The Drummond Estate

Land off Harold's Lane, Enderby

Arboricultural Assessment

October 2020

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Rev	Issue Status	Prepared / Date	Approved/Date
-	Draft	TCB / 27.07.16	TJR / 29.07.16
A	Draft	TCB / 16.06.17	HCK / 16.06.17
	Final	TCB / 24.08.17	TJR / 24.08.17
A	Final	TCB / 20.04.18	CTT / 20.04.18
B	Final	TCB / 09.05.18	TCB / 09.05.18
C	Final	TCB / 25.06.18	CTT / 25.06.18
D	Final	TCB / 17.06.20	HR / 17.06.20
E	Final	TCB / 18.06.20	HR / 18.06.20
F	Final	TCB / 03.09.20	HR / 03.09.20
G	Final	TCB / 05.11.20	HR / 05.11.20

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1.0 INTRODUCTION

1.1 This report has been prepared by FPCR Environment and Design Limited on behalf of The Drummond Estate to present the findings of an arboricultural assessment and survey of trees located at land off Harold's Lane, Enderby (hereafter referred to as the site), OS Grid Ref SK 538 002.

1.2 The survey was carried out on 18th July 2016 and updated on 16th April 2020 and 25th August 2020.

1.3 The tree survey and assessment of existing trees has been carried out in accordance with guidance contained within British Standard 5837:2012 *'Trees in Relation to Design, Demolition and Construction - Recommendations'* (hereafter referred to as BS5837). The guidelines set out a structured assessment methodology to assist in determining which trees would be deemed either as being suitable or unsuitable for retention.

1.4 The guidance also provides recommendations for considering the relationship between existing trees and how those trees may integrate into designs for development; demolition operations and future construction processes so that a harmonious and sustainable relationship between any retained trees and built structures can be achieved.

1.5 The purpose of the report is therefore to firstly present the results of an assessment of the existing trees' arboricultural value, based on their current condition and quality and to secondly provide an assessment of impact arising from the proposed development of the site.

1.6 This report has been produced to accompany a planning application for road development and has included an assessment of any impact to the tree cover. The 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.

1.7 The assessment area was situated to the north of Enderby, a village in Leicestershire and comprised of a section of gravel track leading to Warren Farm, namely Harolds Lane situated off Warren Park Way. Tree cover included in the assessment area comprised of landscape buffer planting associated with Warrens Business Park, self-seeded vegetation along the track and woodland edge trees from the wider woodland, Fox Covert.

1.8 No direct consultation with the Local Planning Authority has taken place, however, it is understood having used the online search facility on the website for the Local Planning Authority, Blaby District Council, it is understood that there is a Tree Preservation Order, namely Fox Covert, Harolds Lane TPO 179/DC, which applies to a number of trees present within the assessment site and therefore statutory constraints apply to the 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 Chapter 4.

1.9 It must be understood that 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 of the application. This should 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 arboriculturalist and has 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 and woodland where it has been determined appropriate. The term group or woodland 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 groups has been made where 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 and 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 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 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 any individual trees, groups and a woodland found during the assessment 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.

Other Considerations

2.10 It may be necessary during detailed design to undertake further assessment and accurate positioning of woody species within hedgerows and tree groups to assist structural calculations for foundation design of structures in accordance with current building regulations. Knowledge of soil type was not known at the time of this tree assessment. If a current soil survey of the site has taken place then it must be read in conjuction with the results of the tree survey when determining foundation design in accordance with NHBC Chapter 4.2 Building near Trees.

Conditions of Tree Survey

2.11 The survey was completed from ground level only and from within the boundary of the site. Aerial tree inspections or the internal condition of the stem/s or branches were not undertaken at this stage as this level of survey is beyond the scope of the initial 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

2.12 The Assessment Boundary Plan identifies the extent of the requested assessment area. Trees positioned beyond this boundary may have been recorded where it is considered that they may pose a constraint upon any future development of the site.

2.13 The individual positions of trees and groups have been shown on the Tree Survey Plan. The positions of trees are based on a topographical / land survey, as far as possible, supplied by the client. Where topographical information has not identified the position of trees and hedgerows, their relation to any existing surrounding features has been plotted using a global positioning system and aerial photography to provide approximate locations. The crown spread, root protection area and shade pattern (where appropriate) are also indicated on this plan.

2.14 As part of this assessment, a Tree Retention Plan 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 would be required to be removed or retained as part of the proposed development.

Tree Constraints and Root Protection Areas

2.15 Below ground constraints to future development are represented by the area surrounding the tree containing sufficient rooting volume for the specimen to have the best chance of survival in the long term which is identified 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 successfully incorporated into any future scheme. Where applicable the shape of the Root Protection Area has been modified to take into account the presence of any nearby obstacles (existing or past) which may have restricted root growth and the likely root distribution i.e. the presence of hard standing, structures and underground apparatus.

2.16 Where groups of trees have been assessed, the Root Protection Area has been shown based on the maximum sized tree in any one group and so may exceed the Root Protection Area required for some of the individual specimens within the group. Further detailed inspection of the individual trees forming a group may be required where development impacts upon the group.

2.17 Above ground constraints such as the current and potential crown spread of the trees and an illustration of the shade pattern (where appropriate) have been considered and identified within the Tree Survey Plan and Tree Retention Plan plans to indicate their potential area of shading influence.

3.0 RESULTS

3.1 A total of eight individual trees, six groups of trees and a single woodland were surveyed as part of the Arboricultural Assessment. Trees were surveyed as individual trees and groups of trees where examples are clearly present as such per the description. Refer to the Tree Survey Plan and Appendix A – Tree Schedule for full details of the trees included in this assessment. The table below summarises the trees assessed. Several of the trees have been discussed in more detail following the table, owing to their physical condition or arboricultural significance.

Table 1: Summary of Trees by Retention Category

	Individual Trees	Total	Groups of Trees	Total
Category U - Unsuitable		0		0
Category A (High Quality / Value)		0		0
Category B (Moderate Quality / Value		0	W1	1
Category C (Low Quality / Value)	T1, T2, T3, T4, T5, T6, T7, T8	8	G1, G2, G3, G4, G5, G6	6

3.2 All of the tree cover assessed with the exception of the woodland was considered to be low in arboricultural quality due to either being sporadic in nature or of small proportions. The individual specimens and groups of trees are discussed in more detail below.

3.3 G1 and G2 were positioned either side of Warren Park Way before it turns into the gravel track of Harolds Lane. Semi and early mature specimens provided landscape buffer planting for commercial units on Warren Business Park. Low, interlocking crowns housed crossing and rubbing branches along with minor deadwood, and dense undergrowth such as bramble had become established throughout both groups. A wide range of species were noted which included ash *Fraxinus excelsior*, English oak *Quercus robur*, field maple *Acer campestre*, goat willow *Salix caprea*, silver birch *Betulus pendula* and wild cherry *Prunus avium*. Due to the lack of active management and small proportions of both G1 and G2 the groups were recorded as retention category C.

3.4 G3 again comprised buffer planting, predominately situated the opposite side of the boundary fence to the north. Species were identical to those in G2 with the addition of crack willow *Salix fragilis*. Due to the presence of the fence access was restricted, however, similar features were again observed. A number of self-seeded trees had become established the other side of the fence and within the assessment area although these were deemed to be poor in form. Overall the tree cover, recorded as G3, was low in quality and category C.

3.5 Tree cover situated along Harolds Lane again comprised of self–seeded material situated either side of an existing stone wall. The majority of this tree cover comprised of sycamore *Acer pseudoplatanus* and hawthorn *Crataegus monogyna* along with English oak, apple *Malus domestica*, field maple and silver birch observed in lower proportions. Multi-stemmed structures with low crowns displayed crossing and rubbing stems, basal suckers, minor dead wood, and crown dieback. Some specimens had grown in close proximity to the wall causing bark wounds. Recorded as T1 to T6 and G5, all again recorded as category C.

3.6 G6 was situated to the east of Warren Farm and comprised of semi mature examples of ash, hawthorn, sycamore and English elm *Ulmus procera*. These trees were growing within a wire mesh fence adjacent to a compound and farm out buildings. Dense ivy growth and dead trees resulted in low quality tree cover regarded as retention category C.

3.7 T7 and T8 were both situated along the track as it entered the farmyard. These early mature and mature specimens exhibited bark wounds, crossing and rubbing branches resulting in included unions along with minor deadwood. As with the majority of trees observed, T7 and T8 were recorded as category C.

3.8 W1 was situated to the north of Harolds Lane and comprised of a small parcel of woodland with an access track positioned halfway along. Early mature and mature specimens displayed typical woodland forms which had seen little management. Dense ivy and undergrowth was established although only the outside edge trees were inspected. The irregular form of the woodland edge meant that the majority of mature trees were approximately 20m away from the edge of the track. Two points of the woodland however did come in close proximity to Harolds Lane, these being to the west at the point the woodland started and also where the track approached a series of open fields to the east.

3.9 The southern edge of the woodland consisted scrub, lower canopy trees such as willow, hawthorn and holly along with the occasional sycamore. More established trees of species such as oak, silver birch and sycamore where set back approximately 20m to 25m from the current track. For full details of species situated with W1 refer to Appendix A – Tree Schedule. The vast majority of W1 was considered to be of moderate quality and provided a key landscape feature in comparison to the surrounding tree cover and for this reason was deemed to be retention category B. The southern edge however was considered to be of lower quality and category C.

4.0 ARBORICULTURAL IMPACT ASSESSMENT (AIA)

4.1 The following paragraphs present a summary of the tree survey and 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 Enderby Relief Road, Leicestershire – Highway General Arrangement dwg: ERR-BWB-HGN-8B-DR-D-100_Highway General Arrangement_S2-P1 and seeks to outline the relationship between the proposals and the existing trees and hedgerows. The above drawing shows the proposals for Option 8b for highway improvements along Harold's Lane, with new footpaths linking to a proposed roundabout to the east. An overlay of the above layout has been incorporated in the Tree Retention Plan to assist in identifying the relationship and any potential conflicts between the proposals and the existing trees and hedgerows.

4.3 To facilitate the proposals as per the above plan tree cover will need to be removed comprising of edge material of low quality tree cover from established tree groups along the existing road and track. A portion of woodland tree cover along the south of W1 will also need to be removed.

4.1 The new carriageway and footpath provision will require the removal of outgrown areas of the southern edge of W1 and a number of established trees within the woodland. Earthworks will be carried out within this area which will involve both cut and fill activities. Tree cover along the woodland edge is considered to be lower in quality than that present within the central portion and despite the loss of moderate tree cover further into the woodland the required losses are not deemed to be detrimental to the overall quality of W1.

4.2 All retained trees situated along the newly formed woodland edge and within falling distance to the new highway will need to the inspected for structural condition and general health. Any specimen that is deemed to be in a poor condition, such that it may fail and fall onto the new highway will need to be removed or pruned to remove any risk. Below are further recommendations in relation to this.

Physical Effects of "Wind Throw" and Evaluation of Risk

4.3 Any newly exposed edge of forest, woodland, plantation or group of trees would be at risk from the effects of "windthrow". In forestry, the term "windthrow" refers to trees being either uprooted or physically damaged by the effects of wind hitting the once protected internal parts. In most cases, it is often breakage of the main stem that occurs rather than total uprooting (referred to as "wind blow") and this type of damage is referred to as "wind snap".

4.4 Having assessed the material that is to be removed and the environmental conditions associated with the woodland, it is the opinion that the level of risk of "wind blow" would be very low. This conclusion has been reached based on a number of factors.

4.5 Firstly, the material is currently of relatively small proportions and with physical forms that are tall and drawn with restricted crown development due to the growing conditions. Therefore, it is the view that the individual trees have a good amount of flexibility and due to their young ages would be better able to withstand wind loading without risk of uprooting. Secondly, at present also as their crowns are also limited in size it would subsequently translate that the amount of natural leverage that may result in failure would be reduced, compared to crowns of larger dimensions thus reducing the chance of excessive movement / sway building up to result in uprooting. Thirdly, the trees are orientated downwind of the prevailing wind direction from the south west hence under normal conditions would mean any impact would be directly onto the edge of the woodland thereby reducing the risk of uprooting. Clearly, overtime the new edge would become more "wind firm" and more resistant to the effects of wind loading therefore reducing the level of risk of wind blow further.

4.6 There would however be reasonable evidence to suggest that potential for "wind snap" would be a realistic risk, although it is the view similarly that this risk level would be low. There is potential for possible failure of stems thereby meaning crown material / branches may fall in close proximity to the new road. However, it is anticipated that the material would fall within the grass verges and not on the road itself.

4.7 To reduce the effects of such damage occurring in the newly created edge of the woodland there are mitigation measures that can be applied, and this has been further detailed below. This would fundamentally be achieved through the application of a structured and graduated tree / shrub planting; selective tree removals and branch pruning where required and regular monitoring post tree clearances.

5.0 RECOMMENDATIONS AND MITIGATION MEASURES

5.1 The following paragraphs detail the recommended measures.

5.2 In such situations, the ultimate safe position to future road users would be to clear back all those trees within falling distance of the highway to avoid any trees reaching the road should they fail. This would mean clearing a distance of a minimum of 10m beyond the edge of the road.

5.3 Having assessed the level of risk, it would not however be considered necessary to clear back any further beyond this distance into the woodland due to the young ages of the trees and low level of risk they present, for the reasons abovementioned, should failure occur. Providing the mitigation measures as set out are implemented there should be little risk to the road from trees within the woodland in close proximity.

5.4 The recommended management and mitigation measures are as follows:

5.5 Before any clear felling undertake a detailed evaluation on site of the final position of the eventual edge. The aim being to identify trees for selective removal along the final edge of the cleared area, following individual assessments and marking out on site. This will allow identification of weaker stems favouring retention of the stronger stems to grow on and develop. This will have the positive effect of creating a “scalloped” final edge over that of a hard straight and unnatural edge, which would serve to assist with reducing the effects of wind blow and wind snap. There may also be possible need for tree surgery to address any obvious weak lower branches where they are present. This will be judged on an individual basis once trees for retention have been identified.

5.6 To carry out “structured graduated planting” in the new verges from the edge of the road as room allows, to the woodland boundary with a range of species of differing planting specifications i.e. larger and smaller sized planting stock in order to form an angled “wind break”, with the aim being to reduce the speed and impact of wind upon the edge of the newly exposed trees as it passes across the planting. This approach to the mitigation planting would have the added benefit of when it eventually matures, creating an effective visually pleasing landscape buffer and a resource for local wildlife.

5.7 It would be proposed that a fully qualified arboriculturalist selects and marks the trees for removal. This will include trees with the narrowest stems in comparison to their height as these are at greater risk of “wind snap”, and trees that are closely positioned to other trees. The final remaining trees would eventually have a minimum of a 4m clearance around their stems. This will need to be achieved over a two – four-year time frame. The reason being to further reduce the risks of wind snap and potential for wind blow through opening the edge too suddenly hence this aims to stagger the clearance and process by which trees are exposed so that there is a lowering of risk of any failure.

5.8 The prevailing wind direction is from the south west and therefore due to the orientation of the woodland, the likely direction trees would fail should this happen would be to the north east and into the woodland itself. The probability of trees falling and collapsing onto the new road therefore is far less likely.

5.9 It is therefore recommended that the mitigation planting is undertaken as described above to reduce the wind speed from the west as it meets with the woodland thereby serving to reduce the chance of individual tree failure into the woodland or onto the road. Secondly it is recommended that any clearly weak trees are removed.

New Tree Planting

5.10 New tree planting will form an integral part of the proposals; however, new tree planting should be appropriate for the future use of the site and not just aim to improve the existing tree population.

5.11 As part of the proposals an adequate quantity of structured tree planting should be demonstrated alongside road infrastructure within the roadside verges. The purpose and function of this new tree planting should be understood from the start of any design stages so that key objectives from a landscape perspective can also be achieved.

5.12 New woodland planting will also be carried out within land to the north in between the existing woodland and the M69 motorway. New woodland planting will aim to replace that which is to be lost along with additional planting to increase the current canopy cover of W1.

5.13 The implementation of a woodland management plan will ensure the future management of both existing and new woodland.

5.14 The success of any landscaping scheme relies on making sure that there is adequate provision of an environment within which trees can thrive and reach their full potential. Planting trees with due care and consideration can, in the long term, provide a greater return on a schemes green investment and ensure trees remain healthy and grow to mature proportions. Healthy mature trees integrate well into the built environment; increase the maturity of the landscape; help provide a natural green and leafy urban environment in which people would want to reside whilst also benefiting local wildlife.

5.15 The planting of trees within confined urban environments should consider the use of appropriately designed planting pits specifically engineered to promote tree health and longevity. The rooting environment will need to provide an adequate volume of quality soil for roots to suitably develop by calculating the amount of available soil volumes needed and selecting species whose mature size is compatible with the site. This is an integral component of the planning stage (Lindsey & Bassuk, 1991).

5.16 Wherever possible, following discussions with the developer and utility company's common service trenches should be specified to minimise land take associated with underground service provision and facilitation access for future maintenance.

5.17 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. Furthermore, during the design process consultation should be made with the local planning authority to obtain information on their tree strategy and incorporate the planting proposals with any local policies and initiatives and/or biodiversity action plans (BAP).

5.18 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, soil type and maintenance requirements in relation to both the built form of the new development and existing properties. Through careful species selection the landscape scheme shall reduce the risk of trees being removed in the future on the grounds of nuisance. Nuisance can be perceived in a number of ways and vary from person to person however most commonly, within the context of trees, low overhanging branches, excessive shading, seasonal leaf fall and the misinformed perception that trees close to buildings cause damage.

5.19 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.

Tree Management

5.20 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 arboriculturalist or arborist to identify any potential public safety risks and to agree remedial works as required.

5.21 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.

5.22 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

5.23 Ground investigation through the use of pneumatic excavation, such as an Air Spade and digging of trial pits, may be required should there be areas where it is not possible to modify the layout to avoid conflict with retained trees. Ground investigations would aim to determine the actual location of the physical roots without causing them damage in the process. Such an assessment would enable consideration of the practicality and suitability of certain 'tree friendly' construction methods and would better inform decision making for a design.

5.24 Further assessment of the impact to actual roots found during the ground investigations can then be made and solutions reached thus greatly reducing any potential future impacts on retained trees whilst allowing the development to proceed and minimising risks to future tree health. Ultimately the aim would be to reduce conflicts between trees and buildings and achieve successful tree retention.

5.25 The use of “no-dig” construction methods should be considered prior to decisions being made as to the removal of each tree concerned, where conflicts between trees identified for retention and the layout arise. Such methods of construction and the use of industry led specialist engineering solutions i.e. three dimensional “load bearing” cellular confinement systems can be used particularly in the case of carriageways, footways and driveways in order to avoid unnecessary losses of trees.

5.26 The routing of below ground services should also be considered with regard to the retained trees as part of a subsequent reserved matters application pursuant to layout. 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 modification 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.

5.27 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.

6.0 TREE PROTECTION MEASURES

6.1 Retained trees will be adequately protected during works ensuring that the calculated root protection area 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

6.2 All trees retained on site will be protected by suitable barriers or ground protection measures around the calculated RPA, crown spread of the tree or other defined constraints of this assessment as detailed by section 6 and 7 of BS5837.

6.3 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.

6.4 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.

6.5 Where it has been agreed, construction access may take place within the root protection area if suitable ground protection measures are in place. This may comprise single scaffold boards over a compressible layer laid onto a geo-textile membrane for pedestrian movements. Vehicular movements over the root protection area will require the calculation of expected loading and the use of proprietary protection systems.

6.6 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

6.7 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.

6.8 In most situations fencing should comprise typical construction fencing panels attached to scaffold poles driven vertically into the ground. For particular areas where construction activity is anticipated to be of a more intense nature supporting struts acting as a brace should be added and fixed into position through the application of metal pins driven into the ground to offer additional resistance against impacts. Where site circumstances and the risk to retained trees do not necessitate the default level of protection an alternative will be specified appropriate to the level / nature of anticipated construction activity. The recommended methods of fencing specifications for this site have been illustrated in Appendix B.

6.9 It may be appropriate on some sites to use temporary site offices, hoardings and lower level barrier protection as components of the tree protection barriers. Details of the specific protection barriers for the site can be provided should the application be approved, as part of a site specific Arboricultural Method Statement for a Reserved Matters application and in accordance with the guidance contained within BS5837.

Ground Protection

6.10 Where it has been agreed, construction access may take place within Root Protection Areas 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

6.11 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.

6.12 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. Protection fencing signs can be provided upon request.

6.13 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.

6.14 Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree stem. No concrete should be mixed within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.

6.15 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.

6.16 Notice boards, telephone cables or other services should not be attached to any part of a retained tree.

6.17 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

6.18 A number of trees were located on the boundaries of the site and therefore the root protection area and crown spread 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 root protection area.

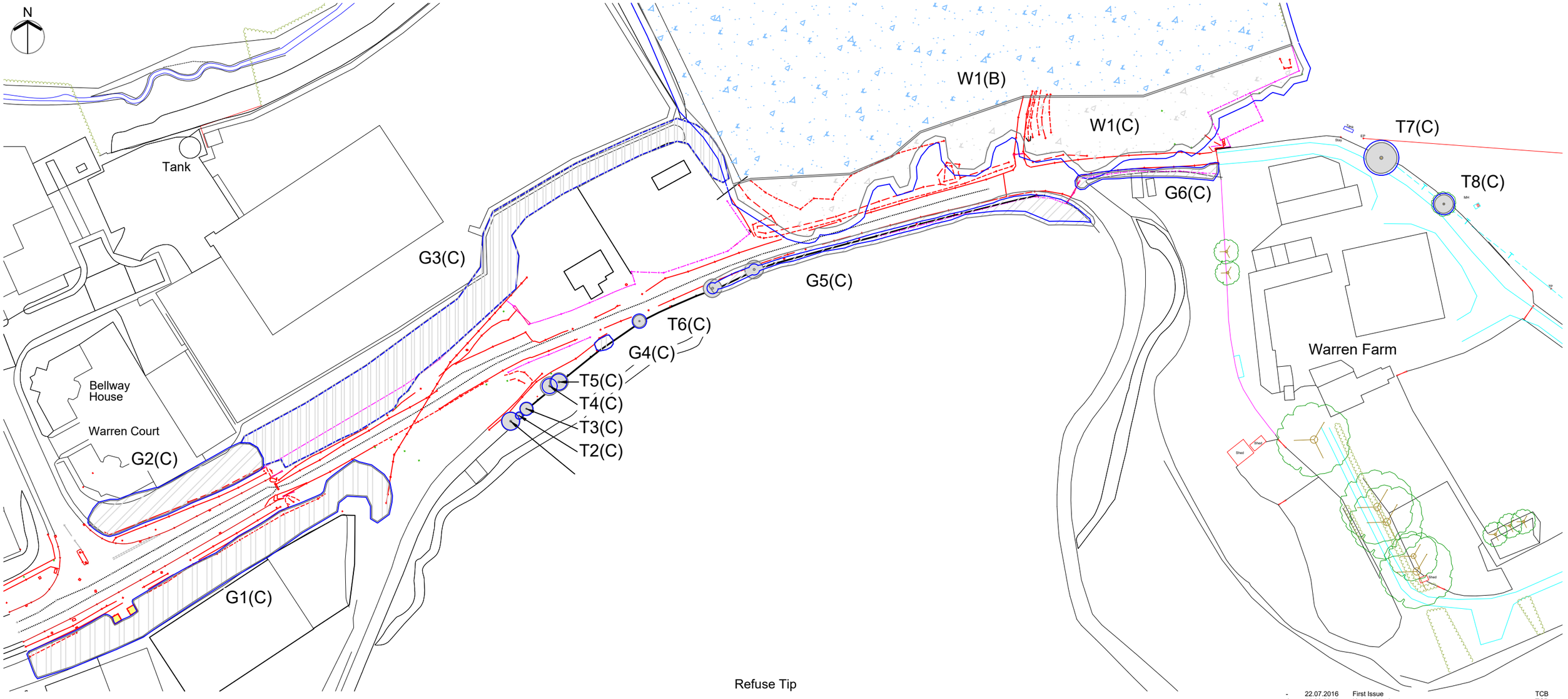
6.19 Any trees which are to be retained and whose Root Protection Areas may be affected by the development should be monitored, during and after construction, to identify any alterations in quality with time and to assess and undertake any remedial works required as a result.

Protection for Aerial Parts of Retained Trees

6.20 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 obstructive 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.

6.21 A pre-commencement site meeting with contractors who are responsible for operating machinery will be required, 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.

6.22 In the event of having caused any 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 and in agreement with the Local Planning Authority prior to correcting the damage, upon completion of development.



KEY

- Category U - Trees / Groups Unsuitable for Retention (BS 5837:2012)
- Category A - Trees / Groups of High Quality (BS 5837:2012)
- Category B - Trees / Groups of Moderate Quality (BS 5837:2012)
- Category C - Trees / Groups of Low Quality (BS 5837:2012)
- Woodland (Colour indicates BS 5837:2012 Category)
- Root Protection Area (The RPA has been altered where appropriate to reflect underground constraints)
- T1 (A) G1 (A) — Individual / Group Number and BS5837:2012 Category

NOTES

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

Drawing has been produced in colour and is based on digital information in .dwg format, aerial images and/or GPS location where appropriate. A monochrome copy should not be relied upon. The exact position of individual trees or species included as part of a tree group, woodland or hedgerow should be checked and verified on site prior to any decisions for foundation design, tree operations or construction activity being undertaken. Further survey work would be required for calculating foundation depths.

Trees are living organisms that change over time, the condition of all trees illustrated herein, are to be checked by the project Arboriculturalist should works commence 12 months after the date of this survey.

SOME TREES MAY BE SUBJECT TO STATUTORY CONSTRAINTS. IT IS THEREFORE ADVISED THAT NO WORKS SHOULD BE UNDERTAKEN TO ANY TREES ILLUSTRATED HEREIN WITHOUT FIRST OBTAINING THE RELEVANT AUTHORISATION TO DO SO UNLESS AGREED AS PER THE APPROVED PLANS THROUGH PLANNING CONSENT.

Scale 1:1250 @ A3

0 25 50 75m

rev	date	description	by
-	22.07.2016	First Issue	TCB
A	14.06.2017	Key updated	TCB
B	17.06.2020	Woodland updated	TCB

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The Drummond Estate

project
Land of Harolds Lane
Enderby

drawing title
TREE SURVEY PLAN

scale
1:1250 @ A3

drawn
TCB

date
June 2017

drawing number
6855-A(BP)-02

rev
B

CAD file: J:\6800\6855\ARB\Bypass Work\Plans\Tree Survey Plan REV A.dwg

rev	date	description	by
-	22.07.2016	First Issue	TCB
A	14.06.2017	New road layout inserted	TCB
B	20.04.2018	New road layout inserted	TCB
C	09.05.2018	New road layout inserted	TCB
D	25.06.2018	New road layout inserted	TCB
E	05.05.2020	New road layout inserted	TCB
F	17.06.2020	New road layout inserted	TCB
G	03.09.2020	New road layout inserted	TCB
H	05.11.2020	New road layout inserted	TCB

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project
Land of Harolds Lane
Enderby

drawing title
TREE RETENTION PLAN

scale	drawn	date
1:2000 @ A3	TCB	Oct 2020

drawing number
6855-A(BP)-03

rev
H

CAD file: J:\6800\6855\ARB\Bypass Work\Plans\Tree Retention Plan REV H.dwg

Scale 1:2000 @ A3

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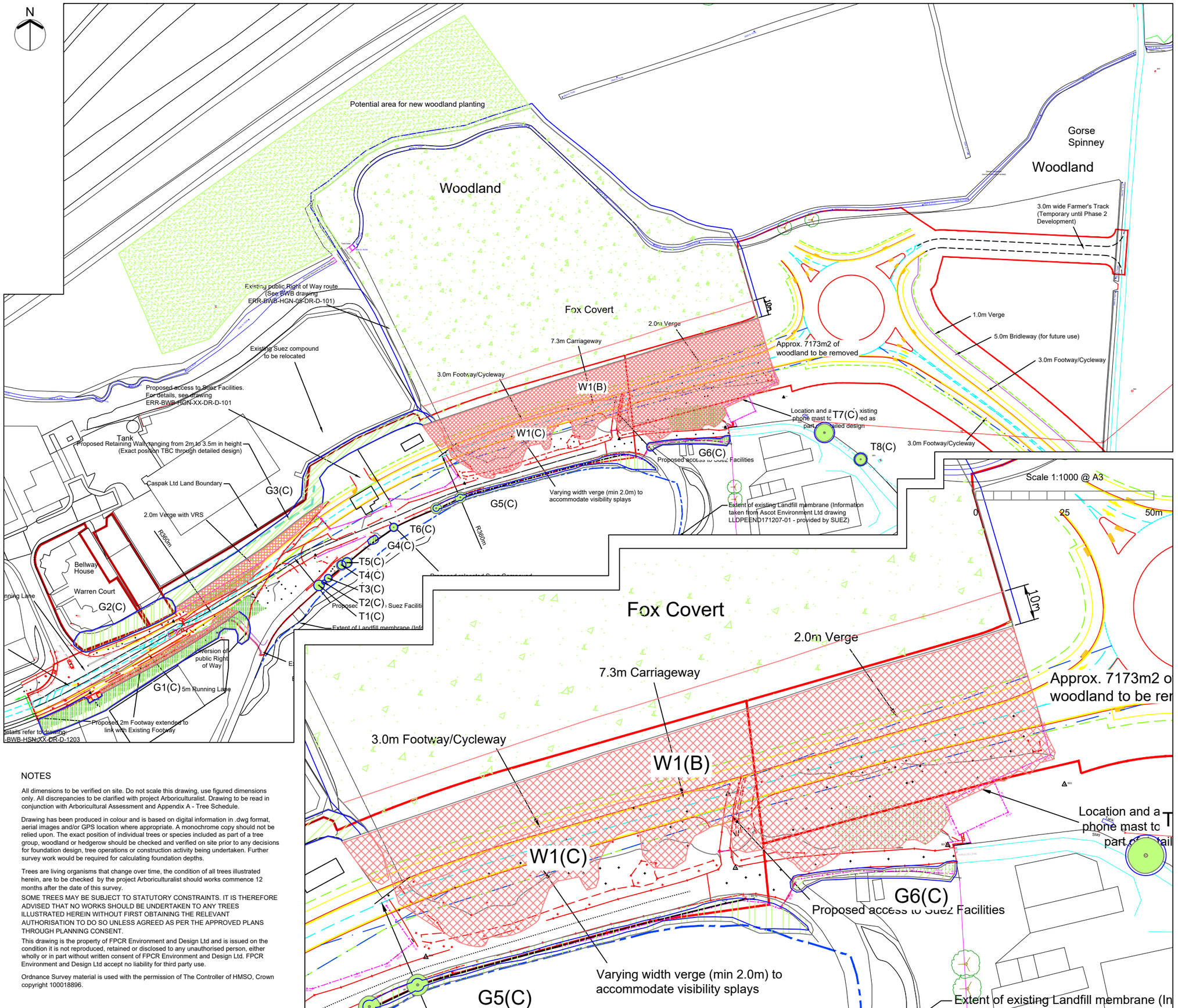
KEY

- Tree/Group to be Retained
- Tree/Group to be removed to facilitate the proposals
- Category U - Unsuitable for retention on arboricultural grounds
- Hedgerow Proposed to be Retained and Incorporated into the New Development
- Hedgerow Proposed to be Removed to Facilitate the Development upon Approval of the Application
- Woodland to be retained
- Root Protection Area (Shown for retained trees only)
- T1 (A) G1 (A) — Individual / Group Number and BS Category
- Potential woodland planting



NOTES

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

Drawing has been produced in colour and is based on digital information in .dwg format, aerial images and/or GPS location where appropriate. A monochrome copy should not be relied upon. The exact position of individual trees or species included as part of a tree group, woodland or hedgerow should be checked and verified on site prior to any decisions for foundation design, tree operations or construction activity being undertaken. Further survey work would be required for calculating foundation depths.

Trees are living organisms that change over time, the condition of all trees illustrated herein, are to be checked by the project Arboriculturalist should works commence 12 months after the date of this survey.

SOME TREES MAY BE SUBJECT TO STATUTORY CONSTRAINTS. IT IS THEREFORE ADVISED THAT NO WORKS SHOULD BE UNDERTAKEN TO ANY TREES ILLUSTRATED HEREIN WITHOUT FIRST OBTAINING THE RELEVANT AUTHORISATION TO DO SO UNLESS AGREED AS PER THE APPROVED PLANS THROUGH PLANNING CONSENT.

Appendix A - Tree Schedule

Measurements	Age Class	Overall Condition	Root Protection Area (RPA)
Height - Measured using a digital laser clinometer (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	• The RPA Radius column provides the extent of an equivalent circle from the centre of the stem (m). • The RPA is calculated using the formulae described in paragraph 4.6.1 of British Standard 5837: 2012 and is indicative of the rooting area required for a tree to be successfully retained. Tree roots extend beyond the calculated RPA in many cases and where possible a greater distance should be protected. • Where veteran trees have been identified the RPA has been calculated in accordance with Natural England guidance i.e. 15x the stem diameter, uncapped.
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 rectifiable defects or in the early stages of stress from which it may recover	
Crown Radius - Measured using a digital laser clinometer 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 - Maximum stem diameter of a group	M: Mature trees over 2/3 life expectancy	D - Dead: This could also apply to trees in an advanced state of decline and unlikely to recover	
	OM: Over mature declining or moribund trees of low vigour	The BS category particular consideration has been given to the following • The health, vigour and condition of each tree • The presence of any structural defects in each tree/group and its future life expectancy • The size and form of each tree/group and its suitability within the context of a proposed development • The location of each tree relative to existing site features e.g. its screening value or landscape features • Age class and life expectancy	
	V: Veteran tree possessing certain attributes relating to veteran trees		

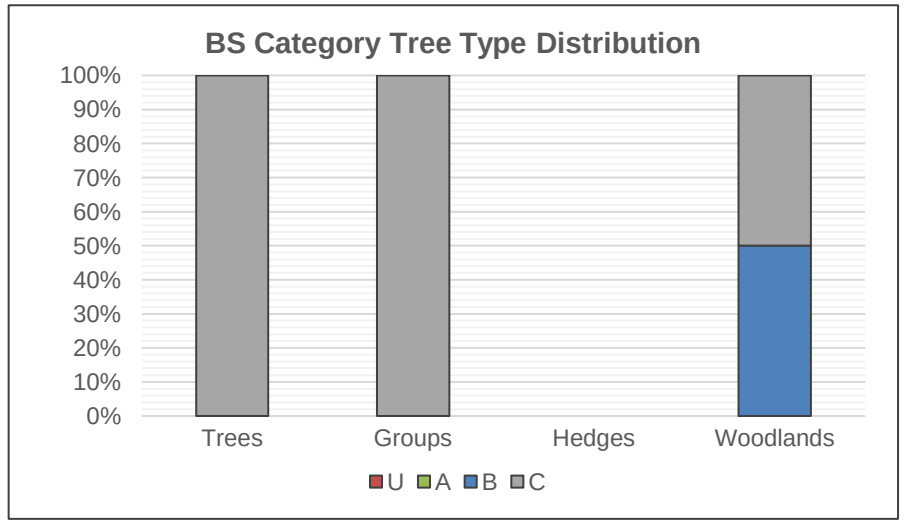
Structural Condition
The following is an example of considerations when inspecting structural condition: • The presence of fungal fruiting bodies around the base of the tree or on the stem, as they could possibly indicate the presence of possible internal decay • Soil cracks and any heaving of the soil 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 • Damage to roots • Basal, stem or branch / limb cavities • Crown die-back or abnormal foliage size and colour

Quality Assessment of BS 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

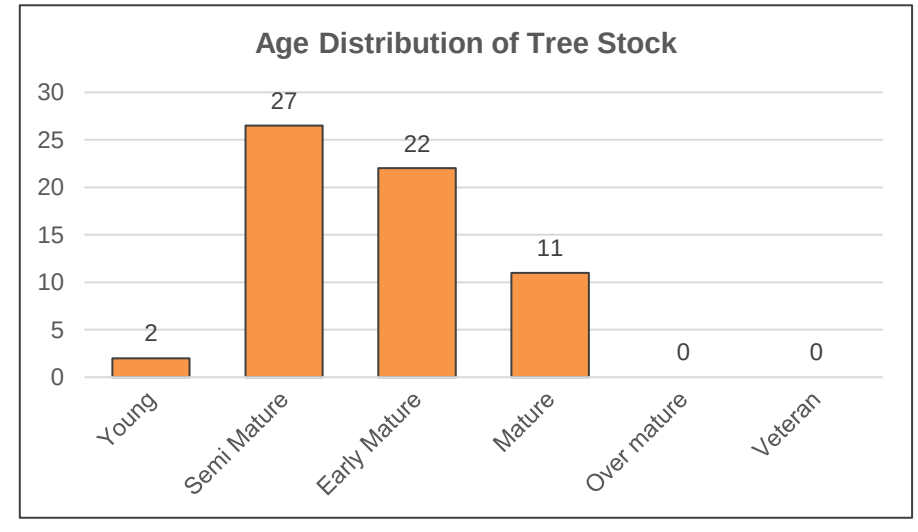
Appendix Summary

	Individual Trees	Totals	Tree Groups and Hedgerows	Totals
Category U		0		0
Category A		0		0
Category B		0	W1	1
Category C	T1, T2, T3, T4, T5, T6, T7, T8	8	G1, G2, G3, G4, G5, G6	7
	Total	8	Total	8

BS Category Tree Type Distribution displays the proportion of trees assessed in each type to enable a better understanding of the category distribution.



Age Distribution of Tree Stock shows the number of trees in each age category across the tree stock allowing assessment of their longevity to be made.



Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
INDIVIDUAL TREES										
T1	Sycamore Acer pseudoplatanus	7	avg 140 140 140	3	SM	F	Base obscured Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base Situated opposite side of wall	27	2.9	C (i)
T2	Sycamore Acer pseudoplatanus	4	est 100	1	Yng	F	Base obscured Low crown form Minor dead wood evident in the crown (<75mm)	5	1.2	C (i)
T3	Sycamore Acer pseudoplatanus	5	est 80 80 80 80	2	Yng	F	Base obscured Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base	14	2.1	C (i)
T4	Sycamore Acer pseudoplatanus	7	est 160 90 90	3	SM	F	Base obscured Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base	19	2.5	C (i)
T5	Apple Malus domestica	7	220	3	EM	F	Base obscured Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base	22	2.6	C (i)
T6	Sycamore Acer pseudoplatanus	5	6x 80	2	SM	P	Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base Growing against wall	17	2.4	C (i)
T7	Sycamore Acer pseudoplatanus	17	330 340	5	M	F	Bark wounds noted Crossing and rubbing branches Included bark union Low crown form Minor dead wood evident in the crown (<75mm) Overhead cables	102	5.7	C (i)

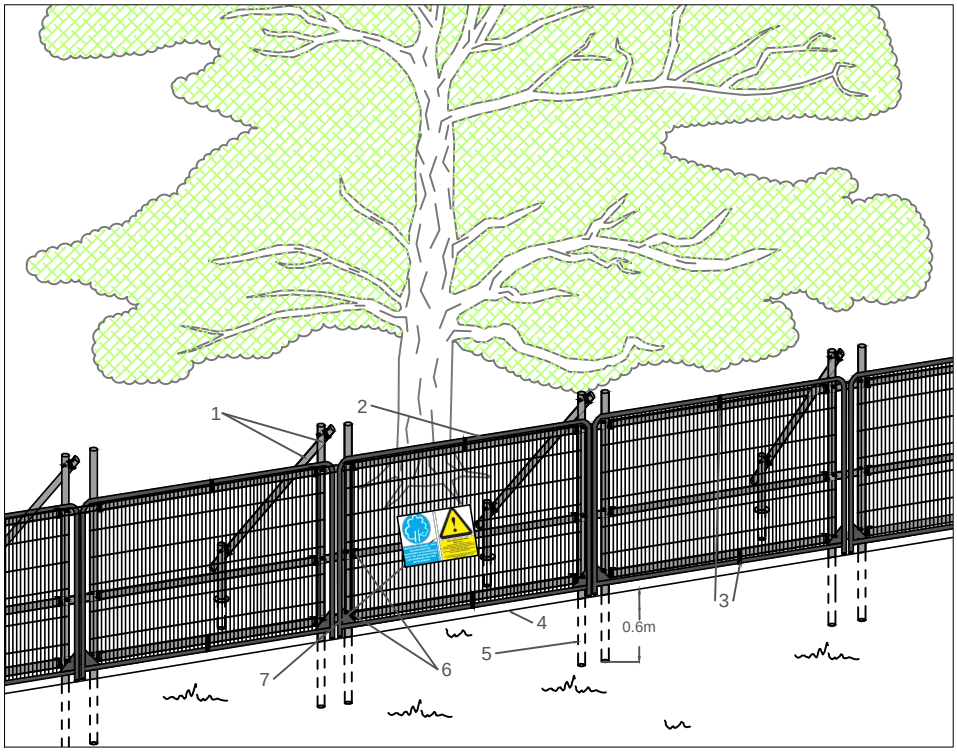
Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T8	Sycamore Acer pseudoplatanus	6	290	3	EM	F	Bark wounds noted Basal suckers present Crossing and rubbing branches Included bark union Low crown form Minor dead wood evident in the crown (<75mm) Overhead cables	38	3.5	C (i)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
GROUPS OF TREES										
G1	Ash Fraxinus excelsior English Oak Quercus robur Field Maple Acer campestre Goat Willow Salix caprea Silver Birch Betula pendula Wild Cherry Prunus avium	12	upto 200	3	SM / EM	F	Crossing and rubbing branches Dense undergrowth at the base Interlocking crowns Low crown form Minor dead wood evident in the crown (<75mm) Buffer planting to industrial estate	18	2.4	C (ii)
G2	Ash Fraxinus excelsior English Oak Quercus robur Field Maple Acer campestre Silver Birch Betula pendula Wild Cherry Prunus avium	12	upto 200	2	SM / EM	F	Crossing and rubbing branches Dense undergrowth at the base Interlocking crowns Low crown form Minor dead wood evident in the crown (<75mm) Buffer planting to industrial estate	18	2.4	C (ii)
G3	Crack Willow Salix fragilis English Oak Quercus robur Field Maple Acer campestre Hawthorn Crataegus monogyna Silver Birch Betula pendula Wild Cherry Prunus avium	8	est 150	2	SM	F	Base obscured Crossing and rubbing branches Dense undergrowth at the base Interlocking crowns Low crown form Multi stemmed from base Situated offsite Unable to gain access Some self set material establishing site side of fence	10	1.8	C (ii)
G4	Hawthorn Crataegus monogyna	4	est 6x 70	2	SM	F	Crossing and rubbing branches Interlocking crowns Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base	13	2.1	C (ii)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
G5	English Oak Quercus robur Field Maple Acer campestre Hawthorn Crataegus monogyna Silver Birch Betula pendula Sycamore Acer pseudoplatanus	9	upto 150	3	SM	P / F	Crossing and rubbing branches Dieback of the crown observed Interlocking crowns Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base Sporadic self-seeded group of trees Numerous self set trees situated both sides of stone wall	10	1.8	C (ii)
G6	Ash Fraxinus excelsior Hawthorn Crataegus monogyna Sycamore Acer pseudoplatanus English Elm Ulmus procera	9	est 150 150	2	SM	P	Crossing and rubbing branches Dead trees noted Dense ivy cover on main stem Interlocking crowns Low crown form Trees growing within metal wire fence	20	2.5	C (ii)

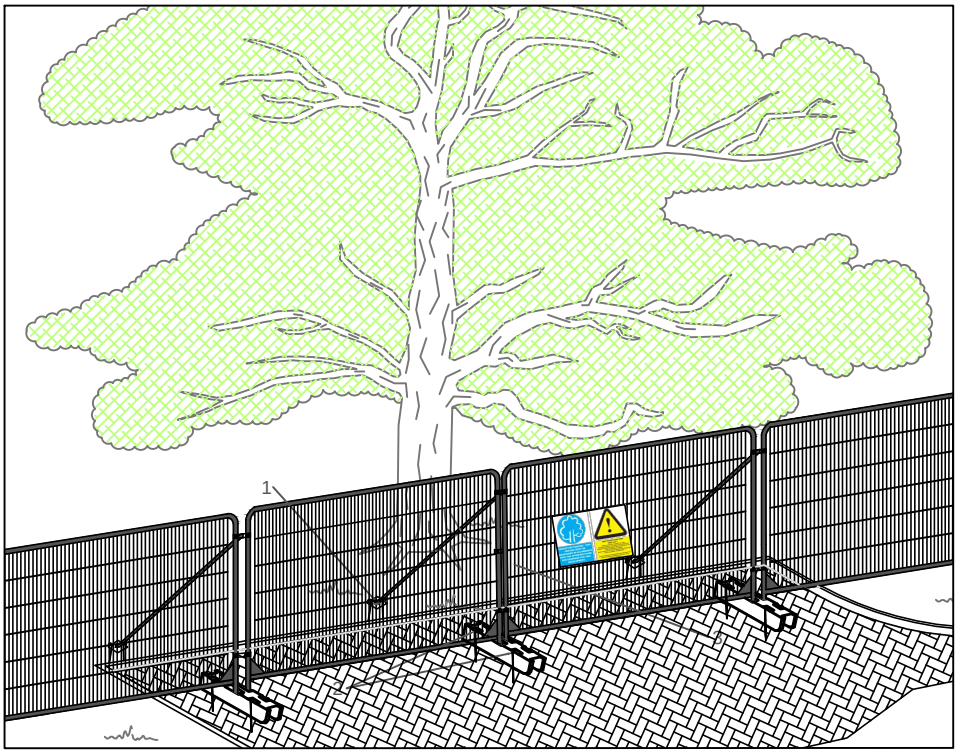
Hedge No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
HEDGEROWS										

Wood No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
WOODLANDS										
W1	Ash Fraxinus excelsior Elder Sambucus nigra English Oak Quercus robur Goat Willow Salix caprea Hawthorn Crataegus monogyna Sycamore Acer pseudoplatanus English Elm Ulmus procera Laural Prunus Laurocerasus	15	upto 600	5	EM / M	F	Base obscured Dense ivy cover on main stem Dense undergrowth at the base Interlocking crowns Low crown form Minor dead wood evident in the crown (<75mm) Typical crown form Typical woodland forms with dense undergrowth along woodland edge Mature trees are set back from track by 20m	163	7.2	B (ii) 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

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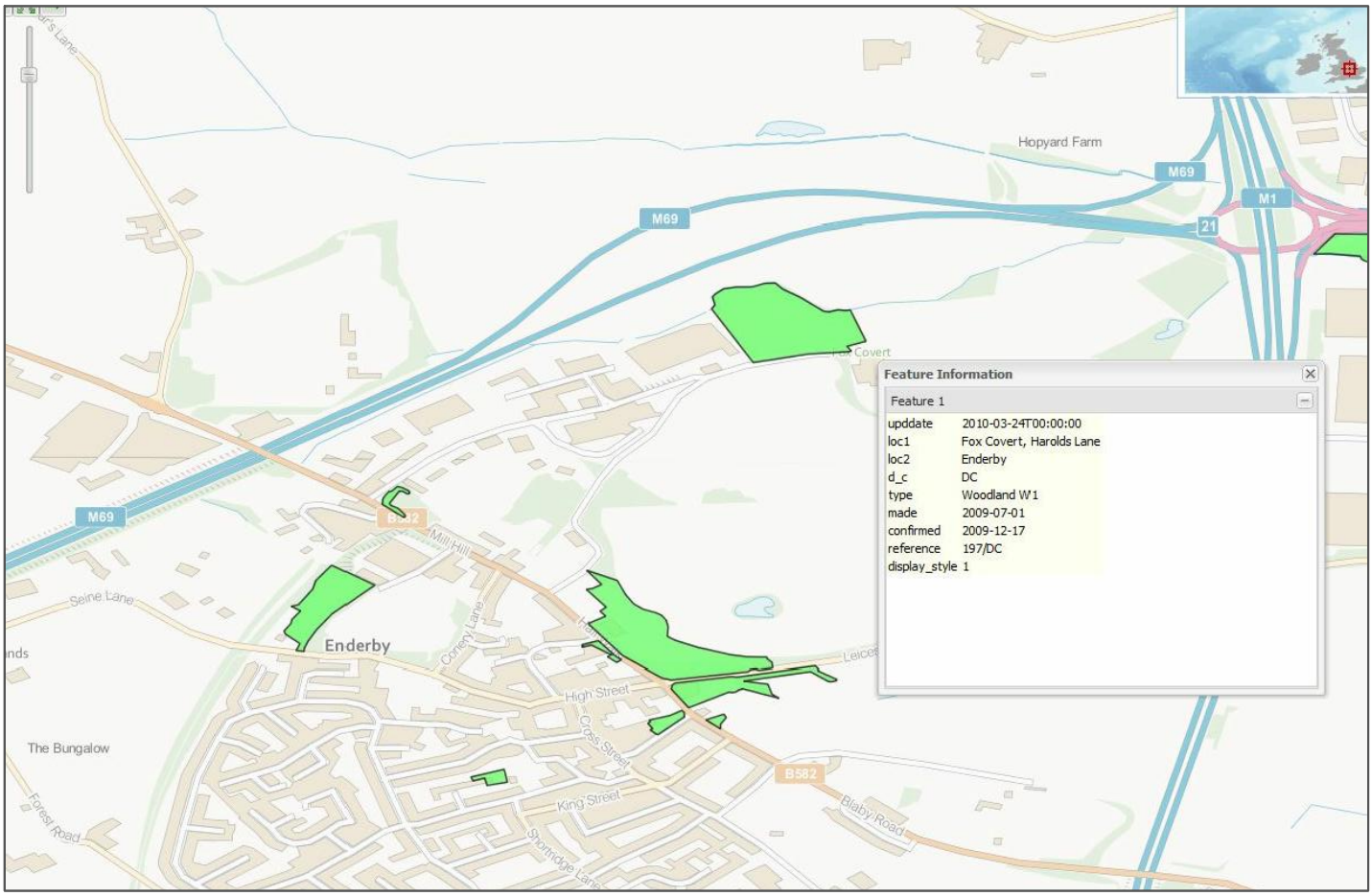
APPENDIX B
PROTECTIVE FENCING SPECIFICATIONS

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



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TREE PRESERVATION ORDER
APPENDIX C

scale	drawn	date
NOT TO SCALE	TCB	June 2017

drawing number

rev

CAD file: J:\6800\6855\ARB\Bypass Work\Plans\Appendix C - TPO.dwg