Underhill
Tree Consultancy

Arboricultural Impact Assessment

Land off Kelvedon Road
Tiptree
Essex
CO5 0LX

0357-03-AIA
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Prepared by
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Summary

An arboricultural survey and this report has been prepared to support a full planning application to construct new residential dwellings.

It provides information in compliance with British Standard *BS 5837:2012, Trees in relation to design, demolition and construction* and considers the effect the proposed development has on the local character from a tree perspective.

The report's purpose is to allow the local planning authority to assess the tree information as part of the planning submission.

There are 39 subject trees and 9 groups which have been assessed in accordance with BS 5837.

The impact of the proposal is that 23 trees, 4 groups and part of 2 groups will be removed. Three of these trees are proposed for removal due to their condition. The majority of the best and largest trees are around the perimeter of the site and are to be retained.

Works are proposed within the root protection area of some trees to be retained and specialist methods of design and construction will need to be employed to minimise the impact on trees and to be acceptable to the local planning authority.

The report contains a draft arboricultural method statement heads of terms in accordance with recommendations in Table B1 of BS 5837. BS 5837 recommends that a detailed arboricultural method statement is produced in response to a planning condition following planning consent. This will describe in detail how retained trees will be protected from the development and methods of work close to trees. This report contains general details such as tree barriers and ground protection which are common to most developments.

There is an opportunity for substantial new tree planting which has the potential to improve the diversity of species and ages of the tree stock in the local area.

If the recommendations made within this report are followed, the development should be achievable in arboricultural terms and should be acceptable to the local planning authority.

Contents

1.0 Introduction

1.1 Instruction and brief

1.1.1 Underhill Tree Consultancy is instructed by Marden Homes Ltd to report on trees in relation to development proposals at Kelvedon Road, Tiptree. It has been carried out by Graham Underhill, Chartered Arboriculturist and registered consultant with the Institute of Chartered Foresters. Details of qualifications and experience can be found at http://www.underhilltc.co.uk/about-us.

1.2 Documents and information provided

1.2.1 Topographical drawing by J Taylor, November 2017.

1.3 Proposed layout 2018.190.002, November 2018.

1.4 Purpose and scope of this report

1.4.1 This report's purpose is to allow the local planning authority (LPA) to assess the tree information as part of the planning submission. It is also to aid layout design and to demonstrate to the LPA that appropriate consideration has been given to the issue of trees as part of the planning process.

1.4.2 It has been produced in accordance with the principles of British Standard BS 5837:2012, Trees in relation to design, demolition and construction - Recommendations (BS 5837)[1].

1.4.3 For LPA validation purposes, this report contains:

- A **Tree Survey**, which records information about trees on or adjacent to the site that may be impacted by the proposal and identifies tree constraints. Tree constraints can be categorised in two areas as follows:

  - Below Ground Constraints
    A **Root Protection Area (RPA)** is a layout design tool indicating the minimum area surrounding the tree that contains sufficient rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. Clause 4.6.2 of BS 5837 states that the RPA may be changed in shape, taking into account local site factors, species tolerance, condition and root morphology. BS 5837 states that no construction works should be carried out within RPAs except in exceptional circumstances, which may need demonstrating.
  - Above Ground Constraints
    These are indicated by the crown spread of trees to be retained, including their ultimate spread, along with a shade pattern shown for each tree, where relevant. This is shown as an arc from north-west to due east. This gives an indication of the patterns of shadows created by trees around midday in the summer. This is as recommended

1 British Standards Institution (2012) BS 5837: Trees in relation to design, demolition and construction – Recommendations, BSI https://shop.bsigroup.com/

by BS 5837 (Section 5.2.2) however actual shade patterns throughout the year will vary widely. Where shading is likely to be a serious constraint, a more detailed analysis of shade pattern using proprietary software may be deemed necessary.
Space needs to be allowed around a tree to be successfully retained after development and to reduce post-development pressures due to shade, daylight, leaf-drop etc. Considerations include: the current and ultimate height and spread of the tree and subsequent shade, daylight and mass issues; species characteristics including evergreen or deciduous, density of foliage, and factors such as susceptibility to honeydew (sticky exudation from aphids) drip, branch drop, fruit fall etc. Areas unsuitable for occupied accommodation may be suitable for unoccupied structures or hard surfacing and this will be indicated on the tree constraints plan where applicable.

- An **Arboricultural Impact Assessment (AIA)**, which takes account of any tree loss resulting from the proposal, and any potentially damaging activities proposed in the vicinity of retained trees, such as the removal of structures and surfaces, construction of new hard surfacing and structures, installation of services or any excavations or soil level changes. In addition to the impact of the permanent works, account will be taken of the buildability of the scheme in terms of adequate working and storage space.

- A **Heads of Terms Arboricultural Method Statement (AMS)**. An AMS describes how retained trees will be protected from the development and methods of work close to trees to minimise any adverse impact on them. Full details of site management and construction can only be finalised once the post-consent detailed design begins, therefore, this report lists the areas which will need to be covered in the detailed AMS. The heads of terms format is following recommendations in Table B1 of BS 5837). BS 5837 recommends that a detailed AMS is produced in response to a planning condition following planning consent. A **Draft Tree Protection Plan (TPP)** is included which indicates tree protection measures and any known incursions into RPAs, with appropriate mitigation measures. **Arboricultural Monitoring and/or Supervision** will usually be required where works are to be undertaken within RPAs.

1.4.4 The report is only concerned with arboricultural issues although other disciplines such as engineering and ecology may be mentioned where relevant. It is important to gain advice from the appropriate expert on these matters.

1.5 The proposal

1.5.1 The proposal is to demolish existing buildings and develop new residential dwellings at land off Kelvedon Road, Tiptree, Essex (hereafter referred to as the 'site').

1.1 Plans & tree positions

1.1.1 The position of trees shown on our plans is based on the supplied topographical drawing which is assumed to be accurate.

1.2 Planning context

1.2.1 Under the Town and Country Planning Act 1990 (as amended)[2] trees are considered a material planning consideration when determining planning applications.

National Planning Policy

1.2.2 The government's National Planning Policy Framework (NPPF)[3] came into effect in March 2012 and updated in July 2018. At the centre of the NPPF is a presumption in favour of sustainable development. The NPPF states that in relation to sustainable development, the planning system should contribute to and enhance the natural and local environment by: protecting and enhancing valued landscapes, geological conservation interests and soils; recognising the wider benefits of ecosystem services and to move from a net loss of biodiversity to achieving net gains for nature. In relation to climate change adaptation: care should be taken to ensure that risks can be managed through suitable adaptation measures, including through planning of green infrastructure.

1.2.3 With direct reference to trees, the 2018 update states that "Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists".

1.2.4 The trees subject to this report are not considered to be part of ancient woodland or aged or veteran trees, and therefore this aspect of NPPF is not considered applicable.

Statutory designations affecting trees on site

1.2.5 I am not aware if any of the subject trees are protected by a tree preservation order or are within a conservation area.

1.2.6 BS 5837 does not make a distinction between trees subject to statutory protection, such as a TPO, and those trees without. This is principally because all trees are a material consideration and full planning consent overrides any TPO protection. Therefore, we do not seek to offer any comparison between, or imply any difference in the quality or importance of trees covered by a TPO and other trees.

1.2.7 The tree protection status is correct at the time of report production but can be subject to change. It is therefore the responsibility of any persons undertaking tree works operations to the trees which are the subject of this report and in accordance with our recommendations, to undertake their own statutory tree protection checks with the local planning authority, to include TPO, conservation area and planning conditions prior to works commencing. Tree work agreed as part of full planning consent overrides the need to apply separately although pre-commencement planning conditions may need to be discharged first. Wilful damage or destruction of TPO/Conservation Area trees can result in prosecutions for companies or individuals and fines can be up to £20,000 (County Court fines are unlimited).

Ecological considerations

[2] Town and Country Planning Act 1990, http://www.legislation.gov.uk/ukpga/1990/8/contents

[3] National Planning Policy Framework (NPPF), published by DCLG, http://www.gov.uk/government/publications/national-planning-policy-framework--2

1.2.8 Although outside the specific scope of this report, tree removal and tree works have the potential to cause harm to wildlife, and this should be considered at the planning stage. Additionally, some wildlife which uses trees is legally protected: the Wildlife and Countryside Act 1981, as amended, The Conservation of Habitats and Species Regulations 2010 and the Countryside and Rights of Way Act 2000, provide statutory protection to species of flora and fauna including birds, bats and other species that are associated with trees. These could impose significant constraints on the use and timing of access to the site. It is the responsibility of the main contractor and tree surgery contractor to ensure that no protected species are harmed whilst carrying out site clearance or tree surgery works. Unless competent to do so, the advice of an ecologist must be sought. It is generally considered that birds nest between March and August but it must be understood that birds and active nests are protected irrespective of the time of year and some species can nest in any month. Therefore, due diligence must be observed towards nesting birds whenever tree works are carried out.

2.0 Appraisal

2.1 The site

2.1.1 The site is a mix of residential properties with various outbuildings in a semi-rural setting to the north-west of Tiptree. Much of the site is open grass fields with vegetation to the boundaries.

2.1.2 The topography of the site is predominantly level.

2.2 Soils

2.2.1 According to information from The British Geological Survey website, the soil is London Clay Formation - clay, silt and sand. The presence of clay indicates that the soil is liable to compaction which is very damaging to trees by restricting air-flow and also that there is the potential for tree root related soil movement which must be considered in relation to building foundations.

2.2.2 Soil type and depth has an influence on rooting depth and consequently, rooting distance. This cannot be determined from soil maps and would require localised soil investigation. Where this is recommended or has been undertaken, full details will be found in the appropriate section.

2.2.3 The data given is from a desk-top study which indicates likely soil types. Soil can vary widely at a local level and therefore any decisions taken with regards to soil type should be based on a detailed soil analysis.

2.2.4 Soils information is for the assessment of any effects on trees. This report does not seek to address the area of subsidence risk assessment.

2.3 The subject trees

2.3.1 Thirty-nine trees and 9 groups are the subjects of this report. Details of the trees as found at the time of the survey are in the tree survey sheets at **Appendix 1** and their locations are found on the plan at **Appendix 2**.

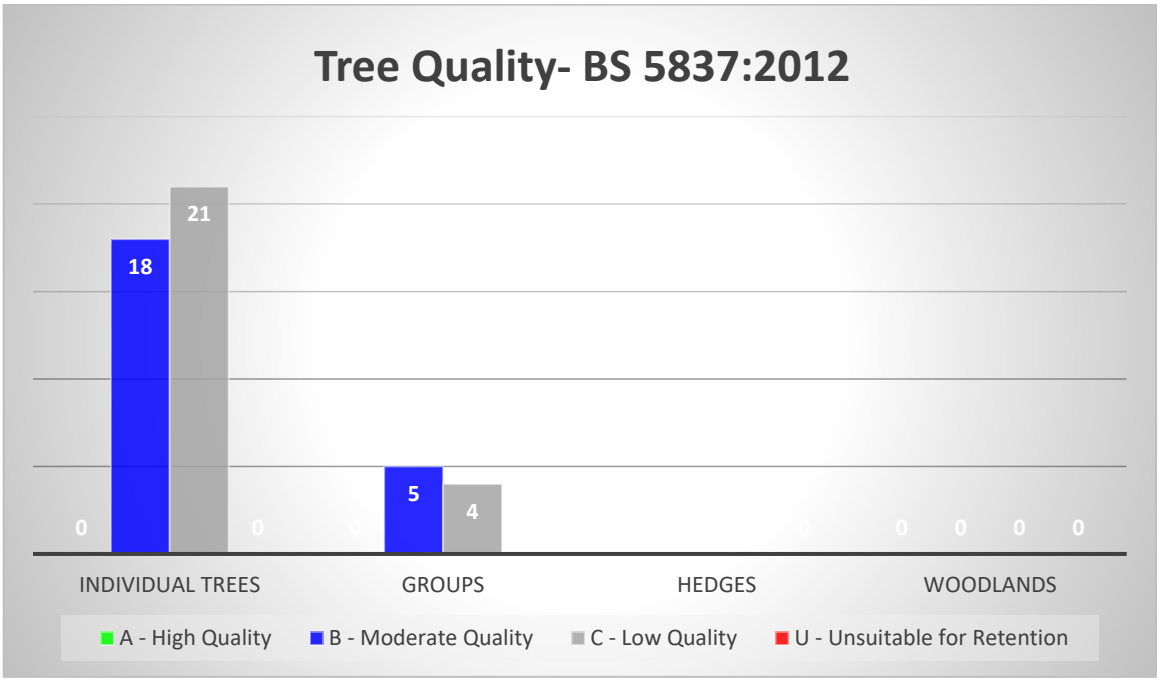
2.3.2 Several of the trees are offsite but could be affected by the development.

2.3.3 The trees are mostly around the perimeters of the site growing along field boundaries.

2.4 Tree quality

2.4.1 Trees have been assessed using the tree categorisation method in BS 5837. This identifies the quality and value (non-fiscal) of existing trees to allow an informed decision to be made concerning which trees should be removed or retained as part of the development proposal.

Table 1 - BS 5837 Quality Valuation



2.4.2 The above table shows that the majority of trees were identified as being of moderate quality (B Category) or low quality (C Category). There are no high quality (A Category) trees.

2.5 Category A trees

2.5.1 Category A trees are considered to be of high value and particularly important and desirable to retain and therefore could be considered a major constraint during the design process.

- None

2.6 Category B trees

2.6.1 Category B trees are considered to be of moderate value. They are considered important to retain where possible.

- T4, T5, T6, T7, T12 & T24 Oaks – Reasonably good hedgerow trees, typical of the better oak trees on site.

Picture 1 - Oaks T5 & T6, typical of oaks on site, to be retained

Picture 2 - Oak T7, to be retained

Picture 3 - Group G1, to be mostly retained

Picture 4 - Group G2, to be mostly retained

Picture 5 - Group G5 & G6, willows, to be retained

2.7 Category C trees

2.7.1 Category C trees are considered to be of low value and of limited benefits which may be readily replaced in the existing context. Therefore, it is generally accepted they are excluded from consideration regarding development although they may be suitable to retain where they pose no constraint on development.

Picture 6 - Willow, T1, to be removed

Picture 7 - Oaks T17-T19. To be removed due to declining condition

as a result of compaction to soil around roots

Picture 8 - T31-T34 Monterey cypresses, to be removed

2.8 Category U trees

2.8.1 Category U trees are in such a condition that they cannot realistically be retained in the current context for longer than 10 years. Although Category U trees should not be a constraint to development, sometimes they have conservation value and may be desirable to retain where appropriate.

- None

3.0 Arboricultural Impact Assessment

3.1 Purpose of the AIA

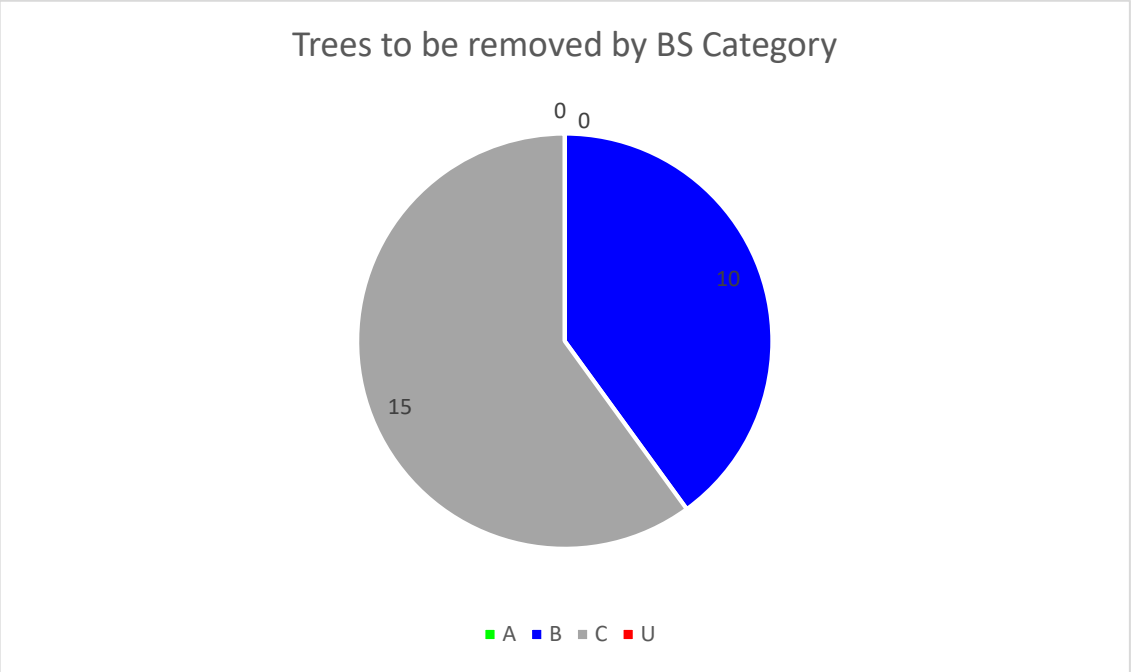
3.1.1 This section evaluates the direct and indirect effects of the proposals on trees on and adjacent to the site. It sets out draft protection measures and principles for work close to trees. Additionally, mitigation measures are described where appropriate.

3.2 Tree removals

3.2.1 A summary of anticipated tree losses for the proposed development are shown in the table below. Trees recommended for removal on arboricultural grounds are also shown.

Table 2 – Trees removals

Trees to be removed	Tree No.	BS Cat.
Trees removed due to condition (Category U or Category C)	T1 T17 T18 T19 Adjacent to T8	C1 C1 C1 C1 Dead tree
Trees to be removed for construction	T10 T14 T15 T16 T25 T26 T27 T28 T30 T31 T32 T33 T34 T35 T36 T37 T38 T39 G1 (part) G2 (part) G7 G8 G9	B2 B2 B2 B1 B1 B1 B1 C1 B1 C1 C1 C1 C1 C1 B1 C1 C1 C1 B1 B1 C1 C1 C1



3.3 Root protection area incursions

3.3.1 The default position should be that development is not sited within RPAs. RPAs represent the **minimum** area required to confidently retain a tree.

3.3.2 Compaction of compressible soils is probably the single most common cause of death or damage to retained trees on development sites. Soil compaction reduces soil pore space, which in turn reduces soil air, the passage of water and available nutrients. These anaerobic conditions prevent root growth and the proliferation of soil microbes essential to tree health. Symptoms in trees will include crown die-back, sparse, and small foliage, poor extension growth etc., however these may not be evident until well after the occurrence of compaction. Even one pass of a vehicle in wet conditions can cause irreparable soil compaction.

3.3.3 On space constrained sites, or where structures already exist within RPAs, it is accepted that incursions into RPAs may be required and BS 5837 recognises this as set out in 5.3 of BS 5837 (reproduced courtesy of BSI below).

> **5.3 Proximity of structures to trees**
>
> **5.3.1** The default position should be that structures (see **3.10**) are located outside the RPAs of trees to be retained. However, where there is an overriding justification for construction within the RPA, technical solutions might be available that prevent damage to the tree(s) (see Clause **7**). If operations within the RPA are proposed, the project arboriculturist should:
>
> a) demonstrate that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA;
>
> b) propose a series of mitigation measures to improve the soil environment that is used by the tree for growth.
>
> **5.3.2** The cumulative effects of incursions into the RPA, e.g. from excavation for utility apparatus, are damaging and should be avoided. Where there is evidence that a tree has been previously subjected to damage by construction activity, this should be taken into account when considering the acceptability of further activity within the RPA.

3.3.4 It is particularly important to ensure that any encroachment does not compromise tree stability. If an encroachment does not reduce the overall assimilative function of a root system, it is unlikely to cause long-term harm. Site-specific factors, including species, vitality and health, and soil condition, must be considered on a case-by-case basis.

3.3.5 The exact location of services is often difficult to establish until construction is in progress. No new services shall be installed within RPAs. When existing services within RPAs require upgrading or where it can be demonstrated that it is unavoidable to install new services in RPAs, conventional excavation techniques are unacceptable and great care must be taken to minimise any disturbance. Trenchless installation should be the preferred option but if that is not feasible, any excavation must be carried out by hand or using a compressed air lance under arboricultural supervision or by following the methodology in Section 4.

3.3.6 Details of work methodology close to trees can be found in Section 4 of this report. Certain works will need describing in full in a detailed arboricultural method statement conditioned following planning consent.

3.3.7 On some sites, there may be a requirement to excavate soil as part of investigation or remediation works not directly connected to the development, such as archaeological investigations, contaminated soil or Japanese knotweed control etc. This has the potential to be very damaging to trees which must be considered in any proposals and the project arboriculturist should be consulted on any excavation within RPAs.

3.3.8 Where works of any kind are to be carried out within RPAs, a detailed arboricultural method statement will be required and will usually be conditioned by the local planning authority. Depending on the extent and potential impact of the proposals, this can include arboricultural supervision and/or monitoring.

Table 3 – RPA incursions

Trees affected by RPA incursions	Tree No.	BS Cat.
Demolition Demolition of structures has the potential to damage trees both above and below ground, so will require careful working methods to avoid this.	T1 T2 T3 T4	B2 B2 B2 B2
Construction activity – temporary access Areas of RPA requiring suitable ground protection for access or scaffolding and other working space requirements.	T2 T3 T4	B2 B2 B2
Construction activity – potential for significant impact, e.g. foundations Specialist foundation design will be required where within RPAs. This may result in higher finished floor levels which should be considered during design. Encroachment into RPAs to construct site features requiring significant excavation.	None	
Construction activity – low impact Areas within RPAs where small, low impact structures (e.g. footpaths, bin or cycle store) are to be constructed.	T2 T3 T4 T5 T6 T7 T8 T9 T11 T12 T20 T21 T22 T23 T24 T29 G1 G2 G3 G5	C1 C1 B1 B1 B1 B1 C1 C1 C1 B1 B1 C1 B1 C1 B1 B1 B1 B1 B1 B1
Hard surfacing Construction of drives, patios or paths will require a suitable no-dig solution to minimise impact, e.g. cellular confinement system or similar.	-	-

3.4 Trees requiring tree surgery works

3.4.1 Facilitation pruning such as crown lifting of lower branches to allow for vehicular or pedestrian access, or the removal of dead branches for safety reasons, are in the table below. Dead branches should only be removed where there is an identifiable risk as they are a valuable ecological resource. The removal of ivy is specified where it is deemed important to enable a close inspection of parts of a tree currently hidden, or because the ivy is causing problems for the tree by competing for light or adding excessive weight which could result in limb or tree failure. Routine severing and removal of ivy is not recommended as ivy has high ecological value as a nesting site and nectar source.

Table 4 - Tree surgery works

Trees to be pruned	Tree No.	BS Cat
Facilitation pruning Crown lifting or pruning to allow for access or working space	T24	B1
Arboricultural pruning Pruning for safety or formative pruning	-	-

Picture 9 - Oak T24, requires crown lifting over road

3.4.2 Tree surgery works to be undertaken in accordance with *BS 3998:2010 Recommendations for tree works*[4], or industry best practice. The Arboricultural Association run an Approved Contractor scheme and provide details of assessed contractors https://www.trees.org.uk/Find-a-professional.

3.4.3 Where appropriate, the arisings from tree felling and pruning should be retained on site as ecological features. The advice of the project ecologist should be sought.

[4] British Standards Institute (2010) BS 3998: Tree work – Recommendations, BSI https://shop.bsigroup.com/

3.5 Existing and proposed finished levels

3.5.1 During design, consideration should be given to changes in ground levels. This should be dealt with in the detailed AMS, however, it is important at the planning stage to recognise any significant changes. Even where this occurs outside the RPA of a retained tree it still has the ability to impact on the tree, particularly in respect to changes in water availability, and methods of dealing with the change in levels such as retaining walls, slopes etc. should be assessed by the project arboriculturist.

3.1 Impact on local landscape character

3.1.1 Most of the significant boundary tree cover will remain. The majority of the trees to be removed are of low value, or due to their central position within the site, will not be noticeable from outside the site.

3.1.2 New tree planting is proposed which has the potential to significantly enhance the contribution of this site to local character and more than compensate for tree removal.

3.1.3 Construction activity could affect existing trees causing them to deteriorate if appropriate protective measures are not taken. Provided the precautions specified in this report are taken, the development proposal will not have a significant impact on the contribution of trees to the character of the area.

3.2 Root Protection Area Modifications

3.2.1 RPAs are plotted as a circle unless site factors indicate otherwise. Such factors may be the presence of roads, structures, underground apparatus, topography, soil type/structure and compaction etc. Additionally, the likely tolerance of the tree to disturbance or damage, based on factors such as species, age, condition and past management may influence the shape of the RPA.

Table 5 – RPA modification

Tree	Reason for RPA modification
None	-

3.3 Contractors' compound and car parking

3.3.1 It is important that space is allocated during the design stage for temporary welfare buildings, site storage, car parking etc., as this must be outside RPAs. Exceptions can sometimes be made for carefully sited and supported temporary buildings where agreed with the LPA.

3.4 New planting

3.4.1 In the context of the loss of trees, a new landscaping scheme is proposed. Planting locations should be determined at the planning stage and protected during the development to preserve soil structure. The suggested selection of species, size, method of planting and location are outside the scope of this report, however, the general principles should be for bigger tree species to be chosen which have the potential to reach their ultimate height and spread without

the need for excessive management. This must be balanced with available site-specific space, both above and below ground.

3.5 Protection of retained trees

3.5.1 Protection measures, usually a combination of barriers and ground protection must be in place before any works, including site clearance or demolition, begin, and stay in place for as long as a risk of damage remains. The protection of trees must take account of the buildability of the proposal, including services, and ensure that all activities such as storage of materials, parking and the use of plant and vehicles can be accommodated outside of RPAs. Particular care and planning are necessary for the operation of excavators, lifting machinery and cranes to ensure all vehicle movements and lifting operations will not impact on retained trees.

3.5.2 The location of tree protection barriers and ground protection can be found on the Tree Protection Plan in **Appendix 2** of this report. The Tree Survey Sheets in **Appendix 1** indicate the RPR (root protection radius) which is the minimum distance protection barriers are to be positioned from the trunks of retained trees.

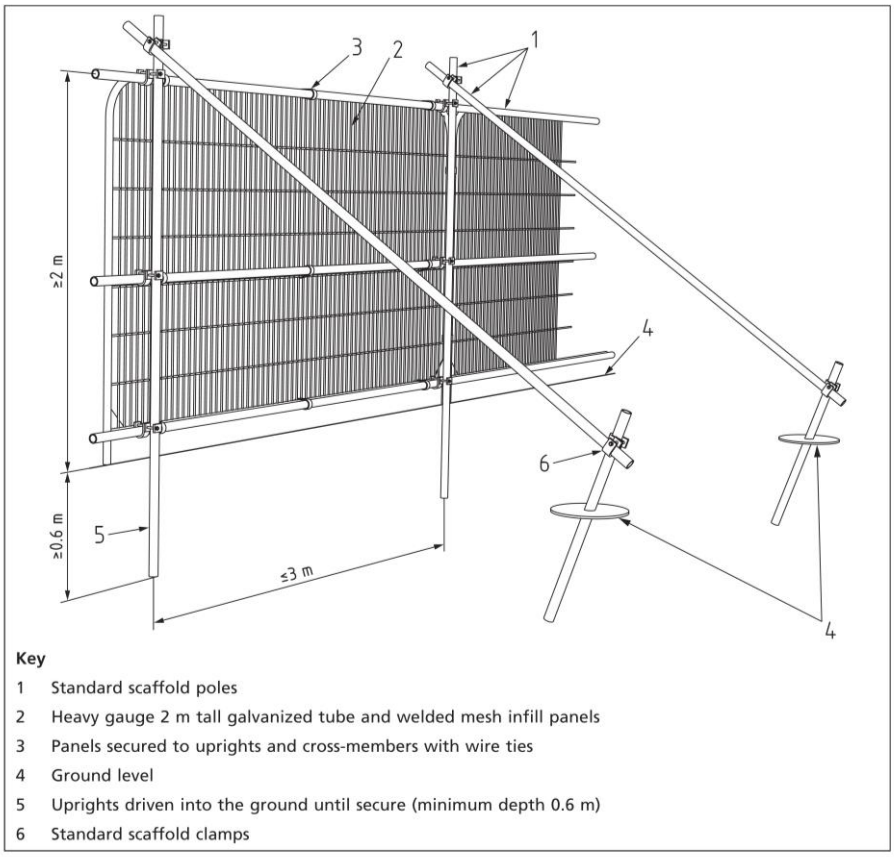
3.5.3 It is important to recognise that the local planning authority have the power to serve a Stop Notice if a breach of conditions occurs. Therefore, it is important that works which may impact upon trees are suitably controlled by competent personnel.

3.5.4 The project arboriculturist's role is to monitor compliance with arboricultural conditions and advise on any tree problems that arise or modifications that become necessary. Following every site visit, a report will be sent to the local authority tree officer and the client/developer as an audit trail of compliance (ref. subsection 6.3 of BS 5837).

3.5.5 A pre-commencement site meeting will be held between the project arboriculturist, the site manager or developer's representative and an LPA representative before works on site start. If an LPA representative cannot attend, the project arboriculturist will provide details of the meeting. The purpose of the meeting is to discuss all tree protection measures in the AMS and agree tree protection to be used. The necessity and frequency of site monitoring and supervision will also be agreed.

3.5.6 The position of the barriers should be confirmed by the project arboriculturist following the first site monitoring visit.

3.5.7 Unless agreed in writing with the LPA, tree protective barriers shall be erected in accordance with Section 6 of BS 5837, see examples below.



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

Figure 1 – Default specification for protective barrier

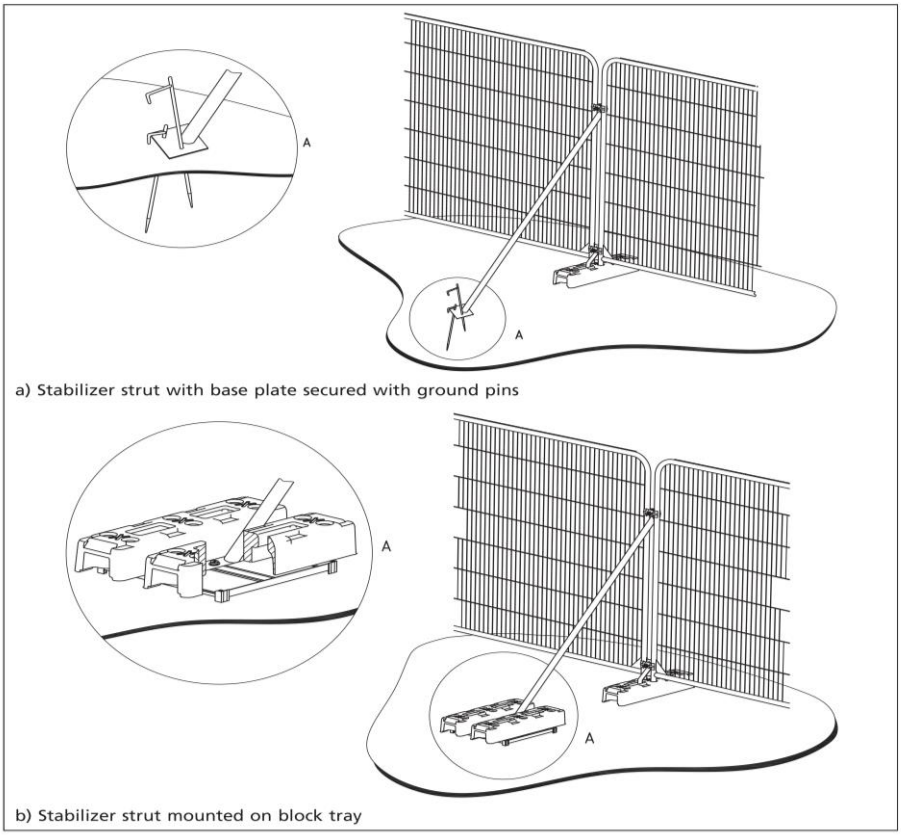


Figure 2 – Example of above-ground stabilising systems

Figures above courtesy of BSI. For illustration at this stage. Full details to be included in a full Arboricultural Method Statement.

Figure 4 – Default specification for protective barrier

Figure 1 – Examples of proprietary ground protection panels

4.0 Principles for working close to trees

4.1.1 The following information is to allow for proper consideration of requirements close to trees at the planning application stage. Details are generic and site-specific details shall be prepared once detailed design takes place following planning consent.

4.2 No-dig hard-surfaces

4.2.1 Cellular confinement systems (CCS) are constructed using a three-dimensional grid of plastic cells filled with no-fines angular aggregate. The system transfers vertical loads horizontally, thereby reducing ground pressure. The cells prevent sideways displacement of the aggregate.
No-dig CCS result in higher finished levels than conventional construction by as much as 300mm. It is important to ensure that a raised finished level can be incorporated into the development. Existing road levels and existing and proposed building thresholds often cause conflict.
Speed-humps or similar can sometimes be used to disguise changes in level between roads.
Several manufacturers produce CCSs (see below). Cellweb® Geosynthetics recommend a grid depth of:

- 100mm for domestic vehicles.
- 150mm for refuse vehicles, fire engines etc.
- 200mm for heavy construction vehicles.

Other than removal of surface vegetation and filling of ground irregularities with sharp sand, there is to be no preparation of the soil beneath the CCS with **NO COMPACTION** of soil by vehicles or plate compactors.
Between the soil and the CCS, a geotextile such a Treetex™ is laid. Apart from separating the soil from the aggregate, Treetex™ minimises the movement of oil pollution into the root zone beneath. A general geotextile such as Terram™, is not suitable.
The CCS cells are filled with a no-fines angular aggregate, such as Type 4/20 or Type 20/40. MOT Type 1 or Type 3 **MUST NOT BE USED**. The fine particles in these products prevents air and water diffusion.
The CCS edges can be retained by several methods, such as filling the outermost cells with concrete, mounding with soil, or by using railway sleepers or timber board edging. These methods can also be used to retain the wearing surface, or a system using aluminium edging, such as AluExcel™ or similar, can be fixed into the concrete in the outermost cells.
The wearing surface must be porous such as SuDS block paving using grit between blocks, porous Bitmac, porous resin-bound gravel using a porous binder course, loose gravel, or a proprietary product such as Golpla System infilled with gravel, or Sudscape.
The suggested methods and products are for illustration only. A structural engineer or other professional, should be consulted to ensure suitability for the intended use and ground conditions. Some CCS manufacturers provide a design service.
The following is a list of manufacturers and suppliers of CCSs and edging materials. Other products and suppliers are available:
Cellweb® - Geosynthetics www.geosyn.co.uk/product/cellweb-tree-root-protection
InfraGreen Solutions – Infraweb TRP http://infragreen-solutions.com/tree-root-protection
ProtectaWeb™ - Wrekin www.wrekinproducts.com/articles/protectaweb-meets-tree-root-protection-requirements
Treetex™ - Geosynthetics www.geosyn.co.uk/wp-content/uploads/2015/08/cellweb-fact-sheet-4-60.pdf

AluExcel™ - Kinley http://www.kinley.co.uk/products/edging/exceledge

4.3 Services

4.3.1 The location and direction of new underground services should be designed to allow services to be routed away from RPAs of retained trees. When existing services within RPAs require upgrading or it is unavoidable for new services to be installed in RPAs, conventional excavation techniques are usually unacceptable. Trenchless installation should be the preferred option but if that is not feasible, any excavation is likely to have to be carried out by hand or using a compressed air lance under arboricultural supervision. The methodology used must comply with *NJUG Volume 4: Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees*[5].

4.3.2 Overhead services such as lighting, electricity, telecoms etc., should be routed outside the present and future canopy spread of retained trees. This is especially important with CCTV cameras to avoid the need for regular pruning in the future.

4.4 Foundations

4.4.1 Conventional foundations require deep excavations which will sever any roots encountered. The principle of acceptable foundations within RPAs is that important tree roots are not just retained but can continue to function normally which includes further growth.
Pile and beam foundations are often assumed to be more suitable than strip foundations, however, conventional pile and beam requires the top of the beam to be at soil level and therefore requires excavation for the beam and any compressible zone beneath. The overall depth is usually 600mm upwards. Most roots are usually found at this depth and therefore this system will not be acceptable where root loss would adversely affect a retained tree.
Where tree species, health and site circumstances allow, it can be advantageous for a trial trench to be excavated using a compressed air lance under arboricultural supervision. The purpose is to allow a proper assessment of the presence or otherwise, of roots. This can help satisfy the local planning authority tree officer that foundations can then be designed which will have a minimal impact on the tree/s.

4.5 Principles of pile and beam foundation design in RPAs

4.5.1 For where excavation is not possible, or important roots are known to be present.

4.5.2 The use of pile and beam or pile and raft can be acceptable providing the beams or raft are designed to be at or above ground-level. This will result in higher finished levels which must be allowed for during design due to the effect on access thresholds and structure heights etc.

4.5.3 The use of conventional piling mats of crushed stone, usually to a depth of around 200-300mm is not acceptable within RPAs and during the design stage the system must allow for the use of mini-piling rigs which can work from proprietary ground protection mats or metal sheets. A

[5] National Joint Utilities Group (NJUG) (2007) Volume 4, Issue 2: *Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees*, http://www.njug.org.uk/publications/

hole 600mm deep should be hand-dug in the position of each pile to ensure no important roots will be damaged. The design for the position of the piles should be flexible enough to allow for repositioning if roots are encountered.

4.5.4 The position of the piles should also take account of sufficient headroom for the piling rig where there are overhanging branches. Pruning may not be acceptable; thin branches can sometimes be tied back, but positioning the piles to avoid this is desirable.

4.5.5 The beam or raft must be designed so an absolute maximum of 100mm excavation takes place. This is to allow for the removal of minor undulations and allow for close contact between the soil and the beam.

4.5.6 Steel beams are available with a lower profile than concrete beams thereby resulting in a lower finished floor level.

4.5.7 Where there is a need for a compressible layer beneath the beam, an acceptable method is to open up a trench using a compressed air lance, which retains roots, and inserting the compressible material between retained roots. An assessment of the exposed roots can be made to determine if roots can be pruned to allow for sufficient compressible material to be inserted.

4.5.8 Depending on the percentage of the RPA covered by the building, and site circumstances, it may be necessary to leave a void for gaseous exchange, and to direct rainwater underneath.

5.0 Arboricultural Method Statement – Heads of Terms

5.1 Heads of terms arboricultural method statement

5.1.1 An arboricultural method statement (AMS) describes how operations which may affect trees will be carried out to minimise any adverse effect on them. Details of site management, detailed construction methods, materials etc. can only be finalised once the post-consent detailed design begins. For that reason, at this stage in the process, only a draft list of heads of terms summary is given and this will need more detailed consideration once consent is issued. This is as recommended in Table B1 of BS 5837 (reproduced courtesy of BSI below).

Table B.1 **Delivery of tree-related information into the planning system**

Stage of process	Minimum detail	Additional information
Pre-application	Tree survey	Tree retention/removal plan (draft)
Planning application	Tree survey (in the absence of pre-application discussions)	Existing and proposed finished levels
	Tree retention/removal plan (finalized)	Tree protection plan
	Retained trees and RPAs shown on proposed layout	Arboricultural method statement – heads of terms
	Strategic hard and soft landscape design, including species and location of new tree planting	Details for all special engineering within the RPA and other relevant construction details
	Arboricultural impact assessment	
Reserved matters/ planning conditions	Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method	Arboricultural site monitoring schedule
	Dimensioned tree protection plan	Tree and landscape management plan
	Arboricultural method statement – detailed	Post-construction remedial works
	Schedule of works to retained trees, e.g. access facilitation pruning	Landscape maintenance schedule
	Detailed hard and soft landscape design	

5.2 Identification of areas to be protected

5.2.1 The draft tree protection plan shows all known areas where protective measures will be required. Tree protection is shown as barriers and/or ground protection defining the Construction Exclusion Zone (CEZ)[6]. Where necessary, areas outside the CEZ but still within the RPA are indicated. Any works within these areas will require arboricultural input, supervision and likely to require specialist techniques.

[6] *Construction Exclusion Zone. An area based on the RPA in m^2 identified by an arboriculturist, to be protected during development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.*

Table 6 - Heads of terms summary

Works within RPAs or with likelihood to impact trees	Arboricultural Input
Who will be responsible for protecting the trees on site.	Usually the site manager – to be agreed at pre-construction meeting.
Auditable system of arboricultural site monitoring, including a schedule of specific site events requiring input or supervision and how problems will be reported and solved.	To be agreed at pre-construction meeting.
Tree works pre-development and any facilitation pruning to allow for site access.	Review with tree work contractor
Site clearance, demolition including the removal of hard surfaces.	Review with main contractor/demolition contractor re working practices.
Installation of tree protection barriers and any ground protection.	Review specification and supervise installation.
Details of soil and archaeological investigations, contaminated soil removal, Japanese knotweed control and other works requiring excavation, if near trees.	Review with specialist.
Site hoarding, temporary services, site facilities, parking, storage of materials and plant and welfare.	Review at detailed-design stage and supervise where close to trees.
Crane access, location and movements.	Review at detailed-design stage and with contractor on site.
Details of changes in soil levels, grading, mounding and removal of spoil and details of retaining structures where permanent changes of soil level are proposed.	Review at detailed-design stage and supervise where close to trees.
Measures to control dust, concrete washings and wheel washings near trees.	Review at detailed-design stage and with contractor on site.
Any excavations within CEZs.	Review at detailed-design stage and supervise where close to trees.
Specialist foundations, including details of piling operations. Installation of new hard surfacing.	Review at detailed-design stage and supervise where close to trees.
Precise services locations, including methods of installation near trees where unavoidable.	Review at detailed-design stage and supervise where close to trees.
Landscaping works, including removal of tree protection.	Review at detailed-design stage and supervise where close to trees.
Post construction amelioration where required.	Specify and supervise.

6.0 Conclusions & Recommendations

6.1 The site comprises several properties and associated land in Tiptree. There are 39 individual trees and 9 groups of trees.

6.2 To implement the design proposal, it will be necessary to remove 20 individual trees, 4 groups of trees and part of 2 further groups. There are another 3 trees recommended for removal due to their condition.

6.3 There are a number of trees that enhance the character of the site giving scale and maturity. These are mostly around the edges of the site and are to be mostly retained as part of the development.

6.4 Many of the trees to be removed are in poor condition or are small.

6.5 Various works will be within the root protection area of some trees to be retained. To ensure these do not adversely impact on trees, design and construction methods must be carefully planned. As recommended in Table B.1 of BS 5837, this report includes a Heads of Terms Arboricultural Method Statement. A detailed Arboricultural Method Statement should be produced in response to a planning condition, and this should cover all works within root protection areas.

6.6 It is important that the project arboriculturist monitors and supervises key stages, particularly any works within RPAs of retained trees. Supervision/monitoring reports should be issued after each inspection as a record of compliance and audit trail for the local authority.

6.7 Provided tree protection and methods of work close to trees outlined in this report are followed, the impact of the development on trees will be minimal.

6.8 The routes of proposed services should be assessed by the project arboriculturist and a detailed arboricultural method statement produced in conjunction with the services engineer and contractor if services are to be routed within root protection areas.

6.9 Foundation design should take into account trees to be retained, trees to be removed and new trees to be planted.

6.10 Tree protection barriers and any ground protection must be in place before any works begin.

6.11 The project arboriculturist should review proposals for archaeological investigations, contaminated soil remediation or Japanese knotweed control, to assess any impact on retained trees and if there is a conflict, advise on mutually acceptable solutions.

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Appendix 1 - Tree Survey Schedule – Explanatory Notes & Survey Sheets

Methodology

A ground level only survey was undertaken. No specialist decay detection equipment was used with just basic sounding and probing tools used where necessary. No soil samples or investigations were carried out.

Access to trees outside the site boundaries may not have been possible, thus observations are confined to what was visible from within the site and any surrounding public areas.

Where heavy ivy, or other vegetation is present, trees are assessed from what can be seen.

The survey and this report is prepared for planning purposes only and is not a safety assessment of trees. Any obvious faults, hazards or health issues will be commented on and are part of the assessment for suitability for retention; however, it must be understood that this report is not a tree risk assessment and should not be construed as such. This report must not be relied on to ensure the tree owner's Duty of Care has been fulfilled.

Tree No.

T: Tree; G: Group; W: Woodland; H: Hedge; S: Shrub mass

Species

Common names are used with the scientific name given the first time of use.

Height

Estimated or measured with the use of a Disto laser measurer, given in metres.

Trunk Diameter

Measured at approximately 1.5m above ground level and given in millimetres.

Radial Crown Spread

Measured by Disto laser measurer at the main cardinal points and given in metres. For trees with reasonably symmetrical crowns, a single averaged figure is given.

Crown Clearance

Estimated height of main crown above ground level. Given in metres.

Height to 1st Branch

The height of the first main branch above ground level and aspect. Usually estimated unless deemed important. Given in metres.

Life Stage

NP: Newly planted.

Y: Young - an establishing tree that could be easily transplanted.

SM: Semi-mature - an established tree still to reach its ultimate height and spread and with considerable growth potential.

EM: Early mature - a tree reaching its ultimate height and whose growth is slowing, however, it will still increase considerably in stem diameter and crown spread.

M: Mature - a tree with limited potential for further significant increase in size although likely to have a considerable safe useful life expectancy.

LM: Late mature - a senescent tree, in decline, although may still have a useful life expectancy.

V: Veteran – has features associated with advanced age for its species but not necessarily very old chronologically.

A: Ancient - a tree older than typical for the species and of great ecological, cultural or aesthetic value.

Physiology

Health, condition and function of the tree, in comparison to a normal specimen of its species and age.

Structure

Structural condition of the tree, based on both the structure of its roots, trunk, major stems and branches, and on the presence of any structural defects or decay. Given as Good, Fair, Poor or Hazardous.

Landscape Value

An evaluation of the visibility of the tree from public viewpoints. Given as Unspecified, Low, Moderate or High.

Estimated Years

Estimated remaining useful contribution in years. This is not necessarily the ultimate life expectancy of the tree as trees can often exist in a collapsed, decayed form for many years, however, this may not be appropriate in the site context.

Comments

Where appropriate, comments could expand on tree condition and health, features within the rooting zone, safety concerns etc.

BS 5837 Category

U: Unsuitable for retention. Existing condition is such that they cannot be realistically retained as living trees in the context of the current land use for longer than 10 years. Note, category U trees can have existing or potential conservation value which it might be desirable to preserve.

A: High quality and value (non-fiscal) with at least 40 years remaining life expectancy.

B: Moderate quality and value with at least 20 years remaining life expectancy.

C: Low quality and value with at least 10 years remaining life expectancy, or young trees with a stem diameter below 150 mm.

A, B and C category trees are additionally graded into 1) Mainly arboricultural values; 2) Mainly landscape values; 3) Mainly cultural values including conservation.

RPA Radius

Root protection radius in metres measured from base of tree.

RPA m^2

The total area of the RPA in square metres.

Survey undertaken on: 22 January 2019 Weather: Clear with visibility not affected

All trees with a trunk diameter of 75mm or above were surveyed, as recommended in BS 5837. Obvious hedges and shrub masses were identified where appropriate. Information collected is in accordance with recommendations in subsection 4.4.2.5 of BS 5837 and includes species, height, diameter, branch spread, crown clearance, age class, physiological condition, structural condition, and remaining contribution. Each tree was then allocated one of four categories (U, A, B or C) to reflect its suitability as a material constraint on development.

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clear-ance	Height to 1st Branch	Life Stage	Physi-ology	Structure	Est. Years	Comments	Cate-gory	RPA Radius	RPA m2
T1	Weeping willow *(Salix* x *sepulcralis* 'Chrysocoma')	8m	720mm	N8m E3m S4m W3m	3m	5m S	M	Fair	Poor	<10	Of very poor form and health. Previously heavily pruned.	C1	8.6m	234m²
T2	Pedunculate oak *(Quercus robur)*	7m	230mm	N0m E4m S7m W4m	2m	2.5m S	Y	Good	Good	40+	Small tree of good form and free from significant defects, growing within hawthorn hedge.	C1	2.8m	24m²
T3	Pedunculate oak	7m	220mm	N3m E3m S3m W3m	4m	-	Y	Good	Good	40+	Small tree of good form and free from significant defects, growing within hawthorn hedge.	C1	2.6m	22m²
T4	Pedunculate oak	12m	520mm 540mm	N7m E7m S7m W7m	3m	3m N	EM	Good	Good	40+	Hedgerow tree of good form and free from significant defects growing within common hawthorn hedge Minor deadwood scattered throughout crown	B1	9m	254m²
T5	Pedunculate oak	9m	325mm	N4m E4m S4m W4m	2m	2m N	Y	Good	Good	40+	Hedgerow tree of good form and free from significant defects growing within common hawthorn hedge	B1	3.9m	48m²

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clear-ance	Height to 1st Branch	Life Stage	Physi-ology	Structure	Est. Years	Comments	Cate-gory	RPA Radius	RPA m2
T6	Pedunculate oak	9m	270mm	N2m E2m S2m W2m	2m	-	Y	Good	Good	40+	Tree leans to the southeast otherwise tree of good form and free from significant defects	B1	3.2m	33m²
T7	Pedunculate oak	12m	520mm 500mm 250mm 250mm 230mm	N6m E6m S6m W6m	2.5m	3m N	EM	Good	Good	40+	Multi-stemmed hedgerow tree of good form and free from significant defects growing within common hawthorn hedge	B1	10m	316m²
T8	Pedunculate oak	10m	200mm 150mm 150mm 100mm	N4m E4m S5m W4m	3m	4m	EM	Good	Good	40+	Multi-stemmed hedgerow tree of good form and free from significant defects growing within common hawthorn hedge Dead tree immediately adjacent to T8, remove for health and safety reasons	C1	3.7m	43m²
T9	Pedunculate oak	9m	300mm	N4m E4m S4m W4m	4m	4m N	EM	Good	Good	40+	Hedgerow tree of reasonable form and free from significant defects growing within common hawthorn hedge	C1	3.6m	41m²
T10	Pedunculate oak	12m	400mm 390mm 300mm	N12m E6m S8m W6m	1.5m	1m N	EM	Good	Good	40+	Multi-stemmed hedgerow tree of good form and free from significant defects growing within common hawthorn hedge	C1	7.6m	182m²

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clear-ance	Height to 1st Branch	Life Stage	Physi-ology	Structure	Est. Years	Comments	Cate-gory	RPA Radius	RPA m2
T11	Pedunculate oak	9m	310mm	N4m E4m S4m W4m	3m	4m N	EM	Good	Fair	40+	Hedgerow tree of poor form	C1	3.7m	44m²
T12	Pedunculate oak	10m	420mm 335mm	N6m E6m S6m W6m	4m	4m W	EM	Good	Good	40+	Tree of good form Bark wound at one metre on west-side of stem	B1	6.4m	131m²
T13	Pedunculate oak	12m	510mm 375mm	N7m E6m S5m W7m	3m	4m W	EM	Good	Good	40+	Tree of reasonably good form Minor deadwood scattered throughout crown	B1	7.6m	181m²
T14	Pedunculate oak	8m	335mm	N5m E7m S3m W3m	3m	4m W	EM	Good	Good	40+	Tree of reasonably good form Minor deadwood scattered throughout crown and numerous old pruning stubs	C1	4m	51m²
T15	Pedunculate oak	12m	555mm 370mm	N7m E3m S5m W8m	2.5m	4m W	EM	Good	Good	40+	Tree of poor form Minor deadwood scattered throughout crown and numerous old pruning stubs	B1	8m	201m²
T16	Pedunculate oak	8m	540mm	N2m E5m S5m W5m	3.5m	3m W	EM	Good	Good	40+	Tree of reasonably good form Minor deadwood scattered throughout crown	B1	6.4m	132m²
T17	Pedunculate oak	7m	330mm	N4m E4m S4m W4m	4m	4m S	EM	Fair	Fair	20+	Tree of reasonably good form Minor deadwood scattered throughout crown	C1	4m	49m²

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clear-ance	Height to 1st Branch	Life Stage	Physi-ology	Structure	Est. Years	Comments	Cate-gory	RPA Radius	RPA m2
T18	Pedunculate oak	11m	440mm 270mm 260mm 230mm	N4m E4m S4m W4m	2m	2m N	EM	Fair	Fair	20+	Tree of poor form Deadwood scattered throughout crown	C1	7.5m	175m²
T19	Pedunculate oak	11m	440mm	N5m E5m S1m W2m	2m	3m N	EM	Poor	Poor	10+	Tree of poor form and declining in health	C1	5.2m	88m²
T20	Pedunculate oak	7m	220mm	N3m E3m S3m W3m	4m	-	Y	Good	Good	40+	Tree of good form	B1	2.6m	22m²
T21	Crab apple (*Malus* sp.)	7m	320mm 220mm 200mm	N3m E3m S3m W3m	3m	1.5m E	M	Fair	Fair	20+	Mature apple, trunk forks at 750mm Off-site tree	C1	5.2m	86m²
T22	Pedunculate oak	7m	650mm e	N4m E4m S4m W4m	3m	-	EM	Fair	Fair	40+	Tree located on edge of public highway Ivy covered stem extending into crown to 7m	B1	7.8m	191m²
T23	Pedunculate oak	7m	230mm	N3m E3m S3m W3m	4m	4m N	Y	Good	Good	40+	Young healthy tree growing adjacent to the public highway	C1	2.7m	24m²
T24	Pedunculate oak	9m	520mm 290mm 200mm	N5m E5m S5m W5m	4.5m	-	EM	Good	Good	40+	Tree growing at the edge of the public highway. Minor damage to branches growing over the carriageway. Prune to clear highway to a height of 5.1	B1	7.5m	179m²

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clear-ance	Height to 1st Branch	Life Stage	Physi-ology	Structure	Est. Years	Comments	Cate-gory	RPA Radius	RPA m2
T25	Pedunculate oak	10m	430mm 420mm	N4m E4m S4m W4m	5m	-	EM	Good	Good	40+	Twin stemmed tree growing adjacent to public highway	B1	7.2m	164m²
T26	Weeping willow	13m	620mm	N6m E6m S6m W6m	1m	4m S	M	Good	Good	20+	Tree of good form previously reduced to approximately 8 metres	B1	7.4m	174m²
T27	Weeping willow	14m	710mm	N6m E6m S6m W6m	1m	4m S	M	Good	Good	20+	Tree of good form previously reduced to approximately 8 metres	B1	8.5m	228m²
T28	Hybrid poplar (*Populus* sp.)	13m	260mm	N3m E3m S3m W3m	3m	-	M	Fair	Fair	20+	Tree growing on bank of ornamental pond Tree heavily reduced previously tree of poor form as consequence	C1	3.1m	31m²
T29	Blue gum *(Eucalyptus gunnii)*	6m	200mm	N2m E2m S2m W2m	2.5m	-	Y	Good	Good	40+	Tree of good form and health Off-site tree – section of crown extends over survey site	B1	2.4m	18m²
T30	Blue gum	6m	220mm	N2m E2m S2m W2m	2m	-	Y	Good	Good	40+	Tree of good form and health Off-site tree – section of crown extends over survey site	B1	2.6m	22m²
T31	Monterey cypress *(Cupressus macrocarpa)*	8m	770mm	N3m E3m S3m W3m	3m	-	M	Fair	Fair	40+	Extensive bark wound at base of tree. Tree of poor form, previously reduced to approximately 7 metres	C1	9.2m	268m²
T32	Monterey cypress	8m	720mm	N3m E3m S3m W3m	3m	-	M	Fair	Fair	40+	Tree forks at 1500mm. Tree of poor form, previously reduced to approximately 7 metres	C1	8.6m	234m²

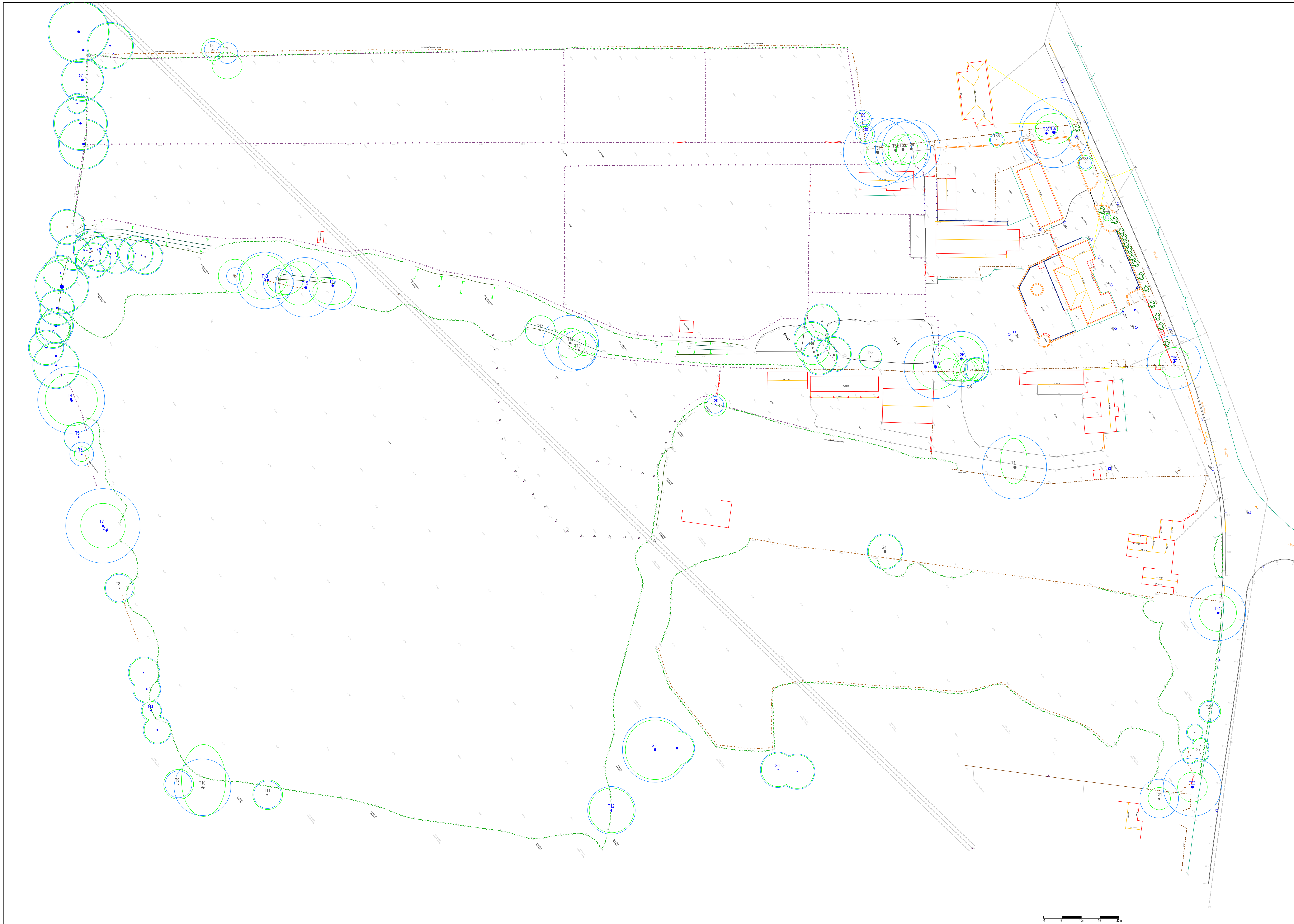
No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clear-ance	Height to 1st Branch	Life Stage	Physi-ology	Structure	Est. Years	Comments	Cate-gory	RPA Radius	RPA m2
T33	Monterey cypress	8m	620mm	N4m E4m S4m W4m	2.5m	-	M	Fair	Fair	40+	Tree of poor form, previously reduced to approximately 7 metres	C1	7.4m	174m²
T34	Monterey cypress	8m	650mm	N4m E4m S4m W4m	3.5m	-	M	Fair	Fair	40+	Tree of poor form, previously reduced to approximately 7 metres	C1	7.9m	191m²
T35	Smoke bush *(Cotinus coggygria)*	4m	100mm 95mm	N2m E2m S2m W2m	1.5m	-	Y	Good	Good	20+	Young tree of good form and health	C1	1.7m	8.6m²
T36	Monterey cypress	11m	560mm	N3m E3m S1m W6m	4m	-	M	Good	Good	40+	Tree growing in raised bed. Previously reduced to approximately 10m	B1	6.7m	142m²
T37	Monterey cypress	11m	785mm	N5m E5m S3m W5m	3m	-	M	Good	Good	40+	Tree growing in raised bed. Previously reduced to approximately 10m. Small section of crown is dead as a result of Coryneum canker	B1	9.4m	279m²
T38	Flowering cherry *(Prunus sp.)*	2m	130mm	N2m E2m S2m W2m	1m	-	Y	Good	Good	20+	Young, healthy tree growing within brick raised bed Tree could be lifted and replanted	C1	1.5m	7.6m²
T39	June berry *(Amelanchier lamarckii)*	1m	85mm	N1m E1m S1m W1m	-	-	Y	Good	Good	20+	Young, healthy tree growing within brick raised bed Tree could be lifted and replanted	C1	1.0m	3.3m²

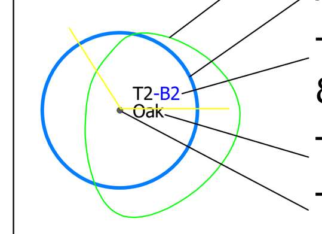
No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clear-ance	Height to 1st Branch	Life Stage	Physi-ology	Structure	Est. Years	Comments	Cate-gory	RPA Radius	RPA m2
G1	Mixed species group	Up to 15m	Group of pedunculate oak, field maple (*Acer campestre*), common hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and bramble. Unable to assess trees within group owing to impenetrable thicket. Major deadwood noted in crown of oaks within group.									B1		
G2	Mixed species group	Up to 12m	Group of pedunculate oak, field maple (*Acer campestre*), common hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), common ash (*Fraxinus excelsior*) and bramble. Unable to assess trees within group owing to impenetrable thicket.									B1		
G3	Mixed species group	Up to 9m	Group of thorn, blackthorn and elm (*Ulmus* sp).									B1		
G4	Group of 3 no. silver maple (*Acer saccharinum*)	Up to 10m	4.1 twin stem tree with stem diameters of: 200 and 200; 4.2 multi stemmed tree: 170, 290. 120, 75, 70,75 and 50.									C1		
G5	White willow (*Salix alba*)	Up to 18m	Group of multi-stemmed trees. Unable to access group as vegetation impenetrable. Trees within group have healthy crown and appear to be free from significant defects.									B1		
G6	White willow	Up to 17m	Group of multi-stemmed trees. Unable to access group as vegetation impenetrable. Trees within group have healthy crown and appear to be free from significant defects.									B1		
G7	Mixed species group	Up to 8m	Group of young elm and oak adjacent to public highway.									C1		
G8	8 x Leyland cypress	Up to 7m	Line of trees maintained to a height of 7 metres.									C1		
G9	Line of 10 no. hybrid poplar	Up to 13m	Trees of poor form and structure, previously topped to 5 metres.									C1		

Appendix 2 – Plans

Tree Constraints Plan 0357-P02-TCP

Draft Tree Protection Plan 0357-P04-TPP





BS 5837 Category
(see report for full details)

Category A - Green Category Letter
Tree of high quality & value - with an estimated remaining life expectancy of at least 40 years

Category B - Blue Category Letter
Tree of moderate quality & value - with an estimated remaining life expectancy of at least 20 years

Category C - Grey Category Letter
Tree of low quality & value - with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm

Category U - Red Category Letter
Tree of such a condition that it cannot be realistically be retained as living trees in the context of the current land use for longer than 10 years

SITE: Land off Kelvedon Road, Tiptree

TREE CONSTRAINTS PLAN

CLIENT: Marden Homes

N

PROJECT NO.	DRAWING NO.	REVISION
0357	P02-TCP	
DATE	SCALE	DRAWING STATUS
24.01.19	500:1 @ A1	Design
REV -		

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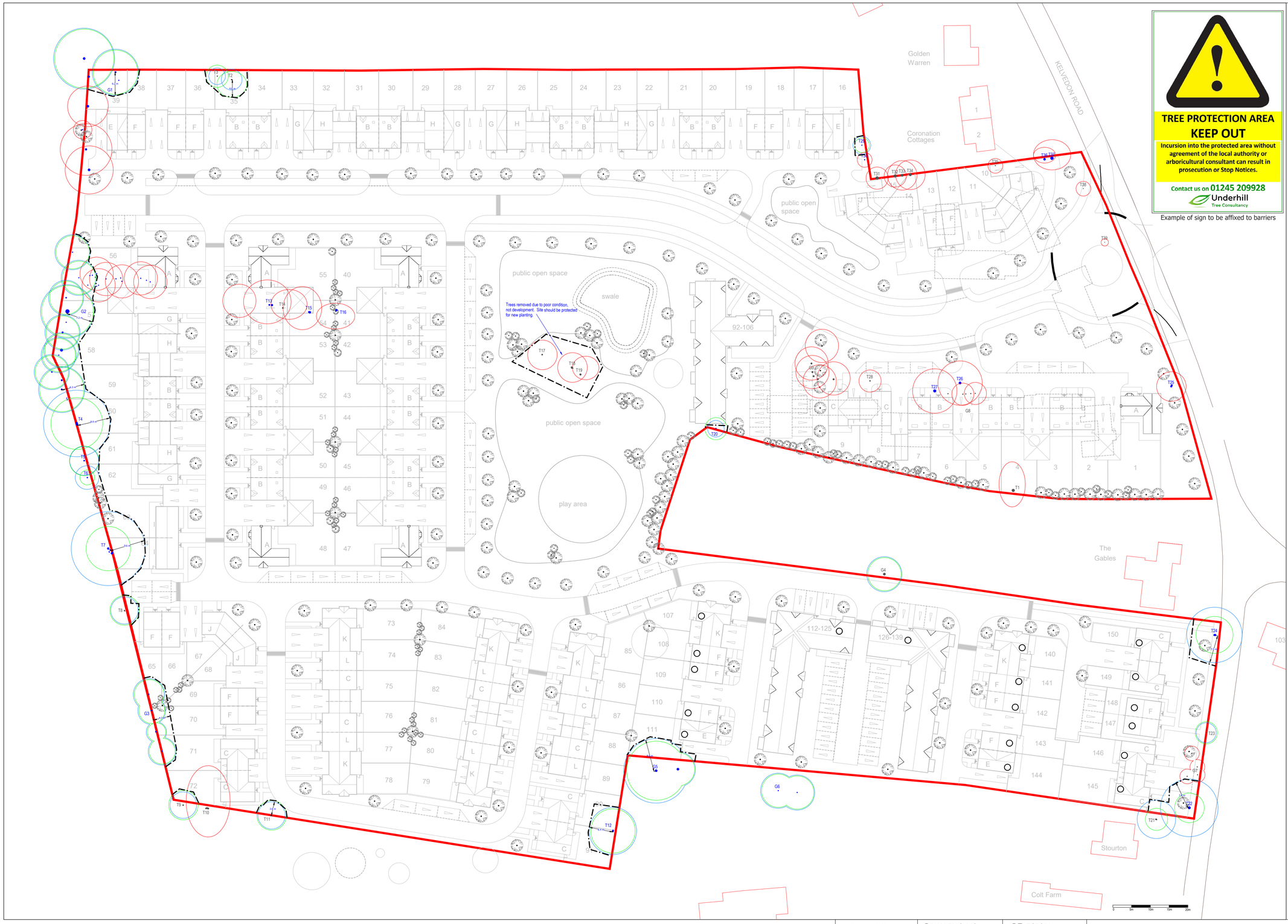
Tree Consultancy

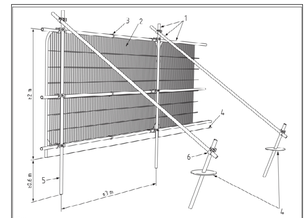


TREE PROTECTION AREA
KEEP OUT

Incursion into the protected area without agreement of the local authority or arboricultural consultant can result in prosecution or Stop Notices.

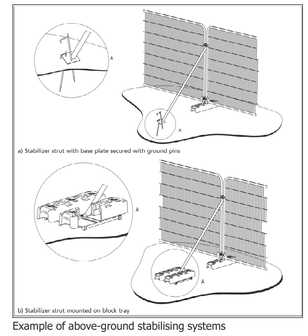
Contact us on **01245 209928**
Underhill Tree Consultancy

Example of sign to be affixed to barriers



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

Default specification for protective barrier



a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray

Example of above-ground stabilising systems

Tree protection barrier

Tree to be removed

Tree Canopy
Root Protection Area (RPA)
Tree Survey Number & BS Category (see below)
Tree Species
Trunk to Scale

BS 5837 Category
(see report for full details)

Category A - Green Category Letter
Tree of high quality & value - with an estimated remaining life expectancy of at least 40 years

Category B - Blue Category Letter
Tree of moderate quality & value - with an estimated remaining life expectancy of at least 20 years

Category C - Grey Category Letter
Tree of low quality & value - with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm

Category U - Red Category Letter
Tree of such a condition that it cannot be realistically be retained as living trees in the context of the current land use for longer than 10 years

SITE: Land off Kelvedon Road, Tiptree

CLIENT: Marden Homes

TREE PROTECTION PLAN

N

PROJECT NO.	DRAWING NO.	REVISION
0357	P04-TPP	
DATE	SCALE	DRAWING STATUS
24.01.19	500:1 @ A1	Planning
REV -		

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The report covers arboricultural issues; however, non-arboricultural matters may be referred to such as soils, ecology, construction methods etc. This should be viewed as provisional and the appropriate expert should be consulted where required.

No assessment has been made of the potential influence of trees upon existing buildings or other structures because of shrinkable soils or from direct damage.

Trees are dynamic living organisms and their condition can change rapidly and therefore this report is valid for a period of 12 months. This period may be reduced if significant changes occur to the trees or the ground conditions close to them.

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