to any tree work being carried out, suitable checks are made to ensure that no wildlife habitat is destroyed or disturbed with regards to bats, birds and squirrels.

9.4.2 Construction Traffic, Heavy Plant Machinery and Access Routes.

It is important that the site planner studies the root protection areas outlined in the tree constraints and protection measures plan. All heavy plant machinery, vehicles and excavation works will need to be prohibited in these areas. Access routes for machinery and vehicles should ideally be routed around these areas. Where this is not possible and access routes need to pass over a root protection area then a Geotech, gravel/ hardcore filled ground protection matting should be used to minimise the impacts of compression and compaction on the root structures. The exact specifications of such matting should be sourced and calculated by the site planner depending on the size and weight of the vehicles and/or machinery to be used.

10. References

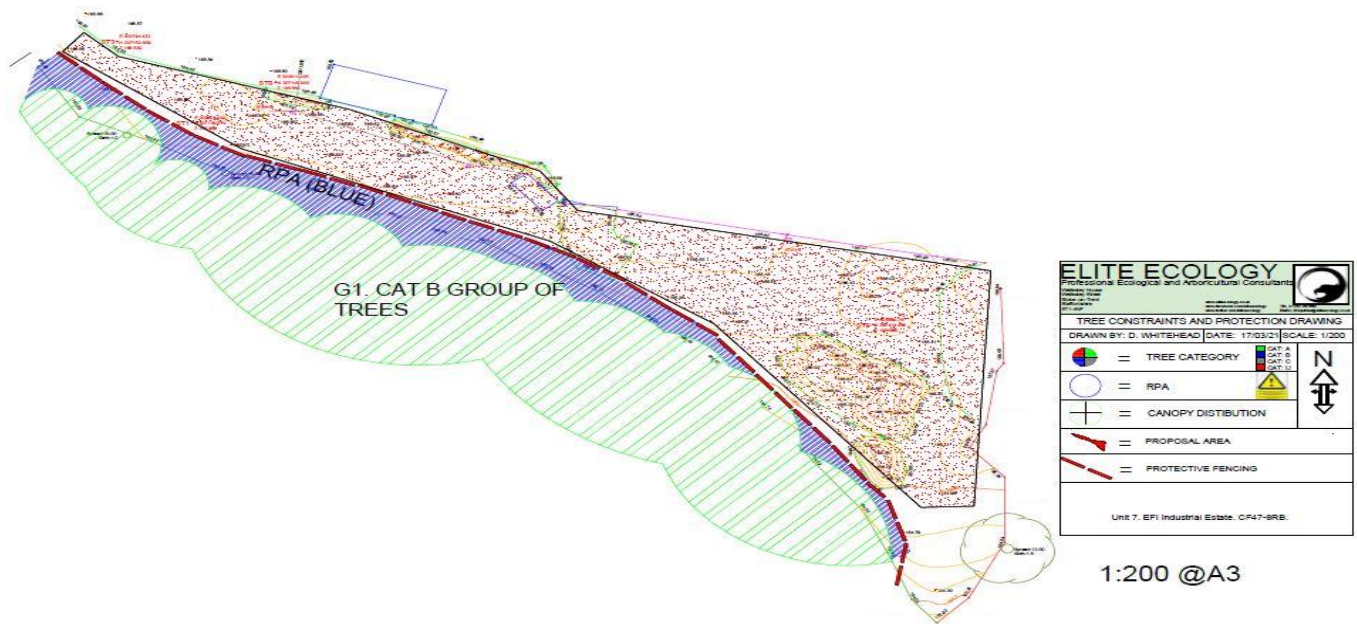
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11. Appendices

Appendix A: Tree Constraints Drawing

Appendix B: Photographic Records

Appendix A: Tree Constraints Plan



Appendix B: Photographic Records

Plate 1: Showing aggregate pushed over RPA's at the west side of the site.



Plate 2: Showing G1 looking west from the east side of the site.



BS5837:2012 Tree Survey and Arboricultural Impact Assessment

Plate 3: Showing proposal area (east side).



Plate 4: Showing the rock face with incorporated vegetation on the east side of the site.



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No reliance should be made on any such comments in relation to the structural integrity of the features located on the surveyed site. All information within the report is based solely on evidence that has been found on site during the service provided. No individual opinion or inference will be made other than that of the suitably qualified ecologist appointed to the project.