



Gladman Developments Ltd

**Land off Duke's Park, Woodbridge**

**Arboricultural Assessment**

November 2015

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## 1.0 INTRODUCTION

- 1.1 This report has been prepared by FPCR Environment and Design Limited on behalf of Gladman Developments Limited to present the findings of an arboricultural assessment and survey of trees located on Land off Duke's Park, Woodbridge (hereafter referred to as the site), Grid Ref TM 257 477 as shown in Figure 1. The survey was carried out on 28<sup>th</sup> February 2014.
- 1.2 The tree survey and assessment of existing trees has been carried out in accordance with British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (hereafter referred to as BS5837). The guidelines give recommendations on the relationship between trees and design, demolition and construction processes to achieve a harmonious and sustainable relationship between trees and structures.
- 1.3 The purpose of the report is to present the results of an assessment of the existing trees' arboricultural value, based on their current condition and quality in accordance with the recommendations, to accompany a planning application for a residential development. The tree survey has therefore focused on any trees present within or bordering the site that may potentially be affected by the future proposals or will pose a constraint to any proposed development.
- 1.4 The site is located to the south west of Woodbridge, and immediately west of Sandy Lane. The residential area of Woodbridge adjoins onto the north western boundary, and a railway line forms the southern boundary. Top Street and (B1348) Ipswich Road are positioned to the east and north of the site.
- 1.5 The site consists of four agricultural field parcels separated by hedgerows, ditches, and steep banks. The largest fields formed the northern, eastern and southern section of the site and had been used for arable cultivation; however, they were not in use for agricultural purposes at the time of the assessment. Contained within the smaller fields, located to the west of the site, was an open storage facility for disused cars and container units.
- 1.6 The site contained only a few trees situated within the field boundaries with English oak *Quercus robur*, and English holly *Ilex aquifolium* being the most dominant. The majority of the surveyed tree stock was located offsite within the adjacent residential gardens and railway embankment. These comprised of a higher diversity of species but English oak was still the most commonly recorded tree within the assessment.
- 1.7 Following consultation with the Local Planning Authority, Suffolk Coastal District Council, it is understood that there is a Tree Preservation Order, namely No: 78 Dukes Hill, Martlesham (1967), which applies to a number of trees present on the edge of the assessment site and therefore statutory constraints apply to the eastern boundary of the proposed development in respect of trees. A plan detailing trees covered by the TPO has been included within the report as Appendix C and further details are given in Section 4.
- 1.8 The report comprises:
  - Chapter 1 provides an introduction to the assessment work, its purpose and background details.
  - Chapter 2 briefly describes the methodology by which the tree survey and assessment has been undertaken.

- Chapter 3 presents a summary of the results of the tree survey.
- Chapter 4 evaluates the findings of the survey and assessment in respect of the development proposals in the form of an Arboricultural Impact Assessment and also provides principal recommendations for mitigation planting and specific tree protection measures including pruning.
- Chapter 5 presents an indication of the tree protection measures to be required from a general viewpoint such as typical fencing requirements.
- Chapter 6 provides a conclusion to the findings of the assessment.

- 1.9 It must be understood should any specific tree protection be required, this would need to be separately considered where needs arise prior to the commencement of construction activity following approval. This would be in the form of an arboricultural method statement produced in accordance with guidance in BS5837 and is beyond the scope of this arboricultural assessment.

## 2.0 METHODOLOGY

- 2.1 The survey of trees has been carried out in accordance with the criteria set out in Chapter 4 of BS5837. The survey has been undertaken by a suitably qualified and experienced arboriculturist and recorded information relating to all those trees within the site and those adjacent to the site which may be of influence to any proposals. Trees were assessed for their arboricultural quality and benefits within the context of the proposed development in a transparent, understandable and systematic way.
- 2.2 Trees have been assessed as groups or woodlands where it has been determined appropriate. The term group has been applied where trees form cohesive arboricultural features either aerodynamically, visually or culturally including biodiversity or habitat potential for example parkland or wood pasture. An assessment of individual trees within the groups or woodlands has been made where there has been a clear need to differentiate between them for example, in order to highlight significant variation between attributes including physiological or structural condition or where a potential conflict may arise.
- 2.3 Trees have been divided into one of four categories based on Table 1 of BS5837, '*Cascade chart for tree quality assessment*'. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below). Category U trees are those which would be lost in the short term for reasons connected with their physiology or structural condition. They are, for this reason not considered in the planning process on arboricultural grounds. Categories A, B & C are applied to trees that should be of material considerations in the development process. Each category also having one of three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural or conservation values accordingly.
- 2.4 **Category (U) – (Red):** Trees which are unsuitable for retention and are 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 within this category are:
- Trees that have a serious irremediable structural defect such that their early loss is expected due to collapse and includes trees that will become unviable after removal of other category U trees.



- Trees that are dead or are showing signs of significant, immediate or irreversible overall decline.
- Trees that are infected with pathogens of significance to the health and/ or safety of other nearby trees or are very low quality trees suppressing adjacent trees of better quality.
- Certain category U trees can have existing or potential conservation value which may make it desirable to preserve.

2.5 **Category (A) – (Green):** Trees that are considered for retention and are of high quality with an estimated remaining life expectancy of at least 40 years and with potential to make a lasting contribution. Such trees may comprise:

- Sub category (i) trees that are particularly good examples of their species, especially if rare or unusual, or are essential components of groups such as formal or semi-formal arboricultural features for example the dominant and/or principal trees within an avenue.
- Sub category (ii) trees, groups or woodlands of particular visual importance as arboricultural and / or landscape features.
- Sub category (iii) trees, groups or woodlands of significant conservation, historical, commemorative or other value for example veteran or wood pasture.

2.6 **Category (B) – (Blue):** Trees that are considered for retention and are of moderate quality with an estimated remaining life expectancy of at least 20 years and with potential to make a significant contribution. Such trees may comprise:

- Sub category (i) trees that might be included in category A but are downgraded because of impaired condition for example the presence of significant though remediable defects, including unsympathetic past management and storm damage.
- Sub category (ii) 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.
- Sub category (iii) trees with material conservation or other cultural value.

2.7 **Category (C) – (Grey):** Trees that are considered for retention and are of low quality with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter below 150mm. Such trees may comprise:

- Sub category (i) unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.
- Sub category (ii) trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value or trees offering low or only temporary / transient screening benefits.
- Sub category (iii) trees with no material conservation or other cultural value.

### **Tree Schedule**

2.8 Appendix A presents details of the individual trees, groups, and hedgerows including heights, diameters at breast height, crown spread (given as a radial measurement from the stem), age

class, comments as to the overall condition at the time of inspection, BS5837 category of quality and suitability for retention and the root protection area.

- 2.9 General observations particularly of structural and physiological condition for example the presence of any decay and physical defect and preliminary management recommendations have also been recorded where appropriate.
- 2.10 By definition, a hedgerow is described as any boundary line of trees or shrubs less than 5m wide at the base, provided that the trees or shrubs are under a regular pruning regime.
- 2.11 For the tree survey and arboricultural assessment undertaken in accordance with BS 5837:2012, hedgerows and substantial internal or boundary hedges (including evergreen screens) have been recorded including lateral spread, height and stem diameter(s). Where woody plants are present within a hedgerow that are significantly different in character from the remainder of it, these have been identified and recorded separately, especially where they comprise a distinct tree form.
- 2.12 A tree survey in accordance with British Standard 5837:2012 does not assess hedgerows against the Hedgerow Regulations 1997 or specifically from an ecological perspective, as such would be outside the scope of the British Standard assessment.

### **Conditions of Tree Survey**

- 2.13 The survey was completed from ground level only and from within the boundary of the site. Aerial inspection of trees was not undertaken at this stage. Investigations as to the internal condition of a tree have also not been undertaken being beyond the scope of this assessment. Evaluation of tree condition given within this assessment applies to the date of survey and cannot be assumed to remain unchanged. It may be necessary to review these within 12 months, in accordance with sound arboricultural practice.

### **Site Plans**

- 2.14 The individual positions of trees and groups have been shown on the Tree Survey Plan, Figure 2 (drawing no. 6106-A-02). The positions of trees are based on a topographical / land survey, as far as possible, supplied by the client. The crown spread, root protection area and shade pattern (where appropriate) are indicated on this plan.
- 2.15 As part of the Arboricultural Impact Assessment, a Tree Retention Plan, Figure 3 (drawing no. 6106-A-03) has been prepared to show the proposed layout in relation to the existing tree cover allowing an assessment of any potential conflicts. The plan also identifies which trees are to be removed or retained as part of the proposed development and also trees considered unsuitable for retention through the assessment process (Category U).

### **Tree Constraints and Root Protection Area (RPA)**

- 2.16 Below ground constraints to future development are represented by the area surrounding the tree that contains sufficient rooting volume for the specimen to have the best chance of survival in the long term. This is known as the root protection area (RPA). The RPA has been calculated in accordance with section 4.6 of BS5837 and requires suitable protection in order for the tree to be incorporated into any future scheme. Where applicable the shape of the RPA has been altered to take into account the presence of surrounding obstacles which may have restricted root growth.

- 2.17 Where groups of trees have been assessed, the RPA has been shown based on the maximum sized tree in any one group and so may exceed the RPA required for some of the individual specimens within the group.

### 3.0 RESULTS

- 3.1 A total of seventeen individual trees, ten groups of trees, and four hedgerows were surveyed as part of the arboricultural assessment. Trees were surveyed as individual trees and groups / blocks of trees where examples are clearly present as such per the description. Refer to Figure 2 – Tree Survey Plan (drawing no. 6106-A-02) and Appendix A – Tree Schedule for full details of the trees included in this assessment. The table below summarises the trees assessed.

#### Results Summary

- 3.2 The trees within the site were sparse overall and confined to the field boundaries, including the hedgerows, ditches and steep embankments. The age range varied amongst the recorded tree stock from young to mature, and consisted of English elm *Ulmus procera*, English oak *Quercus robur*, holly *Ilex aquifolium*, silver birch *Betula pendula*, elder *Sambucus nigra*, and sycamore *Acer pseudoplatanus*. The most dominant species recorded within the site overall was English oak and this was mostly of early mature to mature age.
- 3.3 Most of the surveyed tree stock was located offsite within the adjacent residential gardens beyond the north western and eastern boundary, and the railway embankment beyond the southern boundary. The trees offsite were incorporated into the assessment due to their close proximity to the site, which could potentially pose a constraint to the future use of the land. The offsite trees comprised of a higher diversity of species with common ash *Fraxinus excelsior* and English oak the most dominant.
- 3.4 Several of the trees indicated on the following table have been discussed in more detail, owing to their physical condition or arboricultural significance.

**Table 1: Summary of trees by category**

	Individual Trees	Total	Groups of Trees	Total
Category U - Unsuitable	T3, T8, T9	3		0
Category A (High Quality / Value)	T15	1	TG10	1
Category B (Moderate Quality / Value)	T1, T2, T6, T7, T10, T11, T16, T17	8	TG1, TG4, TG8, TG9	4
Category C (Low Quality / Value)	T4, T5, T12, T13, T14	5	TG2, TG3, TG5, TG6, TG7, H1, H2, H3, H4	9

- 3.5 Trees T1 to T3 were positioned in a line adjacent to the south-eastern boundary by Sandy Lane. T1 and T2 were early mature to mature English oak trees and T3 was thought to be the same however; T3 was covered in dense ivy that obstructed any visually assessment. It was not possible to either identify the species of T3 or thoroughly assess its structural condition. It was considered to be either dead or of poor health as the tree did not display any growth beyond the

ivy, which meant that it would have very limited photosynthetic capability. T1 and T2 displayed much better health with no major defects discovered. Therefore T1 and T2 were noted to be of moderate arboricultural quality and retention category B, whereas T3 was considered to be unsuitable for retention, (category U).

- 3.6 T4 was a mature English oak located in a solitary position adjacent to a ditch that separated the easternmost field of the site. It was in the form of a lapsed pollard with the stem union forming multiple leader stems at approximately four metres above ground. Major decay was observed within the central area of the union with many cracks and openings evident between the individual stems. The cracks between the stems appeared to have formed over many years as the decay was advanced and had exposed the heartwood of one of the stems. Therefore it was considered to be a structural concern as the likelihood for stem failure, at point of the union, is likely to increase as the tree continues to increase in size and weight.
- 3.7 Three other individual trees were also located in solitary positions within the site including T10 to T12. T10 was an over mature English oak with a very sparse upper canopy, indicating that the tree was in decline. Despite this, the tree appeared to be in a reasonable condition overall and was thus considered to be of moderate arboricultural quality (retention category B). T11 and T12 were both holly of good health with no major defects observed. T11 was of mature proportions and subsequently of higher value than the significantly smaller T12. T11 was regarded as retention category B and T12 as retention category C.
- 3.8 Positioned on the railway embankment, just beyond the southern boundary of the site, was a row of young to mature broadleaved specimens that collectively contributed moderate landscape feature. TG1 consisted of common ash, elder, English oak, field maple *Acer campestre*, aspen *Populus tremula*, and hazel *Corylus avellana* and was sparse in some places although generally forming a screen between the fields and the railway line. One common ash tree had failed at the lower section of its stem and fallen into the site. However, the general health of the trees was fair with no other major defects observed.
- 3.9 The remaining trees positioned on the railway embankment included T5 common ash, T6 common ash, and T7 English oak, which were all of a mature age class. T5 was considered to be low quality due to heavy pruning which had been undertaken on all the major branches greatly reducing its overall size. The tree displayed very little in terms of reaction growth and was therefore considered limited in its future life expectancy and arboricultural value. T6 was a lapsed coppice with three co-dominant stems forming at ground level. The tree displayed better vitality and structure and was thus regarded as being of moderate arboricultural quality (retention category B). T7 was mostly covered by dense ivy growth but with many live branches clearly visible. T7 displayed an uneven canopy due to the removal of a large proportion of the southern section however, overall the structural condition of the tree was fair and therefore T7 was regarded also to be of moderate arboricultural quality.
- 3.10 The tree groups within the site covered only small areas of land and comprised trees of small proportions. This included TG2, a row of semi-mature broadleaves, TG3 an outgrown hedgerow, TG5 semi-mature, self-set English elm, and TG6 two semi-mature English oaks that had outgrown the hedgerow H3. All four groups were considered to be of low arboricultural and landscape value due to their small proportions that contributed little to the site, and therefore were graded as retention category C.

- 3.11 TG7 formed a significantly larger tree group positioned offsite and adjacent to the north-western boundary, near (B1348) Ipswich Road. The group was comprised of a semi-mature blackthorn *Prunus spinosa*, English oak, and English elm. Many of the elm specimens within the group were showing the symptoms of Dutch elm disease *Ophiostoma novo-ulmi*, which included major dieback of the crowns and bark delamination. This disease is very common on elm and ultimately results in fatality. The blackthorn and oak specimens displayed much better health and are likely to grow and develop further over future years.
- 3.12 The highest proportion of tree coverage assessed was situated within the residential gardens that abutted the north-eastern boundary. This included trees T15 – T17, and groups TG8 – TG10, which collectively covered the majority of gardens adjacent to the site.
- 3.13 TG10 was the most notable of the surveyed tree stock as it contributed, from an arboricultural perspective, high landscape value due to its mature proportions, including heights of approximately eighteen metres. The group consisted of mature English oak and aspen that were of fair to good structural condition. The specimens had plenty of space to grow and, as a result, had developed well balanced canopies, measuring at up to 18 metres in diameter. The large mature proportions and positions on the bank had resulted in the tree group being a focal point of the site and considered as retention category A.

#### **4.0 ARBORICULTURAL IMPACT ASSESSMENT (AIA)**

- 4.1 The following paragraphs present a summary of the tree survey and offers discussion of particular trees and groups recorded in the context of any proposed development in the form of an Arboricultural Impact Assessment in accordance with section 5.4 of BS5837. Any final tree retentions will need to be reconciled with the advice contained within this report.
- 4.2 The AIA has been based upon the Development Framework Plan and seeks to outline the potential impact that the proposals would have on the existing trees. The above drawing outlines the proposed residential development of the site located in three distinct portions and divided by open space. An overlay of the above layout has been incorporated in the Tree Retention Plan (Figure 3) to assist in identifying potential conflicts with the existing trees.
- 4.3 The proposals are currently in outline only and therefore further assessment at the reserved matters stage will be required to assess any potential impacts and mitigation planting to compensate for the proposed loss of trees and hedgerows.
- 4.4 The proposals allow the retention and integration of the vast majority of existing trees due to their positions around the boundaries of the site. This retained tree cover will be enhanced and managed to offer filtered screening where required and amenity woodland throughout the areas of Public Open Space. Additional planting is to be provided to the north of the railway line to produce a landscape buffer of woodland planting containing native tree species. Tree cover positioned on the railway embankment had recently been heavily pruned away from the railway line which had resulted in trees of poor form and condition. The woodland group aims to improve the existing vegetation belt which will extend eastwards to link the hedgerow forming the eastern boundary adjacent to Sandy Lane to those existing trees located on the railway embankment.

New trees will be planted around the attenuation pond to provide biodiversity benefits for local wildlife and softening to the newly constructed form.

- 4.5 Further planting throughout the central portion of public open space will connect the remaining existing tree cover positioned on the boundaries and new tree planting in pockets as amenity. The new planting will provide intermittent tree cover between each area of development fringing the urban edge and offering high quality arboricultural features where currently none exist.
- 4.6 Trees positioned centrally were generally of moderate to low quality with many trees having self-seeded from the surrounding vegetation. One hedgerow (H3), separating the two field compartments, towards the north of the site will be removed to provide sufficient space for development.
- 4.7 T10 is shown to be removed as part of the development of the site however, retention of this specimen should possibly be considered further due to its landscape value positioned on the edge of the area of high ground towards the west of the site. T10 was visible from across the site and from several adjacent publicly accessible areas and its retention and incorporation would be beneficial.
- 4.8 Suitable offsets will be offered where trees are positioned on the edge of the site between the existing conurbation fringes forming the eastern boundary. Additional tree planting to enhance and improve the existing tree stock forming the eastern boundary will provide a strengthened vegetation buffer.
- 4.9 Two access positions are identified to the north and west of the site. No existing tree or hedgerow cover was present on the western boundary where the access is to be located and therefore no tree or hedgerow removal will be required. A new access point through the northern boundary will connect the site with Ipswich Road (B1438). Removal of approximately 24m of TG7 will be required to provide sufficient space for the alterations to the existing carriageway and new roads into the site and also visibility splays to allow safe passage of vehicles onto Ipswich Road. Further assessment at the detailed application stage will be required to review the potential impact to the existing vegetation and ensure sufficient mitigation is provided throughout the site.
- 4.10 Hedgerow H1 formed the eastern boundary of the site and H2 partially formed the northern boundary. A new electric cable serving the offshore wind farm is to pass across the site requiring a 30m easement where no tree or hedgerow cover is to be retained or planted. Further assessment of the tree and hedgerow cover adjacent to the easement corridor will be required where Root Protection Areas are shown to extend into the area to minimise the effect.

### **Statutory Constraints**

- 4.11 The following table details which trees are covered by the Dukes Hill, Martlesham Tree Preservation Order, 78.1967. The trees covered within the TPO are protected by law from felling or uprooting, pruning including 'topping/lopping' and willful damage or destruction. Were planning permission to be granted for development this would override the protection afforded by the tree preservation order to those trees required for removal to facilitate the proposals.

**Table 2: Tree Preservation Order**

<b>Tree No, taken from FPCR</b>	<b>TPO reference no.</b>
T14, T15, T16, T17, TG9, TG10, H4	Dukes Hill, Martlesham TPO no. 78.1967 A1

**Mitigation for Tree Losses**

- 4.12 The landscaping scheme should consider the use of both native tree species (for their low maintenance requirements and nature conservation value) and ornamental species (for their contribution to urban design and amenity value). Species choices should be selected on the basis of their suitability for the final site use. Careful consideration would need to be given to the following: ultimate height and canopy spread, form, habit, density of crown, potential shading effect, colour, water demand and maintenance requirements in relation to both the built form of the new development and existing properties. Consideration on the effects of water demand of different tree species and soil type should also be applied where appropriate.
- 4.13 The landscaping scheme should consider providing tree planting in the following situations; new amenity planting as part of any proposed road infrastructure; private gardens; areas of incidental open space; new public parks and larger areas of open space; and structural buffer planting where appropriate.
- 4.14 Tree planting should be avoided where they may obstruct overhead power lines or cables. Any underground apparatus should be ducted or otherwise protected at the time of construction to enable trees to be planted without resulting in future conflicts. Wherever possible, following discussions with the developer and utility company concerned, particularly on new development sites, common service trenches should be specified to minimise land take associated with underground service provision and to facilitate access for future maintenance.

**Tree Management**

- 4.15 Should the layout in its current form be approved, a review of the relationship between the layout and the retained trees should be undertaken by a qualified arboriculturalist to prepare an approved schedule of tree works listing all the trees requiring work (making use of reference numbers), accompanied by a plan showing the location of each tree.
- 4.16 All retained trees should be subjected to sound arboricultural management as recommended within section 8.8.3 of BS5837 *Post Development Management of Existing Trees*, where there is a potential for public access in order to satisfy the landowner's duty of care. Additionally inspections annually and following major storms should be carried out by an experienced arboriculturist or arborist to identify any potential public health and safety risks and to agree remedial works as required.
- 4.17 All tree works undertaken should comply with British Standard 3998:2010 and should therefore be carried out by skilled tree surgeons. It would be recommended that quotations for such work be obtained from Arboricultural Association Approved Contractors as this is the recognised authority for certification of tree work contractors.
- 4.18 All vegetation and, particularly, woody vegetation proposed for clearance should be removed outside of the bird-breeding season (March - September inclusive) as all birds are protected

under the Wildlife and Countryside Act, 1981 (as amended) whilst on the nest. Where this is not possible, vegetation should be checked for the presence of nesting birds prior to removal by an experienced ecologist.

### **General Design Principles in Relation to Retained Trees**

- 4.19 At the detailed design stages closer assessment of the distance of proposed development in relation to the calculated root protection area of retained trees should be made and modifications to the layout made where necessary. Should there be areas where it is not possible to modify the layout the use of no-dig construction methods will need to be considered prior to decisions being made as to the removal of each tree concerned. Such construction methods can be used particularly in the case of footways, driveways and other light use access roads.
- 4.20 When considering layouts an important element of detailed design is the consideration of the eventual positioning of any utility services. As recommended by the guidance given in section 7.7 of BS5837 services, where possible, should not encroach within the root protection areas of retained trees. If below-ground services are proposed within a root protection area modifications to the alignment of the service route may need to be made in order to minimise adverse effects on root stability and overall tree-health.
- 4.21 Consideration may also need to be given to the potential for tree roots of newly planted trees and hedgerows to affect or compromise the future services. As far as feasible, it would be preferable that proposed services near both the existing and any new planting should be ducted for ease of access and maintenance and grouped together to minimise any future disturbance.

## **5.0 TREE PROTECTION MEASURES**

- 5.1 Retained trees will be adequately protected during works ensuring that the calculated RPA for all retained trees can be appropriately protected through the erection of the requisite tree protection barriers. Measures to protect trees should follow the guidance in BS5837 and will be applied where necessary for the purpose of protecting trees within the site whilst allowing sufficient access for the implementation of the proposed layout. These have been broadly summarised below.

### **General Information and Recommendations**

- 5.2 All trees retained on site will be protected by barriers or ground protection around the calculated RPA or other defined constraints of this assessment as detailed by section 6 and 7 of BS5837.
- 5.3 Barriers will be erected prior to commencement of any construction work and before demolition including erection of any temporary structures. Once installed, the area protected by fencing or other barriers will be regarded as a construction exclusion zone. Fencing and barriers will not be removed or altered without prior consultation with the project arboriculturalist.
- 5.4 Any trees that are not to be retained as part of the proposals should be felled prior to the erection of protective barriers. Particular attention needs to be given by site contractors to minimise damage or disturbance to retained specimens.



- 5.5 Where it has been agreed, construction access may take place within the RPA if suitable ground protection measures are in place. This may comprise single scaffold boards over a compressible layer laid onto geo-textile materials for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and the use of proprietary protection systems.
- 5.6 Confirmation that tree protective fencing or other barriers have been set out correctly should be gained prior to the commencement of site activity.

#### **Tree Protection Barriers**

- 5.7 Tree protection fencing should be fit for the purpose of excluding any type of construction activity and suitable for the degree and proximity of works to retained trees. Barriers must be maintained to ensure that they remain rigid and complete for the duration of construction activities on site.
- 5.8 In most situations fencing should comprise a scaffold framework comprising a vertical and horizontal framework, well braced to resist impacts. For particular areas where construction activity is anticipated to be of a more intense nature higher fencing may be necessary. Where site circumstances and the risk to retained trees do not necessitate the default level of protection an alternative will be specified. The standard fencing specifications as recommended in BS5837 has been illustrated in Appendix B.
- 5.9 It may be appropriate on some sites to use temporary site offices as components of the protection barriers.

#### **Ground Protection**

- 5.10 Where it has been agreed, construction access may take place within the RPA if suitable ground protection measures are in place. Guidance on examples of appropriate ground protection for several different scenarios is provided in section 6.2.3 of BS5837. The location of and design for temporary ground protection should be detailed as part of an Arboricultural Method Statement required by conditioning should planning permission be granted. In all cases, the objective is to avoid compaction of the soil which can arise from a single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

#### **Protection outside the exclusion zone**

- 5.11 Once the areas around trees have been protected by the barriers, any works on the remaining site area may be commenced providing activities do not impinge on protected areas.
- 5.12 All weather notices should be attached to the protective fencing to indicate that construction activities are not permitted within the fenced area. The area within the protective barriers will then remain a construction exclusion zone throughout the duration of the construction phase of the proposed development.
- 5.13 Wide or tall loads etc should not come into contact with retained trees. Banksman should supervise transit of vehicles where they are in close proximity to retained trees.
- 5.14 Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree bole. No concrete mixing should be done within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.

- 5.15 No fires will be lit where flames are anticipated to extend to within 5m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire.
- 5.16 Notice boards, telephone cables or other services should not be attached to any part of a retained tree.
- 5.17 Any trees which need to be felled adjacent to or are present within a continuous canopy of retained trees, must be removed with due care (it may be necessary to remove such trees in sections).

#### **Protection of Trees Close to the Site**

- 5.18 There were a number of trees located on the boundaries of the site. The root protection area of these trees will need to be protected in the same way as all the retained trees within the site. All trees located outside the boundaries of the assessment site yet within close proximity to works should be adequately protected during the course of the development by barriers or ground protection around the calculated RPA.
- 5.19 Any trees which are to be retained and whose RPAs may be affected by the development should be monitored to identify any alterations in quality with time and to assess and undertake any remedial works required as a result.

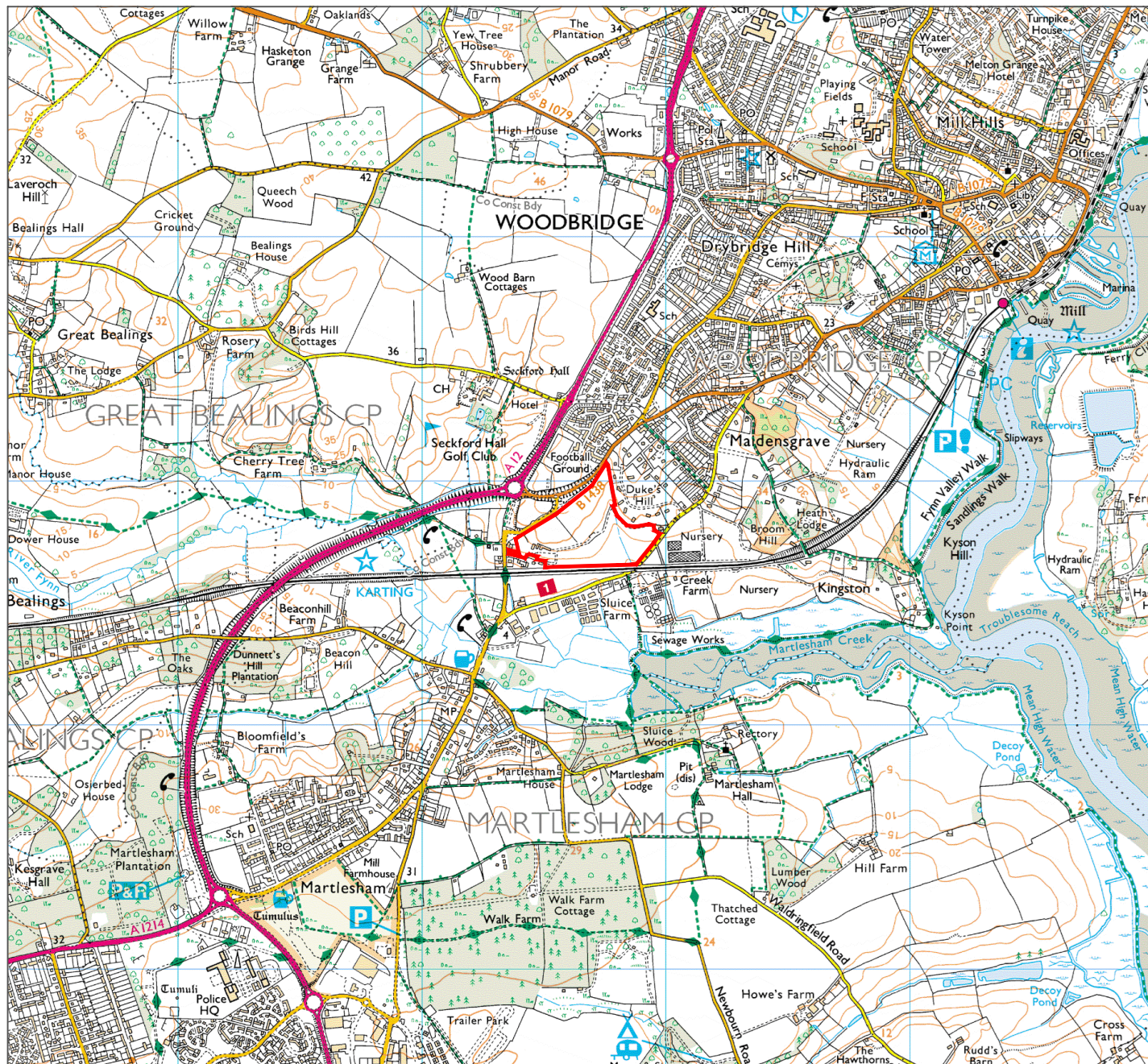
#### **Protection for Aerial Parts of Retained Trees**

- 5.20 Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment as part of the construction works it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obvious problem branches. Any such equipment would have potential to cause damage to parts of the crown material, i.e. low branches and limbs, of retained trees within the protective barriers. This is termed as 'access facilitation pruning' within BS5837. Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist.
- 5.21 It is strongly advised that a pre-commencement site meeting is held with contractors who are responsible for operating machinery, as described above, to firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact.
- 5.22 In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with British Standard 3998:2010 to correct the damage, upon completion of development.

## 6.0 CONCLUSION

- 6.1 The site is located to the south west of Woodbridge, and immediately to the west of Sandy Lane. The residential area of Woodbridge adjoins the north-western boundary, and a railway line forms the southern boundary. The western and northern boundaries of the site are formed by the existing road network comprising Top Street and (B1348) Ipswich Road.
- 6.2 The site consists of six field parcels separated by hedgerows, ditches, and steep banks. The largest fields formed the northern, eastern and southern sections of the site and had been used for arable cultivation; however, they were not in use for agricultural purposes at the time of the assessment having been left fallow. Contained within the smaller fields, located to the west of the site, was an open storage facility for disused cars and container units.
- 6.3 The site contained only a few trees which were situated within the field boundaries with English oak *Quercus robur*, and English holly *Ilex aquifolium* being the most dominant. Most of the surveyed tree stock was located offsite within the adjacent residential gardens and railway embankment.
- 6.4 Following consultation with the Local Planning Authority, Suffolk Coastal District Council, it is understood that there is a tree preservation order, namely No: 78 Dukes Hill, Martlesham (1967), which applies to a number of trees present on the edge of the assessment site and therefore statutory constraints apply to the eastern boundary of the proposed development in respect of trees. A plan detailing trees covered by the TPO has been included within the report as Appendix C and further details are given in Section 4.
- 6.5 The proposals for the site are currently in outline and therefore only limited assessment can be made at this stage. Further consideration of the impacts upon trees will be required where the edge of proposed development extends up to the existing tree cover. Particular attention will need to be considered towards the east of the site where the development parcels are shown to extend up to the boundary of the site and to the base of the trees included in the adjacent area Tree Preservation Order. Further assessment of the existing layout has however provided an initial assessment of the potential impacts.
- 6.6 The majority of the existing tree and hedgerow cover will be retained and incorporated into the new development and new tree planting will be included to soften the built environment and link the existing vegetation surrounding the site. Despite the loss of some moderate and low quality trees, on balance, tree cover will increase across the site offering improved arboricultural and wildlife benefits for the new occupants of the development and wider residential area.





## KEY



Assessment Boundary

rev	date	description	by
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- masterplanning ■
  - environmental assessment ■
  - landscape design ■
  - urban design ■
  - ecology ■
  - architecture ■
  - arboriculture ■
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client  
Gladman Developments Ltd

project  
Land off Duke's Park  
Woodbridge

drawing title  
SITE LOCATION PLAN  
FIGURE 1

scale  
1:25000 @ A4

drawn  
HR

date  
April 2014

drawing number

6106-A-01

rev

A

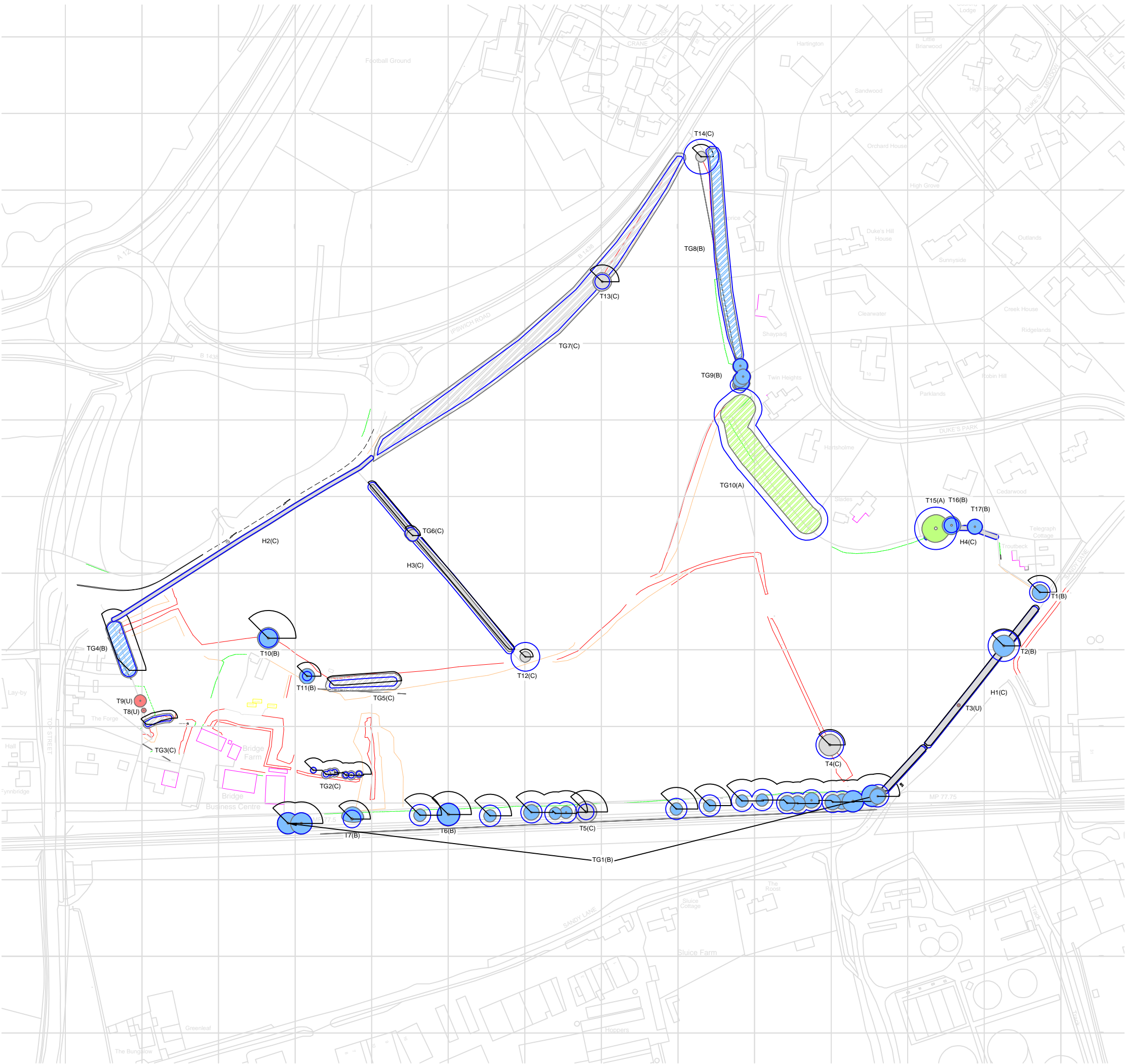
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KEY

Category U - Unsuitable for Retention  
(BS 5837:2012)

Category A - Trees of High Quality  
(BS 5837:2012)

Category B - Trees of Moderate Quality  
(BS 5837:2012)

Category C - Trees of Low Quality  
(BS 5837:2012)

Group hatching  
(Colour indicates BS Category)

Hedgerow hatching  
(Colour indicates BS Category)

Root Protection Area (the RPA has been altered  
where appropriate to reflect underground constraints)

T1 (A)  
TG1 (A)

Individual / Group Number and BS Category

Indicative Shade Pattern (where appropriate)

Scale 1:2500 @ A3

NOTES

All dimensions to be verified on site. Do not scale this drawing. All discrepancies to be clarified with project Arboriculturalist. Drawing to be read in conjunction with Arboricultural Assessment and Appendix A - Tree Schedule .

Drawing produced in colour, a monochrome copy should not be relied upon, and is based on digital information supplied by the client in dwg format. The exact position of trees are to be checked and verified on site prior to any tree work or construction work being undertaken.

Trees are living organisms that change over time, the condition of all trees illustrated herein, are to be checked by a qualified arboriculturalist or tree surgeon should works commence 12 months after the time of this survey. Please note that no works should be undertaken to any trees illustrated herein without first obtaining the proper authorisation to do so.

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-	02.04.2014	First Issue		

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project  
Land off Duke's Park  
Woodbridge

drawing title  
TREE SURVEY PLAN  
FIGURE 2

scale  
1:2500 @ A3

drawn  
SLK

date  
April 2014

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6106-A-02

rev  
-

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## Appendix A - Tree Schedule

Measurements	Age Class	Overall Condition	Root Protection Area (RPA)
Height - estimated from ground level (m).	YNG: Young trees up to ten years of age.	G - Good: Trees with only a few minor defects and in good overall health needing little, if any attention.	<ul style="list-style-type: none"><li>• The RPA column gives the required area (m²).</li><li>• The RPA Radius column gives the radius (m) of an equivalent circle.</li><li>• The RPA is calculated using the formulae described in paragraph 4.6.1 of British Standard 5837: 2012 and is indicative of the required rooting area in order for a tree to be retained.</li></ul>
Stem Dia. - Diameter measured (mm) in accordance with Annex C of the BS5837.	SM: Semi-mature, trees less than 1/3 life expectancy.	F - Fair: Trees with minor, but rectifiable, defects or in the early stages of stress from which it may recover.	
Crown - crown spread estimated radially from the main stem (m).	EM: Early mature, trees 1/3 – 2/3 life expectancy.	P - Poor: Trees with major structural and/or physiological defects such that it is unlikely the tree will recover in the long term.	
Abbreviations est - Estimated stem diameter avg - Average stem diameter for multiple stems upto - Group has a maximum stem diameter of	M: Mature trees, over 2/3 life expectancy.	D - Dead: Trees no longer alive. This could also apply to trees that are dying and unlikely to recover.	
	OM: Over mature, declining or moribund trees of low vigour.	In the assessment, of the BS category, particular consideration has been given to the following <ul style="list-style-type: none"><li>• The health, vigour and condition of each tree</li><li>• The presence of any structural defects in each tree and its future life expectancy</li><li>• The size and form of each tree and its suitability within the context of a proposed development</li><li>• The location of each tree relative to existing site features e.g. its screening value or landscape features</li><li>• Age class</li><li>• Life expectancy</li></ul>	
	V: Veteran, tree possessing certain attributes relating to veteran trees.		

### Structural Condition

The following has been considered when inspecting structural condition:

- The presence of fungal fruiting bodies around the base of the tree or on the stem, as they could possibly indicate the presence of possible internal decay.
- Soil cracks and any heaving of the soil around the base.
- Any abrupt bends in branches and limbs resulting from past pruning.
- Tight or weak 'V' shaped forks and co-dominant stems.
- Hazard beam formations and other such biomechanical related defects (as described by Claus Mattheck, Body Language of Trees HMSO Research for Amenity Trees No. 4 1994).
- Cavities as a result of limb losses or past pruning.
- Broken branches or storm damage.
- Canker formations.
- Loose or flaking bark.
- Damage to roots.
- Basal, stem or branch / limb cavities.
- Crown die-back or abnormal foliage size and colour.

### Quality Assessment of Retention Category

Category U - Trees 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.

Category A - Trees of high quality with an estimated remaining life expectancy of at least 40 years.

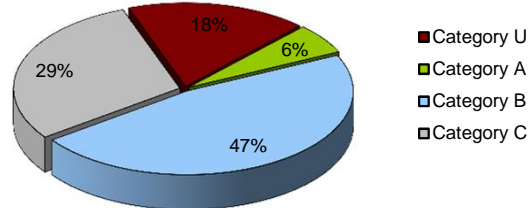
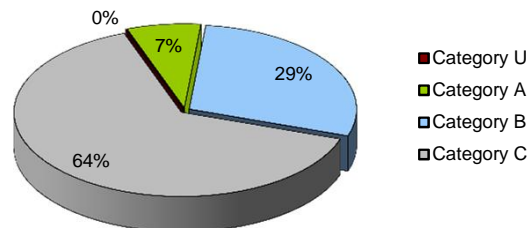
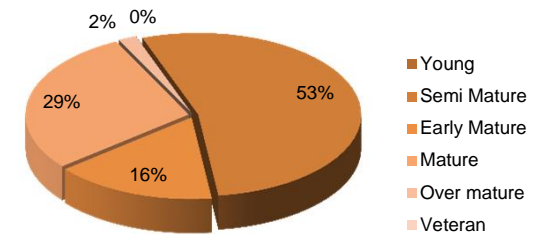
Category B - Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

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 150mm.

Sub-categories: (i) - Mainly arboricultural value  
(ii) - Mainly landscape value  
(iii) - Mainly cultural or conservation value

**Appendix A - Summary**

	Individual Trees	Totals	Tree Groups and Hedgerows	Totals
Category U	T3, T8, T9	3		0
Category A	T15	1	TG10	1
Category B	T1, T2, T6, T7, T10, T11, T16, T17	8	TG1, TG4, TG8, TG9	4
Category C	T4, T5, T12, T13, T14	5	TG2, TG3, TG5, TG6, TG7, H1, H2, H3, H4	9
Total		17	Total	14

**BS5837 category: Individuals****BS5837 category: Groups of trees****Age distribution of tree stock**

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
<b>INDIVIDUAL TREES</b>										
T1	English Oak Quercus robur	11	560	5	EM	G	Few areas of minor deadwood within the canopy Bark wounds, possibly from vehicular damage, evident on the eastern side of the stem No major defects	142	6.7	B (i)
T2	English Oak Quercus robur	11	850	7	M	F	Dense ivy covered the majority of the stem and branches of this tree, restricting the visual assessment of the tree The parts of the tree visible for assessment were two to three metres of the branch extremities Few area off dead branches but only minor in proportions	327	10.2	B (i)
T3	Unidentified species	8	1260	1	M	P	Dense ivy covered the tree obstructing all the branches and stem from visual assessment, and identification No evidence of life growth observed	N/A	N/A	U
T4	English Oak Quercus robur	10	750	7	M	P	Numerous branches within the lowest two metres of the Crown, on the southern side, had suffered from flail damage A former pollard with multiple leader stems forming at approximately four metres above ground Major decay observed within the central area of the stem union, where the extent of the decay was significant with cracking between the individual stems The decay noted in the tree has the potential to result in major stem failure Situating south of adjacent ditch	254	9.0	C (i)
T5	Ash Fraxinus excelsior	14	300 310	7	M	P	Tree been unsympathetically pruned, (lopped and topped), with all the major branches reduced significantly in size The tree displayed very little evidence of life growth, and all was confined to a few live twigs situated sporadically across the tree Major pruning wound Soil excavation within a metre of the tree on the northern side Situating offsite, on a railway embankment	84	5.2	C (i)
T6	Ash Fraxinus excelsior	15	est 350 350 350	7.5	M	F	The tree was a former coppice with three co-dominant stems forming at ground level Situating offsite, by approximately three metres, on a railway embankment	166	7.3	B (i)
T7	English Oak Quercus robur	12	480	N - 8 S - 7 E - 7.5 W - 2	M	F	Major ivy covered most of the tree restricting an accurate measurement of the stem diameter and assessment of the tree Major pruning wound evident on west side over track Situating offsite, on a railway embankment	104	5.8	B (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T8	English Oak Quercus robur	4.5	450	1.5	EM	P	Tree been unsympathetically pruned, (lopped and topped), with all the major branches reduced significantly in size The tree displayed very little evidence of life growth, and all was confined to a few live twigs situated sporadically across the tree Major pruning wound Soil excavation within a metre of the tree on the eastern side	N/A	N/A	U
T9	English Oak Quercus robur	8	800	4	M	P	Tree been unsympathetically pruned, (lopped and topped), with all the major branches reduced significantly in size Soil excavation within one metre of the stem The tree displayed very little evidence of life growth, and all was confined to a few live twigs situated sporadically across the tree major pruning wounds at the extremity of every branch	N/A	N/A	U
T10	English Oak Quercus robur	18	840	7	OM	F	Sparse upper canopy indicating decline of physiological health Flail damage on the northern side Minor and major deadwood	319	10.1	B (i)
T11	Holly Ilex aquifolium	9	350 360	5	M	G	Typical crown form with no major defects observed	114	6.0	B (i)
T12	Holly Ilex aquifolium	5	170 190	3.5	SM	G	Typical crown form with no major defects observed	29	3.1	C (i)
T13	English Oak Quercus robur	11	780	6	M	P	Deadwood evident within the crown of minor and major proportions Dense ivy growth covering the tree up to ten metres above ground, which restricted the assessment	275	9.4	C (i)
T14	Sycamore Acer pseudoplatanus	8	290 220 170	3.5	EM	P	Multiple stems formed from ground level with light ivy cover on dominant stem up to approximately five metres no major defects were observed	73	4.8	C (i)
T15	English Oak Quercus robur	13	est 950	9	M	G	Situated offsite and within a residential garden Pruning wounds observed throughout the crown but all appeared dry with some callus growth, indicating that they had been created many years previous to the assessment No major defects	408	11.4	A (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T16	English Oak Quercus robur	8	est 1150	6	SM	F	Situated offsite and within a residential garden A high proportion of pruning wounds evident, especially within the area of the stem union The stem union displayed reaction growth that appeared as 'swelling' on the tree Branch stubs evident	598	13.8	B (i)
T17	English Oak Quercus robur	8	est 400	5	SM	F	Situated offsite and within a residential garden Branch stubs and pruning wounds observed No major defects	72	4.8	B (i)

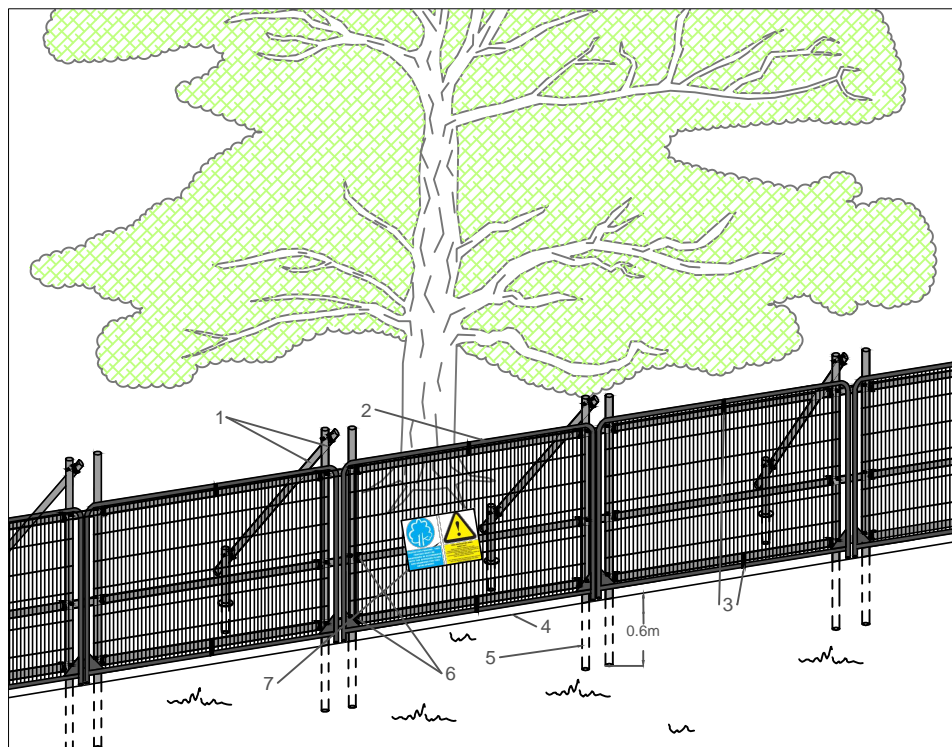


Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
<b>GROUPS OF TREES</b>										
TG1	Ash Fraxinus excelsior, Elder Sambucus nigra, English Oak Quercus robur, Field Maple Acer campestre, Aspen Populus tremula, Hazel Corylus avellana	14	upto 200 330 380 200	4 - 7	Yng, SM, EM	F	Major stem of one specimen had failed and fallen into site Situating offsite by approximately five to seven metres, within a railway embankment	151	6.9	B (ii)
TG2	Elder Sambucus nigra, Silver Birch Betula pendula, Holly Ilex aquifolium	8	150	2 - 3	SM	G	Typical canopy forms with no major defects observed	10	1.8	C (ii)
TG3	Hazel Corylus avellana	5	upto 90 90 90	3	SM	P, F	Many specimens had been felled resulting in numerous gaps and multiple stubs	11	1.9	C (ii)
TG4	Blackthorn Prunus spinosa, English Oak Quercus robur, Hawthorn Crataegus monogyna, Plum Prunus domestica, bullace prunus insititia 'damson'	11	upto 350	5.5	SM, EM	F, G	Bark wounds and minor dead branches evident on some of the specimens Compacted ground at the base Crossing and rubbing branches observed within most of the specimens Dense undergrowth at the base Multiple leader stems forming from base Single stem forms within group Situating offsite within residential gardens	55	4.2	B (ii)
TG5	English Elm Ulmus procera	6	90	3.5	SM	G	Typical crown form with no major defects noted	4	1.1	C (ii)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
TG6	English Oak Quercus robur	5	300	4	SM	F	Originally managed as part of the adjacent hedgerow Now forming two outgrown species	41	3.6	C (ii)
TG7	Blackthorn Prunus spinosa, English Oak Quercus robur, English Elm Ulmus procera	7	upto 120	3.5	SM	F, G	Minor deadwood observed on a minority of elm specimens throughout the group Dense ivy growth covering a high proportion of many specimens Few dead elm specimens	7	1.4	C (ii)
TG8	Leyland Cypress Cupressocyparis leylandii, Western Red Cedar Thuja plicata, Douglas fir Pseudotsuga menziesii Sycamore Acer pseudoplatanus, Cider Gum Eucalyptus gunnii	8	upto 260	2	SM, EM	F, G	Many of the specimens displayed typical crown forms however, some were managed as part of hedgerows No major defects were observed	31	3.1	B (ii)
TG9	English Oak Quercus robur, Tree of Heaven Ailanthus altissima	14	upto 380	5	EM	G	Typical crown forms with no major defects observed	65	4.6	B (ii)
TG10	English Oak Quercus robur, Aspen Populus tremula	18	est 1100	9	M	F, G	Low crown form with a ground clearance Dead branches of both minor and major proportions were evident within the crown Specimens had plenty of space to grow and develop broad canopies Stem cavities discovered Storm damage evident on some specimens	547	13.2	A (ii)

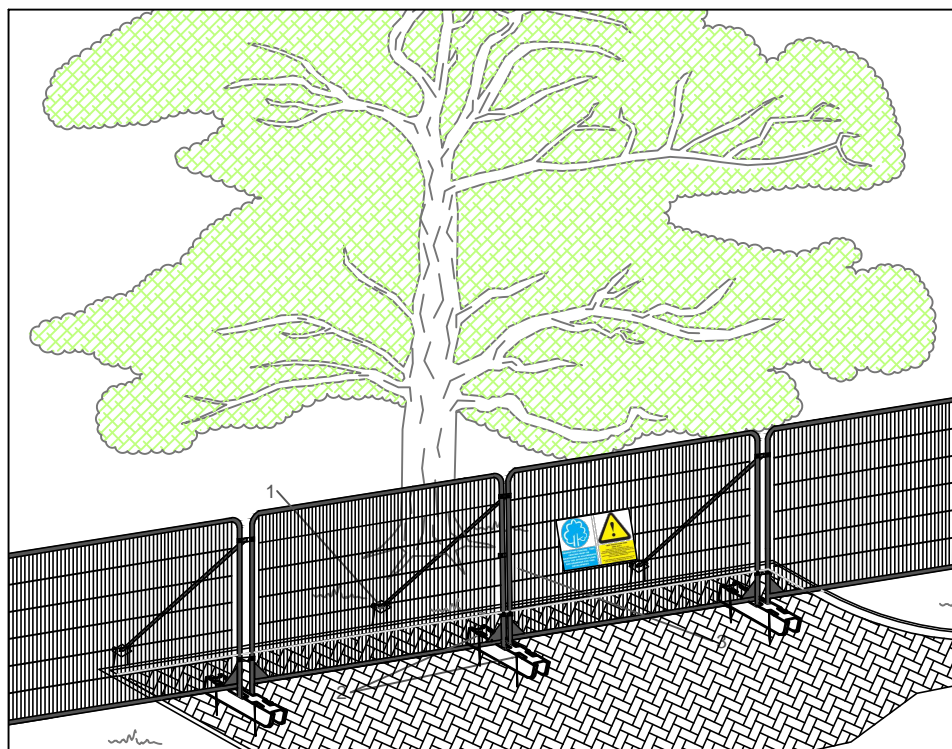
Hedge No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
<b>HEDGEROWS</b>										
H1	Hazel <i>Corylus avellana</i>	2.5	upto 25x 40	2.5	EM	F	Dormouse traps within the canopies of a minority of the trees Flail damage present on some of the specimens within the lower canopy Ivy on a minor amount of specimens	18	2.4	C (ii)
H2	Blackthorn <i>Prunus spinosa</i> , English Elm <i>Ulmus procera</i>	3	upto 7x 40	1.5	SM	F	The hedgerow covers the northern boundary of both fields but was only trimmed along the boundary of the easternmost field	5	1.3	C (ii)
H3	Hawthorn <i>Crataegus monogyna</i> , English Elm <i>Ulmus procera</i>	3.5	140 140 140	1.5	M	P, F	Flail damage in the lowest metre of stem Dense coverage of ivy	27	2.9	C (ii)
H4	Leyland Cypress <i>Cupressocyparis leylandii</i> , English Elm <i>Ulmus procera</i>	3	upto 140	1.5	SM	G	No major defects Predominantly cypresses with only a few elms	9	1.7	C (ii)





### Standard specification for protective barrier

1. Standard scaffold poles
2. Heavy gauge 2m tall galvanized tube and welded mesh infill panels
3. Panels secured to scaffold frame with wire ties
4. Ground level
5. Uprights driven into the ground until secure (min depth of 0.6m)
6. Standard scaffold clamps
7. Construction Exclusion Zone signs



### Above ground stabilising systems

1. Stabiliser strut with base plate secured with ground pins
2. Feet blocks secured with ground pins
3. Construction Exclusion Zone signs

Protective Fencing to be positioned to the specified dimensions in accordance with Figure 3 Tree Retention Plan

#### NOTES

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## APPENDIX B PROTECTIVE FENCING SPECIFICATIONS

CAD file: S:\Arb resources\Basic Templates\Tree Protection\Appendix B - Protective Fencing A4.dwg

