

Arboricultural Appraisal

(Incorporating an Arboricultural Impact Assessment and Tree Protection Measures in accordance with BS5837:2012: *trees in relation to design, demolition and construction – Recommendations*)

Project: Mill House, Marchwiel Hall

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On Behalf of: Mr Creighton

Foreword

Salopian Consultancy Ltd is an Arboricultural/Ecological consultancy which provides inputs to guide developers and architects during the planning process.

Core services include BS5837:2012 tree surveys, condition assessments, mortgage applications and woodland management. In addition, Salopian Consultancy Ltd have in house ecological expertise enabling them to perform a range of Phase 1 and Phase 2 ecological surveys.

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Executive summary

Brief of the study and context of development

This report has been prepared to identify the key arboricultural constraints to inform a planning application for the restoration and change of use of Mill House. The aim of the study has been to highlight those arboricultural constraints so that significant impacts upon trees are avoided or minimised as far as possible whilst identifying opportunities to enhance the tree stock in the long term.

Survey methods

A tree survey was undertaken in accordance with the methodology set out in **BS5837:2012 Trees in relation to design, demolition and construction – Recommendations**. This information has been presented to the design team to act as a tool to ensure consideration has been given to those trees on and immediately off site during the design process.

An Arboricultural Impact Assessment (AIA) has been performed to provide an informed account on how foreseeable direct and indirect impacts associated with development may impact upon the tree stock. Following completion of the AIA, tree protection measures have been prescribed to demonstrate how those trees proposed for retention can be protected during development.

Findings and recommendations

The AIA identified that the removal of two trees (**T4 & T5**) and one member of the tree group **G6** will be necessary to implement the proposal, all of which are classified as 'C grade' items of low quality and value. The pruning of a lower later limb of **T1** will be required to achieve clearance from the ridge of the western extension and the reduction of two tree groups (**G7 & G8**) is also anticipated.

Minor encroachment has been identified within the Root Protection Area (RPA) of **T1** (an 'A grade' pedunculate oak) associated with footpath and foundations of the western extension. In addition, the gravel drive marginally encroaches into the RPA of **T3** and the bat house within the RPA of **T9**. The level of encroachment in both cases is considered within the species ability to tolerate and therefore hand dig methodologies have been proposed during these works to provide a degree of caution in areas where tree roots may be encountered.

Those remaining trees can be protected during construction by means of protective barrier fencing to maintain a Construction Exclusion Zone (CEZ) that respects the RPA of each tree.

Section 1: Tree Survey

Introduction

- 1.1 This report, its plans and associated appendices have been prepared on behalf of Mr Creighton 'the client', to meet the requirements of **BS5837:2012 Trees in relation to design, demolition and construction - Recommendations**, at Mill House, Marchwiel Hall hereafter referred to as 'the site'.
- 1.2 The tree survey was performed on the 21st February 2020 by Douglas Williams, Salopian Consultancy Ltd's Principal Arboriculturalist. Doug has over a decade of experience working within the Arboricultural industry and is a professional member of the Arboricultural Association. He holds a MSc in Biological Recording, a BSc (Hons) in Biological Sciences, and the Arboricultural Association's Professional Tree Inspection Certificate.
- 1.3 The tree survey has been undertaken in accordance with the methodology set out in **Section 4.4** of **BS5837:2012** which is summarised in **Appendix 1**.
- 1.4 The data obtained from this survey is presented within the Tree Schedule and depicted in the Tree Constraints Plan (**Plan1**) towards the end of the report. The position of those trees surveyed are derived from measurement taken on site cross reference with aerial mapping information and reference point/feature included in **Appendix 2**. The position of all trees/tree group are therefore approximate but deemed sufficient for the purpose of this study. Each tree has been allocated a sequential identification number which correlates with the Tree Schedule.
- 1.5 **Plan 1** depicts the theoretical rooting system of each tree using a yellow circle or polygon with the crown spreads of high-grade trees illustrated in green, moderate quality trees shown in blue and low-grade trees in grey. Those trees which have a limited life expectancy due to either a compromised structure or poor physiological condition are shown with red canopy spreads and referred to as 'U grade' trees.
- 1.6 The classification of trees has been undertaken in accordance with **Table 1 Cascade Chart for Tree Quality Assessment** described in **BS5837:2012** to provide a hierarchy system for tree retention based on their condition and contribution to the amenity of the local area.
- 1.7 The theoretical RPA for each tree has been calculated using formulas provided in **Section 4.6** of **BS5837:2012**. Both **Plan 1** and **Plan 2** acknowledge that pre-existing site conditions may prevent tree roots distributing asymmetrically. In such instances RPAs may be modified but not reduced based on arboricultural reasoning.
- 1.8 The findings of the tree survey have been used to highlight initial design implications with the aim of guiding the design process to encourage a harmonious relationship between trees and development.

Scope of the study

- 1.9 The primary focus of the study is to inform the planning process by;
- Meeting the validation requirements of Wrexham County Borough Council by presenting the findings of a tree survey undertaken in accordance with **BS5837:2012**.
 - Present those arboricultural constraints in a clear and concise manner to aid the design process.
 - Perform an assessment of those likely impacts associated with propose site layout **DRG.NO MHM-LAW-X-G00-DR-A-061001 P05**
 - Detail appropriate tree protection measures and working methodologies to safeguard trees proposed for retention during construction.
 - For fill the requirement of **Planning Condition 9** of **P/2020/0106** byway of an Arboricultural Method Statement and Tree Protection Plan in accordance with BS5837:2012

Limitations

- 1.10 This report does not;
- Provide an assessment of the likelihood of subsidence caused by the interactions between water availability, soils and tree roots, at present or in future years. Foundation design should be undertaken in accordance with the guidance available in **National House Building Council (NHBC) publication Building near trees, Chapter 4.2** following a soil assessment by competent personnel.
 - Carry out a detailed structural assessment of each tree surveyed. The absence of recommended tree work in **Schedule 1** does not imply that a tree is safe. Trees are dynamic structures and even those trees in good condition can fail or enter decline under extraordinary physical stress or following infection by pests and disease.
 - The accuracy of the findings of this report are reliant on the information presented in the existing site layout and proposed site layout. Checks of the accuracy of third-party information have not been undertaken.

Site location and context of development

- 1.11 The application area focuses upon a former Mill within the wider curtilage of Marchwiel Hall, set in a secluded woodland backdrop immediately to the east of Gefeilau Brook. The main body of the site support numerous young self set standards of goat willow and ash due to the lack of recent management, as the property has been vacant for some time. Notably, there is

a large mature pedunculate oak and western red cedar located immediately to the west and north west of the Mill respectively. These trees form the main arboricultural constraints/features of the site, both of which are considered significant arboricultural assets.

Planning Status

- 1.12 An initial assessment of the proposal identified that the site holds planning permission (P/2020/0106) for the change of use of the Mill to a residential dwelling including refurbishment, a two storey extension, basement extension and replacement of outbuildings.
- 1.13 Whilst a previous tree survey was undertaken as part of the application it did not include a formal Arboricultural Impact Assessment (report reference Mancoed Tree Report 01/11/2019).
- 1.14 A detail Arboricultural Impact Assessment has therefore been undertaken within this study to support a robust Arboricultural Method Statement as trees were missing from the previous study and inconsistencies between the accuracy of the RPAs and canopies noted between the "Tree Constraint Map" and information within the report.

Overview of the tree stock

- 1.15 The tree survey identified that the main body of the site comprises of a large area of open space, unmanaged grass, and ruderal vegetation; this is characteristic of the lack of recent management with the site being vacant for some years. Areas of self set goat willow and ash denote the western and northern boundaries of the site with a mature pedunculate oak and western red cypress forming the most notable arboricultural features. Access is provided by a narrow track which leads to the east.

Modification of RPAs

- 1.16 **Plan 1** recognises that the presence of an historic wall is likely to have had an influence upon the root development of **T1**. The presence of Gefeiliau brook to the west is also likely to have had similar effects on the RPAs of both **T1** and **T9**.
- 1.17 To take these factors into account the shape of the RPAs of these trees have been modified whilst retaining the overall area of the theoretical RPA in accordance with **Section 4.6** and **Annexes C & D of BS5837:2012**. These alterations have been made to provide an informed assessment of their likely root morphology reflecting past and existing site conditions.

Statutory legislation & planning Policy

- 1.18 Necessary checks prior to all tree works must be undertaken by the appointed tree work contractors to ensure statutory laws are not contravened. In addition to individual protection by virtue of TPOs or Conservation Areas (CA) consideration should also be given to restrictions to tree removal imposed by the Forestry Act (1967) and the potential to support protected species (notably nesting birds and roosting bats) governed by the Wildlife and Countryside Act (1981) and EU Habitats directive, detailed further in **Appendix 3**.

- 1.19 Trees have many social, ecological and cultural benefits and are gaining more recognition in terms of their economic value through the ecosystem services they provide. Such services include, but are not limited to; shade provision, pollution absorption/interception¹, carbon sequestration/storage and stormwater attenuation reducing the risk of flooding and soil erosion². In addition numerous studies³ have also shown that there are significant human physiological and physiological benefits associated the presence of mature trees. The demand for properties set within neighbourhoods with matures trees is also reflected by higher average house prices, as is the investment in areas with established green infra structure “environmental attractiveness”^{4 5}.
- 1.20 The importance of trees are recognised in various European and UK legislation such as; EU Habitats directive, Welsh Government Technical Advice Note 5 (TAN5) and the Town and Country Planning Act (1990). These policies refer to trees in respect to conserving and enhancing the natural environment and indirectly in relation to issues such as climate change, biodiversity and biosecurity.
- 1.21 Local planning policies GDP1, EC4, and EC6 give particular weight to the retention and protection of trees as assets that contribute towards biodiversity and landscape value. The default position should be to incorporate trees into any proposed layout with consideration to the direct and indirect impacts associated with development. Where there is tree loss as a consequence of development it should be demonstrated how the wider benefits of the proposal outweighs tree loss prior to determination of a planning application. In such instances appropriate level of compensatory planting is expected to attempt to mitigate tree loss as part of sustainable development.

¹Nowak *et al.* (2006) Air pollution Removal by Urban Trees and Shrubs in the United States. *Urban Forestry and Urban Greening* 4, p115-123

² <http://www.woodlandtrust.org.uk/en/moretrees-moregood/Documents/Trees-flooding.pdf>

³ R.S.Ulrich Health Benefits of Gardens in Hospitals Chalmers University of Technology

⁴ CABI (2005) Does money grow on trees?

<http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabi.org.uk/files/does-money-grow-on-trees.pdf>

⁵ Gripaios *et al.* (1997) The Role of Inward Investment in Urban Economic Development: The Cases of Bristol, Cardiff and Plymouth

Section 2: Arboriculture Impact Assessment

Summary of impacts

- 2.1 The Arboricultural Impact Assessment (AIA) is a desk-based study which has been undertaken by superimposing the final site layout (**Appendix 4**) onto **Plan 1**. Development has the potential to cause a number of direct and indirect impacts upon trees that can be detrimental to their health. This section highlights those impacts that the construction process is likely to have upon the tree stock and gives consideration to the likely conflicts that the built form may have with those retained trees in future years.
- 2.2 **Plan 2** depicts those trees which are to be retained with their sequential numbering, full RPAs and crown spreads intact. Those trees and hedgerows which will need to be removed to implement the proposal are illustrated with a dashed red canopy spread and their RPAs omitted.
- 2.3 Impacts associated with construction activities can in most cases be reduced or completely mitigated for in the first instance through the installation of protective barrier fencing to maintain a stand-off area from trees. This stand-off area is referred to as the Construction Exclusion Zone (CEZ). Where activities within the RPAs of retained trees are necessary, specialised construction methods and working practices will be required to mitigate impacts to an acceptable level as detailed in **Section 3**.

Table 1 Summary of tree removal/impacts

Impacts	A Grade Items	B Grade Items	U/C Grade Items
Trees/Hedgerow loss	N/A	N/A	T4, T5 & one member of G6
Tree pruning	T1	N/A	G7, G8
Activities within RPAs	T1	T3	T9
Temporary RPA set back	N/A	N/A	N/A
Conflicts with shading	N/A	N/A	N/A

Tree removal

- 2.4 Review of the proposed site layout identified that the removal **T4, T5** and one member of **G6** will be necessary to rebuild the most eastern outbuilding as part of the bat mitigation and demolish the most western outbuilding to construct the proposed parking bays. All Three trees are 'C grade' self-set trees of low arboricultural merit such that their loss is not deemed a major constraint to the proposal.

Tree pruning

- 2.5 The reduction of the lowest secondary eastern limb of **T1** will be necessary as it falls below the ridge line of the proposed western extension. In addition, the reduction of **G7** and **G8** is anticipated as part of the landscaping arrangements and future occupancy of the site. All tree work should be undertaken in accordance with **BS3998:2010 Tree work. Recommendations**

and in line with those statutory controls and permissions outlined in **Appendix 3** by suitably trained and insured Arborists.

Activities within RPAs

- 2.6 A review of the proposed layout and discussions on site with Mr Creighton identified that the western extension of the building will be sat on a steel frame secured to two 1m² concrete pads, elevated above the ground level with minimal disturbance to the RPA of **T1**. The level of encroachment is therefore considered within the species ability to tolerate. It is understood this is also a requirement of the EPS licence for roosting bats to main access to the mill pit.
- 2.7 Further encroachment has been identified where paving fall within the RPA of **T1** associated with the frontage of the building and the gravel driveway within the RPA of **T3**. In both case this level of infringement is considered minor.
- 2.8 Any excavation within either area should be undertaken using a hand dig methodology as discussed in **Section 3** to exercise a degree of caution in areas where tree roots may be encountered.

Figure 1 Approximate location of concrete pads



Temporary RPA set back

- 2.9 The proposed site layout has identified the need for temporary RPA set back of several trees to aid access during the construction process. During the set back of protective barrier fencing, ground protection measures must be installed in accordance with **Appendix 6** where exposed RPAs are to be accessed by workers, machinery or vehicles to avoid damage to tree roots.

Shading and future growth of trees

- 2.10 The house and extension falls outside of the shade arc of **T1** and all other trees on site. Whilst the presence of large/mature trees in close proximity to buildings is often seen as a contributing factor towards future tree pruning/removal it is considered that in this case neither will be sought in future years given the value it provides to the applicant as a landscape feature.
- 2.11 **Paragraph 5.3.4 b and e of BS5837:2012** acknowledges some of the benefits of shading and screening as well as design options by way of non-slips paving and provisions of leaf guards or grilles on gutters to reduce seasonal nuisance of leaf fall.

Utilities

- 2.12 It is anticipated that underground and overhead services can be located outside the RPA and canopies of retained trees. Where unavoidable, allowances are made for the use of hand dig methodologies or trenchless insertion methods so that roots can be retained and desiccation avoided as permitted in **Section 7.1 and 7.7 of BS5837:2012**

Storage of materials

- 2.13 Space for the storage of materials and vehicles during site preparation and construction is limited within the site. It is envisaged that delivery of materials and removal of arisings will be managed via a phased programme on an as need basis.

New tree planting

- 2.14 New Tree and hedgerow planting should meet the requirements of **BS8545: 2014 Trees: from nursery to independence in the landscape. Recommendations** with specific reference to the procurement of new trees, species selection, aftercare, and maintenance.

Figure 2 Proposed pruning of **T1**



Section 3: Arboricultural Method Statement

Schedule of development

- 3.1 The AMS details specific solutions to those impacts raised in **Section 2** in order to mitigate/reduce potential impacts upon those trees proposed for retention. An outline program of management and an auditable process has been prepared to demonstrate that those tree protection measures proposed are capable of providing sufficient protection for trees pre, during and post development.
- 3.2 Such a program of activities is advised under the guidance of an experienced Arboricultural Clerk of Works (ACW) to ensure that the content of this method statement is understood and implemented effectively.
- 3.3 Direct supervision by the ACW is advised at pre-determined phases to assist with the development process and ensure correct implementation of tree-protection measures. A copy of this report plans and appendices will be available on site throughout the duration of construction.

Stage 1: Pre-commencement meeting

- 3.4 An appropriately experienced ACW will be appointed at the cost of the developer to ensure tree-protection measures are understood and enforced which could be secured using a suitably worded planning condition. A pre-commencement meeting will be held before the commencement of works, normally attended by the ACW, the site manager and a Local Planning Authority (LPA) representative.
- 3.5 The sequence of construction and implementation of tree-protection measures will be discussed to identify any changes or difficulties that may arise from the onset. The extent of the CEZ will be marked out during this meeting and an inspection regime will be agreed upon by all parties.

Stage 2: Pre commencement tree works and Installation of tree protection measures

- 3.6 The reduction of the eastern lower secondary limbs of **T1** as well as the reduction of **G6, G7 G8** and removal of **T4 & T5** will be completed prior to any construction works. The appointed tree contractor must hold adequate public liability, product liability and employer's liability insurances, with the relevant qualifications for the tasks at hand. All tree operations will be undertaken in accordance with **BS3998: 2010 Tree works. Recommendations.**
- 3.7 Construction activities have the potential to cause long-term detriment to trees. It is therefore essential that appropriate tree-protection measures are installed and maintained throughout the duration of construction to prevent avoidable impacts upon trees. The position of these measures will be confirmed by an appointed ACW prior to the implementation of construction activities.
- 3.8 The majority of a trees rooting system is located within the upper 50cm of the soil horizon. This layer provides the optimal level of organic material, water, enabling tree roots to respire,

grow, repair and drive photosynthesis. Compaction or disturbance of this layer can have a serious effect on a tree's ability to perform these functions. Root severance must be avoided at all costs to prevent undermining a tree's stability in addition to causing physiological stress.

- 3.9 To ensure adequate protection is afforded to the root system, stem and canopy of retained trees, the extent of the RPA will be enclosed using a protective barrier fencing as illustrated in **Appendix 4. Plan 2** depicts the position of protective barrier fencing as a solid pink line and should be checked against the RPA measurements provided in the Tree Schedule. Once installed the ACW will inform the LPA that protective barrier fencing is in place and fit for purpose to allow works to commence.
- 3.10 The area within the line of protective barrier fencing is referred to as the CEZ, illustrated as an orange hatched area in **Plan 2**. This area will be treated as sacrosanct and will not be entered during construction. Once installed, protective barrier fencing must not be removed or altered without the prior approval of the ACW and LPA.
- 3.11 Access to the site will be restricted to the existing vehicular access. Parking of vehicles, plant and storage of materials will be located within a designated compound, 2m from the RPA of any tree.
- 3.12 Lighting of fires or mixing of materials will not be permitted within 2m of the CEZ. No mixing of materials will take place uphill from the CEZ to prevent leakage into these areas. In the event of spillage, all works will halt and the ACW will be contacted for advice. All plant and machinery will be fitted with spill kits and water will be available to flush spilt material to avoid contamination of the rooting environments.
- 3.13 Biosecurity control measures shall be implemented to avoid transportation of pest or disease to and from the site in line with the **Arboricultural Associations Guidance Note 2 Application for Biosecurity**. This broadly involves cleaning machinery, uniform, PPE and vehicles using a disinfectant to minimise transportation of soil, water and plant materials from the works site.
- 3.14 Cases of ill health in trees must be brought to the attention of the ACW. The presence of a pest or disease will then be reported using the Forestry Commission Tree Pest and Pathogen sighting reporter (Tree Alert) <https://treealert.forestry.gov.uk>.
- 3.15 New tree planting must be undertaken in line with those provisions detailed in **Section 10 of BS8545: 2014 Trees: from nursery to independence in the landscape. Recommendations**; to ensure success.

Stage 3 Works to be performed under supervision by ACW.

- 3.16 Where construction activities are undertaken within the RPA of retained trees, direct supervision by the appointed ACW is required. The ACW will be given a minimum of one weeks' notice prior to such works.
- 3.17 Movement across exposed areas of the RPA of **T1** will be necessary during construction of the western extension of the Mill (highlighted in orange in **Plan 2**). Ground protection measures shall be installed within these areas to prevent the compaction of underlying soils as specified in **Appendix 6**.
- 3.18 In this instance the installation of single scaffold boards placed on top of a compression resistant, layer such as 150mm of wood chip would provide sufficient ground protection during pedestrian movement. Alternatively scaffold boards placed on top of a scaffold frame to form a suspended walkway would also be sufficient. The set back of protective barrier fencing will only be permitted during those specific actions which require it (construction of the western extension), after which the line of protective barrier fencing will be reinstated
- 3.19 The construction of the concrete pads to site the steel frame for the western extension falls within the RPA of **T1**. Any excavation will be undertaken using hand dig methodologies to provide a degree of caution where tree roots may be encountered. Such actions are permitted in **Section 7.2 of BS5837:2012** and restricted to the use of hand tools only. The same hand dig methodology will be used during the construction of the bat house within the RPA of **T9**, parking bays within the RPA of **T3** and paved areas within the RPA of **T1**, highlighted in blue in **Plan 2**
- 3.20 In the event that tree roots are encountered, those smaller than 25mm in diameter may be pruned back using a sharp tool to perform a clean cut. In the unlikely event roots above 25mm are encountered, works will halt, exposed roots will be covered with hessian to prevent desiccation and advice sought from the appointed ACW.

Stage 4 Monitoring of tree protection measures

- 3.21 The ACW will undertake predetermined site visits agreed during the pre-commencement meeting, to ensure tree protection measures remain intact and fit for purpose. In the event that conflicts arise between trees and construction activities, it is the responsibility of the site manager to contact the ACW to seek advice on alternative working methods.

Stage 5 Removal of tree-protection measures

- 3.22 Following completion of works, tree protection measures can be dismantled and removed from site. A post-construction tree survey undertaken by the project ACW is advised to highlight any remedial tree work required prior to occupation of the site.

Concluding statement

- 3.23 Provided that the tree protection measures and working methodologies detailed in the AMS are adhered to, no adverse effects upon trees proposed for retention or conflict with construction activities are envisaged. Such protection measures and provisions for new planting could be secured by a suitable worded planning condition.
- 3.24 The tree survey and arboricultural appraisal is valid for two years; it is recommended that a bi-annual survey of the tree stock is undertaken as part of proactive management of those trees on site to help maintain a healthy and safe tree population.
- 3.25 In the event that the development proposals alter significantly, an updated impact assessment must be undertaken to identify the likely impacts upon the tree stock and amendments made to the AMS accordingly.

Tree schedule

Site Mill Cottage
 Client Mr Creighton
 Surveyor D.Williams
 Survey date 05/03/2021
 Climatic conditions Clear and sunny

			Tree Constraints Information														
Tree Reference No.	Species	Stem Diameter (mm) at 1.5m	Category Grade	Radius of RPA (m)	Area of RPA (m2)	Height (m)	Canopy Spread (m)				First Significant Branch (m)	Canopy Clearance (m)	Life Stage	Physiological Condition	Structural Condition	Proposed Tree Works	Priority Code
							N	E	S	W							
T1	Pedunculate Oak	960	A1	11.5	417.0	28	11	11	10	9	3e	3	Over Mature	Good	Stream to the east and cottage to the west likely to have influenced the RPA of the tree. Main stem bifurcates 6m major deadwood at 9m south west, minor deadwood through canopy typical of age and species.	Undertake canopy clean of major deadwood.	3
T2	Holly	220, 250, 120	C3	4.4	60.7	10	2	2	2	2	1e	0.5	Semi-mature	Fair	Competing with T3, canopy development partially suppressed.	N/A	N/A
T3	Western Red Cedar	560, 570	B3	2.5	19.2	26	4	4	3.5	3	2e	0.5	Mature	Fair	Bifurcates at base.	N/A	N/A
T4	Ash	250	C1	2.4	18.8	12	1	1	1.5	2.5	4w	3	Semi-mature	Fair	Tall etiolated growth form.	N/A	N/A
T5	Ash	390	C1	1.3	5.4	12	0.5	3	5	2.5	2s	2	Semi-mature	Fair	Suppressed, asymmetric canopy due to group competition. Main stem conflicting with structure to the south.	N/A	N/A
G6	Goat Willow	400	C1	4.8	72.4	14	2	2	5	5	0.5	0.5	Semi-mature	Fair	Wire fence line runs through southern aspect of stems. Historically pollarded at 1m dbh reading taken beneath.	N/A	N/A
G7	Ash, Buddleia, Beech, cypress, Holly, Hazel & Elder.	100	C3	5.6	98.7	6	2	2	2	2	1e	0.5	Semi-mature	Fair	Largely young regen, self set some ornamental.	N/A	N/A
G8	Cherry & Goat willow	100	C3	2.2	14.7	6	2	2	2	2	0.5	0.5	Young	Good	Self set group.	N/A	N/A
T9	Damson	230	C1	2.8	23.9	7	1	1	1	1.5	1s	1.5	Young	Fair	Little amenity value.	N/A	N/A

Appendix 1: Summary of BS5837:2012 survey methodology

The methodology adopted for this survey is based on guidelines set out in **BS5837:2012 Trees in Relation to Design, Demolition and Construction Recommendations**, especially **Section 4.4**, 'Tree Survey'.

The tree survey includes all trees and other significant vegetation with a stem diameter of >75mm at 1.5m within the site, in addition to those located beyond the boundaries within a distance of 12 times their stem diameter. The position of those trees surveyed are derived from measurement taken on site cross reference with aerial mapping information and reference point/feature included in **Appendix 2**. The position of all trees/tree group are therefore approximate but deemed sufficient for the purpose of this study.

All trees have been visually inspected from ground level, with no climbing or further detailed investigative tests undertaken. All measurements detailed in the Tree Schedule are metric and have been recorded in accordance with **Section 4.4.2.5 of BS5837:2012** summarised below. Where access to trees has been restricted, either as a result of vegetation, ground conditions or third party land ownership, dimensions have been estimated and highlighted using symbol '#' in **Schedule 1**.

Any recommendations given regarding longer-term management have been made on the basis of optimising the life expectancy of trees, given their current situation and any effects, which may arise as the results of the development proposal.

Sequential reference number

All numbering of surveyed items is sequential with the respective prefix 'T' for trees 'G' for groups of trees, 'H' for hedgerows and 'W' for woodland.

Species

Common English names are used wherever possible for simplicity.

Stem diameter (DBH)

This is the measurement of the stem diameter in millimetres taken at 1.5m above ground level in accordance with **Annex C of BS5837:2012**.

Category Grading

Trees have been assigned 'U' or category grading 'A' to 'C' in accordance with the Cascade Chart given in **BS5837:2012** reproduced overleaf.

RPA radius & RPA Area (m²)

Both values been calculated using the methodology set out in **Section 4.6** and **Annexes C & D of BS5837:2012**. Where pre-existing site conditions may indicate that the rooting system is not asymmetric, the RPAs may be modified in **Plans 1** and **2** but the area not reduced based

on arboricultural reasoning. Such instances include the physical obstruction to root development or inhospitable rooting environments.

Height

An approximation of height in metres is provided for the highest point of each tree.

Canopy spread

This is taken at four cardinal points, to provide a representative account of the canopy spread.

First significant branch

Height of first significant branch and direction of growth (e.g. 2m N)

Existing height above ground level

An approximation of height in metres of crown clearance above adjacent ground level.

Life stage

There are six classes to which trees are assigned:

Table A.1: Definition of ages classes

Age class	Description
Young	Newly planted within 0-10 years
Semi mature	A tree in the first third of its normal life expectancy for the species (significant potential for future growth).
Early mature	A tree in the second third of its normal life expectancy for the species (some potential for future growth).
Mature	A tree in the latter third of its normal life expectancy for the species (typically having reached its ultimate size).
Over mature	Beyond the normal life expectancy for the species.
Veteran	A tree that is of interest biologically, aesthetically or culturally because of its condition size and/or age.

Physiological condition

The trees physiological condition is classified as good, fair, poor or dead on the basis of leaf or bud density, taking note of signs of physiological stress.

Structural condition

Details of the trees structural condition are provided identifying structural defects and or signs of decay, pest and pathogens where present.

Proposed tree works

Whilst a formal tree inspection has not been undertaken the survey process does take into consideration implications for damage or injury to persons and/or property; recording defects and assessing the structural condition of those trees surveyed. Where necessary, tree works have been proposed within the tree schedule to mitigate potential hazards as

part of proactive management of the tree stock with the aim of optimising the life expectancy of those trees surveyed.

Tree work priority codes

Priority codes from 1 to 3 have been given for those trees requiring tree works detailed in **Table A.2** below. The definition and level of urgency have been determined based on the perceived likelihood of failure and hazards posed to potential or actual targets.

Table A.2: Tree works priority codes

Priority Code	Description
Priority Code 1	An identified hazard considered to pose an imminent or serious risk to person or property in the context of the current land use. Works must be undertaken at the earliest possible opportunity.
Priority Code 2	Works considered necessary to mitigate a perceived hazard from an observed and recorded defect. These tree works should be undertaken prior to any development works commencing on site.
Priority Code 3	Considered to be general maintenance works which should commence post development but prior to residential occupancy.

Table A.3: Summary of Cascade Chart for tree quality assessment

Category and definition	Criteria
Category U	Those trees in such a condition that they that cannot be realistically retained as a living tree in the context of the current land use for longer than 10 years. If they cannot be safely retained as an ecological receptor following proposed remedial works, these trees should be removed for arboricultural reasons followed by appropriate replacement planting.
Category A (High quality of value)	Trees with an estimated life expectancy of at least 40 years. These trees may be of particular good example of their species or contribute an important visual landscape feature or provide significant historical/conservation value.
Category B (Moderate quality and value)	Trees with an estimated life expectancy of at least 20 years. These are trees that may be included within category A, but are downgraded due to the presence of significant but remedial defect. May also include trees present in such numbers that they form a distinctive landscape feature i.e. woodland, or tree of a material conservation/cultural value.
Category C (Low quality and value)	Trees with an estimated life expectancy of at least 10 years. Generally regarded as an unremarkable specimen of its species, or of such an impaired condition that they do not qualify for higher categories providing little landscape/conservation or cultural value.

Appendix 2: Existing Site Plan



Appendix 3: Statutory Controls

Tree Preservation Orders & Conservation Area

Written consent must be obtained from the local planning (LPA) authority prior to any works upon a tree subject of a Tree Preservation Order unless the tree is;

- Dead or dangerous
- Works are in line with an obligation under an Act of Parliament
- Permission has been granted through a Planning application

A six week notice to the LPA is required under Section 211 of the Town and Country Planning Act (1990) for any tree works within a Conservation area.

It is a criminal offence to cut down, uproot, wilfully destroy or deliberately damage a tree subject of a Tree Preservation Order. Under Section 210(2) of the Town and Country Planning Act (1990) anyone found guilty of the actions above are liable of a fine of up to £20,000 if convicted by a magistrates' court. In serious cases a person may be committed for trial in the Crown Court which will also consider any financial benefits which has or is likely to result from such an offence. In addition there is also a duty requiring landowners to replace a tree removed, uprooted or destroyed in contravention of a Tree Preservation Order.

Forestry Act 1987

A felling licence is required wherever an excess of 5 cubic metres of timber is felled per calendar quarter. Exceptions to the Forestry Act (1967) include felling trees which when measured at 1.3m above ground that have a stem diameter of 8cm or below. Other exceptions include thinning of woodland trees with a stem diameter of 10cm or below and coppicing of trees with a diameter of 15cm or below.

Exceptions are also afforded to work carried out by statutory undertakers; removal of dangerous and dead trees, prevention of abatement of a nuisance and to prevent the spread of quarantined pests or disease in response to a notice served by a Forestry Commission Plant Health Officer.

Where full planning permission is authorised, both statutory obligations above are no longer applicable, transcended by the Town and Countryside Planning act (1990), which permits tree removal for the purpose of development.

The Occupiers Liability Act 1957/1984

Land owners have a duty of care to ensure they have taken practice steps to ensure those tree within their curtilage of their property are reasonably safe for permitted visitors to be there.

Highway Act 1980

The highway authority have the ability to issue a land owner a 14 days notice to carry out works upon tree or hedgerow that overhand a highway road or footpath which the public has access to as to endanger or obstruct the passage/sight lines of vehicles or pedestrians.

Protected species

All species of British bat are listed as a European Protected Species (EPS) on Schedule 2 of The Conservation of Habitats and Species Regulation (2017) which transpose the Habitats Directive making it an offence to:

- *Deliberately capture, injure or kill a wild animal of a EPS;*
- *Deliberately disturb wild animals of a EPS wherever they are occurring, particularly any disturbance which is likely to impair their ability to survive, to breed or reproduce, or in the case of hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong;*
- *Deliberately take or destroy the eggs of a wild animal of a EPS; or*
- *Damage or destroy a breeding site or resting place of a wild animal of a EPS.*

Additional protection for bats is also afforded under the Wildlife and Countryside Act 1981 (as amended), making it an offence to intentionally or recklessly disturb bats whilst they are occupying a structure or place which is used for shelter or protection, or to obstruct access to this structure or place.

All wild birds, their nests and eggs are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), this makes it an offence to:

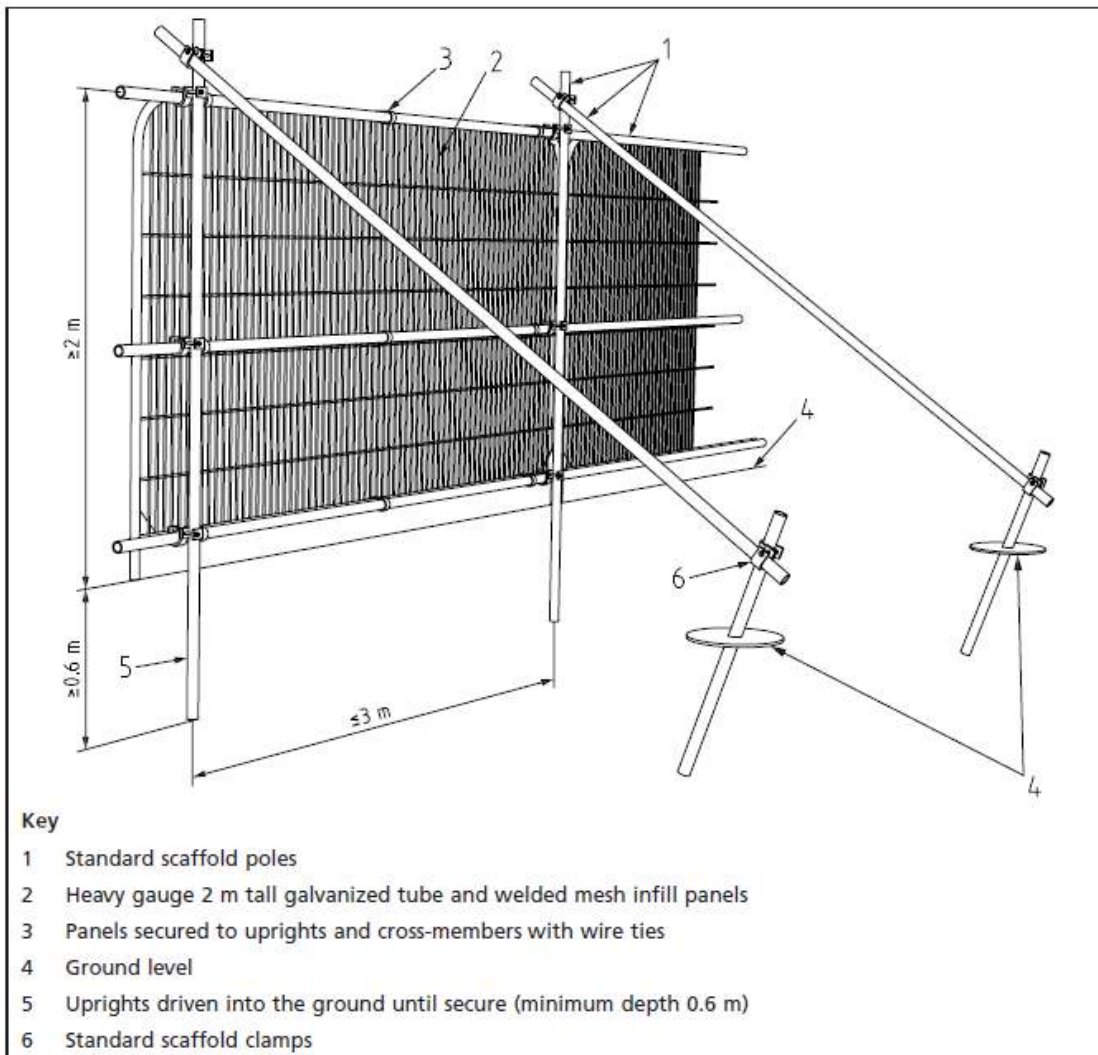
- *Intentionally kill, injure or take any wild bird;*
- *Take, damage or destroy the nest of any wild bird while it is in use or being built;*
- *Take, damage or destroy the egg of any wild bird; or*
- *To have in one's possession, or control, any wild bird (dead or alive) or egg or any part of a wild bird or egg.*

Appendix 4: Site Layout

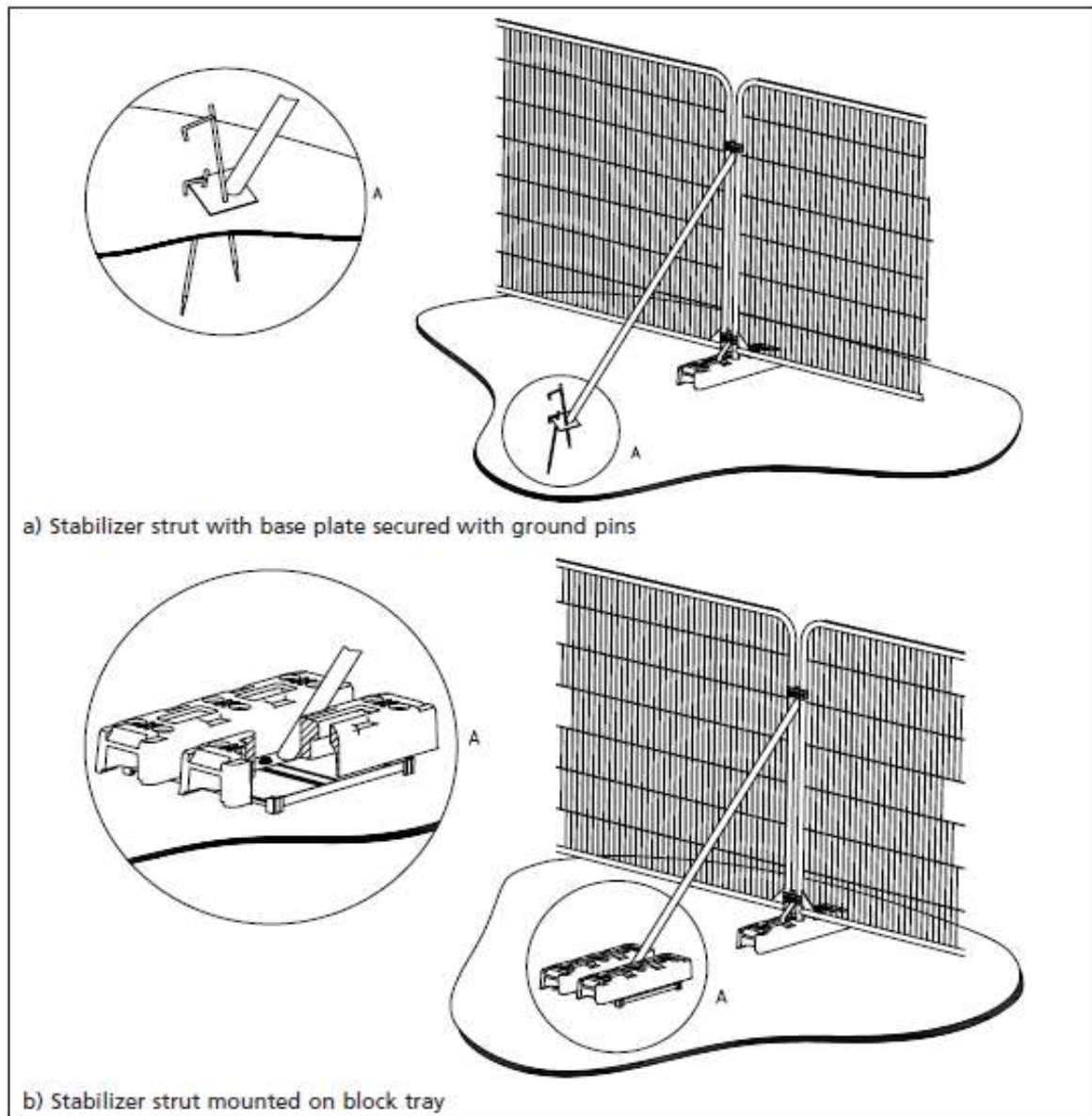


Appendix 5: Specification of protective barrier fencing

(Extract from BS 5837:2012, Figure 2)



Alternative options available for securing protective barrier fencing (Extract from BS 5837:2012, Figure 3)



Appendix 6: Specification of ground protection measures

(Extract from BS5837:2012)

6.2.3.2 Where the set-back of the tree protection barrier would expose unmade ground to construction damage, new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.

6.2.3.3 New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

NOTE The ground protection might comprise one of the following:

- a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;*
- b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;*
- c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.*

6.2.3.4 The locations of and design for temporary ground protection should be shown on the tree protection plan and detailed within the arboricultural method statement (see 6.1).

6.2.3.5 In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

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Plan 1: Tree Constraints Plan

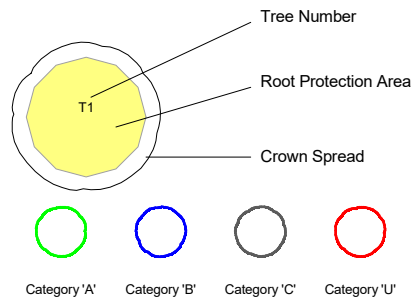
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09/03/2021

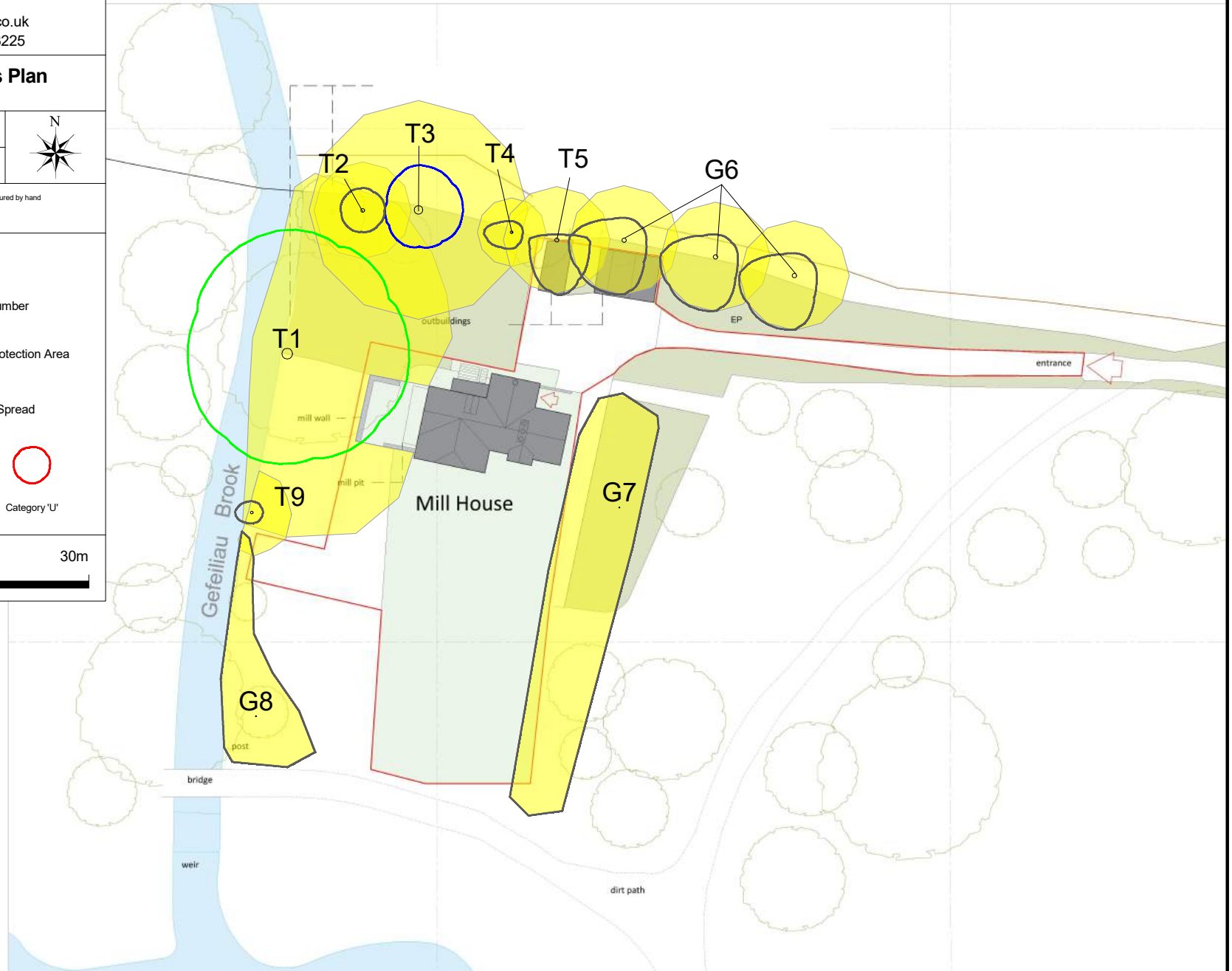


MAP FILENAME :
Mill House

Topographical information not available the position of trees have been measured by hand and therefore approximate.



0 30m



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Plan 2: Tree Protection Plan

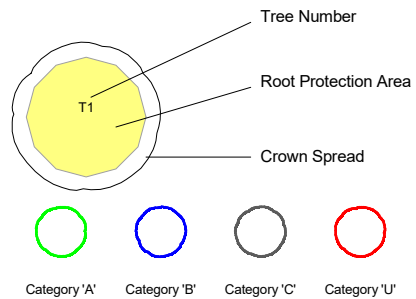
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DATE :
15/03/2021



MAP FILENAME :
Mill House

Topographical information not available the position of trees have been measured by hand and therefore approximate.



0 30m

Tree Protection Measures

- Construction Exclusion Zone (CEZ)
- Hand dig under Arboricultural supervision
- Ground Protection
- Tree Removal
- Protective Barrier Fencing

