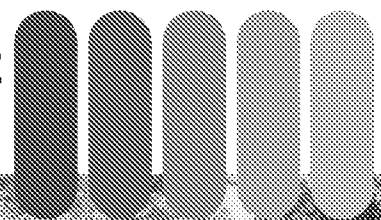


Arboricultural Impact Assessment

January 2017



HOOK LANE PAGHAM

on behalf of:
Hallam Land Management Ltd



Hallam Land Management

Rose Green, Pagham

Arboricultural Assessment

January 2017

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1.0 INTRODUCTION

- 1.1 This report has been prepared by FPCR Environment and Design Limited on behalf of Hallam Land Management to present the findings of an Arboricultural Assessment and survey of trees located at Rose Green, Pagham (hereafter referred to as the site), OS Grid Ref SZ 89569 99190, as shown in Figure 1. The survey was carried out on 5th April 2016.
- 1.2 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.
- 1.3 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.
- 1.4 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.
- 1.5 This report has been produced to accompany a planning application for a residential 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.
- 1.6 The site consists of two large arable field parcels to the west of Rose Green, bound by Hook Lane to the east, Sefter Road to the north and Pagham Road to the west. Several residential properties are present to the north west corner of the site. The tree stock on site is restricted to its boundaries and consists of a mixture of naturalised broadleaved species.
- 1.7 It is understood having used the online search facility on the website for the Local Planning Authority, Arun District Council that there are no tree preservation orders and Conservation Areas that would apply to any trees present on, or in close proximity to the assessment site and therefore no statutory constraints would apply to the development in respect of trees.

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 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 groups or woodlands 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 hedgerows 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.

Hedgerows

- 2.10 For the purposes of this assessment, a hedgerow is described as any boundary line of trees or shrubs less than 5m wide at the base and are managed under a regular pruning regime. Hedgerows and substantial internal or boundary hedges (including evergreen screens) have been recorded including lateral spread, height and stem diameter(s). Where trees are present within a hedgerow that are significantly different in character from the remainder, these have been identified and recorded separately.
- 2.11 A tree survey in accordance with BS5837 does not assess hedgerows against the Hedgerow Regulations 1997 or specifically from an ecological perspective, and is outside the scope of this assessment.

Other Considerations

- 2.12 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 conjunction 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

- 2.13 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

- 2.14 Figure 1 (drawing no. 7232-A-01) identifies the assessment area including trees beyond the application boundary that may be affected by future development of the site and should not be considered as the application boundary.
- 2.15 The individual positions of trees and groups have been shown on the Tree Survey Plan, Figure 2 (drawing no. 7232-A-02). 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.
- 2.16 As part of the Arboricultural Impact Assessment, a Tree Retention Plan, Figure 3 (drawing no. 7232-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 would be required to be removed or retained as part of the proposed development.

Tree Constraints and Root Protection Areas

- 2.17 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.
- 2.18 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.
- 2.19 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 seven individual trees, six groups of trees and four hedgerows were surveyed as part of the Arboricultural Assessment. Trees were surveyed as individual trees and groups of trees where examples are clearly present as per the description. Refer to Figure 2 – 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)	T6	1		0
Category C (Low Quality / Value)	T1, T2, T3, T4, T5, T7	6	G1, G2, G3, G4, G5, G6, H1, H2, H3, H4	10

- 3.2 T1 was an early-mature specimen of ash *Fraxinus excelsior* positioned within the centre of the site adjacent to a ditch that separated the two field parcels. This was a multi stemmed specimen that had been coppiced in the past. The close cultivation around the base of this tree would likely to have impacted upon its health through repeated root damage / disturbance and therefore could possibly be the cause of the reactionary epicormic regrowth within its crown. As a result of this T1 was in a poor physical condition and coupled with the trees overall form, was graded as retention category C, a tree of limited arboricultural and landscape value.
- 3.3 The northern boundary of the site was formed by H1, G1 and G2. H1 was a typical maintained boundary hedgerow which ran adjacent to Sefton Road. G1 and G2 consisted of specimens of ash and hawthorn *Crataegus monogyna* that had been planted within the hedgerow and left to develop as taller trees. The trees within these groups were considered to be in a fair condition, but had suffered flail damage to their lower limbs through the management of H1.
- 3.4 The boundary of the site with the residential properties to the north east supported several groups of trees and a number of individual specimens. Again these consisted of similar specimens of ash and hawthorn. H2 due to its height of approximately 4m formed effective buffering of views to the site from the residential properties and also as it contained occasional specimens of the evergreen species holly *Ilex aquifolium* this buffering would continue throughout winter. Due to the quality of this material and limited impact to the local landscape, these were all graded as category C material.
- 3.5 Similarly, the western boundary of the site was formed by a hedgerow (H3) with comparable species composition to that of the northern boundary hedgerow and tree groups. It was a typical maintained boundary hedgerow with G5, which were taller specimens of ash planted within it. Again, typical defects were noted in this hedgerow and tree group, which contributed to their category C classification.

- 3.6 The eastern boundary of the site was formed by H4, another typical boundary hedgerow which consisted mainly of hawthorn, but there were specimens of ash, hazel *Corylus avellana* and goat willow *Salix caprea* noted as also being present within it. Again this hedgerow had been managed in the past to control its height and width through the use of a flail mower.
- 3.7 T6 was the highest quality tree arboriculturally assessed during the tree survey. By virtue of the species having considerable life expectancy, this early mature specimen of English oak *Quercus robur* would potentially continue to contribute to the local landscape for many years. . This tree currently held a low crown form through absence of pruning, which displayed flail damage caused through the management of the hedgerow below. Due to T6's moderate impact on the local landscape and its overall physical condition, it was considered to be a category B specimen. G6 was an outgrown group of hawthorn present directly to the north of T6 which originally formed part of the boundary hedgerow but due to the absence of management had now reached six metres in height. This was considered to be of limited arboricultural value and graded as category C material accordingly.
- 3.8 Further north on the eastern boundary was T7, another specimen of oak, however this tree had been heavily managed in the past leaving a limited amount of crown remaining. Dense ivy obscured the base of this tree and flail damage was also noted on its lower crown. Due to this tree's limited landscape value and low arboricultural quality it was considered as a category C tree.
- 3.9 H4 formed the majority of the eastern boundary of the site adjacent to Hook Lane. Again this was a typical maintained hedgerow that had been managed with a flail mower. Occasional larger specimens of ash were present within this hedgerow that had been damaged in the past through the use of the flail mower.

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 Development Framework Plan and seeks to outline the relationship between the proposals and the existing trees and hedgerows. The above drawing shows the proposals for a residential development with areas of public open space and flood attenuation in the form of balancing ponds. An overlay of the above layout has been incorporated in the Tree Retention Plan (Figure 3) to assist in identifying the relationship and any potential conflicts between the proposals and the existing trees and hedgerows.
- 4.3 Having appraised the above plan for any arboricultural implications that may arise as a result of the layout it would appear that the layout is capable through its design to retain and incorporate the majority of existing trees by virtue of their peripheral locations around the boundaries of the site. The only tree and hedgerow removals required would be to create the necessary openings to facilitate construction of the various external vehicular and pedestrian access points.

- 4.4 One of the vehicle access points into the site from Pagham Road to the west would require a small section of G5 and H3 to be removed. This group and hedgerow were both considered to be category C material of limited arboricultural value. The removal of these small sections would therefore be unlikely to raise objections on arboricultural grounds as the vast majority would be retained thereby maintaining overall visual amenity, benefits to wildlife and screening currently being provided.
- 4.5 On the eastern boundary of the site, to facilitate one point of vehicle to Hook Lane a section of H4 would require removal to provide adequate clearance. H4 was regarded as being category C material of limited arboricultural value and therefore the removal of a small section should not raise any objections on arboricultural grounds as the vast majority will be retained.
- 4.6 It would be recommended that T1, within the centre of the site is removed and replaced with more suitable planting due to the fact that the alignment of the existing ditch is being altered which would be likely to impact on the root system and current growing conditions of this tree thereby decreasing its chances of long term survival. T1 was considered to be of low arboricultural value and its replacement would serve to increase the level of visual amenity in the new development to that which this tree is currently providing.
- 4.7 The proposals will be providing an extensive amount of new tree planting around the development and in area of public open space as part of the supporting Green Infrastructure. This new planting would more than offset the loss of the small amount of low quality boundary material that requires removal to facilitate the various access points into the site. This new planting would serve to increase, enhance and improve the existing overall tree cover on site, by further contributing to the sites bio-diversity and ecological recourse and aiding the built elements incorporation into the local landscape.

New Tree Planting

- 4.8 New tree planting will form an integral part of the new development however, proposals for new tree planting should be appropriate for the future use of the site and not just aim to improve the existing tree population.
- 4.9 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.
- 4.10 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).

- 4.11 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.
- 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. 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).
- 4.13 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.
- 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.

Tree Management

- 4.15 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.
- 4.16 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.
- 4.17 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

- 4.18 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.

- 4.19 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.
- 4.20 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.
- 4.21 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, 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.
- 4.22 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 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

- 5.2 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.
- 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 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.
- 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 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.
- 5.9 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.

Protection outside the exclusion zone

- 5.10 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.
- 5.11 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.
- 5.12 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.

- 5.13 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.
- 5.14 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.
- 5.15 Notice boards, telephone cables or other services should not be attached to any part of a retained tree.
- 5.16 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

- 5.17 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.
- 5.18 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

- 5.19 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.
- 5.20 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.
- 5.21 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.

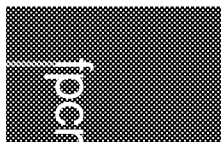
6.0 CONCLUSION

- 6.1 The site consists of two large arable field parcels to the west of Rose Green, bound by Hook Lane to the east, Sefter Road to the North and Pagham Road to the west. Several residential properties are present to the north west corner of the site. The tree stock on site is restricted to its boundaries and consists of a mixture of naturalised broadleaved species.
- 6.2 To facilitate vehicular and pedestrian access into the site from the east and west, several short sections of low quality tree and hedgerow boundary material will require removal. This was all considered to be of limited arboricultural value and its loss should not raise any objection on arboricultural grounds. T1, a single specimen of ash in the centre of the site would also require removal due to the re-alignment of a drainage ditch. The remaining trees around the sites boundaries will soften the built element of the proposals.
- 6.3 The proposals will be providing an extensive amount of new tree planting around the development and in area of public open space as part of the supporting Green Infrastructure. This new planting would more than offset the loss of the small amount of low quality boundary material that requires removal to facilitate the various access points into the site. This new planting would serve to increase, enhance and improve the existing overall tree cover on site, by further contributing to the sites bio-diversity and ecological recourse and aiding the built elements incorporation into the local landscape.



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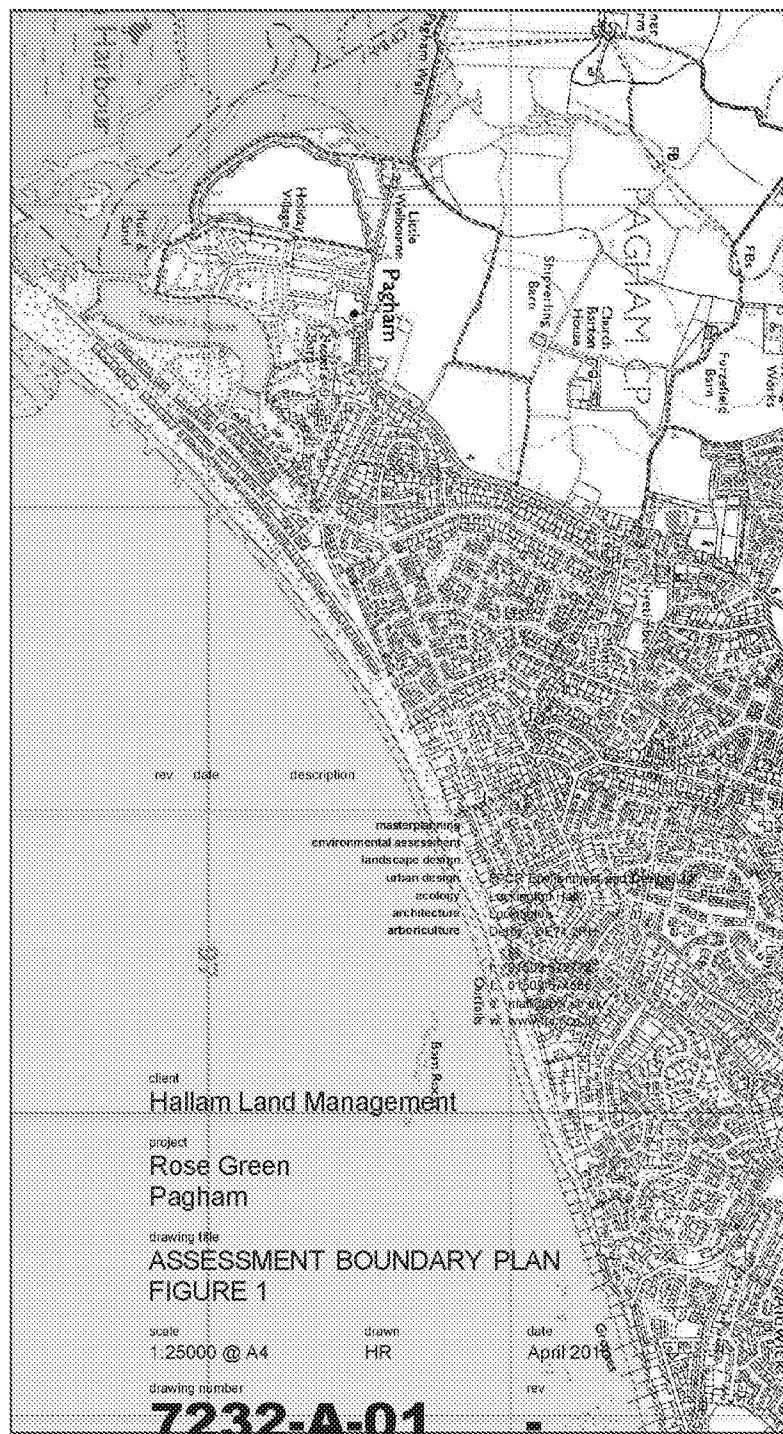
Assessment Boundary



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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)

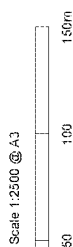
Category C - Trees / Groups of Low Quality
(BS 5837:2012)

Hedge-row
(Colour indicates BS5837:2012 Category)

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

Individual / Group Number and BS5837:2012 Category

Indicative Shade Pattern (in accordance with BS5837:2012 where appropriate)



NOTES

All dimensions to be worked to the Drawings are to be dimensioned to the centre of the tree trunk or the centre of the canopy, unless otherwise stated. Dimensions to be dimensioned to the centre of the tree trunk or the centre of the canopy, unless otherwise stated.

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These are the trees and groups of trees that have been identified as being suitable for retention, and are to be retained, by the project. All other trees and groups of trees are to be removed, and are to be removed, by the project.

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rev	date	description	by
1	06.04.2010	Final Issue	HR



environmental assessment
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client
Hallam Land Management

project
**Rose Green
Pagham**

drawing title
**TREE SURVEY PLAN
FIGURE 2**

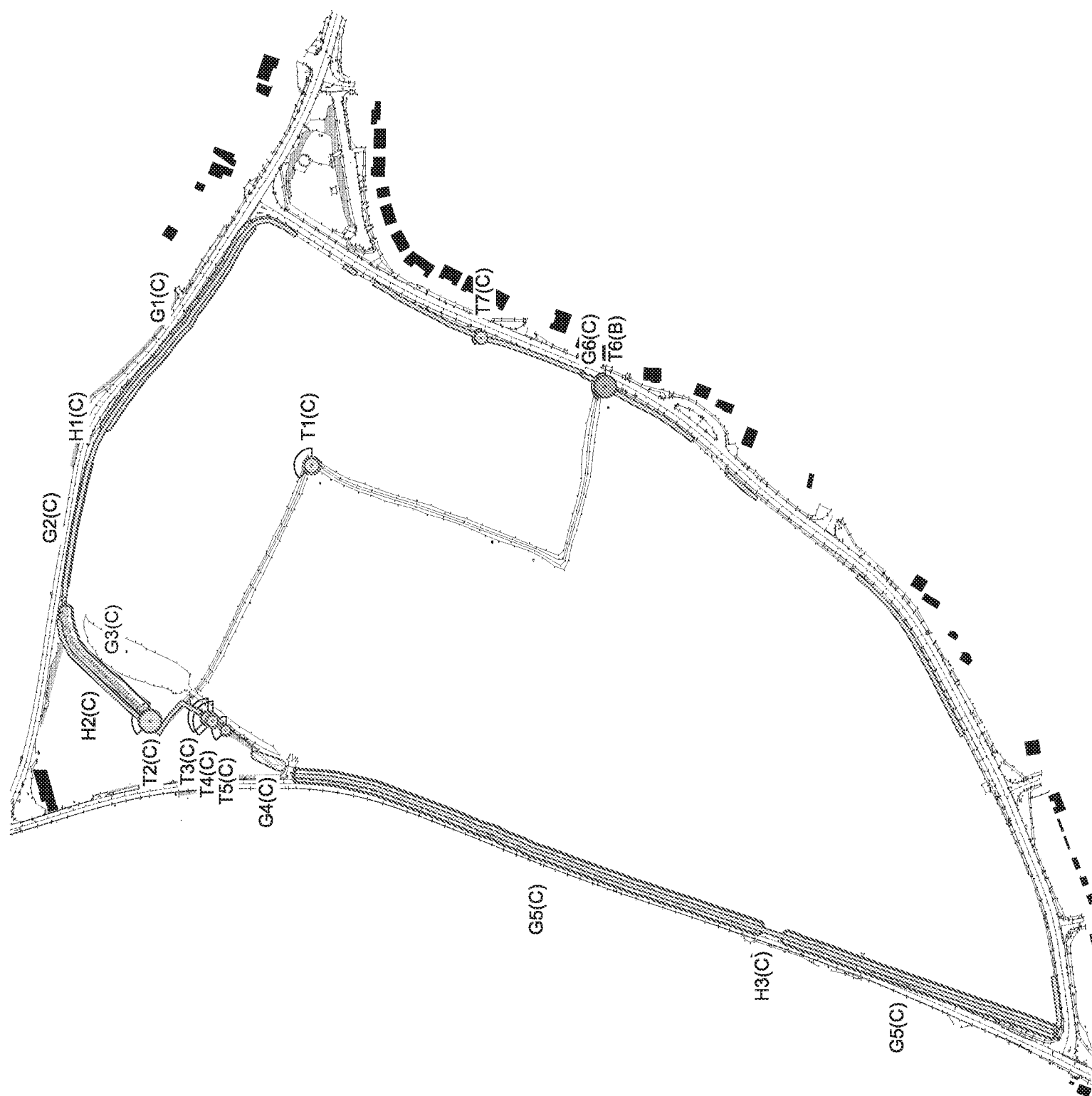
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1:2500 @ A3

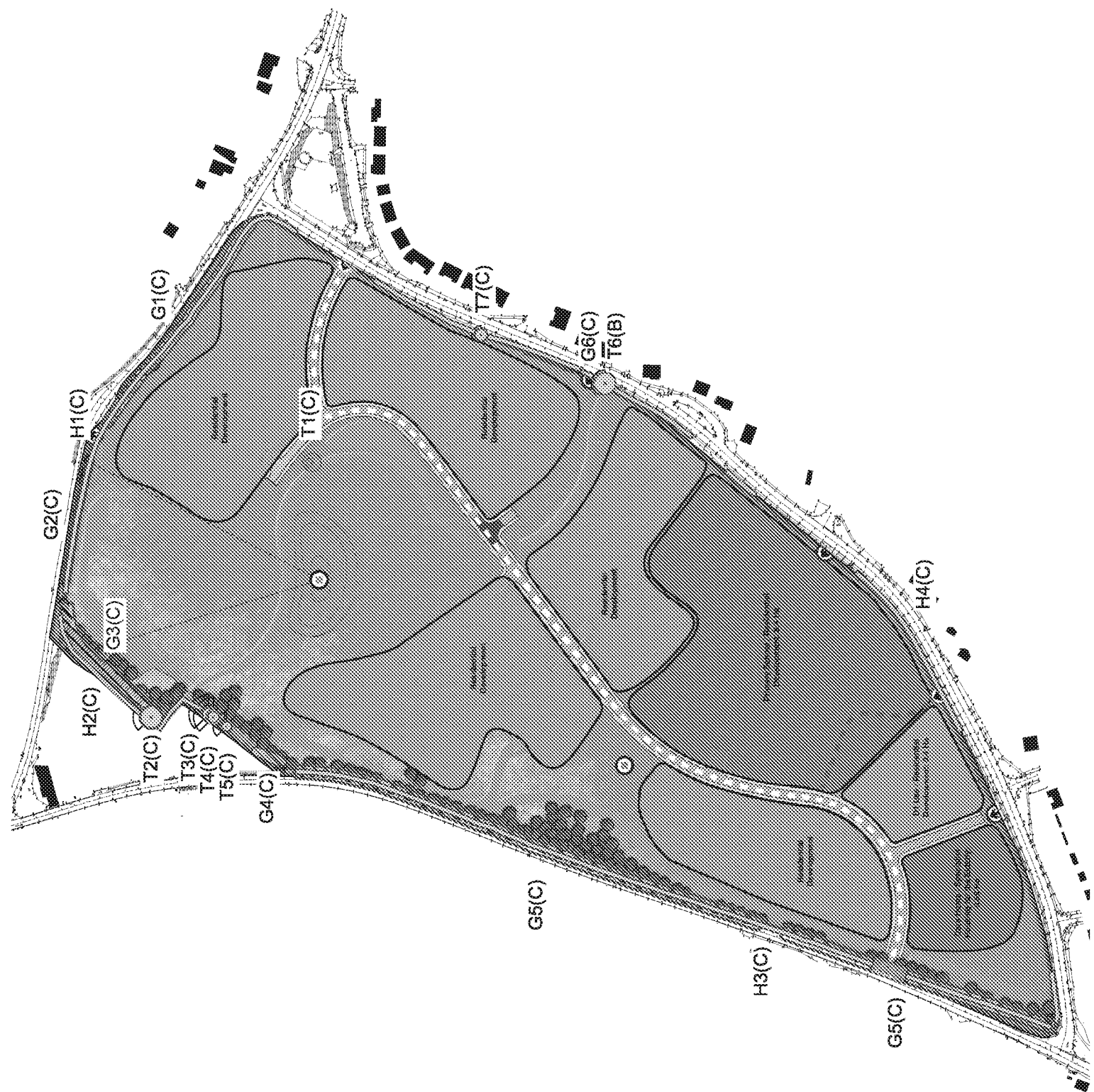
drawn
HR

date
April 2016

rev

drawing number
7232-A-02





KEY

- Tree/Group to be Retained
- Tree/Group to be removed to facilitate the proposals
- Category U - Unsuitable for retention on arboricultural grounds
- Hedge/row Proposed to be Retained and incorporated into the New Development
- Hedge/row Proposed to be Removed to Facilitate the Development upon Approval of the Application
- Root Protection Area (Shown for retained trees only)
- Individual / Group Number and BS Category
- Indicative Shade Pattern (where appropriate)



NOTES

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There are being submitted for approval, the condition of all trees illustrated herein, as to be checked, by the project Arboriculturist, should works commence 12 months after the date of this survey.

SOME TREES MAY BE SUBJECT TO STATUTORY CONSTRAINTS. IT IS THEREFORE ADVISED THAT THE DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN CONSENT OF THE AUTHOR.

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13.12.2016	First Issue	HR
03.01.2017	Updated Layout (1:2500 Plan 5)	HR
	(rev / date)	(signature)

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project: **Rose Green Pagham**

drawing title: **TREE RETENTION PLAN**

FIGURE 3

scale: 1:2500 @ A3

drawn: HR

date: January 2017

rev: A

7232-A-03

045 (Rev. 01/2017) 232-A-03-03 Tree Retention Plan.dwg

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 V: Veteran tree possessing certain attributes relating to veteran trees	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 suitability within the context of a proposed development - The size and form of each tree/group and its suitability relative to existing site features e.g. its screening value or landscape features - The location of each tree relative to existing site features e.g. its screening value or landscape features - Age class and life expectancy	

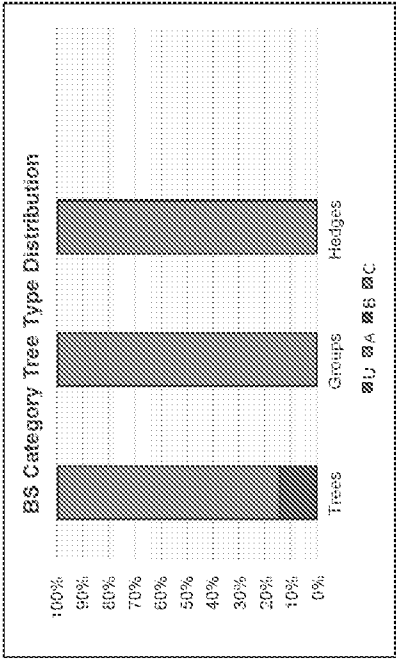
Structural Condition
The following is an example of considerations when inspecting structural condition: - The presence of fungal fruiting bodies around the base of the tree or on the stem, as they could possibly indicate the presence of possible internal decay - Soil cracks and any heaving of the soil 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 Aramity 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

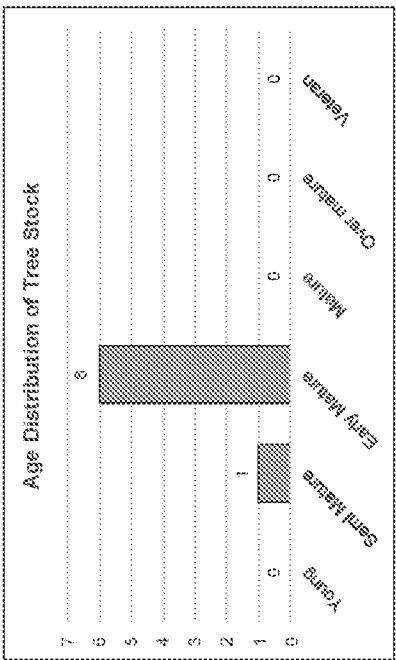
Appendix Summary

	Individual Trees	Totals	Tree Groups and Hedgerows	Totals
Category U		0		0
Category A		0		0
Category B	T6	1		0
Category C	T1, T2, T3, T4, T5, T7	6	G1, G2, G3, G4, G5, G6, H1, H2, H3, H4	10
	Total	7	Total	10

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.



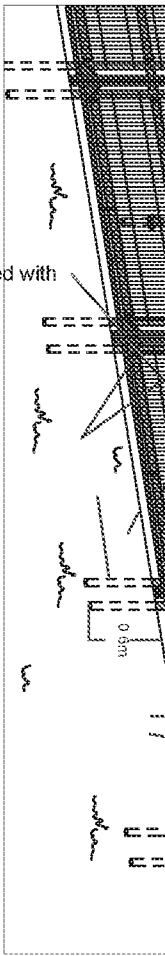
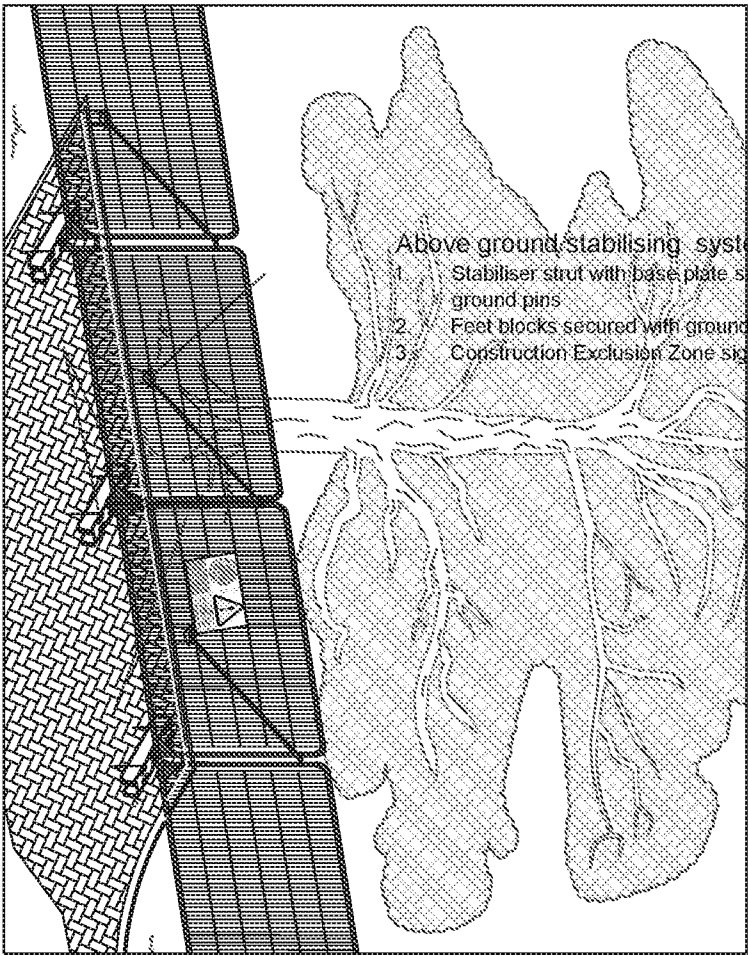
Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
INDIVIDUAL TREES										
T1	Ash Fraxinus excelsior	11.5	avg 11x120	6	EM	P	Bark wounds noted Basal suckers present Branch stubs evident Broken branches evident Close cultivation of the soil Dense ivy cover on main stem Epicormic growth evident within the crown	72	4.8	C (i)
T2	Ash Fraxinus excelsior	12	est 350 350 400 150	7	EM	P	Basal suckers present Base obscured Branch socket cavities observed Branch stubs evident Broken branches evident Dense ivy cover on main stem Dense undergrowth at the base Major dead wood evident in the crown (>75mm)	193	7.8	C (i)
T3	Ash Fraxinus excelsior	13	340	5	EM	F	Base obscured Dense ivy cover on main stem Minor dead wood evident in the crown (<75mm) No major defects were noted	52	4.1	C (i)
T4	Ash Fraxinus excelsior	13	310	5	EM	F	Base obscured Dense ivy cover on main stem Minor dead wood evident in the crown (<75mm) No major defects were noted	43	3.7	C (i)
T5	Ash Fraxinus excelsior	9	270	4	EM	F	Basal suckers present Base obscured Dense ivy cover on main stem Minor dead wood evident in the crown (<75mm) No major defects were noted	33	3.2	C (i)
T6	English Oak Quercus robur	9	620	7	EM	F	Branch stubs evident Broken branches evident Close cultivation of the soil Epicormic growth evident within the crown Foliage damage evident Low crown form Minor dead wood evident in the crown (<75mm) Overhead cables	174	7.4	B (i)
T7	English Oak Quercus robur	6	370	4	SM	F	Base obscured Close cultivation of the soil Dense ivy cover on main stem Foliage damage evident Overhead cables	62	4.4	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 Hawthorn Crataegus monogyna	9	upto 310	4	SM	F	Branch stubs evident Foliage damage evident Minor dead wood evident in the crown (<75mm) No major defects were noted	43	3.7	C (ii)
G2	Ash Fraxinus excelsior	8	upto 190	2	SM	F	Branch stubs evident Foliage damage evident Minor dead wood evident in the crown (<75mm) No major defects were noted	16	2.3	C (ii)
G3	Ash Fraxinus excelsior	11	upto 330	5	SM	F	Branch stubs evident Broken branches evident Light ivy cover on main stem Minor dead wood evident in the crown (<75mm) No major defects were noted	49	4.0	C (ii)
G4	Ash Fraxinus excelsior English Oak Quercus robur Hawthorn Crataegus monogyna	9	upto 250	3	Yng / SM	F	Browsing damage noted on main stem No major defects were noted Situating offsite	28	3.0	C (ii)
G5	Ash Fraxinus excelsior Hawthorn Crataegus monogyna	12	upto 330	5	SM	F	Branch stubs evident Close cultivation of the soil Dense ivy cover on main stem Foliage damage evident Minor dead wood evident in the crown (<75mm) No major defects were noted Overhead cables Pruning wounds noted Storm damage present	49	4.0	C (ii)
G6	Hawthorn Crataegus monogyna	6	est 6x 50	2	SM	F	Un-maintained hedgerow	7	1.5	C (ii)

Hedge No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
HEDGEROWS										
H1	Hawthorn Crataegus monogyna	2	est 100 50 50	1	SM	F	Maintained hedgerow	7	1.5	C (ii)
H2	Hawthorn Crataegus monogyna Holly Ilex aquifolium	4	est 60 60 60 60	1.5	SM	F	Maintained hedgerow Taller to buffer residential garden	7	1.4	C (ii)
H3	Hawthorn Crataegus monogyna	2	est 100 50 50	1	SM	F	Maintained hedgerow	7	1.5	C (ii)
H4	Goat Willow Salix caprea Hawthorn Crataegus monogyna Hazel Corylus avellana Ash Fraxinus excelsior	2	est 100 50 50	1	SM	F	Gaps present in hedgerow Maintained hedgerow Occasional outgrown specimens of ash with flail damage	7	1.5	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



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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