

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: High Barton, Marford Hill, Marford, LL12 8SY

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On Behalf of: Mr & Mrs Hodgson

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 a replacement dwelling, at High Barton. 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 **14T** and **20T**, both of which have been classified as ‘C grade’ items of low arboricultural merit will be required to construct the replacement dwelling and a retaining wall respectively. In addition, the removal of 23m of **22H** is anticipated to implement the modifications to the driveway.

Minor encroachment has been identified within the RPAs of **24T** and **25T** a mature ‘B grade’ sycamore and beech associated with the and driveway amendments and single storey extension. The level of encroachment equated to 3.5% in the case of **24T** and 2% in the case of **25T**. In addition, <1% encroachment has been identified within the RPA of **13T**, a mature ‘A grade’ Corsican pine in connection with the modifications to a boundary wall/steps.

In all cases these impacts are considered to be 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.

Ground protection measures have been proposed where access is anticipated within the RPA of **T24** to accommodate the erection of scaffolding and provide sufficient working space. In other areas hard existing hard standing provides sufficient ground protection to avoid further compaction within the RPA of **21H, 22H, 23H, & 27T**.

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 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 and Mrs Hodgson 'the client', to meet the requirements of **BS5837:2012 Trees in relation to design, demolition and construction - Recommendations**, at High Barton, hereafter referred to as 'the site'.
- 1.2 The tree survey was performed on the 31st of December 2022 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 (**Plan 1**) towards the end of the report. The position of those trees surveyed are derived from topographical data included in **Appendix 2**. Each item surveyed 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 proposed site layout DRG.TY/1090/PL04
 - Detail appropriate tree protection measures and working methodologies to safeguard trees proposed for retention 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 a residential setting at Marfod Hill, located to the north of the B5445 which provides access to the property, with alternative access arrangement available via an unadopted road leading from Sunnyridge Avenue. The curtilage of the property is bound to the north, east and west by exisiting residential properties of Woodbridge Avenue, Sunnyridge Avenue and the Byways.

- 1.12 An initial assessment of the proposal identified that planning permission is sought for the demolition of the existing property to make way for the construction of a replacement dwelling.

Figure 1 Site location plan provided by Ty Architecture



Overview of the tree stock

- 1.13 The tree stock comprises of a variety of coniferous and broadleaved trees varying in their age class with the majority of the items falling within the southern half of the property. This area which contains notable specimens of Beech **9T**, Corsican Pine **13T**, and yew **17T** all of which provide significant amenity value.
- 1.14 Conversely congested, etiolated standards of ash and Leyland cypress fall adjacent to and beneath the canopies of the standards above, which although of lower arboricultural merit do provide a degree of screening to and from the B5445.
- 1.15 Tree work recommendations have been provided irrespective of development with the aim of promoting a healthy tree stock with a sufficient safety threshold in the current context of the site, detailed within **Schedule 1** at the rear of this report. Notable works include the removal of **1T** and **3T** given the presence of significant defects and the high occupancy of the adjacent highway. All tree works must be carried out in line with those statutory controls and permissions outlined in **Appendix 3** by suitably trained and insured Arborists.

Modification of RPAs

- 1.16 **Plan 1** recognises that the presence of the highway which runs adjacent to the southern aspect of the site and the existing driveway/topography and retaining walls which are likely to have had an influence upon root development byway of a physical barrier to root development and impediment to gaseous exchange and the free movement of water within the rhizosphere.
- 1.17 To take these factors into account the shape of the RPAs of **T1, 13T, 14T, 15T & 17T** have been modified, whilst retaining the theoretical area of their respective RPAs 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

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

erosion². In addition, numerous studies³ have shown that the presence of mature trees provides significant physiological and psychological benefits. The demand for properties set within neighbourhoods with mature trees is also reflected by higher average house prices, as is the investment in areas with established green infrastructure “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.

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 **Plan 1** to produce **Plan 2** which illustrates the foreseeable impacts associated with development.
- 2.2 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.
- 2.3 **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 red infilled canopy spread and their RPAs omitted.
- 2.4 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	23m of 22H	14T, 20T
Tree pruning	N/A	N/A	N/A
Activities within RPAs	13T	T24, T25	N/A
Temporary RPA set back	N/A	T24	N/A
Conflicts with shading	13T	12T	N/A

Tree removal

- 2.5 Review of the proposed site layout identifies that removal of 23m of **22H** a 'B grade' hedgerow is required to achieve the modification to the driveway. In addition, the removal of **14T** a ornamental cypress and **20T** a cherry plum (both classified as C grade items of low arboricultural merit), are anticipated to construct the retaining and the eastern elevation of the replacement property respectively.

Tree pruning

- 2.6 The pruning of canopies of retained trees is not envisaged as part of the proposal however where required 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

- 2.7 A review of the proposed site plan identified a retaining wall associated with the parking area falls within 2% of the RPA of **T25** a mature B grade beech tree of moderate quality and value. In addition, the single storey northern extension encroaches into 3.5% of the RPA of **T24** a mature B grade Sycamore. Furthermore <1% RPA encroachment was noted within that of **13T**, a mature A grade Corsican pine associated with modification to boundary wall/steps.
- 2.8 In all cases the level of RPA infringement/ground disturbance is considered is within the species ability to tolerate. It is advised that excavation within this 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.

Temporary RPA set back

- 2.9 The proposed site plan has identified the likely need enter the RPAs of **T24** to aid access during the construction process. Such activities will require the installation of ground protection measures installed in accordance with **Appendix 6** to avoid compaction within RPAs by vehicles, machinery and workers.

Shading and future growth of trees

- 2.10 **T12** a mature beech and **13T** a large Corsican pine will both cast significant shade upon proposed replacement building. Mindful that the footprint of the replacement dwelling does not extend any further into the shade arch of these trees than that of the current building the shading imposed is not considered any greater than that already experience by the current dwelling and it's historic occupants.
- 2.11 Acknowledging the above and that both trees are close to the maximum expected stature and hight given their growing conditions, the degree of shading is not considered excessive or a major constraint to the 'reasonable enjoyment' or use of the dwelling in a domestic context.
- 2.12 Whilst there can be negative issues associated between residential development adjacent to large trees in terms of 'overbearing influence' or 'future pressures to prune'; **Paragraph 5.3.4 b and e of BS5837:2012** also acknowledges these benefits of shading and screening as well as design options by way of non-slip paving and provisions of leaf guards or grills on gutters to reduce seasonal nuisance of leaf fall.

Utilities

- 2.13 It is anticipated that underground and overhead services can be located outside the RPAs 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

- 2.14 Space for the storage of materials and vehicles during site preparation and construction is limited within the site. It is envisaged however that the delivery of materials and removal of arisings, will be managed via a phased programme particularly for ground works to make best use of the space available.

New tree planting

- 2.15 There is little space to incorporate new tree planting within the sites curtilage given the existing high density of trees. This has resulted in the tall, etiolated growth forms of several members within the southern area of congested tree planting. Further tree planting should not be shoehorned into the site purely to increase numbers.
- 2.16 A key consideration of any future tree planting scheme will be the planting of species in areas where they can achieve their full potential and expected stature without outgrowing their environment. Any future 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.

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 as illustrated within **Plan 2**. 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. Monthly site meetings will be scheduled to identify any issues associated between trees and construction before conflicts occur. 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 further to identify any changes or difficulties that may arise. The extent of the CEZ/Protective Barrier Fencing will be double checked during this meeting and an inspection regime will be agreed upon by all parties and the timing of protection/mitigation measures will follow the time table below.

Table 1: Implementation and timings of Tree protection/mitigation measures

Actions	Timing						
Installation of protective barrier fencing and ground protection							
Removal of 14T and 20T and 23m of H22							
Demolition phase							
Excavation using hand dig methodology within RPA 13T, 24T & 25T							
Monthly check to ensure tree protection measures are upheld							
Ground works and construction phase							
Removal of protective barrier fencing							
Post development tree survey							

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

- 3.6 The removal of **14T** and **20T** and **23m of H22**, will be completed prior to any construction works as well as the installation of tree protection measures as depicted with **Plan 2**.
- 3.7 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 work operations will be undertaken in accordance with **BS3998: 2010 Tree works. Recommendations**. All necessary checks prior to all tree works must be undertaken by the appointed tree work contractors to ensure statutory laws are not contravened which includes the potential for trees 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**.
- 3.8 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.
- 3.9 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.
- 3.10 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 5**. **Plan 2** depicts the position of protective barrier fencing as a solid pink line and must 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.
- 3.11 The area within the line of protective barrier fencing is referred to as the CEZ, illustrated as an Transparent grey 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.
- 3.12 Access to the site will be restricted to the existing vehicular access from the unadopted road to the north currently used as the primary access route. Parking of vehicles, plant and storage of materials will be located within a designated compound, 2m from the RPA of any tree.
- 3.13 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.

- 3.14 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.
- 3.15 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>.

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 two weeks' notice prior to such works.
- 3.17 The level of excavation identified in **Plan 2** within the RPAs of **13T, 24T & 25T** is not considered likely to have a significant impact upon the condition of these trees. Excavation in these areas will be undertaken using hand dig methodologies under arboricultural supervision to provide a degree of caution where tree roots may be encountered to act as a failsafe measure. Such actions are permitted in **Section 7.2 of BS5837:2012** and restricted to the use of hand tools only.
- 3.18 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.
- 3.19 Movement across the RPA of a small section of **24T** is anticipated during the erection of scaffolding to facilitate access of workers and aid construction of the northern aspect of the replacement building. 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 northern single storey elevation**), after which the line of protective barrier fencing will be reinstated

- 3.21 Movement across the RPA's of other retained trees (i.e **21H, 22H, 23H, & 27T.**) will only be permitted where existing hard standing is present capable of acting as ground protection

Stage 4 Monitoring of tree protection measures

- 3.22 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

- 3.23 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

- 3.24 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.
- 3.25 The tree survey and arboricultural appraisal is valid for two years; it is recommended that a biennial 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.
- 3.26 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 High Barnton
 Client A Hodgson
 Surveyor D.Williams
 Survey date 31/12/2022
 Climatic conditions Clear and dry

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)				Life Stage	Physiological Condition	Structural Condition	Recommendations	Priority Code
							N	E	S	W					
1T	Ash	320	U	3.8	46.3	13	0.5	1.5	4	1.5	Early-mature	Poor	Ivy on main stem, asymmetric canopy bias towards highway. Lower small diameter limbs exhibit lesions/dischouring typical of ash die back.	Remove	2
2T	Ash	350	C1	4.2	55.4	15	2	3	1.5	1.5	Early-mature	Fair	Tall, etiolated growth form.	Re-survey when in leaf to determine presence of ash die back/need for removal	2
3T	Ash	230, 200	U	3.7	42.0	13	0.5	1	2	2.5	Semi-mature	Poor	Stem bifurcates at 0.5m from tight included fork, stem wound on both stems at 1m north.	Remove	2
4T	Lawson cypress	480	B1	5.8	104.2	18	2	1.5	1	1.5	Early-mature	Fair	No significant defects recorded.	N/A	N/A
5G	Lawson cypress, sycamore, ash, holly oak & elder	200	C1	2.4	18.1	11	N/A	N/A	N/A	N/A	Semi-mature	Fair	Tall etiolated congested planting, linear section of Lawson cypress provide screening to and from the highway	N/A	N/A
6T	Lawson cypress	390	B1	4.7	68.8	18	1	1.5	1.5	1	Fair	Fair	No visible defects, set on top of roadside cutting.	N/A	N/A
7T	Holly	240	C1	2.9	26.1	9	2	1.5	1	1.5	Mature	Fair	Canopy development suppressed.	N/A	N/A
8T	Lawson cypress	300	C1	3.6	40.7	12	1.5	1.5	1	1.5	Mature	Fair	Tall, etiolated growth form.	N/A	N/A
9T	Beech	620	B1	7.4	173.9	20	6	7.5	3.5	6	Mature	Fair	Etiolated lateral limbs providing sparse wide spreading canopy.	N/A	N/A
10T	Sycamore	360	B1	4.3	58.6	14	3	3	1.5	2.5	Semi-mature	Good	Set upon boundary fence line, access to western aspect of main stem/buttrass not available.	N/A	N/A

- The tree survey process has been undertaken in accordance with [Section 4.4 of BS5837:2012 Trees in Relation to Design, Demolition and Construction Recommendations](#), summarised in [Appendix 1](#) of the Arboricultural Appraisal.
- Each item surveyed has been given a sequential number with the respective prefix 'T' for trees 'G' for groups of trees, 'H' for hedgerows and 'W' for woodland which corresponds to the Tree Constraints Plan ([Plan 1](#)) and Tree Protection Plan ([Plan 2](#)).
- The Root Protection Area (RPA) values have 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 [Plan 1](#) and [Plan 2](#) but the area not reduced based on arboricultural reasoning. Such instances include the physical obstruction to root development or inhospitable rooting environments.
- Where trees are located outside of the client land ownership, or access is not achievable stem diameter have been estimated, highlighted using the suffix #
- Category Grading afforded to each item surveyed provides a hierarchy system for retention based on condition, amenity value and longevity in accordance with [Table 1 Cascade Chart for Tree Quality Assessment described in BS5837:2012](#). **A** = High value, **B** = Moderate value **C** = low value & **U** compromised condition. Suffix 1,2 & 3 related to Arboricultural, Cultural and Ecological value respectively.
- Priority codes provide a classification of the urgency of works; Code 1 = Undertake within 1 month or sooner, Code 2 = Perform within 12 months or sooner, Code 3 = Undertake once all code1 and 2 works are complete, within 12 months
- Where specified small diameter limbs/deadwood refer to a diameter <75mm, moderate deadwood/medium diameter limb equates to that of 75mm – 150mm and large diameter limbs/deadwood are those that exceed a diameter of 150mm

Site High Barnton
 Client A Hodgson
 Surveyor D.Williams
 Survey date 31/12/2022
 Climatic conditions Clear and dry

			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)				Life Stage	Physiological Condition	Structural Condition	Recommendations	Priority Code
							N	E	S	W					
11T	Leyland Cypress	390	U	4.7	68.8	10	1.5	1.5	1.5	1.5	Semi-mature	Poor	Large proportion of the canopy has die back indicating physiological stress/reduced longevity	Remove	3
12T	Lawson Cypress	470	C1	5.6	99.9	8	4	6	3	2	Mature	Poor	Form suggests historic heave/partial failure, main stem has a heavy lean north east. Canopy has attempted to adjust, evident by a clear phototropic response.	N/A	N/A
13T	Corsican pine	650	A1	7.8	191.2	20	6.5	7	5	7	Mature	Good	A large notable specimen, RPA likely to be asymmetric due to the presence of the driveway cutting to the east.	N/A	N/A
14T	Cypress spp	80,80,80,80,80	C1	2.1	14.5	5	1	1	1	1	Semi-mature	Fair	Multi-stemmed form typical of species.	N/A	N/A
15T	Holly	200	C1	2.4	18.1	4	1.5	1.5	1.5	1.5	Semi-mature	Fair	RPA likely to be asymmetric due to the presence of the driveway cutting.	N/A	N/A
16G	Laurel, ash, sycamore, Lawson cypress	150	C1	1.8	10.2	6 to 13	N/A	N/A	N/A	N/A	Young	Fair	Congested tree group denotes part of eastern boundary. Ash are starting to interfere with gateway retaining wall.	Remove tall, etiolated ash located adjacent to gate way entrance	3
17T	Yew	640	A1	7.7	185.3	10	4	3	4	3	Mature	Good	Long lived species displaying good vitality and branching structure. RPA likely to be asymmetric due to driveway cutting to the west.	N/A	N/A
18T	Variegated holly	170	C1	2.0	13.1	6.5	1	1	2	0.5	Young	Fair	A variegated variety provides an attractive contrasting foliage. Lower western lateral limbs have been crown raised and pruned back from driveway.	N/A	N/A
19G	Laurel	100	C1	1.2	4.5	6	1.5	0.5	1.5	1	Young	Fair	Boundary planting provides screening.	N/A	N/A
20T	Cherry plum	260, 420	C1	6.0	113.3	7	2.5	2	2.5	1.5	Mature	Fair	Large diameter pruning wounds on main stem at 0.75m north west and 0.5m north. Has historically been crown raised to 4m west to aid clearance over driveway.	N/A	N/A

- The tree survey process has been undertaken in accordance with [Section 4.4 of BSS5837:2012 Trees in Relation to Design, Demolition and Construction Recommendations](#), summarised in [Appendix 1](#) of the Arboricultural Appraisal.
- Each item surveyed has been given a sequential number with the respective prefix 'T' for trees 'G' for groups of trees, 'H' for hedgerows and 'W' for woodland which corresponds to the Tree Constraints Plan ([Plan 1](#)) and Tree Protection Plan ([Plan 2](#)).
- The Root Protection Area (RPA) values have been calculated using the methodology set out in [Section 4.6 and Annexes C & D of BSS5837:2012](#). Where pre-existing site conditions may indicate that the rooting system is not asymmetric, the RPAs may be modified in [Plan 1](#) and [Plan 2](#) but the area not reduced based on arboricultural reasoning. Such instances include the physical obstruction to root development or inhospitable rooting environments.
- Where trees are located outside of the client land ownership, or access is not achievable stem diameter have been estimated, highlighted using the suffix #
- Category Grading afforded to each item surveyed provides a hierarchy system for retention based on condition, amenity value and longevity in accordance with [Table 1 Cascade Chart for Tree Quality Assessment described in BSS5837:2012](#). **A** = High value, **B** = Moderate value **C** = low value & **U** compromised condition. Suffix 1,2 & 3 related to Arboricultural, Cultural and Ecological value respectively.
- Priority codes provide a classification of the urgency of works; Code 1 = Undertake within 1 month or sooner, Code 2 = Perform within 12 months or sooner, Code 3 = Undertake once all code1 and 2 works are complete, within 12 months
- Where specified small diameter limbs/deadwood refer to a diameter <75mm, moderate deadwood/medium diameter limb equates to that of 75mm – 150mm and large diameter limbs/deadwood are those that exceed a diameter of 150mm

Site High Barnton
 Client A Hodgson
 Surveyor D.Williams
 Survey date 31/12/2022
 Climatic conditions Clear and dry

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)				Life Stage	Physiological Condition	Structural Condition	Recommendations	Priority Code
							N	E	S	W					
21H	Beech & Laurel	75	B2	0.9	2.5	1.5	0.5	0.5	0.5	0.5	Mature	Good	Provides screening to and from the property.	N/A	N/A
22H	Laurel & Leyland cypress	75	B1	0.9	2.5	1.5	0.5	0.5	0.5	0.5	Mature	Good	Denotes the northern access/driveway.	N/A	N/A
23H	Privet	75	B2	0.9	2.5	1.5	0.25	0.25	0.25	0.25	Mature	Fair	Provides screening to and from the property.	N/A	N/A
24T	Sycamore	670	B1	8.0	203.1	15	6	5	5	7	Mature	Good	Main stem bifurcates at 1.8m forming a compression fork extending into co-dominant stems. A degree of bark inclusion was noted with little signs of bulging/reaction growth. Recent loss of companion shelter to the south.	Reduce eastern stem by 2m in height and later limbs by 1.5m to ease loading pressures on inclusion and promote single apical dominance	2
25T	Beech	450	B1	5.4	91.6	16	6	5	6	5	Mature	Fair	Damage to bark on northern primary lib, sapwood exposed. Gap within south eastern canopy noted, likely due to suppression in early development indicating loss of companion shelter.	N/A	N/A
26T	Portuguese laurel	80, 80, 80, 80, 80	C1	2.1	14.5	4.5	2.5	2.5	1.5	1.5	Mature	Fair	Multi-stemmed form.	N/A	N/A
27T	Beech	525 #	B1	6.3	124.7	13	5	5	6	5	Mature	Good	Off-site tree, dimension estimated. Set within hedgerow. Lower western limbs have been crown raised, branch stubs remain. Small diameter crossing limbs at 5m south east, telephone wire pass through the northern aspect of the canopy.	N/A	N/A

- The tree survey process has been undertaken in accordance with [Section 4.4 of BS5837:2012 Trees in Relation to Design, Demolition and Construction Recommendations](#), summarised in [Appendix 1](#) of the Arboricultural Appraisal.
- Each item surveyed has been given a sequential number with the respective prefix 'T' for trees 'G' for groups of trees, 'H' for hedgerows and 'W' for woodland which corresponds to the Tree Constraints Plan ([Plan 1](#)) and Tree Protection Plan ([Plan 2](#)).
- The Root Protection Area (RPA) values have 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 [Plan 1](#) and [Plan 2](#) but the area not reduced based on arboricultural reasoning. Such instances include the physical obstruction to root development or inhospitable rooting environments.
- Where trees are located outside of the client land ownership, or access is not achievable stem diameter have been estimated, highlighted using the suffix #
- Category Grading afforded to each item surveyed provides a hierarchy system for retention based on condition, amenity value and longevity in accordance with [Table 1 Cascade Chart for Tree Quality Assessment described in BS5837:2012](#). **A** = High value, **B** = Moderate value **C** = low value & **U** compromised condition. Suffix 1,2 & 3 related to Arboricultural, Cultural and Ecological value respectively.
- Priority codes provide a classification of the urgency of works; Code 1 = Undertake within 1 month or sooner, Code 2 = Perform within 12 months or sooner, Code 3 = Undertake once all code1 and 2 works are complete, within 12 months
- Where specified small diameter limbs/deadwood refer to a diameter <75mm, moderate deadwood/medium diameter limb equates to that of 75mm – 150mm and large diameter limbs/deadwood are those that exceed a diameter of 150mm

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 suffix '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.

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 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



Legend

Symbols

Bollard	Rain Water Gully
Direction of Watercourse	Road Sign
Electricity Pole	Shrubs
Fire Hydrant	Slope
Gas Tap	Stop Tap
Gate	Stop Valve
Gully	Survey Station
Lamp Post	Telegraph Pole
Manhole/Inspection Chamber	Tree (Spread to scale)
Manhole/Inspection Chamber	Tree Stump
Manhole/Inspection Chamber	Utilities Marker Post

Abbreviations

AV	Air Valve
BED	Flower Bed
BH	Bore Hole
BOL	Bollard
BT	British Telecom Inspection Chamber
BT	Telegraph Pole
BS	Bus Stop
CCTV	Closed Circuit Television Furniture
CEB	Control Electricity Box (Above ground)
DK	Drop Kerb
ER	Earth Road
EP	Electricity Pole
FH	Fire Hydrant
GU	Gully
IC	Inspection Chamber
LP	Lamp Post
LB	Letter Box
MP	Utilities Marker Post
MH	Manhole
P	Post
RS	Road Sign
RE	Rodding Eye
RWG	Rain Water Gully
SOP	Setting Out Point
ST	Stop Tap
SV	Stop Valve
TCB	Telephone Call Box
TL	Traffic Light
WM	Water Meter

Boundary Abbreviations

B/W	Barbed Wire Fence
C/B	Close Boarded Fence
C/Br	Crash Barrier
C/L	Chain Link Fence
C/P	Chestnut Paving
C/I	Corrugated Iron Fence
I/R	Iron Railing
L/L	Larchlap Fence Panel
P/W	Post & Wire Fence
P/C	Post & Chain
RTW	Retaining Wall
S/PAL	Steel Palisade Fence
S/P	Stock Proof Fence
W/M	Wire Mesh Fence

Title:

TOPOGRAPHIC SURVEY
HIGH BARTON
MARFORD
LL12 8SY

Client:

Ty Architecture

Notes:

1. Grid - tied into OS grid using OSGB 36
2. Datum - tied into OS datum using OSGB 36
3. Contour vertical interval = 1m
4. Survey orientated to grid north

SCALE: 1:200@A1 DATE: 03/05/22 CHECKED: SR DWG NO. 22_074/01

Survey data and drawings produced by,

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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 trees within the curtilage of their property are reasonably safe for permitted visitors.

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 overhang 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 (Amended) (EU Exit) (2019) which transpose the Habitats Directive making it an offence to:

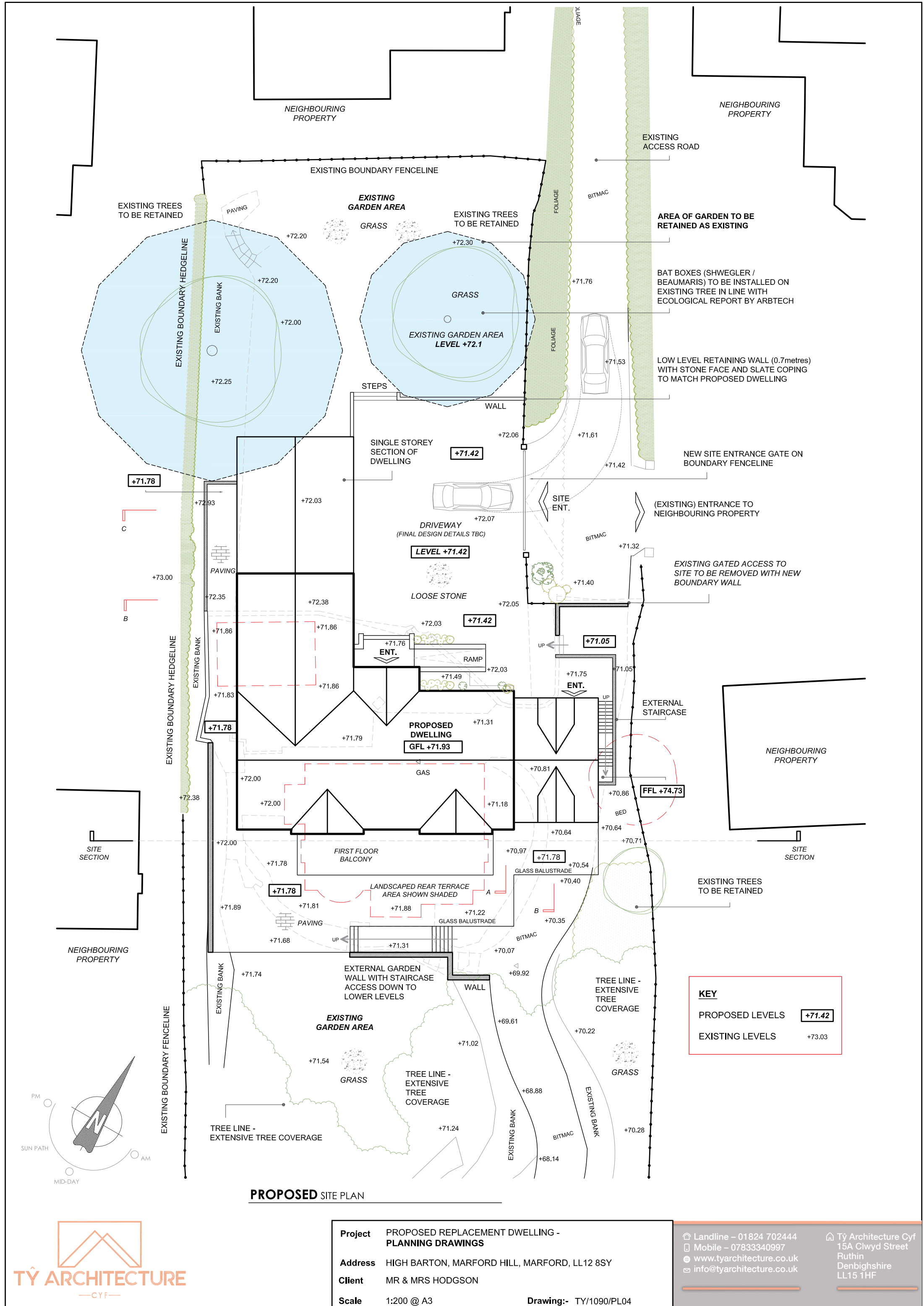
- *Deliberately capture, injure or kill a wild animal of a EPS;*
- *Deliberately disturb wild animals of a EPS wherever they are occurring, particularly any disturbance which is likely to impair their ability to survive, to breed or reproduce, or in the case of hibernating or migratory species, to hibernate 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.*

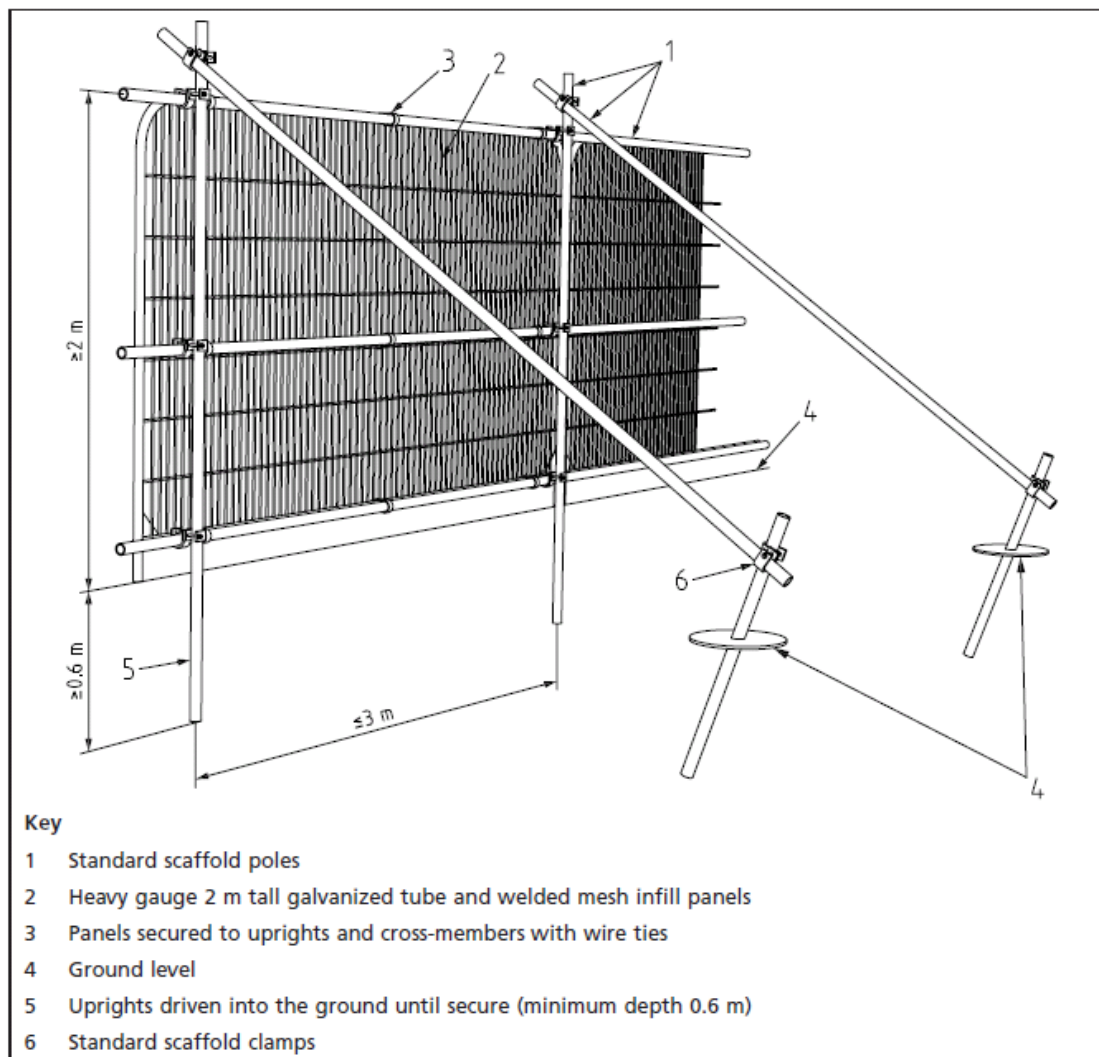
Appendix 4: Site Layout



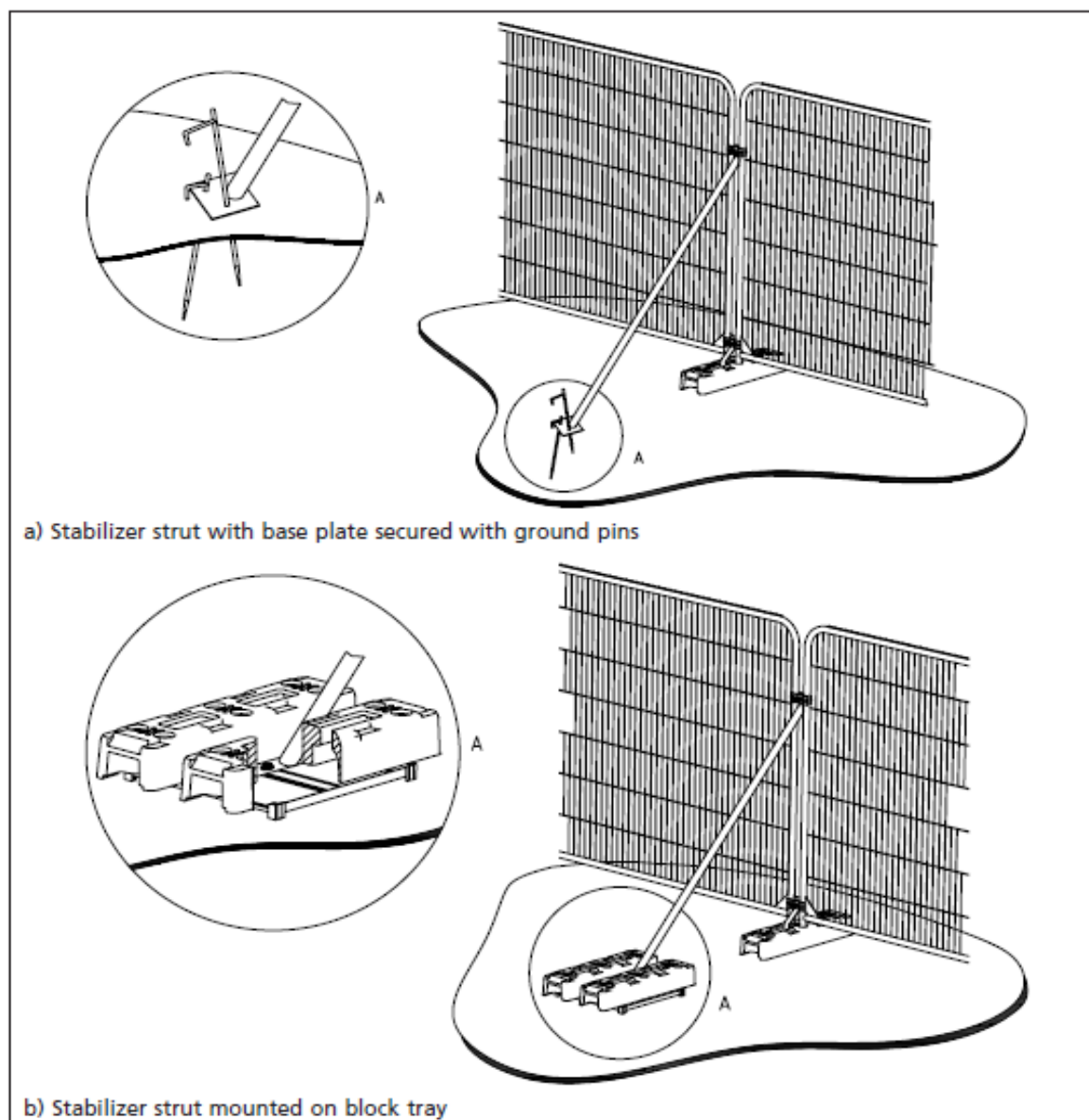
PROPOSED SITE PLAN

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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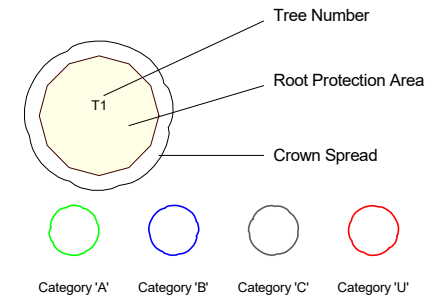
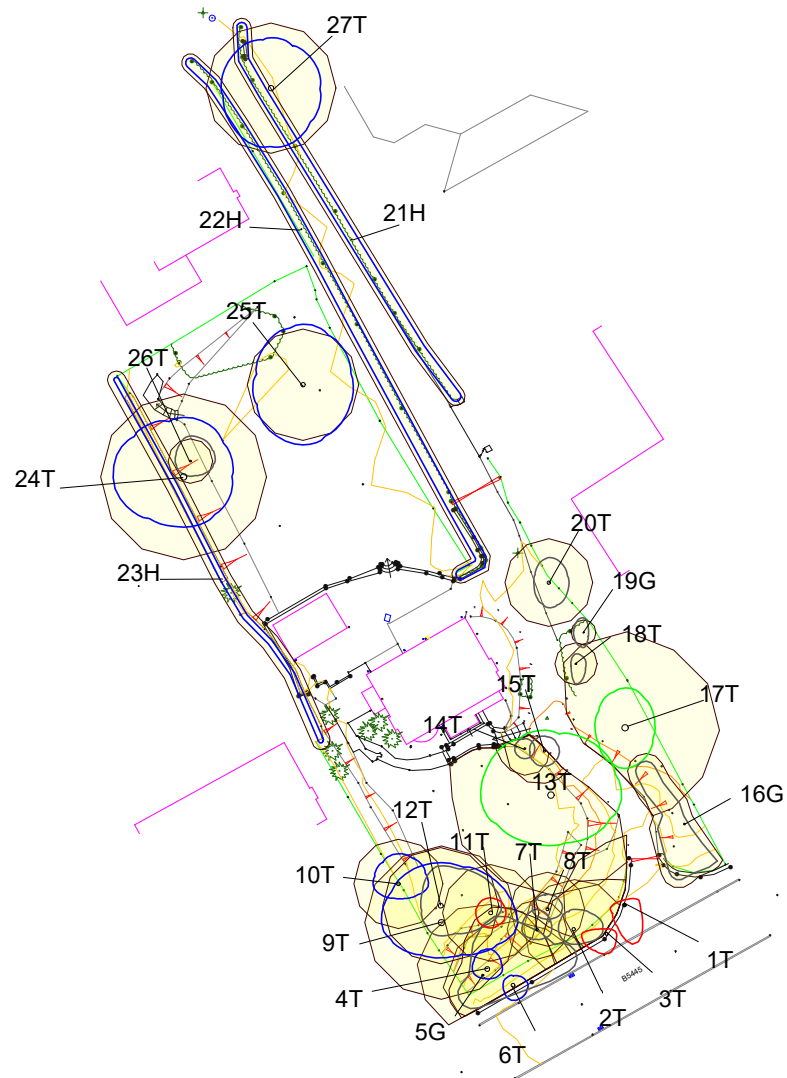
Plan 1: Tree Constraints Plan

SCALE :
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High Barton



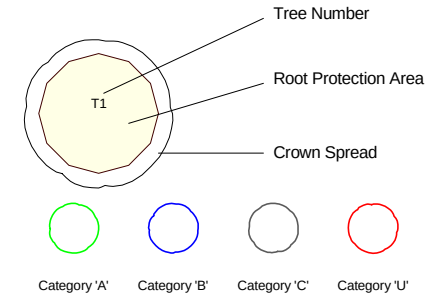
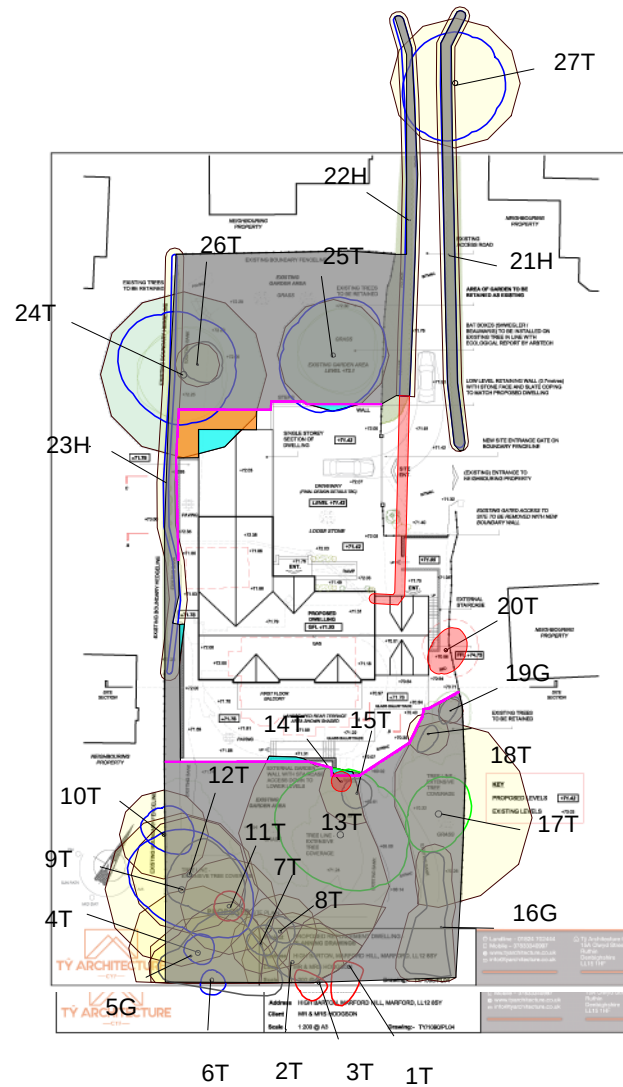
Plan 2: Tree Protection Plan

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19/01/2023

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High Barton



Arboricultural Impact/Protection Measures

- Hand dig Methodology
- Ground Protection
- Construction Exclusion Zone
- Tree/Hedgerow Removal
- Protective Barrier Fencing