Salopian Consultancy

# 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:** Residential development at Bryn Morfa, Bodelwyddan, Denbighshire

**Prepared by:** D. Williams MArborA, MRSB, MSc, BSc, RFS Cert, AA PTI

**On Behalf of:** Mr M Jones

# 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.

## Report revision record

| | **Draft** | **Final version** |
|---|---|---|
| **Report reference** | SC:298 | SC:298V2 |
| **Project** | Bryn Morfa | Bishop Close |
| **Author** | D. Williams | |
| **Proof read** | R. Parry | |
| **Issue date** | 30/03/2021 | 06/04/2021 |

## Contents

# 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 construction of 28 residential dwellings at the land east of Bryn Morfa. 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 **H10** a 'B grade' hedgerow and **G12** a 'U grade' group of Elm trees is anticipated to implement the design. The reduction of two boundary hedgerows (**H2 & H9**) will be necessary to installed the perimeter fence line and widening of the highway access route.

Minor encroachment has been identified within the Root Protection Areas (RPA) of **T5** and **T7**, two 'B grade' oak trees of moderate quality and value. This level of encroachment is considered within the species ability to tolerate and therefore a hand dig methodology and ground protection measures 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. Such protection measures and provisions for new tree planting could be secured by a suitably worded planning condition.

# Section 1: Tree Survey

## Introduction

1.1 This report, its plans and associated appendices have been prepared on behalf of Mr M Jones `the client', to meet the requirements of **BS5837:2012 Trees in relation to design, demolition and construction - Recommendations**, at Bryn Morfa hereafter referred to as 'the site'.

1.2 The tree survey was performed on the 20st September 2019 by Douglas Williams, Salopian Consultancy Ltd`s Principal Arboriculturalist. The survey was undertaken to update the initial study performed by Middlemarch Environmental Ltd in February 2019. 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 topographical data included in **Appendix 2**. 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;

- Perform an updates assessment of those likely impacts associated with propose site layout **DRG.NO 5401 002 (26/03/21)**
- Present those arboricultural constraints in a clear and concise manner to aid the design process.
- Detail appropriate tree protection measures and working methodologies to safeguard trees during construction

## Limitations

1.10 This report does not;

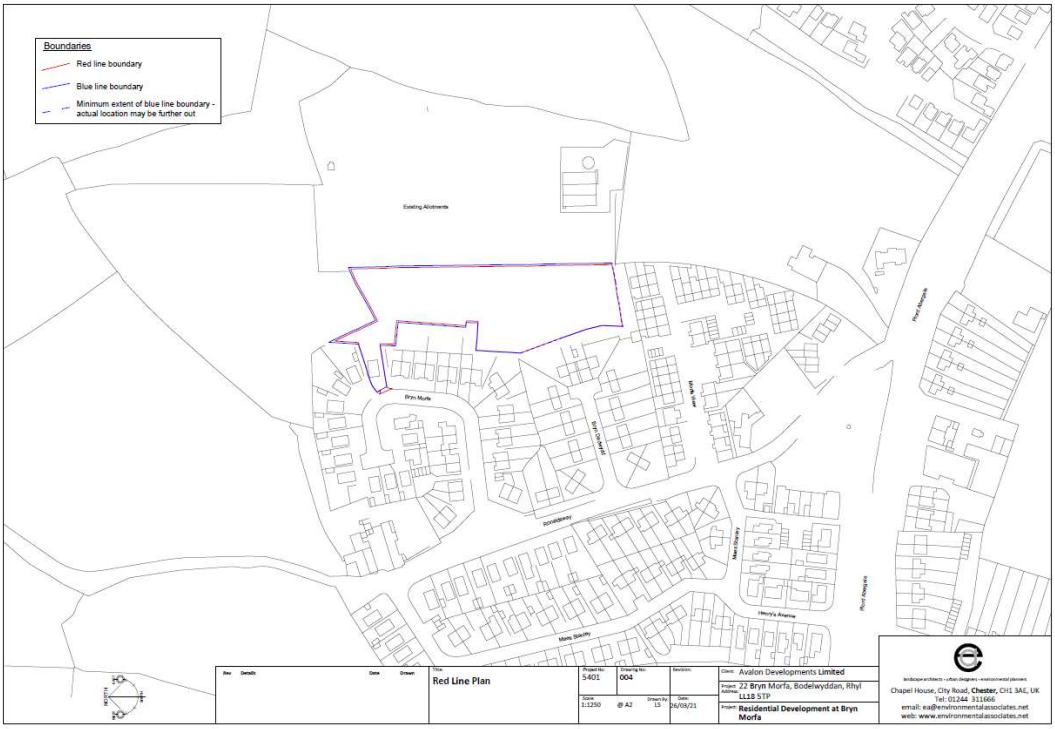
- Provide an assessment of the likelihood of subsidence caused by the interactions between water availability, soils and tree roots, at present or in future years. Foundation design should be undertaken in accordance with the guidance available in **National House Building Council (NHBC) publication 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 topographical survey and site layout. Checks of the accuracy of third-party information have not been undertaken.

## Site location and context of development

1.11 The site is located within the village of Bodelwyddan, situated immediately east of the existing residential properties associated with Bryn Morfa. The site encompasses a linear field which is bound to the north by grazed pasture, to the east by a series of allotments and to the south and west by existing residential development.

1.12 An initial assessment of the proposal identified that planning permission is sought for the construction of 28 residential units utilising the existing residential access provided by Bryn Morfa.

**Figure 1** Site location plan prepared by EA environmental associates




## Overview of the tree stock

1.13 The tree survey identified that the tree stock is largely restricted to the boundaries of the site which are denoted by unmanaged mixed species hedgerows. Within these hedgerows are three mature Oak trees which provide the highest arboricultural contribution to the site in terms of their amenity value and arboricultural merit.

1.14 Several trees, including another mature Oak (**T7**) were also noted within neighbouring properties which have the potential to be influenced by development due to the size of their root systems which are likely to extend into the site.

## Statutory legislation & planning policy

1.15 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.**

1.16 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/interception[1], carbon sequestration/storage and stormwater attenuation reducing the risk of flooding and soil

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

erosion[2] . In addition, numerous studies[3] 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].

1.17 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.

[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] CABE (2005) Does money grow on trees? http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.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 the tree constraints information. 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 | **H10** | **G12** |
| Tree pruning | N/A | N/A | **H2, H9** |
| Activities within RPAs | N/A | **T5, T7** | N/A |
| Temporary RPA set back | N/A | **T4,T5,T7,T11** | **T3, T6, T8** |
| Conflicts with shading | N/A | N/A | N/A |

## Tree removal

2.4 Review of the proposed site layout identifies that the removal **H10** a 'B grade' mixed species hedgerow and an area of undergrowth will be necessary to implement the landscaping scheme, specifically in relation to work works within the rear gardens of plots 22 - 26. In addition, the removal of **G12** a group of dead Elm has been advised irrespective of development.

## Tree pruning

2.5 The pruning of the hedgerows **H2** and **H9** are anticipated to implemented the widening of the access point and installation of a 1.8m close board timber fence line around the curtilage of the site. Such works must 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 identified that the concrete paving slabs associated with plots 10 and 11 marginally fall within the RPA of **T5** a 'B grade' oak. Further areas of paving and a shed associated with Plots 20 and 21 fall within the RPA of **T7**, another 'B grade' Oak tree. The level of encroachment in both cases is considered within the species ability to tolerate. Any excavation within either area must 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.

### Temporary RPA set back

2.7 The setback of protective barrier fencing will be necessary during the installation of the close panel fencing which are considered minor works. In addition, access within the RPA of **T7** is anticipated to erect scaffolding and aid the installation of concrete paving slabs. In the latter case ground protection measures will be necessary, 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

2.8 The plots fall outside the shade arc of those boundary tree such that issues associated with shading and an overbearing influence are not anticipated. **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

2.9 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

2.10 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

2.11 The proposed site layout demonstrates that areas of new tree and hedgerow planting have been designated within the layout, associated with the frontage of the plots and boundaries of the site. It is envisaged that a diverse mix of broadleaved species would provide a robust future tree population resilient to pests and disease. A key consideration of any future tree planting scheme will the planting of species in areas where they can achieve their full potential and expected stature without outgrowing their environment. Planting trees in close proximity to structure and existing trees or in high densities often results in tall etiolated standards or stunted growth forms, both of which should be avoided.

2.12 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. This could be achieved via planning condition through a formal Tree Planting Scheme.

# 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 removal of **H10** and **G12** and pruning of **H2** and **H9** 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 trees 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, highlighted in grey within the **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 Exisiting access to the site is available from Bryn Morfa. 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 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. Key considerations are outlined in **Section 11** of this guidance, notably the application of mulch and irrigation during post-planting management and maintenance. The benefits of using organic mulches have been well documented in improving the soil environment for newly planted trees. These benefits include, but are not limited to; weed suppression, nutritional enrichment, regulating pH, moisture and temperature fluctuations, suppression of pathogens (*Phytophthora & Armillaria sp*[6]) and mitigating compaction of soils.

[6]Percival G. Controlling tree diseases: thinking outside the box. Arboricultural Association The Arb Magazine 42 -45. https://www.bartletttree.co.uk/resources/Controlling-Tree-Diseases-Thinking-Outside-the-Box.pdf

To provide such benefits, an organic mulch applied to a radius 0.3m is advised for young trees at a depth of 50mm – 100mm. Care must be taken to avoid placing mulch directly against the buttress of the tree.

3.16 The use of Treegator is advised as a slow release system to allow gradual irrigation avoiding the wilting point of trees or conversely waterlogging by over watering. This product is easy to install and requires minimal maintenance with refilling required every 5-7 days during dry periods. The use of this product is advised over the first two growing seasons of newly planted trees.

3.17 Particular care should be taken to source new tree and plant material from UK nurseries which are free of pests and disease and have been grown in the UK for at least 12 months. Information of the origin of plants shall be requested by the contractor from the nursery during the procurement of trees.

### Stage 3 Works to be performed under supervision by ACW.

3.18 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.

3.19 Movement across exposed RPAs of **T7** will be necessary during the construction of Plots 20 and 21 for the purposes of the erecting scaffolding and landscaping. Ground protection measures shall be installed to prevent the compaction of underlying soils as specified in **Appendix 6**.

3.20 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 adjacent units or the access route). after which the line of protective barrier fencing will be reinstated

3.21 The installation of concrete slab paving and shed bases fall within the extremities of the RPAs of **T5** & **T7**. Any excavation will be undertaken under arboricultural supervision 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.

3.22 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.

3.23 The erection of a 1.8m close panel boundary fence line around the curtilage of the site within the RPAs of several trees. These works are considered minor in scope and duration such that the need for ground protection is not anticipated but will be re assessed by the ACW. The excavation of post holes within the RPAs of tree will be undertaken by hand. Such actions are permitted in **Section 7.2 of BS5837:2012** and restricted to the use of hand tools only. Where concrete is to be poured within post holes, the holes will be lined with plastic to ensure no leakage into the surrounding soil of retained trees.

### Stage 4 Monitoring of tree protection measures

3.24 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

3.25 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

3.26 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.

3.27 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.

3.28 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 | Bryn Morfa |
| Client | Mr M Jones |
| Surveyor | D.Williams |
| Survey date | 20.09.2019 |
| 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 | 1230 | A1 | 14.8 | 684.5 | 10 | 5 | 6 | 7 | 7 | 2s | 1.5 | Mature | Good | Small stem cavity at 1.5m south west. Ivy on stem extending into canopy which contains small diameter deadwood typical of age and species. | N/A | N/A |
| H2 | Blackthorn , Dog rose & Hawthorn | 75 | C1 | 0.9 | 2.5 | 2 | N/A | N/A | N/A | N/A | 0.25 | 0.25e | Semi-mature | Good | Field boundary hedgerow. | N/A | N/A |
| T3 | Hawthorn | 250 | C1 | 3.0 | 28.3 | 3.5 | 3 | 3 | 3 | 3 | 2e | 1.5 | Early mature | Good | Set in hedgerow, base and lower stem obscured by dense undergrowth. Dimensions estimated. | N/A | N/A |
| T4 | Pedunculate Oak | 385 | B1 | 4.6 | 67.1 | 6.5 | 4 | 5 | 5 | 6 | 2w | 1.5 | Early mature | Fair | Good shoot extension and vitality. Dimension estimated, set on the eastern side of wire fence line, no visible defects. | N/A | N/A |
| T5 | Pedunculate Oak | 530 | B1 | 6.4 | 127.1 | 6.5 | 5 | 5 | 5 | 5 | 1.5n | 1.5 | Early mature | Good | Small diameter ivy on main stem extending into crown. Some signs of powdery mildew within canopy, however overall vitality is good. | N/A | N/A |
| T6 | Hybrid Black Poplar | 300 | C1 | 3.6 | 40.7 | 8 | 1.5 | 3 | 3 | 3 | 2.5n | 2.5n | Semi-mature | Fair | Off-site tree, dimensions estimated | N/A | N/A |
| T7 | Pedunculate Oak | 950 | B1 | 11.4 | 408.3 | 7 | 4 | 5 | 5 | 4 | 2.5e | 2 | Mature | Fair | Set back approximately 1.5m from fence line. Off site tree dimensions estimated, squat form. | N/A | N/A |
| T8 | False acacia | 180, 290 | C1 | 4.1 | 52.7 | 6 | 2.5 | 2 | 3 | 4 | 2w | 2w | Semi-mature | Fair | Base of tree obscured by debris and rubbish. Small diameter deadwood noted on eastern canopy symptomatic with reduced vascular function\ground disturbance. | Remediate rooting environment . | 3 |
| H9 | Elm | 75 | C1 | 0.9 | 2.5 | 2 | N/A | N/A | N/A | N/A | 0.25e | 0.25 | Early mature | Good | Contains dead stems of Lawson cypress. | N/A | N/A |

| | |
|---|---|
| Site | Bryn Morfa |
| Client | Mr M Jones |
| Surveyor | D.Williams |
| Survey date | 20.09.2019 |
| 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** | | | | | | | |
| H10 | Blackthorn, Elm & Lawson cypress | 100 | B1 | 1.2 | 4.5 | 2 | N/A | N/A | N/A | N/A | 0.25 | 0.25 | Early mature | Good | Provides screening to and from neighbouring properties. | N/A | N/A |
| T11 | Silver Birch | 250 | B1 | 3.0 | 28.3 | 7 | 3 | 3 | 2.5 | 3 | 1.5se | 1.5se | Semi-mature | Good | Off site tree, no visible defects | N/A | N/A |
| G12 | Elm | 600 | U | 7.2 | 162.9 | 12 | N/A | N/A | N/A | N/A | 3ne | 3ne | Mature | Poor | Dead group of dead elm succumb to Dutch elm disease (*Ophiostoma novo-ulmi*). | Fell | 1 |
| H13 | Cypress sp | 75 | B1 | 0.9 | 2.5 | 2 | N/A | N/A | N/A | N/A | 0.25 | 0.25 | Semi-mature | Good | Neighbouring hedgerow | 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 each item is represented in **Plan 1,** are derived from the topographical data included in **Appendix 2.** Those items not recorded on the topographical survey have been annotated by hand and marked using the symbol '*'.

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 ($m^2$)

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.

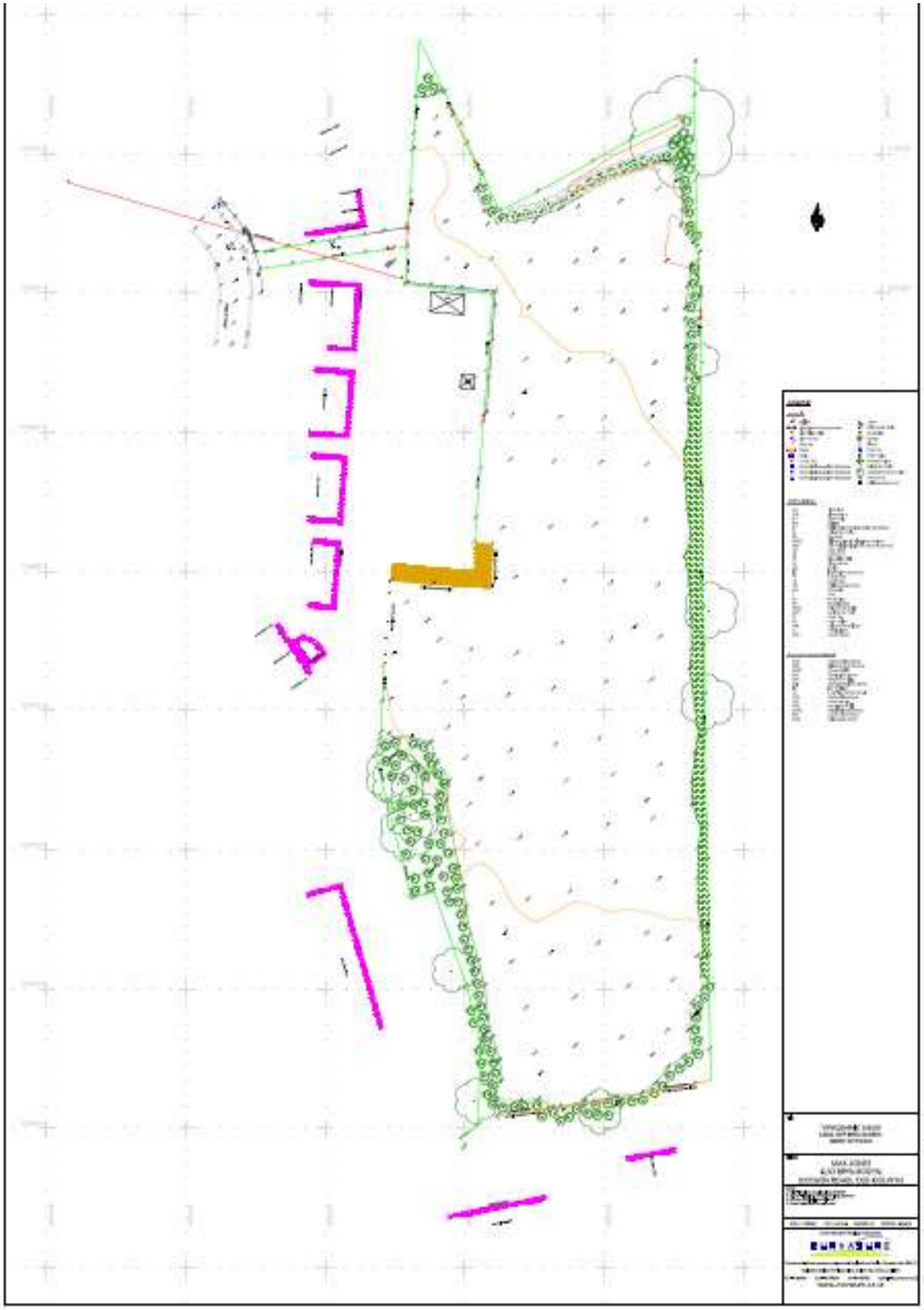
**Table A.2**: Tree works priority codes

| 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: Topographical survey



# 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.

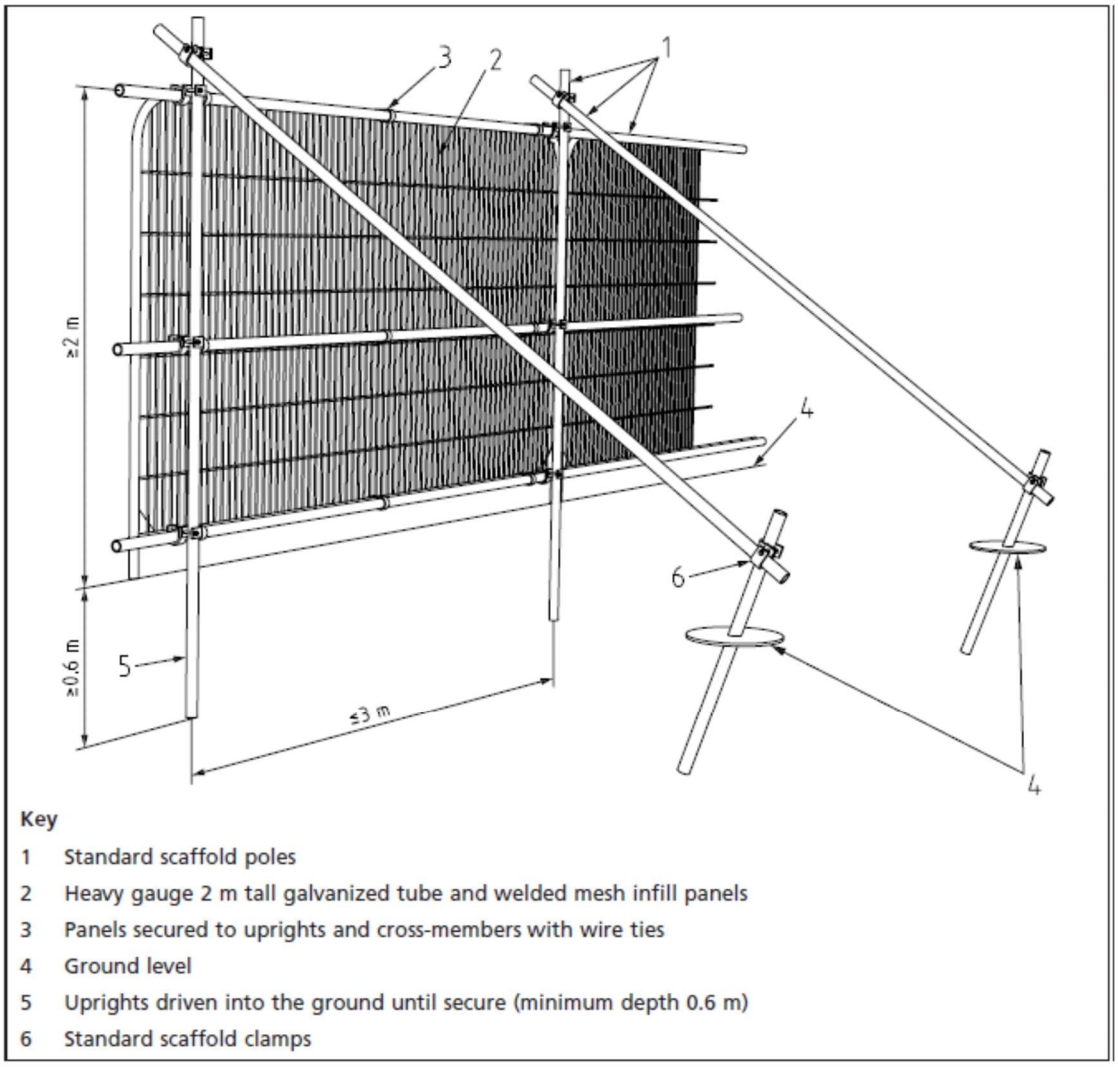
All wild birds, their nests and eggs are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), this makes it an offence to:

- *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

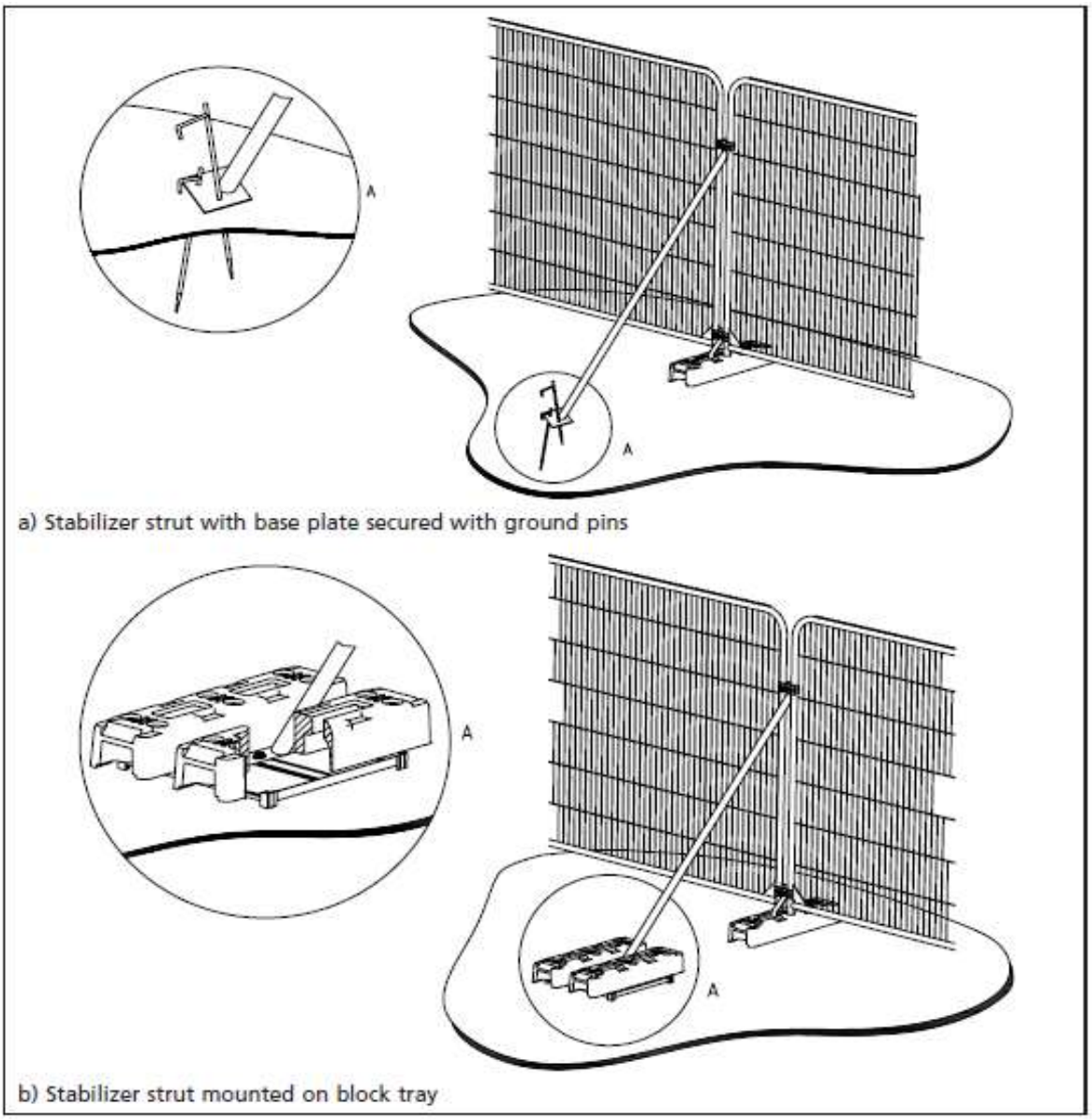
(Extract from BS 5837:2012, Figure 2)




**Key**

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

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**).

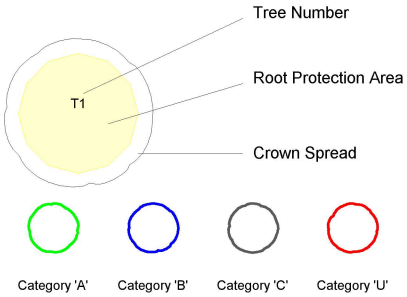
**6.2.3.5** In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

**Salopian Consultancy Ltd**

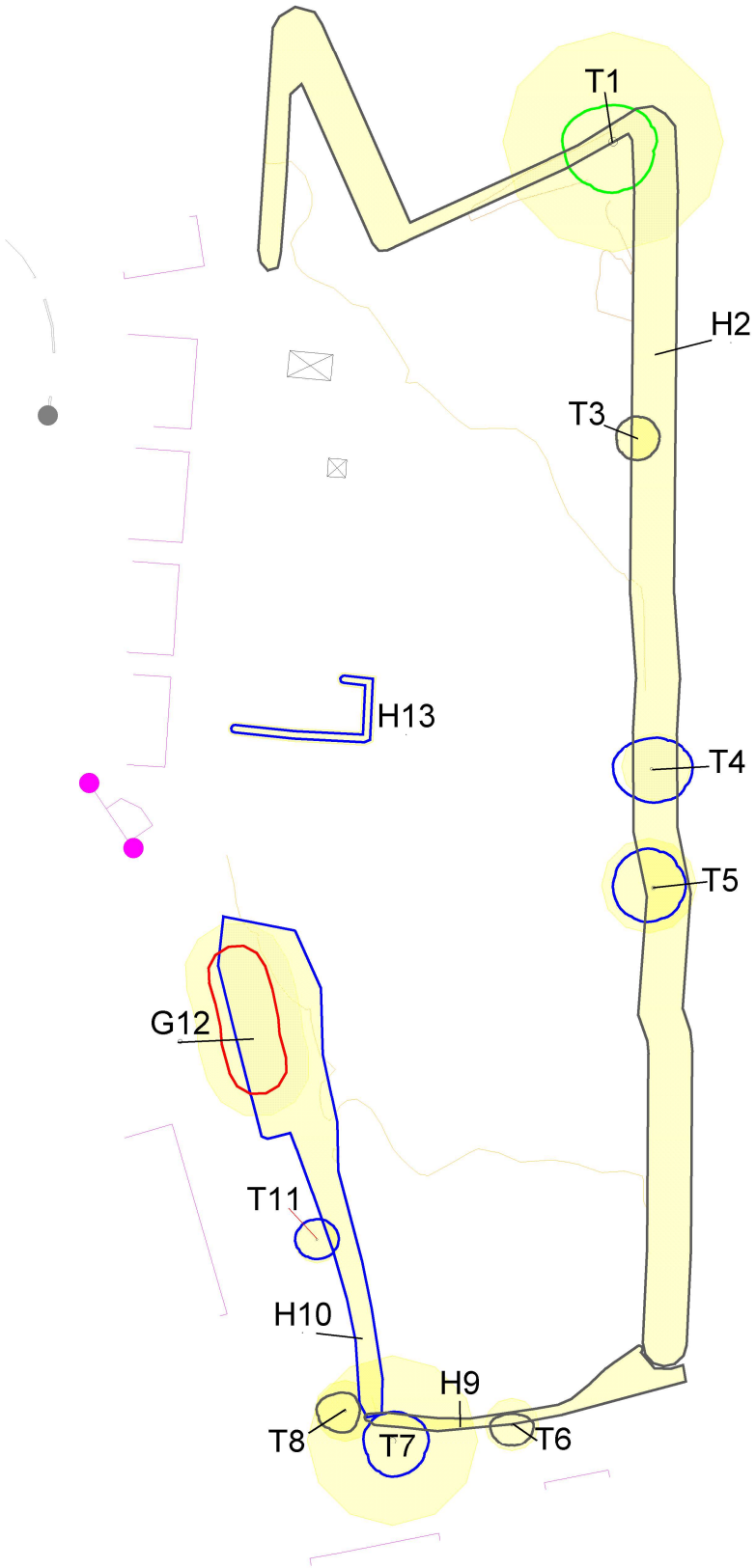
doug@salopianconsultancy.co.uk
M:07939947631 T:01743 243 225

## Plan 1: Tree Constraints Plan

| SCALE : 1 : 1000 @ A4 | DATE : 30/03/2021 | N |
|---|---|---|
| MAP FILENAME : Bryn Morfa | | |




0 60m



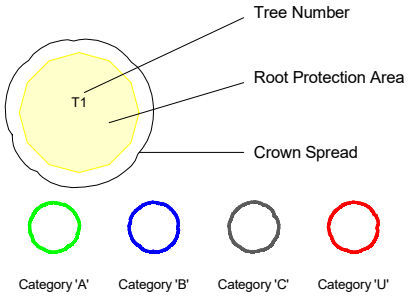
**Salopian Consultancy Ltd**

doug@salopianconsultancy.co.uk
M:07939947631 T:01743243225


# Plan 2:Tree Protection Plan

| SCALE : | DATE : |
|---|---|
| 1 : 1000 @ A4 | 06/04/2021 |

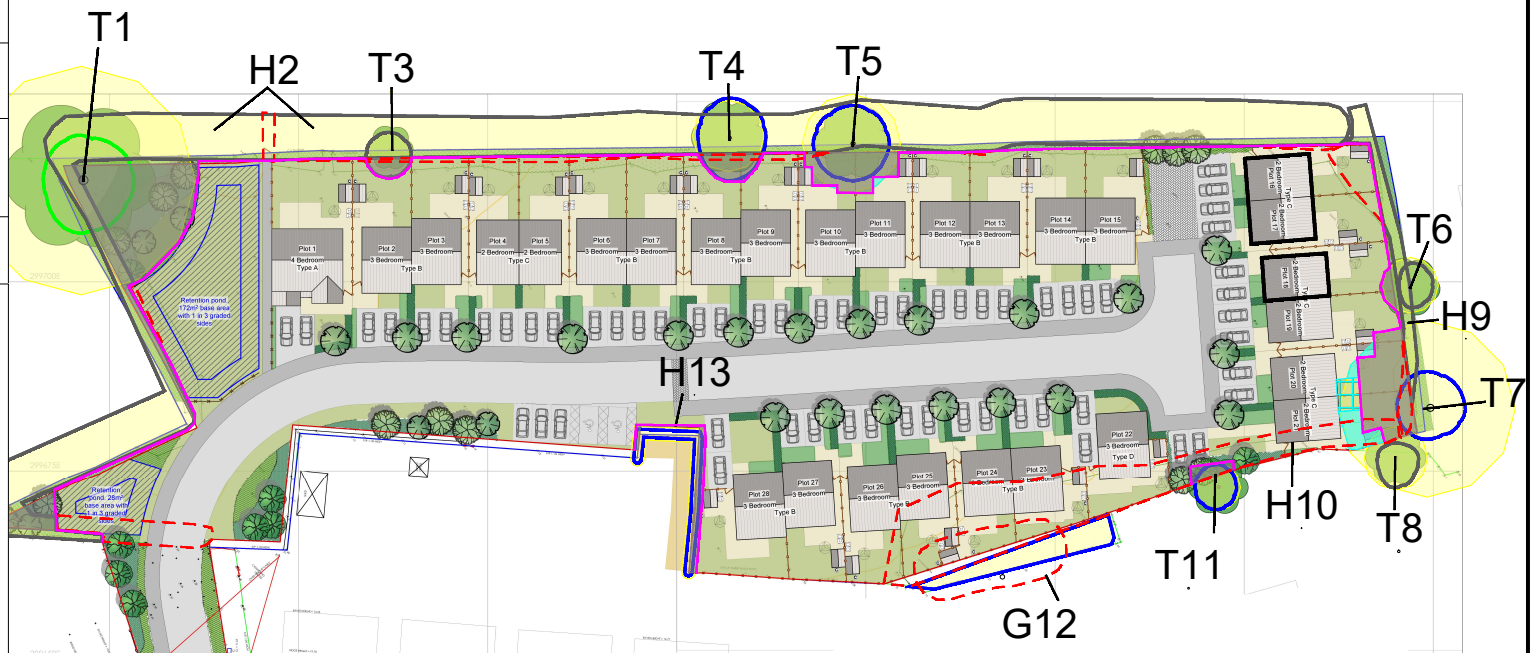
MAP FILENAME :
Bryn Morfa



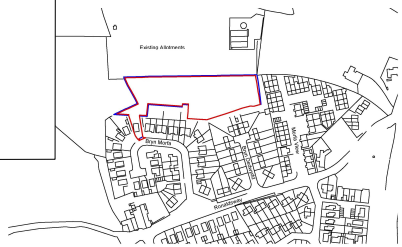

0 60m

## Arboricultural Impacts/Protection Measures

- Arboricultural Supervision (Hand dig)
- Ground Protection Measures
- Construction Exclusion Zone
- Pruning/Removal
- Protective Barrier Fencing




oposed Landscape and Housing Layout
ale: 1:250




2 Site location plan
Scale: 1:2500

House Type Mix

Private Sale Units

| House Type | Description | No |
|---|---|---|
| Type - A | 4 Bed Detached (incl. Garage) | 1 |
| Type - B | 3 Bed Semi-Detached (No internal Garage) | 18 |
| Type - C | 2 Bed Semi-Detached (No internal Garage) | 8* |
| Type - D | 3 Bed Detached (No internal Garage) | 1 |

* Pink Outline denotes affordable unit

Key

- Asphalt roadway/car parking
- Asphalt footpath
- Herringbone block paving
- Concrete paving flags to private footpaths and patio areas
- Private compost bin - min. 330L capacity
- Timber garden shed (2.4 x 1.8m)
- Fixed and secured rotary dryer in concrete footing to provide min 4lin.m drying line
- Bin storage location: 1 no. 240L black wheeled bin for general refuse ( 0.58 x 0.74m) 1 no. 240L green wheeled bin for general refuse ( 0.58 x 0.74m)
- 1.8m high close board timber fence with gates where indicated
- 0.45m high knee rail to retention pond edge
- Grassed drainage retention pond. To engineer's specification. Base area as indicated
- Red line boundary
- Blue line boundary
- Low growing ornamental shrubs
- Biodiverse grassed area
- Ornamental hedge (1.2m high)
- Native shrub planting (above 1.2m high)
- Native planting (below 1.2m high)
- Existing retained tree (size of symbol indicates size of canopy)
- Existing retained hedgerow. To be pruned
- Proposed trees. Min 80% native species

| Rev | Details | Date | Drawn |
|---|---|---|---|

Title: **Proposed Housing Layout and Landscape**

Project No: 5401 | Drawing No: 002 | Revision:
Scale: 1:250 @ A1 | Drawn By: LS | Date: 26/03/21

Client: Avalon Developments Limited
Project Address: 22 Bryn Morfa, Bodelwyddan, Rhyl LL18 5TP
Project: **Residential Development at Bryn Morfa**


landscape architects • urban designers • environmental planners
Chapel House, City Road, Chester, CH1 3AE, UK
Tel: 01244 311666
email: ea@environmentalassociates.net
web: www.environmentalassociates.net