Arboricultural Impact Assessment

BE858.1b

10 Taylor Hill, Cawthorne, Barnsley S75 4HB

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Site address	10 Taylor Hill, Cawthorne, Barnsley S75 4HB
Grid reference	SE 28322 07957
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Client	Mr and Mrs Masters
Date	2nd August 2019

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Executive Summary

Bagshaw Ecology Ltd have been instructed by Mr and Mrs Masters to undertake an Arboricultural Impact Assessment of the land at 10 Taylor Hill, Cawthorne, Barnsley S75 4HB in relation to an application for planning.

The development proposals are to demolish the existing building, and construct a new detached residential dwelling. Garden areas located to the front and rear of the property are also proposed to be re-landscaped.

The site survey identified two individual trees with potential to be affected by the development proposals. The trees on the site include one Category A tree of high-quality, and one Category C tree of low-quality.

According to a representative of Barnsley Metropolitan Borough Council, the site is situated within the boundaries of a Conservation Area, therefore all of the trees within are afforded legal protection.

Proposed stone walls within the RPA of a Category A tree, should be constructed upon a foundation design that will minimise the impact upon tree roots, for example, mini pile foundations – of the smallest feasible diameter – with ground beams laid horizontally across.

To ensure the retained trees survive and thrive upon completion, tree protective palisade fencing and ground protection should be installed throughout construction.

It is recommended that an Arboricultural Method Statement is followed during construction works.

To mitigate for the removal of a protected tree from the site, one tree should be included within a post-development planting scheme at the site.

1. Introduction

1.1. Background

Bagshaw Ecology Ltd have been instructed by Mr and Mrs Masters to undertake an Arboricultural Impact Assessment of the land at 10 Taylor Hill, Cawthorne, Barnsley S75 4HB in relation to an application for planning. The purpose of the report is to:

- Assess the quality of the trees on and immediately adjacent to the site, in accordance with BS5837: 2012 – Trees in Relation to Design, Demolition and Construction: Recommendations (hereafter referred to as BS5837: 2012).
- Identify trees suitable for retention and for removal due to the proposed development.
- Prescribe tree protection measures to ensure that retained trees survive the proposed development and thrive after its completion.
- Prescribe arboricultural recommendations for the long-term management of trees on the site.
- To assess the site for its suitability for mitigation planting, and to specify planting requirements.

1.2. Site Details

The site is located at grid reference SE 28322 07957 and is accessed north-west off Tivy Dale. The site is bound by Tivy Dale to the south-east, a small brook to the north, a residential property to the west and an allotment site to the east.

The study area is approximately 0.09 ha in size, and at the time of the survey can be described as a single storey residential property with adjacent garden area.

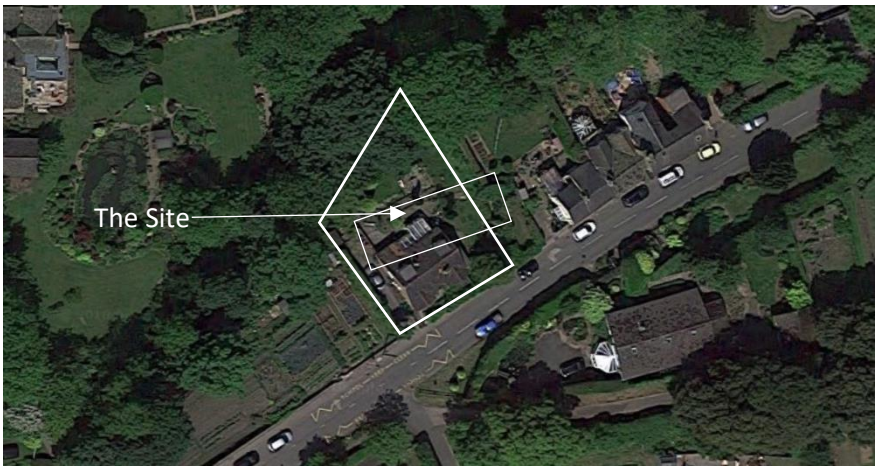


Figure 1: Aerial imagery of site and surrounding area (Google Earth Pro, 2018)

1.3. Proposed Development

The development proposals are to demolish the existing building, and construct a new detached residential dwelling. Garden areas located to the front and rear of the property are also proposed to be re-landscaped.

2. Methods

2.1. Desk Based Study

The local council was consulted to determine if any trees on the site and immediately adjacent to the site are protected by Tree Preservation Orders (TPOs) and/or are within Conservation Areas. Cranfield (2018) was consulted as to the soil type of the surrounding area.

2.2. Site Survey

The site survey was carried out on Monday 12th November 2018. The weather at the time of the survey was clear and dry, with good visibility.

The survey was carried out by Jack Delaney. Jack Delaney has worked within the arboricultural industry for ten years and hold an FdSc in Arboriculture.

All trees on site were inspected from ground level, using the Visual Tree Assessment (VTA) method (Mattheck *et al*, 2015). Any notable defects of trees were recorded, although the site survey did not constitute a full tree safety assessment.

Tree heights and crown clearances were measured to the nearest 0.1 m with a clinometer. Crown spreads of trees were measured on their, north, east, south and west aspects to the nearest 0.1m.

The diameter at breast height (DBH) of trees was measured to the nearest 10mm. This was used to calculate the root protection area (RPA) of trees using methods prescribed in BS5837: 2012:

- For single stem trees, the RPA was calculated as a circle with a radius 12 times the DBH.
- For trees with 2-5 stems, the RPA was calculated using the formula:

  $$\text{RPA} = \sqrt{(\textbf{Stem 1 DBH})^2 + (\textbf{ Stem 2 DBH})^2 + \ldots (\textbf{Stem 5 DBH})^2}$$

- For trees with 6 or more stems, the RPA was calculated using the formula:

  $$\text{RPA} = \sqrt{(\mu \boldsymbol{DBH})^2 \textbf{ x number of stems}}$$

In accordance with BS5837: 2012, trees were classified as either A, B, C or U, using the criteria shown in Table 1.

Table 1: BS5837 Cascade Chart (adapted from British Standards, 2012)

Category	Definition	Retention	Colour code
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.	Highly desirable	Light green
Category B	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years; trees lacking the special quality to merit category A designation.	Desirable	Dark blue
Category C	Trees of low quality with an estimated remaining contribution of at least 10 years, or trees with a stem diameter below 150mm; unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.	Feasible, but should be removed if posing a constraint to development	Grey
Category U	Trees that have serious, irremediable, structural and/or physiological defects, including those that will become unviable after removal of other category U trees.	Unfeasible	Dark red

2.3. Constraints

The survey was constrained by the season in which it took place. Some pathogens of trees, in particular fruiting bodies of decay fungi, are only visible at certain times of year.

3. Results

3.1. Desk Based Study

According to a representative of Barnsley Metropolitan Borough Council, the site is situated within the boundaries of a Conservation Area, therefore all of the trees located within are afforded legal protection.

Cranfield (2018) states that the surrounding area consists of slightly acidic loamy soils, which are freely draining. No further detailed soil analysis was carried out as part of the survey.

3.2. Tree Population Assessment

The site survey identified two individual trees with potential to be affected by the development proposals. The trees on the site include one Category A tree of high-quality, and one Category C tree of low-quality.

Table 2: Summary of Tree Categories

Category	Description	Tree/group numbers	Totals
A	Trees of high-quality which should where be possible be retained throughout any proposed development	T1	1 Tree
B	Trees of moderate-quality which should where possible be retained throughout any proposed development	-	-
C	Trees of low-quality which should not be considered a constraint to development	T2	1 Tree
		Total:	**2 Trees**

Tree data can be viewed in **Appendix 1: Tree Survey Schedule**. Tree locations can be viewed in **Appendix 3: Tree Protection Plan.**

Tree species on and adjacent to the site include; hawthorn *Crataegus monogyna* and sycamore *Acer pseudoplatanus.*

3.3. Additional Comments

Prior to completion of the survey, one tree located to the west of the existing building had recently been removed.

Although appropriate consent should have been verified prior to removal, the tree had recently suffered significant storm damage, which according to the owner had resultantly left it unsafe.

4. Impact Assessment

4.1. Root Protection Areas (RPAs) Affected by the Development

The RPA of T1 – a Category A tree of high-quality - will be encroached upon by two proposed stone walls.

Retention of T1 is considered feasible, provided that construction of both walls avoids trenching for footings, and incorporates a design that will minimise the potential impacts upon trees roots; for example, mini pile foundations – of the smallest feasible diameter – with ground beams laid horizontally across.

Although one wall also passes through the RPA of T2, since this is Category C tree of low-quality, the expenditure required on the application of such specialist foundations is considered out of proportion to its retentive value. That being said, the tree can potentially be retained, providing that no major roots >25mm diameter are severed during construction of the proposed wall.

5. Recommendations

5.1. Tree Protection

In order to ensure that the retained trees survive and thrive upon completion of the development, tree protective palisade fencing and ground protection should be installed throughout construction works, as is specified in **Appendix 3: Tree Protection Plan**

As the majority of tree roots are typically found within 1m of ground level, particular attention should also be paid to existing ground levels - which should be observed and maintained within the RPA of T1. Any further unavoidable excavations into the soil within the RPA of T1 should be carried out by use of hand-operated tools only.

It is recommended that works follow an **Arboricultural Method Statement** (AMS). A site specific AMS can be viewed in **Appendix 4**; this includes further details regarding tree protective fencing.

As aspects of the development may be subject to change, the AMS should be reviewed by an arboricultural consultant prior to the commencement of works on the site.

5.2. Mitigation

Although the development proposals do not directly necessitate the removal of trees, one tree should be planted to mitigate for a previous tree removal (refer to Section 3.3).

To ensure the best possible chances of successful establishment, the tree should be standard in size and should be planted in accordance with BS845: 2014 – Trees: from Nursery to Independence in the Landscape. The tree should be affixed with a wooden stake, secured by a biodegradable cable tie. An organic woodchip mulch should be applied in a 1m radius around the stem.

Tree species should be agreed with by the local authority tree officer. Suggested species include:

- Hornbeam *Carpinus betulus*
- Silver birch *Betula pendula*
- Scot's pine *Pinus sylvestris*
- Sessile oak *Quercus petraea*

Aftercare will be required for a period of at least three years after planting. This should include watering, removal of weeds and if necessary, removal of cable ties, formative pruning and reapplication of mulch. If the tree fails to establish within this period then it should be replaced.

6. References

British Standards (2010). BS3998: 2010 – Tree Works: Recommendations. British Standards Institute, London

British Standards (2012). BS5837: 2012 - Trees in Relation to Design, Demolition and Construction: Recommendations. British Standards Institute, London

British Standards (2014). BS8545: 2014 – Trees: from Nursery to Independence in the Landscape. British Standards Institute, London

Cranfield (2018). *Interactive Soilscapes Viewer* [online]. Available at: >www.landis.org.uk< [accessed 16th November 2018]

Google Earth Pro (2018). *Google Earth* [online]. Available at: >www.google.co.uk/earth< [accessed 16th November 2018]

Johnson, O., More, D. (2004). *Collins Tree Guide.* London: HarperCollins

Mattheck, C., Bethge, K., Weber, K. (2015). *The Body Language of Trees.* The Karlsruhe Research Institute, Karlsruhe (Germany)

Appendices

Appendix 1: Tree Survey Schedule

A plan of the tree locations can be viewed in **Appendix 3: Tree Protection Plan**.

Key			
Species	Common name following Johnson & More (2004)	**Age**	EM – Early mature; tree in 2/3 of estimated lifespan
Height	Measured to nearest 0.5m		M – Mature; tree in 3/3 of estimated lifespan
CC	Height of crown clearance, measured to nearest 0.5m		OM – Over mature; tree that has exceeded its natural life span
Stems	Number of stems bifurcating below 1.5 metres		V – Veteran tree
DBH	Diameter at breast height (1.5m), in millimetres	**RPA**	Root protection area, in metres squared
Crown spread	Measured to nearest 0.5m	**RPR**	Root protection radius from stem, in metres
Age	Y – Young sapling/newly planted tree	**SULE**	Safe useful life expectancy of tree, in years
	SM – Semi-mature; tree in 1/3 of estimated lifespan	**Category**	See BS5837 cascade chart (Table 1)
		#	Denotes estimated value

Tree No.	Species	Height	CC	Stems	DBH	Crown Spread				Age	Comments	RPA	RPR	SULE	Category
						N	E	S	W						
T1	Sycamore *Acer pseudoplatanus*	18	2	1	1400	11	12.5	13.5	12	M	Multiple pruning large wounds on main stem from previous removal of primary branches, display good occlusion. Two knotholes on E aspect of main stem at 3m and 4m. Dense basal epicormic. Multiple poorly reduced branches to south-west of crown.	887	16.8	>40	A1

Tree No.	Species	Height	CC	Stems	DBH	Crown Spread				Age	Comments	RPA	RPR	SULE	Category
						N	E	S	W						
T2	Hawthorn *Crataegus monogyna*	7	0	1	250#	2	2	2	2	EM	Position of tree restricting inspection, estimated DBH and crown spread. Dense ivy throughout crown, limited arboricultural merit.	28	3.0	11-20	C1

Appendix 2: Images of Trees



Plate 1: T1



Plate 2: T2

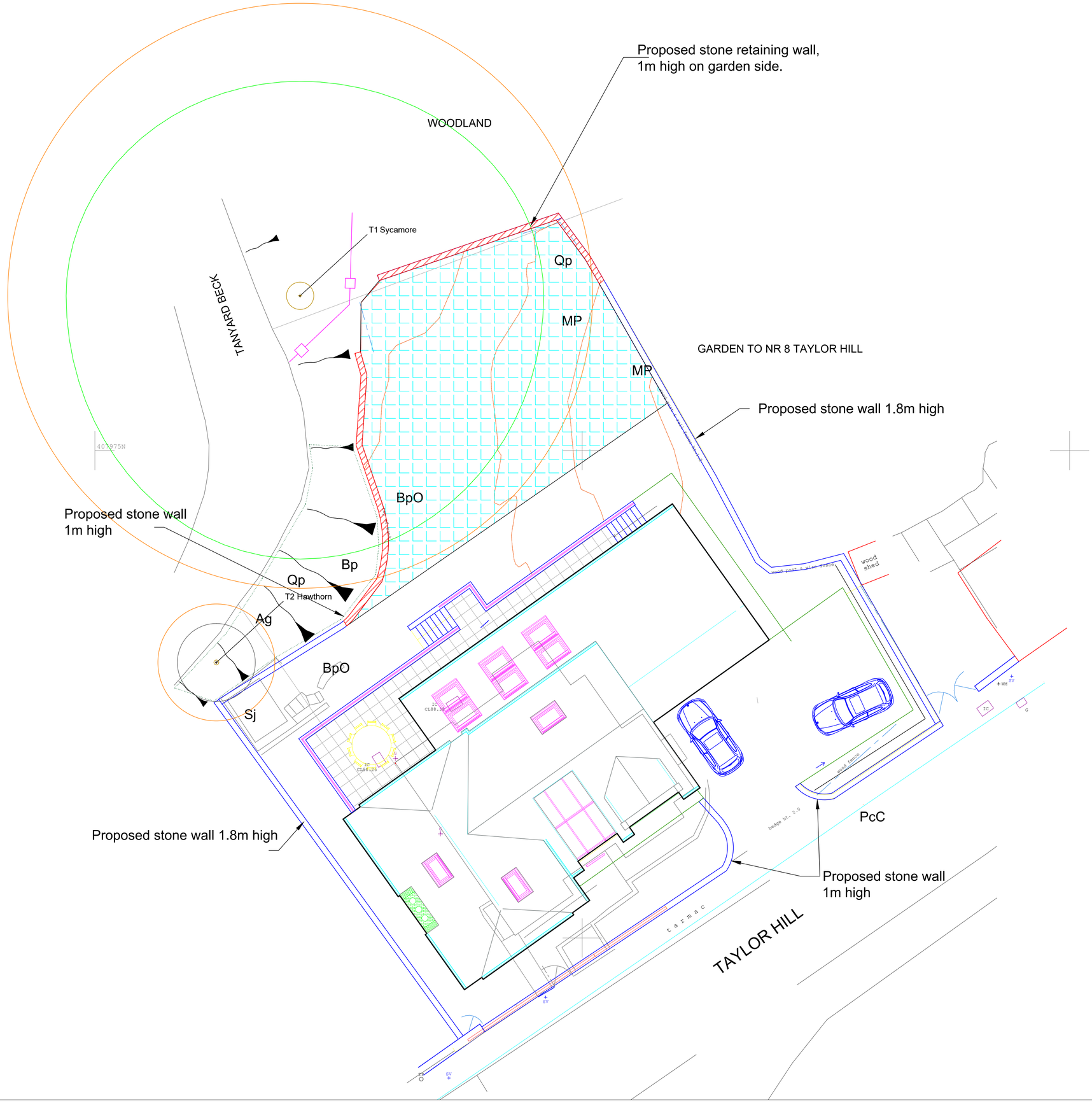
Appendix 4:
Tree Protection Plan

Project:	Taylor Hill
Drawn by:	Jack Delaney
Date:	1st August 2019
Scale:	1:100 @ A1

Do not scale off this drawing - to be reproduced in colour only

Key:

	Category A trees of high-quality
	Category C trees of low-quality
	Tree Protection Fencing
	Ground Protection/no-dig zone
	Sections of wall constructed upon mini pile foundations with ground beams



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Appendix 5: Arboricultural Method Statement

1. Introduction

Bagshaw Ecology Ltd have been instructed by Mr and Mrs Masters to produce an Arboricultural Method Statement in relation to a proposed development of the land adjacent to 10 Taylor Hill, Cawthorne, Barnsley S75 4HB.

This document should be read in accordance with the Arboricultural Impact Assessment produced for the site.

The development proposals are to demolish the existing building, and construct a new detached residential dwelling. Garden areas located to the front and rear of the property are also proposed to be re-landscaped.

2. Timing of Works

The phasing of works should be carried out in accordance with Table 1, below.

Table 1. Timing of Works

Stage	Works
1	Site induction
2	Install temporary tree protection and ground protection
3	Inspection by arboricultural consultant
4	Carry out construction works
5	Remove tree protection fencing and ground protection once works completed
6	Final inspection by arboricultural consultant

3. Site Induction

Prior to works commencing, all contractors should attend a site induction. All contractors should be briefed on arboricultural concerns arising from the development proposals, including tree root protection areas (RPAs). This method statement and a copy of the Tree Protection Plan should be issued to all contractors on the site.

4. Tree Protection Fencing

Prior to machinery entering the site, it will be necessary to ensure that all trees are adequately protected. This will require the installation of temporary of tree protection fencing on the site between the building and adjacent trees.

Tree protection fencing should consist of a vertical scaffold framework, well braced to resist impacts. The vertical poles should be spaced at a maximum interval of 3m and driven securely into the ground. Onto this framework, welded mesh panels should be fixed (see figure 1, on the following page).

Laminated waterproof A3 signs should be fixed securely to fencing panels on each enclosure at 9m intervals. The signs should clearly read: ‘Protected Tree Zone, no storage or operations within fenced off areas’.

If any breach in the tree protection measures occurs it is the site manager’s responsibility to report this to an arboricultural consultant so the appropriate measures may be taken. As there are trees which are afforded legal protection on the site, any breach in the tree protection resulting in the death of or damage to trees could result in a criminal offence being committed.

No materials hazardous to tree health, such as oil, bitumen or cement should be stored within the protective fencing. Where possible this area should be extended to 10m away from the fencing.

Where there is a risk of polluted water runoff into RPAs, heavy duty plastic sheeting and sandbags must be used to contain any spillages and prevent contamination.

No fires should be lit within 20 metres of the protective fencing.

Once the construction works have been completed, the tree protection fencing may be removed. This should be done with care to ensure that no damage to trees is caused.

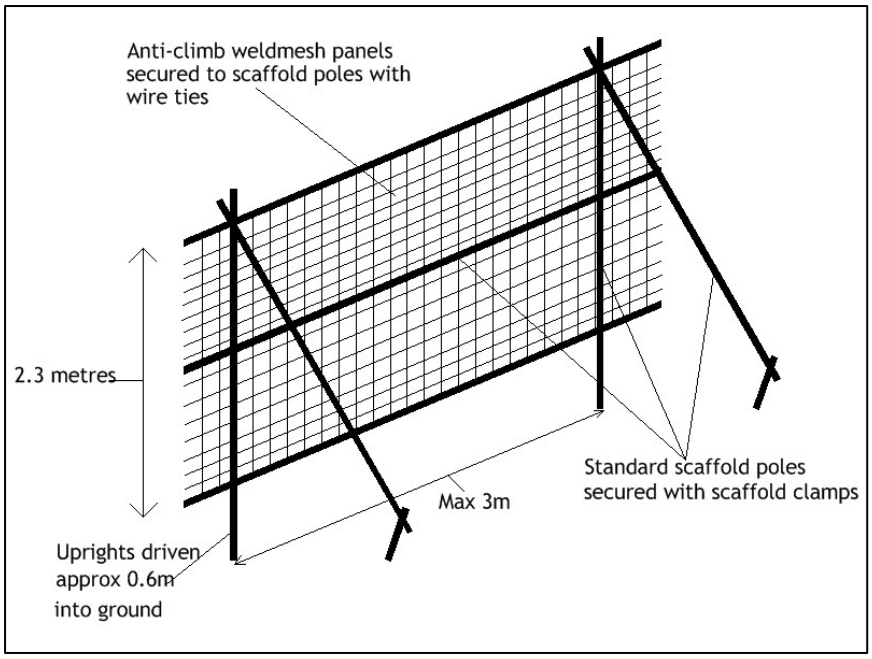


Figure 1. Temporary Protective Fencing

5. Ground Protection

Where construction works have been justified within the RPA of T1, this has been facilitated with a setback in alignment of the protective fencing.

Prior to the commencement of construction works, ground protection should be installed as specified in **Appendix 3: Tree Protection Plan**; this should incorporate inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip) which are laid onto a geotextile membrane.

Any plant or machinery operating within the RPA of T1 must ensure it is operated on this ground protection.

6. Supervised works and further inspection

It is recommended that inspections by an arboricultural consultant are undertaken:

- Once the tree protection fencing has been installed to determine if it is satisfactory.
- Upon completion of the development works.

After each inspection a letter should be submitted by the arboricultural consultant to the local authority tree officer to confirm if the method statement has been followed correctly and if trees have not been adversely affected by construction works.