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GLADMAN DEVELOPMENTS LIMITED

LAND AT HEMPSTED LANE

ARBORICULTURAL IMPACT ASSESSMENT

FEBRUARY 2020

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ARBORICULTURAL IMPACT ASSESSMENT

FEBRUARY 2020

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APPENDICES

DRAWINGS	TITLE	SCALE
GM10710-018 Rev. A	Tree Protection Plan	1:1000@A1

1 INTRODUCTION

1.1 Brief

1.1.1 Wardell Armstrong LLP (WA) was commissioned by Gladman Developments Ltd to undertake a BS 5837 tree survey on the site and to assess and report on the impacts on the trees and hedgerows in connection with the proposed development at Land at Hempsted Lane, Gloucester (Ordnance Survey grid reference SO 815165). For the purpose of this report this will be referred to as the 'Site' hereafter.

1.1.2 The purpose of this report is to provide an Arboricultural Impact Assessment (AIA), in order to evaluate the direct and indirect effects of the proposed layout design on the trees and hedgerows surveyed. These include trees identified within the Site, as well as those located off-site but within influencing distance. Where there are impacts from the development proposal, this report recommends, where feasible, mitigation measures to be taken to ensure that important trees and hedgerows are adequately considered during the design process. Where trees and hedgerows must be removed to enable the development, potential mitigation measures are proposed.

1.1.3 The BS5837 tree survey was undertaken by Scott Reid, Senior Arboriculturist with Wardell Armstrong, on the 15th September 2019. This, in combination with the proposed layout, supporting documents/drawing and any liaison we have had with the design team and the LPA, forms the basis of our assessment.

1.1.4 If planning permission is granted for the proposal assessed in this report, it is usual for the Local Planning Authority (LPA) to condition an Arboricultural Method Statement (AMS). An AMS would set out the specifications and methodologies for the tree protection measures implementation and would also provide a methodology for any proposed works that either encroach within the root protection areas (RPAs) or retained trees and/ or that have the potential to result in loss or damage to those trees.

1.1.5 This AIA report and attached Tree Protection Plan (TPP) accords with the methodologies and guidance set out in British Standard BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations* (The British Standards Institution, 2012).

1.2 Site Context

1.2.1 The Site is located off Hempsted Lane, Gloucester. The Site comprises of arable fields, bordered by hedgerows. To the north is Hempsted Lane and dwelling. To the south-east is the A430 highway and to the south-west and west are agricultural fields.

1.3 Development Proposal

1.3.1 Detailed development proposals are not currently available however, we understand that approximately 245 residential dwellings and associated infrastructure and areas of public open space are proposed.

1.4 Trees and the Planning Process

1.4.1 Under s197 of the Town & Country Planning Act 1990, LPAs have a legal duty to consider the protection of trees and the planting of new trees on development sites when granting planning permission. LPAs must also consider the potential effects, whether detrimental or positive, that proposed developments will have on retained trees, and the effect that these trees will have on the users of the development.

1.4.2 The Site is located within the administrative boundaries of Gloucester City Council (GCC). The following relevant saved policy from the Council's Core Strategy is reproduced below:

Gloucester, Cheltenham and Tewkesbury Joint Core Strategy 2011-2031

'***Policy INF3: Green Infrastructure***

3. Existing green infrastructure will be protected in a manner that reflects its contribution to ecosystem services (including biodiversity, landscape / townscape quality, the historic environment, public access, recreation and play) and the connectivity of the green infrastructure network. Development proposals that will have an impact on woodlands, hedges and trees will need to include a justification for why this impact cannot be avoided and should incorporate measures acceptable to the Local Planning Authority to mitigate the loss. Mitigation should be provided on-site or, where this is not possible, in the immediate environs of the site'.

1.4.3 National Planning Policy in England is detailed in the National Planning Policy Framework (NPPF). The last revised version of the NPPF (February 2019) includes the following two paragraphs on trees and development, with the latter giving specific protection to Ancient Woodland, Veteran and Ancient trees:

'*NPPF Para. 170:* *Planning policies and decisions should contribute to and enhance the*

natural and local environment by:

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland'.

*'**NPPF Para 175**: When determining planning applications, local planning authorities should apply the following principles:*

c) 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'.

1.4.4 Table B.1 taken from British Standard BS 5837:2012 gives guidance on the level of information required by LPAs in order to make an informed decision on the impact of development on trees. The production of an Arboricultural Constraints Report and Plan is the first stage of assessment in the context of the planning process.

1.4.5 Even though we have not produced a standalone Arboricultural Constraints Report and Plan, WA have undertaken a tree survey in accordance with BS5837, with this data and plan being supplied to the client to enable them to consider the arboricultural constraints for the Site. We have plotted the trees on the proposed layout so that the specific impacts on the trees can be assessed, with this informing the Arboricultural Impact Assessment (AIA) and the associated TPP, which fulfils the requirement to present the impacts of the proposed layout on the trees that are on and immediately adjacent to the Site.

1.4.6 If the proposed scheme is approved, it is common for the LPA to condition the protection of the retained trees and hedgerows on Site during the proposed development. This will usually take the form of an AMS and an updated TPP. These will show how the trees and hedgerows will be protected and will provide a methodology for any works within the RPAs of retained vegetation. These steps accord with the recommendations in BS 5837:2012 as detailed in Table B.1 as shown in Figure 1.

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	

Figure 1: BS 5837:2012 Table 1

1.5 Statutory Legal Protection

1.5.1 The two main sources of protection afforded to trees are i) Conservation Area (CA) control and ii) Tree Preservation Orders (TPO).

1.5.2 Trees within Conservation Areas are protected under the *Town & Country Planning Act 1990 (as amended)*, which affords blanket[1] protection to trees with a stem diameter of 75 mm and above when measured at 1.5 m from ground level.

1.5.3 Trees may also be protected by a TPO under the Town & Country Planning Act 1990 (as amended), The Town and Country Planning (Tree Preservation) (England) Regulations 2012 and in Wales the Town and Country Planning (Trees) Regulations 1999.

1.5.4 It is a criminal offence to carry out any unauthorised works to trees that are either protected by a TPO or located within a CA, including:

- Cutting down, uprooting or wilfully destroying a tree, or wilfully damaging, topping or lopping a tree in such a manner as to be likely to destroy it;

[1] Protection is similar to that afforded to trees protected by TPO.

- Any works that contravene the provisions of a TPO; and/or
- Any works in contravention to the regulations.

1.5.1 Penalties for non-compliance of a TPO and/or CA can be unlimited, if tried in a County Court, and up to £20,000 if tried in a Magistrates Court. Note, if the Local Planning Authority decides to also prosecute under the Proceeds of Crime Act 2002 in addition to prosecuting under the Town and Country Planning Act 1990, the fine can be unlimited in a magistrate's court.

1.5.2 It should be noted that the felling of trees prior to receiving full planning permission may also require a felling licence under the *Forestry Act 1967*. This requires that any persons wishing to fell 5 m^3 of trees within any three-month period (i.e. January to March, April to June, July to September and October to December) apply for a felling licence from the Forestry Commission. There are a number of exemptions to this requirement, with some of the more relevant exemptions including:

- Pruning trees;
- Felling fruit trees or trees growing in a garden, orchard, churchyard or designated public open space;
- Felling trees that, when measured at a height of 1.3 m from the ground, have a diameter of 8 cm or less;
- Felling trees immediately required for the purpose of carrying out development authorised by full planning permission;
- Felling necessary for the prevention of danger or the prevention or abatement of a nuisance[2] (e.g. threat/danger to a third party); and
- Felling necessary to prevent the spread of a quarantine pest or disease.

1.5.3 Other legislation that affords a lesser or indirect level of protection to trees includes the following:

- The Wildlife & Countryside Act 1981 (as amended);
- Conservation of Habitats and Species (amendment) Regulations 2018; and
- Hedgerow Regulations (1997).

[2] NB - This only applies when a real and/or immediate danger is present.

1.5.4 All of the above provide for the identification and safeguarding of flora and fauna that may be found in association with trees and woodlands.

1.6 Protected Species

1.6.1 Trees can contain features such as cavities, cracks, splits and loose bark which can offer potential habitat to species such as bats. Bats and their roosts are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) as well as the Conservation of Habitats and Species Regulations 2018 (as amended) and are also listed under Section 41 of the Natural Environment and Rural Communities Act 2006.

1.6.2 Trees provide potential nesting habitat for birds and all UK birds and their active nests are protected under the *Wildlife & Countryside Act 1981 (*as *amended)*. Bird species that are listed on Schedule 1 of *The Act* are also protected against disturbance of their active nest(s).

2 THE SURVEY

2.1 Desk Study – Legal Constraints

2.1.1 WA contacted GCC by email on 18th September 2019 to ascertain whether any trees within and/or immediately adjacent to the Site are protected by TPO and/or CA status.

2.1.2 GCC confirmed by email on 18th September 2019 that no TPOs or CAs are present on/immediately adjacent to the Site at this time. However; it should be noted that this situation can change as LPA's can serve TPOs at any time. Therefore, it is advisable to check the protective status of these trees again prior to undertaking any planned works.

2.1.3 WA conducted a search using the Woodland Trust's Ancient Tree Inventory[3] and DEFRA's Magic Map Application[4] on 18th September 2019 to ascertain whether any veteran trees or ancient woodlands are located within influencing distance of the Site.

2.1.4 No veteran trees or ancient woodlands were recorded on either of these two websites on or near the Site.

2.2 Field Survey

2.2.1 This AIA report and the associated TPP is based on a topographical survey plan supplied by the client. Where tree stem locations are not shown on the topographical survey, these are plotted using GPS plotting and/ or the utilisation of site features to manually plot the tree stem locations and canopy spreads for tree groups. Aerial photography is also utilised to plot tree group canopy spreads, where utilisation of GPS is not feasible. These methods provide a good representation of the surveyed trees; however, please note that the GPS used is not sub-metre accurate. WA cannot be held responsible for inaccurate tree locations where these are not shown on the topographical survey.

2.2.2 The arboricultural survey was undertaken by Scott Reid on the 15th September 2019 using the methodology set out in BS5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations* (see Appendices 2 and 3).

2.2.3 Weather conditions during the survey were overcast but did not impair the survey.

2.2.4 Each individual surveyed tree (T), tree group (G) and hedgerow (H) was given a sequential reference number.

[3] https://ati.woodlandtrust.org.uk/
[4] https://magic.defra.gov.uk/magicmap.aspx

2.2.5 The surveyed trees and hedgerows were then identified by their common and/or Latin name. Where a number of surveyed trees formed a cohesive feature, such as groups, they were recorded, assessed and plotted as groups (G). Whilst not every tree within groups are surveyed, a representative sample of the largest edge trees were measured in order to be able to plot the group crown spreads and RPAs. Where detailed plans show development proposed within a group or woodland, all trees within influencing distance of the development proposals are recorded, plotted and assessed.

2.2.6 A series of measurements were taken where appropriate, including:

- Stem diameters measured at 1.5 m above ground level with a standard diameter measuring tape to enable RPAs to be calculated;
- Tree height, crown height and height of first significant branch in the crown above ground level measured using a Truepulse 200L laser to inform on ground clearance, crown/stem ratio and shading; and
- Crown (branch) spreads measured with a Truepulse 200L at the four cardinal points (i.e. north, east, south and west) to enable an accurate representation of the crowns to be plotted on the TPP.

2.2.7 A description of the life stage of each surveyed tree is identified as follows:

- Young – Newly planted trees and self-seeded trees;
- Semi-mature – Large nursery stock that can be newly planted or self-seeded trees still in the early stages of establishment;
- Early mature – Trees in the first third of their life cycle which is characterised by their quickness of growth and subsequently significant increase in size;
- Mature – Trees in the second third of their life cycle, characterised by reaching their ultimate size and slowing of annual incremental growth;
- Late mature – Trees in the final third of their life cycle, often characterised by showing signs of decline; and
- Veteran – Trees that show ancient tree characteristics irrespective of their age, such as crown retrenchment and decaying wood habitat.

2.2.8 An assessment of each tree's physiological and structural condition is identified as G (good), F (fair), P (poor) or D (dead).

2.2.9 An estimated remaining contribution in years within the context of the current Site usage was identified as <10, 10+, 20+ or 40+.

2.2.10 The trees were then classified in accordance with the BS5837:2012 tree quality assessment categories 'A', 'B', 'C' and 'U' (see category criteria and grading within Appendix 3). 'A' and 'B' category trees are considered as 'high' and 'moderate' quality, respectively, and are considered as a constraint to development. As such, these trees should be retained and afforded appropriate protection during development. 'C' category trees are considered to be of 'lower' quality due to their condition or 'lower' amenity value and are, therefore not usually considered a constraint to development. 'U' category trees are those in such a 'poor' condition that they cannot usually be retained within the current Site context for longer than ten years. It should be noted that in some cases, category 'U' trees may have valuable habitat/ecological value despite being in poor condition. In such cases, where it is safe to do so, these trees may be recommended for retention and/or pruning works. Where relevant, we will bring such trees to your attention. Where trees are located outside of the red and blue line Site boundaries, irrespective of their BS 5837 categorisation, these should be considered as a constraint during the Site layout design process and protected during construction, as such trees are not within the control of the Site owner.

2.2.11 Root Protection Areas (RPAs) are calculated for individual trees utilising the methodology set out in BS 5837:2012, which is calculated by multiplying the stem diameter (measured at 1.5 m from ground level) by twelve for single-stemmed trees and a variant on this for multi-stemmed trees. For surveys in England (and outside England where it is a Local Planning Policy requirement), individual veteran trees are given a standard BS 5837 RPA and also a secondary veteran tree RPA, to accord with government's standing advice 'Ancient woodland, ancient trees and veteran trees: protecting them from development' [5] and local planning policy, which is based on a calculation of fifteen times the stem diameter or five metres beyond the crown spread, whichever is greater.

2.2.12 For tree groups, woodlands and hedgerows, the calculated RPAs are based on a set distance from the canopy edge of the tree groups, woodlands and hedgerows. This calculation is based on the largest stem diameter of the trees on the edge of the tree groups and woodlands and the crown spread measurement for these edge trees. A variant of the tree group and woodland RPA calculation is used to calculate hedgerow

[5] https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences

RPAs, with the calculation based on the largest stem diameter of the hedgerow woody plants and the hedgerow width.

2.2.13 Further details for each tree, and the groups of trees surveyed are set out in the Arboricultural Survey Schedule (see Appendix 1) and on the Tree Protection Plan Ref. No. GM10710-018 Rev. A.

2.3 Report Limitations

2.3.1 Trees are influenced by a variety of environmental variables, which can affect the health of trees causing biomechanical and physiological changes. All comments made on tree health reflects their physical condition at the time of the survey. Due to the changeable nature of trees and other site/environmental conditions, which may influence trees, the preliminary management recommendations/ further works for the surveyed trees undertaken, which can be found in Appendix 1 of this report, are only valid for a period of 12 months from the date of the Site survey (15th September 2019). These recommendations relate specifically to the general maintenance of tree health and safety and do not affect the implications of this Arboricultural Impact Assessment and therefore, the results of the survey remain valid.

2.3.2 Although comments and recommendations on the safety of particular trees may have been made, this survey is not a Tree Risk Management Survey and thus should not be treated as such. All trees were surveyed from ground level only and in a solely visual nature. However, where trees have been identified as presenting an imminent safety risk due to structural defects, this has been brought to the attention of the client and treated as a separate matter. Should trees require further detailed assessment (decay detection, aerial inspections) and do not present an imminent safety risk, the information will be detailed within the survey schedules.

2.3.3 Any management recommendations have been made in accordance with BS3998: 2010 Tree Works – Recommendations; and/or industry best practice. Works have been recommended in accordance with any statutory obligations on the landowners or occupiers.

2.3.4 This survey did not include an ecological survey of vegetation or habitat areas. Any ecological issues incidentally observed during the survey are reported on in the tree schedule.

2.3.5 For the purpose of this report no samples where obtained from Site for analysis or any other reason.

2.3.6 The survey did not include soil sampling to determine whether the soil is shrinkable. Such analysis should be carried out by a specialist to ensure building foundations are adequate in accordance with current National House Building Council Guidelines (NHBC).

3 SURVEY RESULTS AND EVALUATION

3.1 Tree Population

3.1.1 The trees assessed included nine individual trees, ten tree groups and nine hedgerows which were surveyed on and immediately adjacent to the Site.

3.1.2 45% of the individual tree population was classified as category 'B', 44% were classified as category 'C' and 11% were classified as category 'U'. None of the individual trees were classified as category 'A' during the assessment. Category 'A' trees are considered the best quality trees, whilst 'B' category trees are of moderate quality; thus, both are considered a constraint to development. Category 'U' trees are considered to be of poor quality and category 'C' trees are those of low quality, so these two categories typically comprise the lowest constraint to development.

3.1.3 In terms of combined tree groups, 40% were classified as category 'B' and 60% were classified as category 'C'. None of the groups or woodlands were classified as category 'A' or 'U' during the assessment.

3.1.4 The surveyed hedgerows were not allocated a quality category, as BS 5837 does not include a methodology for the categorisation of hedgerows. However, the extent of the canopy spread and RPA for hedges is shown on the Tree Protection Plan.

3.1.5 An assessment of the age class of the individual tree population on Site, reveals that the population is made up of semi mature and early mature trees, with these accounting for 33% and 67% of the individual tree population, respectively. On this occasion, no young, mature, late-mature and veteran individual trees were found during the survey. A summary of the age class assessment for individual trees is shown in the graph below in Figure .

Figure 2: Individual trees age class assessment summary

3.1.6 A detailed description of all trees and groups of trees surveyed and recommended works can be found in the Tree Survey Schedule in Appendix 1. Table 1 and Table 2 below summarises the BS 5837 quality grading of the trees found on Site, with these figures represented in graph format in Figure 3 and Figure 4.

Table 1: Individual Trees Quality Assessment Summary				
Tree quality	**A**	**B**	**C**	**U**
Individual Trees Identification	None	T1, T5, T6, T8	T2, T3, T4, T9	T7
Totals	**0**	**4**	**4**	**1**

Table 2: Tree Groups & Woodlands Quality Assessment Summary				
Tree quality	**A**	**B**	**C**	**U**
Tree Groups and Woodland Identification	None	G1, G4, G7, G8	G2, G3, G5, G6, G9, G10	None
Totals	**0**	**4**	**6**	**0**

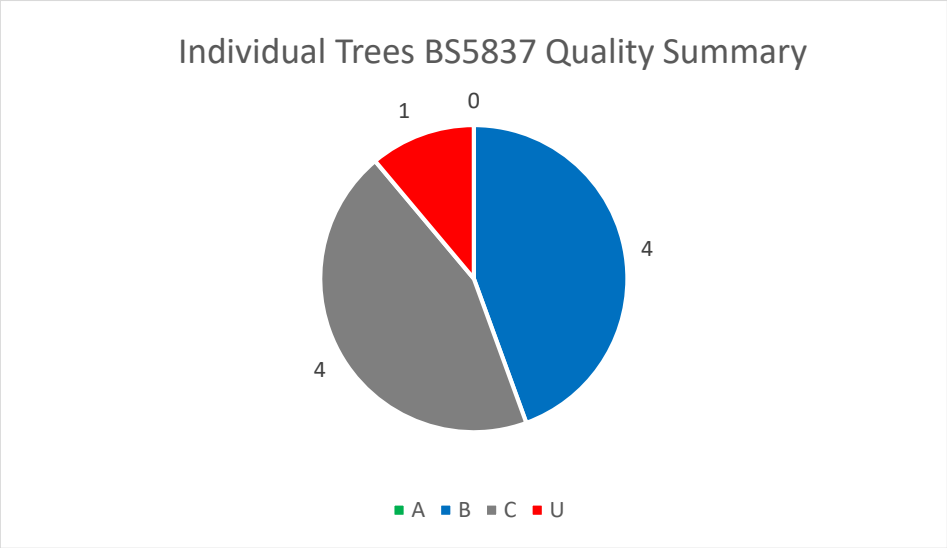


Figure 3: Overview of the BS 5837 quality of individual trees found on Site

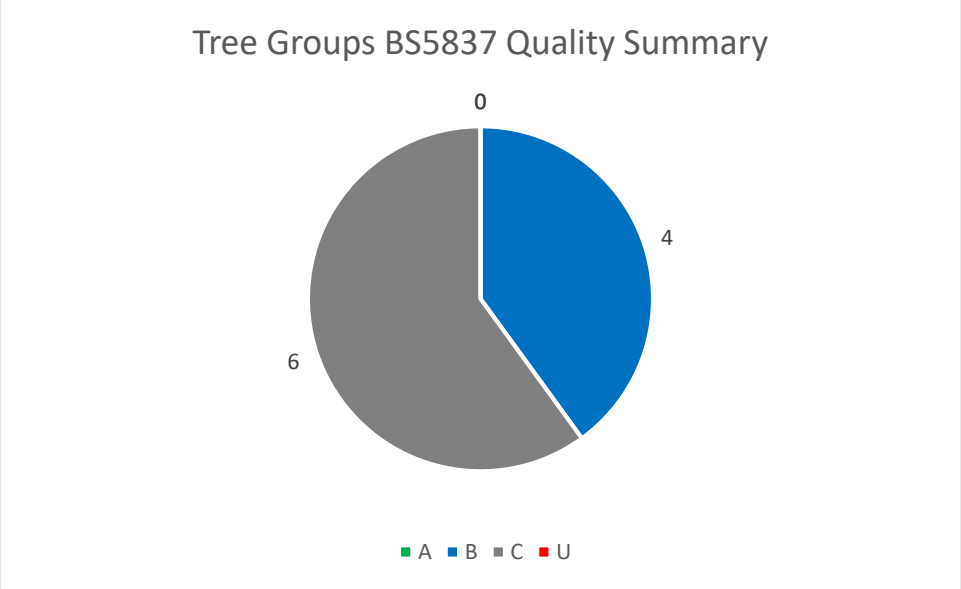


Figure 4: Overview of the BS 5837 quality of tree groups found on Site

3.2 General Tree Constraints

3.2.1 Trees impose a constraint to development in a variety of ways. These principally include their rooting areas, referred to as Root Protection Areas (RPAs), their current and future crown spread, and their species characteristics (e.g. branch and fruit drop, production of 'honey dew', density of foliage etc). Where located on shrinkable clay soils, trees can also contribute to subsidence damage to buildings.

3.2.2 Consideration should be given during the design stage for any incompatibilities between the design and tree retention. These include (but are not limited to) the effects on the amenity value provided by existing trees, working space required during

construction, infrastructure/utility requirements, highway visibility requirements and foundation design to prevent the effects of subsidence.

3.2.3 The RPA is calculated using the tree's diameter at 1.5m and represents the minimum area which should be left undisturbed around each retained tree to enable its survival following development.

3.2.4 Tree root morphology is influenced by many factors including, but not limited to; past land use, the presence of roads, structures and underground services, drainage and soils. Any of these factors may result in non-uniform root growth and therefore result in an RPA represented as a polygon RPA that reflects suitable protection of the root system.

3.2.5 The majority of tree roots are generally found within the top 600mm of soil, depending on soil types and profiles. Any disturbance or sudden changes to the rooting environment can result in damage being caused to roots and alterations to the roots physiological ability to absorb water, nutrients and undertake gaseous exchange.

3.2.6 Where alterations have been made within the trees' rooting environment, the damage can often be observed within the crown of the trees, reduced vitality and increased deadwood production. Trees are likely to decline progressively, or in some circumstances may become a hazard where stability and structural integrity has been compromised by Site operations.

3.2.7 The RPA must be protected by the installation of tree protection fencing prior to the commencement of development work on Site. The fencing provides a physical barrier that is secured, to prohibit activities considered detrimental to the retention of healthy trees (e.g. excavations, soil stripping, discharge of substances harmful to trees, storage of materials, fires). In addition to this, it may be necessary to install specialist temporary ground protection which enables access within the RPA, without causing long-term detriment to the health of the tree/s.

3.2.8 No traditional construction works should take place within the RPA of retained trees. However, in some circumstances and where there is an overriding requirement for construction and the retention of trees, it may be appropriate to employ techniques and use materials that allow trees to be retained, whilst enabling the construction. For hard surfacing, such as drives, roads and footways, utilising no-dig construction techniques and using three-dimensional geogrids and permeable wearing course materials may be appropriate. For built structures within RPAs, the use of pile and above ground level beam foundations and/or cantilevered engineering solutions can

enable structures to be constructed within RPAs. The project arboriculturist should be consulted on the appropriateness of building within retained tree RPAs, as this is not appropriate for all trees and soil types.

3.2.9 Where aerial parts of the tree crowns extend beyond the edge of the RPA, consideration should be given to protection of these parts, allowing for protection during development processes including working space. It may be appropriate to consider pruning of aerial parts to allow construction clearances and future nuisance abatement, this however must be considered by the project arboriculturist and the LPA. Where development proposals identify a need for working within the RPA/crown spread of retained trees and it can be demonstrated that retained trees remain viable, then it is important that the project arboriculturist is contacted to advise and prepare an AMS and identify appropriate stages of supervision.

4 DEVELOPMENT IMPACT TO RETAINED TREES

4.1.1 Implementation of the proposed scheme will necessitate the removal of nine small sections of hedges, as detailed in full in Table 3. No trees are required to be removed to enable the development.

4.1.2 In assessing the impacts of the proposed development on the trees on and adjacent to the Site and in proposing mitigation for these impacts, the planning application for development of the Site accords with the requirements of British Standard 5837:2012 and local and national planning policies for trees and development.

Table 3: Overview of Arboricultural Impacts and Proposed Mitigation				
Tree/ Group No.	**Proposed Works**	**Impact**	**Mitigation/Compensation**	**BS 5837 Quality Categorisation**
H1, H3 and H8	The removal of hedgerows to facilitate the proposed access and internal site roads.	Low Impact In order to facilitate the proposed access into and around the site, sections of three hedgerows will need to be removed. H1 – 1 section H3 – 2 sections H8 – 2 sections At this stage the exact length of hedgerows to be removed cannot be quantified as this will depend on the width of the roads and the amount of clearance required for visibility splays. It is recommended that the bare minimum is removed to achieve the required access and clearance, and this should be detailed in the reserved matters application.	The required amount of hedgerow removal for access and visibility splays will be detailed in reserved matters and will be kept to the minimum required to achieve these objectives.	**N/A**
H3, H6 and H7	The removal of hedgerows to facilitate proposed footpath access.	Low Impact In order to facilitate the proposed footpath access into and within the site, four sections of hedgerows will need to be removed. H1 – 1 section H3 – 1 section H6 – 1 section H7 – 1 section At this stage the exact length of hedgerows to be removed cannot be quantified as this will depend on the width of the footpaths and whether	The required amount of hedgerow removal for access and visibility splays will be detailed in reserved matters and will be kept to the minimum required to achieve these objectives.	**N/A**

Table 3: Overview of Arboricultural Impacts and Proposed Mitigation				
Tree/ Group No.	**Proposed Works**	**Impact**	**Mitigation/Compensation**	**BS 5837 Quality Categorisation**
		any clearance is required. It is recommended that the bare minimum is removed to achieve the required access, and this should be detailed in the reserved matters application.		
N/A	Removal of trees and groups to facilitate the proposed development.	Low Impact The exact details of the proposed development is unknown at this stage and therefore it is not possible to detail the exact impacts of the proposed development on the retained trees. The current masterplan shows development within the centre of the site and therefore away from the trees on site. It is possible that further hedgerow losses within the centre of the site are incurred at the detailed design stage.	It is recommended that the detailed site layout is assessed as part of the reserved matters application to determine whether the proposed development will cause any impacts on the retained trees on site.	**N/A**
N/A	Increase in ground levels/soil piling	Low Impact No information is available regarding changes in site levels. This should be assessed in relation to trees as part of the reserved matters application.	Assess any impacts on retained trees as part of the reserved matters application.	**N/A**
N/A	Proposed drainage strategy	Low Impact No information is available regarding the proposed drainage strategy. This should be assessed in relation to trees as part of the reserved matters application to determine whether there are any impacts on the retained trees. As the retained trees are around the edge of the site, it is likely that the impacts of the drainage strategy will be minimal.	Assess any impacts of the drainage scheme as part of the reserved matters application.	**N/A**

5 SUMMARY AND RECOMMENDATIONS

5.1.1 The requirements of BS 5837:2012 have been complied with in assessing the arboricultural impacts arising from the proposed residential development in this report.

5.1.2 There are no TPO or CA constraints on the Site and there are no veteran trees or ancient woodlands within or adjacent to the Site.

5.1.3 Five small sections of hedgerows will need to be removed to create the proposed access into and within the site. The exact length of hedgerow removals will depend on the detailed design of the road and associated visibility splays. It is recommended that the removals are kept to the minimum required to achieve the desired access. As currently assessed the impacts of the small sections of hedgerows removals on local amenity is considered negligible.

5.1.4 Four sections of hedgerows will need to be removed to create the proposed pedestrian access into and within the site. The exact length of removals will depend on the detailed design of the footpaths and it is recommended that removals are kept to a minimum required to achieve the desired access. As currently assessed the impacts of the small sections of hedgerows removals on local amenity is considered negligible.

5.1.5 It is recommended that the detailed development design is assessed as part of the reserved matters application to determine the exact impacts of the proposed access roads and footpaths and any further impacts that may arise from any level changes and the proposed drainage strategy.

5.1.6 The trees and hedgerows that are to be retained on the Site will be protected with tree protection fencing when the reserved matters application is decided, and development commences on Site. Unless otherwise stated in an Arboricultural Method Statement (AMS), the protective fencing will comprise the default fencing described in BS5837:2012. An example of this is included at Appendix 4. Signage on the fencing will also be required and an example of this is included at Appendix 5.

5.1.7 The location of the Tree Protective Fencing?? (TPF) will be detailed as part of the assessment of the detailed design within the reserved matters application and shown on an updated TPP.

5.1.8 An AMS and an updated TPP may be required by the LPA prior to commencement of the proposed development following reserved matters approval, to ensure tree and

hedgerow protection measures are fully specified and implemented. This can be conditioned by the LPA, if required.

6 REFERENCES

- British Standard, BS 3998:2010 Tree work. Recommendations. (The British Standards Institution, 2010).
- British Standard, BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations. (The British Standards Institution, 2012).
- NJUG Volume 4 - Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees (Issue 2:16th November 2007).
- Quantified Tree Risk Assessment User Manual, (QTRA User_Manual_V5.1.4_ 2015_01). (Incorporating extracts).
- Ministry of Housing, Communities and Local Government (2014) Tree Preservation Orders and Trees in Conservation Areas. https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas
- Forestry Commission (2007) Tree Felling – Getting Permission.
- Claus Mattheck (2007) Updated field guide for Visual Tree Assessment.
- Forestry Commission & Natural England (Updated 4th January 2018) Ancient Woodland and Veteran Trees: Protecting them from Development – Guidance. https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences#veteran-trees

Appendix 1

Tree Survey Schedule

Location: Hempsted Lane, Gloucester (Job. No. GM10710)

Estimated Stem Diameters & Other Measurements highlighted in this colour

Surveyor: SR

Weather: Overcast

Survey Date: 15/09/2019

Item type: **T** (tree), **G** (group), **H** (hedge), **W** (woodland)	Tree/ Group Ref. No.	Botanical Name	Height(m)	Crown Clearance (m) & compass direction	Crown Spread (m)				Stem Diameter @ 1.5m (mm)					Number of stems	Age Class: **Y** (Young), **SM** (Semi-Mature), **EM** (Early-Mature), **M** (Mature), **LM** (Late-mature), **V** (Veteran)	Condition		Estimated Remaining Contribution: (<10, 10+, 20+, 40+)	BS5837 Categorisation Grading		Comments	Preliminary management recommendations/ further works	BS 5837 Root Protection Area (m^2)	BS 5837 Root Protection Radius (m)	Veteran Tree Root Protection Radius (m)
					North	East	South	West								Physiological Condition: **G** (Good), **F** (Fair), **P** (Poor), **D** (Dead)	Structural Condition: **G** (Good), **F** (Fair), **P** (Poor)			Sub Category					
T	1	Common ash	12	3 W	4.5	5.5	4	4	300					1	EM	G	G	40+	B	1,2	Hedgerow tree. Small deadwood noted. Ivy cover to main stem and branches. Well developed crown.	No works required.	41	3.6	N/A
T	2	Lawson cypress 'Ellwoodii'	7	1	1	1	1	1	60	50				2	EM	G	G	20+	C	1	Typical garden specimen located in an adjacent property. Shaded-out crown to south, causing some exposed dead foliage to this aspect.	No works required.	2.8	0.9	N/A
T	3	Common ash	10	2 S	6.5	4	5	3	550					1	EM	F	G	20+	C	1	Standard tree within hedgerow. It has been topped in the past to the main stem but has since lapsed in management and now has a well formed crown. The canopy appears to be thinning with some small deadwood production. Surrounding hedgerow prevents a detailed inspection at base. There is a decay pocket in the mid crown visible from the east side.	If land use intensifies near tree, re-inspect tree for safety/risk purposes, prior to land-use intensification.	137	6.6	N/A
T	4	Hawthorn	5	2	2.5	2.5	2.5	3	60	130	70			3	SM	F	F	20+	C	1	Standard hedgerow specimen. Fairly thinning crown. Dense hedgerow vegetation prevents a detailed inspection at base.	No works required.	11.5	1.9	N/A

					Crown Spread (m)											Condition								
Item type: T (tree), **G** (group), **H** (hedge), **W** (woodland)	**Tree/ Group Ref. No.**	**Botanical Name**	**Height(m)**	**Crown Clearance (m) & compass direction**	**North**	**East**	**South**	**West**	**Stem Diameter @ 1.5m (mm)**					**Number of stems**	**Age Class: Y** (Young), **SM** (Semi-Mature), **EM** (Early-Mature), **M** (Mature), **LM** (Late-mature), **V** (Veteran)	**Physiological Condition: G** (Good), **F** (Fair), **P** (Poor), **D** (Dead)	**Structural Condition: G** (Good), **F** (Fair), **P** (Poor)	**Estimated Remaining Contribution: (<10, 10+, 20+, 40+)**	**BS5837 Categorisation Grading**	**Sub Category**	**Comments**	**Preliminary management recommendations/ further works**	**BS 5837 Root Protection Area (m²)**	**BS 5837 Root Protection Radius (m)**	**Veteran Tree Root Protection Radius (m)**
T	5	English oak	11	2	6	7	5	6	450					1	EM	G	G	40+	B	1	Standard tree within hedgerow. Single main leader with a wide crown. Some minor bark wounds noted in canopy and small deadwood.	No works required.	92	5.4	N/A
T	6	Common ash	12	2.5 NW	5.5	6	5	5.5	360					1	EM	G	G	20+	B	1	Standard tree within hedgerow. Epicormic growth in crown. Surrounding hedgerow prevents a detailed inspection at base. Small deadwood noted.	No works required.	59	4.3	N/A
T	7	English elm	6	3	2	2	2	2	210					1	SM	D	D	<10	U		A completely dead specimen covered in ivy.	Fell to ground level within 1 year.	20	2.5	N/A
T	8	Common ash	13	3	5	6	4.5	5	380					1	EM	G	G	40+	B	1	Hedgerow tree which appears to be in good condition. Ivy and surrounding hedgerow prevented a detailed inspection at base. Main stem rubs against an elm stem in hedgerow. Small deadwood noted.	No works required.	65	4.6	N/A
T	9	Sycamore	8	3 SE	3	4.5	3.5	4	250					1	SM	G	G	40+	C	1,2	Off-site specimen, possibly within influencing distance of the site. Limited access prevents a detailed inspection but it appears to be in good condition when viewed from the site site.	No works required.	28	3.0	N/A
G	1	Silver birch	11	3	Plotted using GPS.				220					1	SM	G	G	40+	B	1,2	Located in an adjacent garden. 2 trees in close proximity forming one homogenous canopy which overhangs the site. Ivy to stems. No major observed defects.	No works required.	RPA 1.4m inside canopy.		N/A

Item type: **T** (tree), **G** (group), **H** (hedge), **W** (woodland)	Tree/ Group Ref. No.	Botanical Name	Height(m)	Crown Clearance (m) & compass direction	Crown Spread (m)				Stem Diameter @ 1.5m (mm)					Number of stems	Age Class: **Y** (Young), **SM** (Semi-Mature), **EM** (Early-Mature), **LM** (Late-mature), **M** (Mature), **V** (Veteran)	Condition		Estimated Remaining Contribution: (<10, 10+, 20+, 40+)	BS5837 Categorisation Grading	Sub Category	Comments	Preliminary management recommendations/ further works	BS 5837 Root Protection Area (m^2)	BS 5837 Root Protection Radius (m)	Veteran Tree Root Protection Radius (m)
					North	East	South	West								Physiological Condition: **G** (Good), **F** (Fair), **P** (Poor), **D** (Dead)	Structural Condition: **G** (Good), **F** (Fair), **P** (Poor)									
G	2	Field maple, sycamore	13	4	Plotted using GPS.				230	150				2	SM to EM	G	G	40+	C	1,2	Small group of off-site trees overhanging the site. They have been flailed over the field side to 4m.	No works required.	RPA to canopy.		N/A
G	3	Ash, blackthorn, hawthorn, dogwood, hazel, field maple, English oak.	7	0	Plotted using topographical survey and aerial photgraph.				70					1	Y to SM	G	G	40+	C	1	Large cohesive screening belt along boundary with main road. Unmaintained, and unclear whether a planted shelterbelt or self-set vegetation. Provides effective screening.	No works required.	RPA to canopy.		N/A
G	4	Contorted willow, orchard apple.	10	3.5	Plotted using GPS.				300					1	EM to M	G	G	20+	B	1	A group of off-site trees located close to the site boundary and slightly overhanging. The single contorted willow in group has cracking bark to main stem and a lower branch. Minor deadwood noted. Fire damage at base of one of the apple trees. Stubs due to crown lifting. Apples have been topped in the past. Acceptable condition at this time.	No works required.	RPA to canopy.		N/A
G	5	Orchard apple	5	1.5	Plotted using GPS.				130					1	SM	G	G	40+	C	1	Two small apple trees in close proximity to each other and forming a homogenous canopy. Located off-site but slightly overhanging the site boundary.	No works required.	RPA to canopy.		N/A

Item type: **T** (tree), **G** (group), **H** (hedge), **W** (woodland)	Tree/ Group Ref. No.	Botanical Name	Height(m)	Crown Clearance (m) & compass direction	Crown Spread (m)				Stem Diameter @ 1.5m (mm)					Number of stems	Age Class: **Y** (Young), **SM** (Semi-Mature), **EM** (Early-Mature), **LM** (Late-mature), **M** (Mature), **V** (Veteran)	Condition		Estimated Remaining Contribution: (<10, 10+, 20+, 40+)	BS5837 Categorisation Grading	Sub Category	Comments	Preliminary management recommendations/ further works	BS 5837 Root Protection Area (m^2)	BS 5837 Root Protection Radius (m)	Veteran Tree Root Protection Radius (m)
					North	East	South	West								Physiological Condition: **G** (Good), **F** (Fair), **P** (Poor), **D** (Dead)	Structural Condition: **G** (Good), **F** (Fair), **P** (Poor)								
G	6	Plum, ash.	9	2.5	Plotted using GPS.				180					1	SM	G	G	40+	C	1	A group of off-site plum trees (and one ash) which are close to, and slightly overhanging, the boundary. A utility cable runs through the group and is conflicting with canopies.	Prune to clear rubbing branches off of the utility cables - within 1 year. Note, this may be the responsibility of the utility cable company.	RPA to canopy.		N/A
G	7	Field maple, Holm oak, hawthorn, Norway maple 'Crimson King'	12	0	Plotted using GPS.				200					1	SM to EM	G	G	40+	B	1,2	Large band of dense trees along northern boundary, providing effective screening to/from adjacent properties. Located off-site but slightly overhanging. The lower crowns have been flailed over the field side.	No works required.	RPA to canopy.		N/A
G	8	Himalayan birch, silver birch	9	3	Plotted using GPS.				200					1	SM	G	G	40+	B	1,2	Four off-site birch trees, potentially within influencing distance of development. All located within nearby gardens. Limited access prevents a detailed inspection but they appear to be in good condition when viewed from site side.	No works required.	RPA to canopy.		N/A
G	9	Plum, hawthorn, goat willow	7	0	Plotted using GPS.				100					1	SM	F	F	20+	C	1	A small cluster of scrubby trees which have not been flailed in line with the hedgerow and left to grow tall. Of limited arboricultural value.	No works required.	RPA to canopy.		N/A

Item type: **T** (tree), **G** (group), **H** (hedge), **W** (woodland)	Tree/ Group Ref. No.	Botanical Name	Height(m)	Crown Clearance (m) & compass direction	Crown Spread (m)				Stem Diameter @ 1.5m (mm)				Number of stems	Age Class: **Y** (Young), **SM** (Semi-Mature), **EM** (Early-Mature), **LM** (Late-mature), **M** (Mature), **V** (Veteran)	Condition		Estimated Remaining Contribution: (<10, 10+, 20+, 40+)	BS5837 Categorisation Grading	Sub Category	Comments	Preliminary management recommendations/ further works	BS 5837 Root Protection Area (m^2)	BS 5837 Root Protection Radius (m)	Veteran Tree Root Protection Radius (m)
					North	East	South	West							Physiological Condition: **G** (Good), **F** (Fair), **P** (Poor), **D** (Dead)	Structural Condition: **G** (Good), **F** (Fair), **P** (Poor)								
G	10	Hornbeam, silver birch, black pine, sycamore.	10	3	Plotted using GPS.				160				1	SM	G	G	40+	C	1,2	A group of off-site hedgerow trees set back from the boundary but still potentially within influencing distance. All appear to be in good condition when viewed from the site side.	No works required.	RPA to canopy.		N/A
H	1	Hawthorn, blackthorn, English elm, field maple, wild privet.	7	0	Plotted using topographical survey.				80				1	Y to SM	G	G	40+	N/A		Large field boundary hedgerow, generally well maintained over the site side. Occasional semi-mature elms and field maples have been allowed to grow as standards within the hedgerow. Some dead elms have been noted within the hedgerow.	Remove dead elm trees (shown on the plan) within 1 year.	RPA to canopy.		N/A
H	2	Bramble, hawthorn, field maple, hazel, walnut.	6	0	Plotted using topographical survey.				70				1	Y to SM	G	G	20+	N/A		Unmaintained section of old hedgerow, now mainly bramble. Provides very effective screening to/from adjacent properties.	No works required.	RPA to canopy.		N/A
H	3	Bramble, hawthorn, blackthorn.	2	0	Plotted using topographical survey.				30				1	Y	G	G	20+	N/A		Fairly insignificant hedgerow. Not well maintained to the north and returning to bramble scrub.	No works required.	RPA to canopy.		N/A
H	4	Hawthorn, English elm, bramble.	2.5	0	Plotted using topographical survey.				30				1	Y	F	F	20+	N/A		Small, insignificant section of field boundary hedgerow. Fairly unmaintained.	No works required.	RPA to canopy.		N/A

Item type: **T** (tree), **G** (group), **H** (hedge), **W** (woodland)	Tree/ Group Ref. No.	Botanical Name	Height(m)	Crown Clearance (m) & compass direction	Crown Spread (m)				Stem Diameter @ 1.5m (mm)					Number of stems	Age Class: **Y** (Young), **SM** (Semi-Mature), **EM** (Early-Mature), **LM** (Late-mature), **M** (Mature), **V** (Veteran)	Condition		Estimated Remaining Contribution: (<10, 10+, 20+, 40+)	BS5837 Categorisation Grading		Comments	Preliminary management recommendations/ further works	BS 5837 Root Protection Area (m^2)	BS 5837 Root Protection Radius (m)	Veteran Tree Root Protection Radius (m)
					North	East	South	West								Physiological Condition: **G** (Good), **F** (Fair), **P** (Poor), **D** (Dead)	Structural Condition: **G** (Good), **F** (Fair), **P** (Poor)			Sub Category					
H	5	Blackthorn, hawthorn, English elm.	2	0	Plotted using topographical survey.				30					1	Y	G	G	20+	N/A		Long field boundary hedgerow running along the entire southern boundary of the site. Fairly well maintained though bramble is overtaking in places.	No works required.	RPA to canopy.		N/A
H	6	English elm, blackthorn, hawthorn, common ash, bramble.	2.5	0	Plotted using topographical survey.				40					1	SM	G	G	20+	N/A		Large and generally consistent field boundary hedgerow. Gappy in places but overall fairly well maintained.	No works required.	RPA to canopy.		N/A
H	7	Hawthorn, blackthorn, plum, elder, English elm, common ash, beech, bramble.	3	0	Plotted using topographical survey and aerial photgraph.				70					1	Y	G	G	40+	N/A		Large field boundary hedgerow running along the northern boundary. Intact sections are generally well maintained; however, there are also sections which have reverted to bramble scrub, particularly to the east.	No works required.	RPA to canopy.		N/A
H	8	Bramble, elder, English elm, blackthorn	2.5	0 N/A	Plotted using topographical survey.				50					1	Y	G	G	20+	N/A		Section of fairly typical field boundary hedgerow; somewhat overtaken by bramble.	No works required.	RPA to canopy.		N/A
H	9	Hawthorn, blackthorn, hazel, bramble, English elm.	3.5	0 N/A	Plotted using topographical survey.				50					1	SM	G	G	40+	N/A		Scrubby mixed hedgerow formed from garden species and original field boundary hedgerow, all flailed as a single unit. Provides effective screening to/from adjacent properties.	No works required.	RPA to canopy.		N/A

Appendix 2
Survey Methodology

Appendix 2: Survey Methodology

The following features of each tree, group of trees or woodland have been recorded in the Arboricultural Data Sheets:

- Species includes common names.
- Height measured in metres from the stem base. Where the ground has a significant slope, the higher ground is selected.
- Crown height is measured in metres and is an indication of the average height at which the main crown begins.
- Stem diameter is measured in millimetres at 1.5m above the adjacent ground level (upslope on sloping ground).
- Crown spread is measured in metres and taken at the four cardinal points to derive an accurate representation of the crown.
- Age class of the tree is described as young, semi-mature, early mature, late-mature, mature or veteran.
- Physiological condition is classed as good, fair, poor, or dead. This is an indication of the health of the tree and takes into account vitality, presence of disease and dieback.
- Structural condition is classed as good, fair or poor. This is an indication of the structural integrity of the tree and takes into account significant wounds, decay and quality of branch junctions.
- Life expectancy is classed as: less than 10 years (<10), at least 10 years (10+), at least twenty years (20+) or at least 40 years (40+). This is an indication of the number of years before the removal of the tree is likely to be required.
- Comments include a brief description of the tree with comments on the form, vitality, health and any significant defects that may be present.

Appendix 3
Tree Categorisation Method

Appendix 3: Tree Categorisation Method

Table 1 **Cascade chart for tree quality assessment**

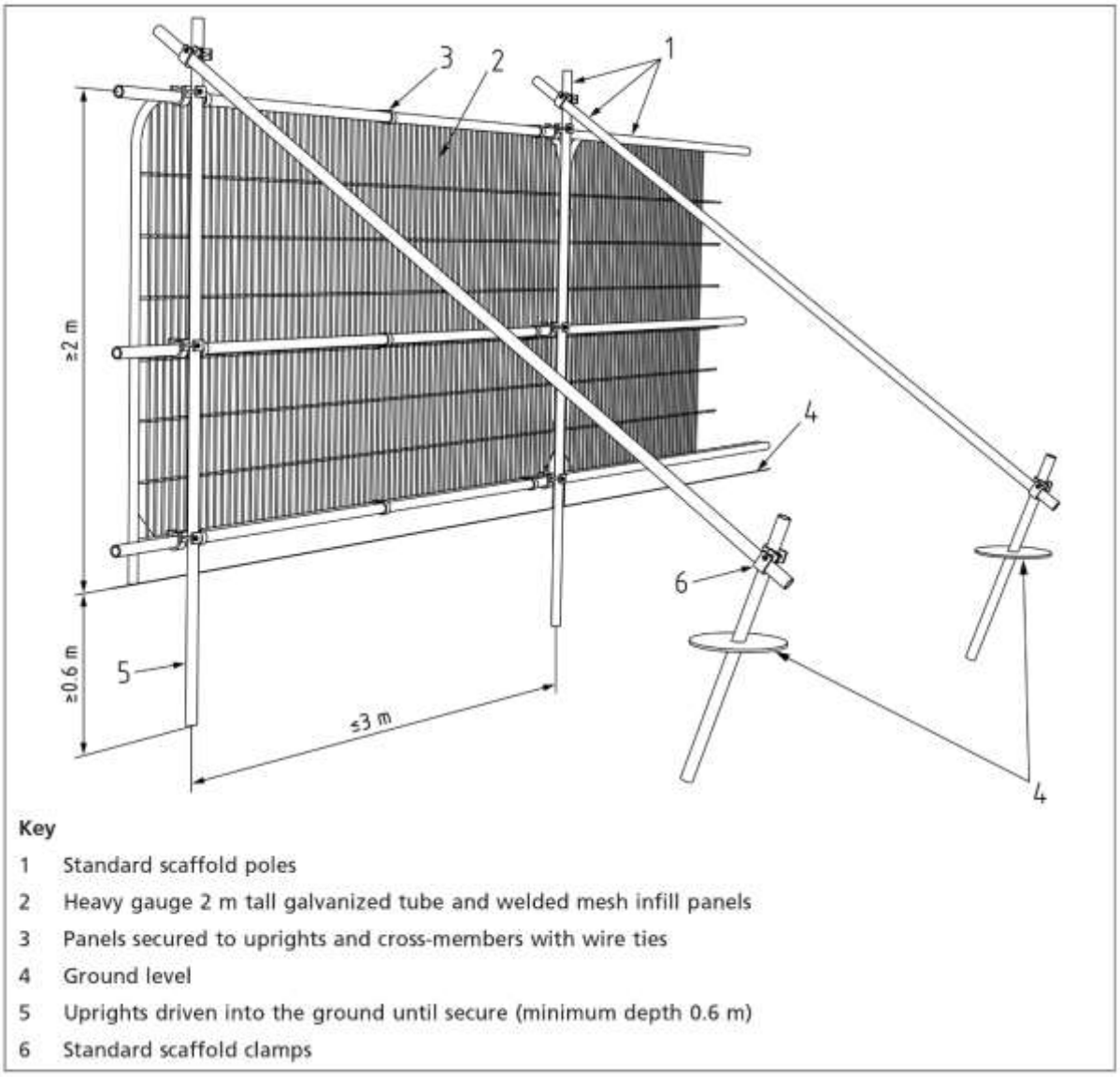
Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

A single tree, group or woodland can come under one or more sub-headings. This does not confer on it a higher value than a tree with a single value. For the purposes of this report.

Appendix 4

Tree Protection Fencing

Appendix 4: Tree Protection Fencing



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

Appendix 5
Tree Protection Signage

Appendix 5: Tree Protection Signage

Appendix 6

Glossary of Common Terms Used in Arboriculture

Appendix 6: Glossary of Common Terms Used in Arboriculture

Abscission. The shedding of a leaf or other short-lived part of a woody plant.
Abiotic. Pertaining to non-living agent's e.g. environmental factors.
Absorptive Roots. Non-woody short-lived roots, generally having a diameter less than one millimetre, the primary function of which is the uptake of water and nutrients.
Access Facilitation Pruning. One off pruning operation to provide access for development operation. Pruning that will not be detrimental to trees health or amenity.
Arboricultural Method Statement (AMS). A methodology for the implementation of development where encroachment within the RPA has the potential to cause damage or loss of retained trees.
Arboriculturist. Someone who through relevant training and experience has gained knowledge in the expertise of trees.
Adaptive Growth. The process by where wood formation rates increasing in the cambial zone, as well as wood quality, responds to gravity and other forces acting on the cambium.
Adaptive Roots. The adaptation of existing roots; or a production of new roots in response to damage or decay.
Adventitious Buds, Roots, Shoots. Which grow in other than primary apical control.
Anchorage. The process in which a tree uses its roots system to support itself within the soil structure.
Ancient: A tree that has passed beyond maturity and is old, or aged, in comparison with other trees of the same species.
Arisings. Parts of the tree that has been removed for disposal, branches, leaves, roots etc.
Canker. Area of dead cambium killed by overlying pathogenic tissues.
Cavity. A hole in the woody structure of the tree; often caused through decay.
Cleaning Out. The removal of dead, diseased crossing branches, damaged branches and alien structures.
Competent Person. Person with training and experience in accordance with the proposed matter being addressed, having an understanding of a particular matter being approached.
Condition. An indication of the physiological vitality of a tree, but not the stability of a tree.
Construction. A Site based operation that has the potential to affect retained trees.
Construction Exclusion Zone. An area based on the RPA from which construction activity is prohibited.
Coppicing. Removal of all aerial parts of the tree leaving a stump for regeneration of new shoot.
Crown/Canopy. The parts of the tree that supports the leaves.
Crown Lifting. The removal of limbs and small branches to a specified height above ground level.
Crown Thinning. The removal of a proportion of secondary branch growth throughout the crown to produce an even density well balanced crown structure.
Crown Reduction/Reshaping. Removal in the height to a specified description to maintain a flowing crown structure.
Deadwood. Non-functional branches which no longer support natural growing conditions of the tree but may be beneficial for the support of habitats and species, possibly including rare saproxylic invertebrates. Thus, may also be referred to as 'Decaying Wood Habitat' or 'Dysfunctional wood'. Size ranges for deadwood referred to in this report and/or Appendix 1: - Small (<75 mm diameter), Medium (76 – 150 mm), Large (151-300) mm and Very large >301 mm. For some species such as oak etc, the risk of deadwood falling from the tree can be lesser than for other species, due to the variety of wood strengths of different tree species.

Defect. Any area of the tree that longer has an optimal mechanical uniformity of stress, making the tree unsuitable for its location.
Dieback. Death of woody parts of the tree starting at distal ends of the tree.
Disease. Damage occurring to living organisms as a result of pathenogenic micro-organisms.
Distal. Furthest distance away from the main body of the tree.
Dysfunction. In woody tissues, the loss of physiological function, especially water conduction, in sapwood.
Epicormic Growth. Growth from dormant or adventitious buds, not developing from the first shoot.
Girdling Roots. A circling root which constricts the stem or roots, with the potential to cause death and the restriction of flow within the phloem.
Heartwood. Dysfunctional xylem which no longer has conductive properties, but which has become an integral structural part of the tree.
Heave. The swelling of shrinkable clay soils, often when vegetation has been removed allowing soil rehydration to develop, with the potential for listing structures (e.g. walls).
Included Bark/Acute Forks. Face to face contact of bark usually at fork unions, or branch unions.
Lopping/Topping. A term used to describe the removal of large sized branches
Monolith. Removing some or most of the trees crown and sometimes the upper stem, in order to retain as much of the tree as standing deadwood habitat for ecological reasons.
Pathogen. A micro-organism that causes disease within another organism.
Phytotoxic. Toxic to plants.
Pollarding. The removal of the tree canopy to produce knuckles where new growth develops and is removed cyclically usually performed on young trees.
Pruning. Selective removal of parts of the tree to achieve a desired outcome.
Root Protection Area(RPA). An area around a tree identified by multiplying the stem diameter at 1.5 m from ground level by 12 to produce a radial area or rooting volume around a tree to be protected Ref. BS 5837: 2012.
Service. Any above and below ground structure or apparatus for utility provision.
Size of part. Relating to risk assessments, identifying the size of the hazard, or parts of a tree which may cause harm if failure occurs.
Stem(s). The main structure from the ground up supporting the crown.
Stress. In plants, the physiological depletion as a result of environmental influences.
Structure. A manufactured object, such as building, roads, path, wall or excavated structures.
Structural Roots. The primary larger diameter roots which hold and support the aerial parts of the tree.
Subsidence. The shrinkage of soil through the absorption of water via vegetation and the sinking effects on surrounding architectural structures.
Targets. In risk assessment, persons or property at risk of harm as a result of a hazard (falling tree, branch, etc.).
Transitioning Veteran Trees: Trees with some veteran features, but not sufficient veteran features to be considered full veteran trees. They contribute to the veteran tree resource and, through the ageing process are expected to become true veterans in time, before which they offer bridge and continuity habitat for important saproxylic invertebrates and fungi.

Tree Protection Plan (TPP). A scaled drawing informed by descriptive text where necessary, based upon finalised Site proposals, showing trees for retention and illustrating the tree and landscape protection measures.
Veteran Tree. Tree that, by recognized criteria, shows features of biological, cultural or aesthetic characteristics of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.
Windthrow. The blowing over a tree at its roots.

DRAWING

DO NOT SCALE FROM THIS DRAWING

OS data supplied by client

KEY

- RED LINE BOUNDARY
- HEDGE
- TREES REMOVED DUE TO CONDITION AND/OR TO ENABLE DEVELOPMENT
- CATEGORY A CROWN SPREAD
- CATEGORY B CROWN SPREAD
- CATEGORY C CROWN SPREAD
- CATEGORY U CROWN SPREAD
- ROOT PROTECTION AREA
- T1/G1/H1 TREE/TREE GROUP/ HEDGE NUMBER
- POTENTIAL DIRECT OBSTRUCTION OF SUNLIGHT
- DEAD ELM

TREES

QUALITY CATEGORIES BASED ON BS5837:2012 TREES IN RELATION TO DESIGN, DEMOLITION AND CONSTRUCTION - RECOMMENDATIONS
RPA - ROOT PROTECTION AREA
WHERE RPA IS NOT VISIBLE IT EXTENDS TO THE SAME DISTANCE AS THE CANOPY.
THE ORIGINAL OF THIS DRAWING WAS PRODUCED IN COLOUR - A MONOCHROME COPY SHOULD NOT BE RELIED UPON.

MASTERPLAN KEY

- Proposed development (6.4Ha) up to 245 dwellings @38 dph
- Local Equipped Area for Play (0.04Ha)
- Neighbourhood Equipped Area for Play (0.1Ha)
- Public open space: Informal recreation (4.81Ha)
- Incidental greenspace, habitat enhancement and meadow grassland margins (0.87Ha)
- Existing hedgerows and trees
- Proposed hedgerows and trees
- Proposed drainage basin
- Existing drainage basin
- Proposed footways
- Proposed vehicular access
- Proposed pedestrian access
- Proposed primary vehicle route
- Secondary street and lanes / private drives
- Public Right of Way: Bridleway
  Public Right of Way: Footpath
- Permissive path
- Retained agricultural access
- Vehicular access to proposed pumping station
- Proposed pumping station
- Proposed trim trail (stations indicative only)

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
A	First Issue	21-01-20	DR	MS	MS

CLIENT: Gladman Developments Limited

PROJECT: Land at Hempsted Lane, Gloucester

DRAWING TITLE: Tree Protection Plan

DRG No.	REV
GM10710-018	A

DRG SIZE	SCALE	DATE
A1	1:1000	18-09-19

DRAWN BY	CHECKED BY	APPROVED BY
DR	MS	MS

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