Harworth Estates

Rockingham, Barnsley

Arboricultural Assessment

January 2015

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1.0 INTRODUCTION

1.1 This report has been prepared by FPCR Environment and Design Limited on behalf of Harworth Estates to present the findings of an arboricultural assessment and survey of trees located at Rockingham, Barnsley (hereafter referred to as the site), OS Grid Ref SE 350 008 as shown in Figure 1. The survey was carried out on 29th July 2014 for the main site and 9th January 2015 for the area to the east.

1.2 The tree survey and assessment of existing trees has been carried out in accordance with the guidelines 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. The guidelines also provide 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.

1.3 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 in accordance with the guidelines and to secondly provide an assessment of impact arising from the proposed re-development of the site.

1.4 This report has been produced to accompany a planning application for a commercial development and has included an assessment of any impact arising to the existing tree cover. The tree survey has therefore focused on any trees present within or bordering the site that may potentially be affected by the future proposals or will pose a constraint to any proposed development.

1.5 The site comprised a disused open plot of land situated to the south of the village of Birdwell, south of Barnsley. The site had been prepared for construction, with an existing access being provided from Dearne Valley Parkway which formed the sites southern boundary. An existing residential development stood beyond the sites western boundary and further arable and disused land extended beyond the sites northern and eastern boundaries.

1.6 Existing tree cover was confined to the site boundaries and comprised planted mixed species tree groups situated along the sites northern and eastern boundaries. Areas of self-seeded scrub growth were also recorded along the sites western boundary and adjacent to Rockingham Row, a single lane access road which abutted the sites western boundary.

1.7 The presence of any tree preservation orders or conservation area designations that may affect the site has yet to be confirmed by Barnsley Metropolitan Borough Council. Once this information has been received, the report will be updated accordingly.

1.8 The report comprises:

- Chapter 1 provides an introduction to the assessment work, its purpose and background details.
- Chapter 2 briefly describes the methodology by which the tree survey and assessment has been undertaken.

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

1.9 It must be understood 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 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 & 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 assessed 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 report, a hedgerow is desribed 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, under which "…it is against the law to remove or destroy certain hedgerows without permission from the local planning authority.", or specifically from an ecological perspective, and is outside the scope of this assessment.

Other Considerations

2.12 In accordance BS5837, section 4.4 Tree Survey; sub section 4.4.2.9, the tree survey has recorded details of any evidence that trees or substantial stems may have been removed from a hedgerow and any signs of past management, such as laying or significant height reduction. The purpose being to identify where the current composition of species and dimensions may not reflect the previous influence of a hedgerow on soil moisture levels. Such information would assist when determining foundation design in accordance with current building regulations.

2.13 Knowledge of soil type may however not be known at the time of this tree assessment and therefore the results of the tree survey must be read in conjuction with a current soil survey of the site. It may also be necessary 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.

Conditions of Tree Survey

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

Site Plans

2.15 The individual positions of trees and groups have been shown on the Tree Survey Plan, Figure 2. 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 Global Positioning Systems and aerial photography to provide approximate locations. The crown spread, root protection area and shade pattern (where appropriate) are indicated on this plan.

2.16 As part of the Arboricultural Impact Assessment, a Tree Retention Plan, Figure 3 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 that contains sufficient rooting volume for the specimen to have the best chance of survival in the long term. This is known as the root protection area. The root protection area 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.

2.19 Above ground constraints have been considered such as the current and potential crown spread of the trees and an illustration of the shade pattern (where appropriate) has been plotted on the plans to indicate their potential area of shading influence.

3.0 RESULTS

3.1 A total of three individual trees and twelve groups of trees were surveyed as part of the arboricultural assessment. Trees were surveyed as individual trees and groups / blocks of trees where examples are clearly present as such per the description. Refer to Figure 2 – Tree Survey Plan 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.

Results Summary

3.2 Existing tree cover was confined to the site boundaries, with the centre of the site being largely devoid of any significant tree cover. Tree cover comprised planted mixed species tree groups situated along the sites northern and eastern boundaries, and areas of self-seeded scrub growth along the sites western boundary and adjacent to Rockingham Row. Tree cover on site was all regarded as being of low or moderate arboricultural value.

Table 1: Summary of trees by 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	TG4	1
Category C (Low Quality / Value)	T1, T2, T3	3	TG1, TG2, TG3, TG5, TG6, TG7, TG8, TG9, TG10, TG11, TG12	11

3.3 Two tree groups (TG1 and TG2) stood adjacent to Rockingham Row, a single lane access road which abutted the sites western boundary. Comprising of goat willow *Salix caprea*, ash *Fraxinus excelsior* and hawthorn *Crataegus monogyna* the groups had likely established through self-seeding. Neither TG1 nor TG2 had been subject to any past management with the individual trees displaying outgrown forms and interlocking crowns due to being closely spaced.

3.4 TG2, the larger, by virtue of the number of trees, of the two tree groups, had spread into the site through self-seeding. Overhead power lines ran above the group and TG2 would require future management to avoid the crowns coming into contact with these wires as the trees matured in size. Both TG1 and TG2 were considered to be of low arboricultural value due to the absence of any formal management; current young age and small proportions of the individual trees.

3.5 TG3 comprised a row of semi mature planted trees situated along the sites northern boundary. Having attained a height of 4m, TG3 had been planted with close spacing between the individual trees, likely with a view to maintain the group as a hedgerow in the future. Comprising largely of native species the group displayed no visible defects however, was considered to be of low arboricultural value due to its limited landscape value from an arboricultural perspective.

3.6 TG4, TG7, TG10 and TG11 comprised semi mature planted tree groups situated towards the sites eastern boundary. Having likely been planted at a similar time to TG3, these groups had been planted with smaller spacing between the individual trees likely with a view to form a buffer tree group, to provide screening from the site to further arable land to the east. These groups had not been subject to any visible past management and had reached the point in its development where the group would benefit from some thinning work, removing the small lower quality trees to allow the larger trees adequate space to develop and reach maturity. These groups was considered to be of moderate arboricultural quality predominantly for its landscape value, and with future management could form an effective screen from any proposed development.

3.7 Two further tree groups were recorded as part of the arboricultural assessment. This included TG5 a sporadic self-seeded tree group situated around a flood attenuation pond and TG6 a small self-seeded tree group situated to the west of the site adjacent to an existing off site commercial unit. Goat willow was the dominant species in both groups and both TG5 and TG6 were considered as being of low arboricultural value due to the existing poor forms of the individual component trees; limited future potential by virtue of the species and limited landscape value offered from an arboricultural perspective.

3.8 Three individual trees were recorded as part of the arboricultural assessment two of which were goat willow. T1 was situated within TG1 however was recorded separately due to its larger proportions having attained a height of 5m and with a crown spread of 3m. T2 was a self-seeded specimen which was situated within the site approximately 4m from the northern boundary. Both T1 and T2 displayed minor defects which included multi stemmed forms from the base and numerous crossing and rubbing branches within their crowns. For these reasons, both were regarded as being of low arboricultural value.

3.9 T3 was a silver birch Betula pendula which was growing from the bank of the pond in the eastern portion of the site. The specimen was 8m in height and had developed an even crown form. Due to its immaturity and early development it was considered to only provide limited arboricultural value. It could only therefore be considered category C.

4.0 ARBORICULTURAL IMPACT ASSESSMENT

4.1 The following paragraphs present a summary of the tree survey and offers discussion of particular trees and groups recorded in the context of any proposed development in the form of an Arboricultural Impact Assessment in accordance with section 5.4 of BS5837. Any final tree retentions will need to be reconciled with the advice contained within this report.

4.2 The AIA has been based upon the Proposed Site Plan (drwg.no.11462-110L) and seeks to outline the potential impact that the proposals would have on the existing trees and vice versa. The above drawing shows the proposals for a nine unit commercial development. An overlay of the above layout has been incorporated in the Tree Retention Plan (Figure 3) to assist in identifying potential conflicts with the existing trees.

4.3 By virtue of the existing tree cover being positioned around the extents of the site and the proposed commercial development being positioned centrally within the development area minimal tree loss would be required to facilitate the construction of the built element of the development.

4.4 The only tree loss necessary to facilitate the built element as per the above plan would be the removal of TG2, to allow for the construction of an access road and proposed car park.

4.5 TG2 as detailed within paragraph 3.4 comprised an area of self-seeded scrub growth situated below over-head power lines. The removal of TG2 should therefore not raise any particular objections from an arboricultural perspective, as it is certain that the group would require continuous future management to reduce the potential for growth to contact with the overhead lines, and being considered to be of low arboricultural value.

4.6 It may also be necessary that T2 be removed as part of site preparation and infrastructure works. T2 as detailed within paragraph 3.8 was regarded as being of low arboricultural value hence its removal should not raise any objection from an arboricultural perspective. With new tree planting proposed as part of the developments landscaping scheme set to more than adequately mitigate for its removal.

4.7 Existing tree groups TG3 and TG4 would be retained within landscape buffer strips around the extents of the site, to provide immediate screening from the proposed development. Retaining these tree groups within areas of open space would also see the trees retained within a similar growing environment and allow them adequate space to develop and reach maturity. Both TG3 and TG4 would require future management as recommended within section 8.8.3 of BS5837 *Post Development Management of Existing Trees*.

4.8 The drainage pond to the east of the site is proposed to be enlarged in order to mitigate the new development. The increased area of the pond will require some trees to be removed, namely TG8, TG9, TG10, part of TG11 and TG12. All of the trees to be removed were considered category C for their low arboricultural quality and lack of maturity. Many of these groups had developed a dense structure due to the freely self-seeding characteristic of the pioneers species with which they were planted.

4.9 This potential minor tree loss should not raise any objections from an arboricultural perspective, due to the young proportions of the individual specimens which could be mitigated for with new tree planting reaching a similar size within a short time frame.

4.10 New tree planting has been proposed as part of the developments landscaping scheme which has shown tree planting centrally within the development area, and within the landscape buffer strips around the extents of the site. This new tree planting will provide some green infrastructure centrally within the development area in the form of street trees positioned within grassed verges, adjacent to road and car parks. This should seek to use tree species which would be suitable for the future use of the site and 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.

4.11 Tree planting proposed within the landscape buffer strips around the extents of the site could seek to use larger species which would over time provide further screening from the proposed development. Provided this would not cause future issues, with need for continuous pruning due to their proximity in relation to proposed units. New tree planting proposed at the sites western boundary will provide screening from to the existing residential area and enhance this boundary. The choice of species used however, will need to take into consideration the existing overhead power lines and the potential future maintenance requirements.

4.12 This new tree planting is set to significantly increase tree cover on the site and would more than adequately mitigate for the necessary tree loss required to facilitate the construction of the proposed development.

New Tree Planting

4.13 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. The purpose and function of any 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.

4.14 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 and maintenance requirements in relation to both the built form of the new development and existing properties.

4.15 Where it may have been proposed to use ash species this is now not viable as currently there is still a restriction on movements of the species throughout the U.K. To prevent further spread of the disease Chalara Dieback of Ash *Chalara fraxinea* in Britain a Plant Health Order prohibits all imports and internal movement of ash seeds, plants and trees until further notice. Therefore English oak *Quercus robur* would be the first choice as a suitable alternative for new planting in areas of open space. Other possible options may be hornbeam *Carpinus betulus,* small leaved lime *Tilia cordata* and sweet chestnut *Castanea sativa*.

4.16 Tree planting should be avoided where they may obstruct overhead power lines or cables. Any underground apparatus should be ducted or otherwise protected at the time of construction to enable trees to be planted without resulting in future conflicts. Wherever possible, following discussions with the developer and utility company concerned, particularly on new development sites, common service trenches should be specified to minimise land take associated with underground service provision and to facilitate access for future maintenance.

Tree Management

4.17 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 health and safety risks and to agree remedial works as required.

4.18 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.

4.19 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.

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 root protection area , 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 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

5.6 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.

5.7 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.

5.8 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

5.9 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.

5.10 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.

5.11 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.

5.12 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.

5.13 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.

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

5.15 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).

6.0 CONCLUSION

6.1 The site was situated to the south of the village of Birdwell, south of Barnsley and comprised a disused levelled plot of land with an existing access road. Existing tree cover was confined to the site boundaries and comprised planted mixed species tree groups situated along the sites northern and eastern boundaries and areas of self-seeded scrub growth along the sites western boundary.

6.2 By virtue of the existing tree cover being positioned around the extents of the site and the proposed commercial development being positioned centrally within the development area minimal tree loss would be required to facilitate the construction of the development.

6.3 Tree losses necessary to facilitate the construction of the proposed development would be the removal of an area of young planted trees and self-seeded scrub growth considered to be of low arboricultural value and therefore should not raise objection.

6.4 Existing tree groups would be retained within landscape buffer strips around the extents of the site to provide immediate screening from the proposed development. New planting is set to significantly increase tree cover on the site and would more than adequately mitigate for the necessary tree loss required to facilitate the construction of the proposed development.

6.5 In conclusion the proposed development would be considered as being arboricultural sound. The development is capable of retaining the vast majority of existing tree cover and is proposing to support the new commercial area with a raft of new tree planting which would significantly increase the amount and quality of tree cover on the site to that which currently exists.

KEY

Assessment Boundary

rev	date	description	by
-		First Issue	Initial

masterplanning
environmental assessment
landscape design
urban design
ecology
architecture
arboriculture

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client
Harworth Estates

project
Rockingham,
Barnsley

drawing title
SITE LOCATION PLAN
FIGURE 1

scale	drawn	date
1:25000 @ A4	EC	July 2014

drawing number
6424-A-01

rev
-

CAD file: J:\6400\6424\ARB\Plans\Fig 1 Site Location Plan.dwg

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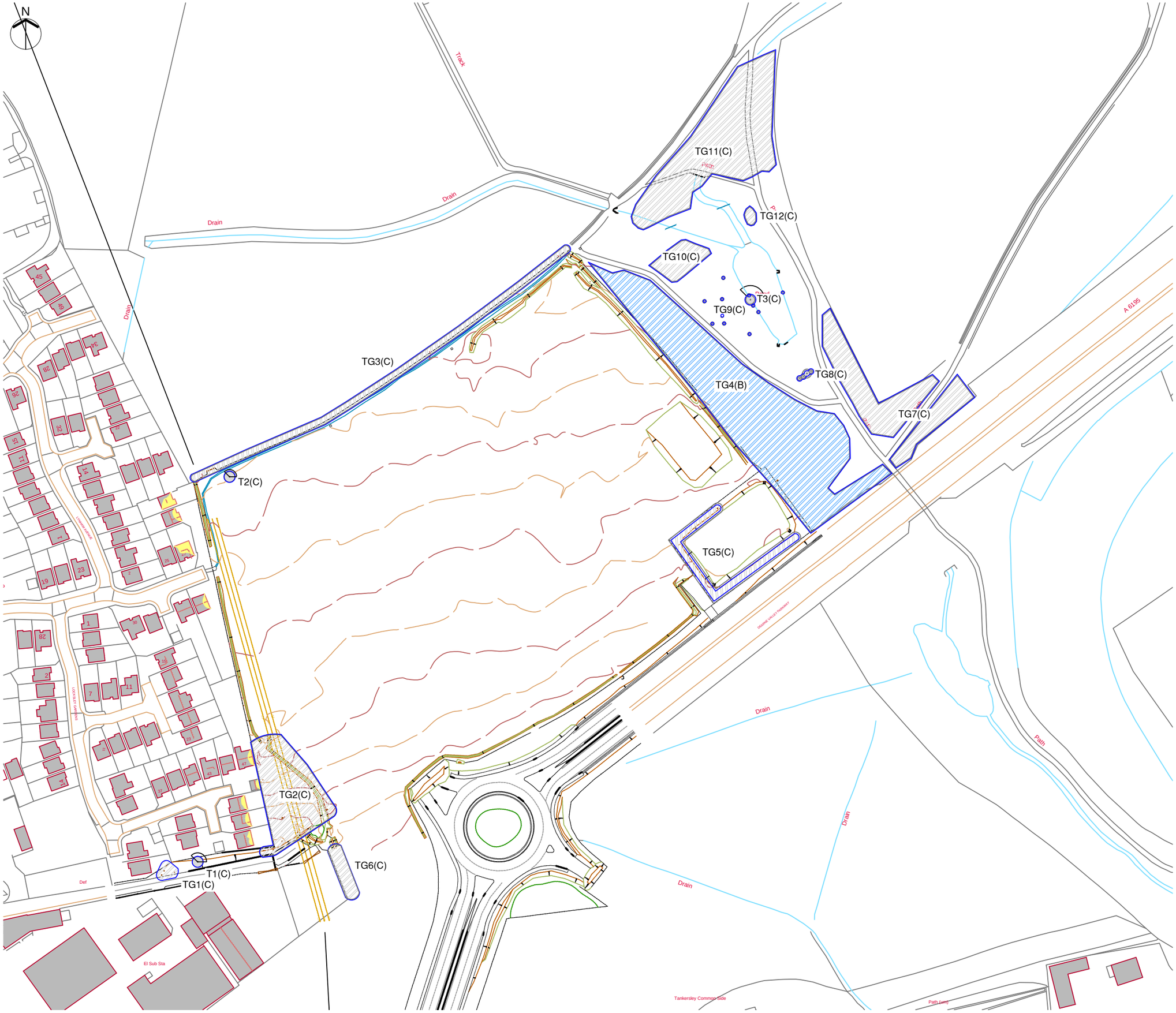

KEY

- 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)
- Root Protection Area (The RPA has been altered where appropriate to reflect underground constraints)
- T1 (A) TG1 (A) — Individual / Group Number and BS5837:2012 Category
- Indicative Shade Pattern (in accordance with BS5837:2012 where appropriate)

Scale 1:2000 @ A3

0 50 100m

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 assessment may therefore be required where deemed necessary.

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.

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rev	date	description	by
-	30.07.14	First Issue	EC
A	09.01.15	Updated with additional area	NJG

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project
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drawing title
TREE SURVEY PLAN
FIGURE 2

scale	drawn	date
1:2000 @ A3	EC	January 2015

drawing number
6424-A-02

rev
A

CAD file: J:\6400\6424\ARB\Plans\Fig 2 Tree Survey Plan.dwg

KEY

- Tree/Group to be Retained
- Tree/Group to be removed to facilitate the proposals
- Root Protection Area (Shown for retained trees only)
- T1 (A) TG1 (A) — Individual / Group Number and BS Category
- Indicative Shade Pattern (where appropriate)

Scale 1:2000 @ A3

0 50 100m

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 assessment may therefore be required where deemed necessary.

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.

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rev	date	description	by
-	01.08.14	11462-V111B	EC
A	09.01.15	11462-110L	NJG

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drawing title
TREE RETENTION PLAN
FIGURE 3

scale	drawn	date
1:2000 @ A3	EC	January 2015

drawing number	rev
6424-A-03	A

CAD file: J:\6400\6424\ARB\Plans\Fig 3 Tree Retention Plan.dwg

Appendix A - Tree Schedule

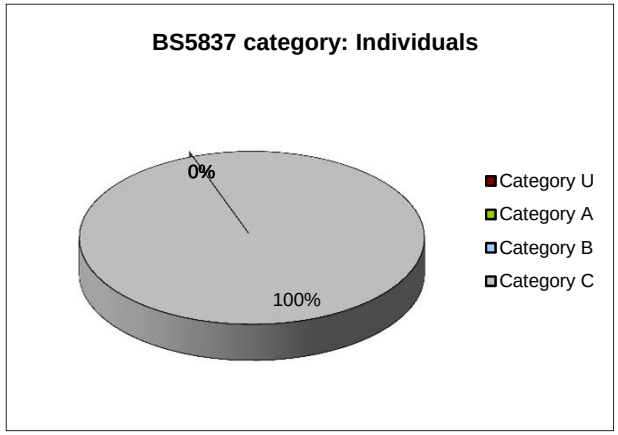
<table>
<tr><th>Measurements</th><th>Age Class</th><th>Overall Condition</th><th>Root Protection Area (RPA)</th></tr>
<tr><td>Height - estimated from ground level (m).</td><td>YNG: Young trees up to ten years of age.</td><td>G - Good: Trees with only a few minor defects and in good overall health needing little, if any attention.</td><td rowspan="4">• The RPA column gives the required area (m²).
• The RPA Radius column gives the radius (m) of an equivalent circle.
• The RPA is calculated using the formulae described in paragraph 4.6.1 of British Standard 5837: 2012 and is indicative of the required rooting area in order for a tree to be retained.</td></tr>
<tr><td>Stem Dia. - Diameter measured (mm) in accordance with Annex C of the BS5837.</td><td>SM: Semi-mature, trees less than 1/3 life expectancy.</td><td>F - Fair: Trees with minor, but rectifiable, defects or in the early stages of stress from which it may recover.</td></tr>
<tr><td>Crown - crown spread estimated radially from the main stem (m).</td><td>EM: Early mature, trees 1/3 – 2/3 life expectancy.</td><td>P - Poor: Trees with major structural and/or physiological defects such that it is unlikely the tree will recover in the long term.</td></tr>
<tr><td rowspan="2">Abbreviations
est - Estimated stem diameter
avg - Average stem diameter for multiple stems
upto - Group has a maximum stem diameter of</td><td>M: Mature trees, over 2/3 life expectancy.</td><td>D - Dead: Trees no longer alive. This could also apply to trees that are dying and unlikely to recover.</td></tr>
<tr><td>OM: Over mature, declining or moribund trees of low vigour.</td><td colspan="2" rowspan="2">In the assessment, of 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 and its future life expectancy
• The size and form of each tree 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
• Life expectancy</td></tr>
<tr><td></td><td>V: Veteran, tree possessing certain attributes relating to veteran trees.</td></tr>
</table>

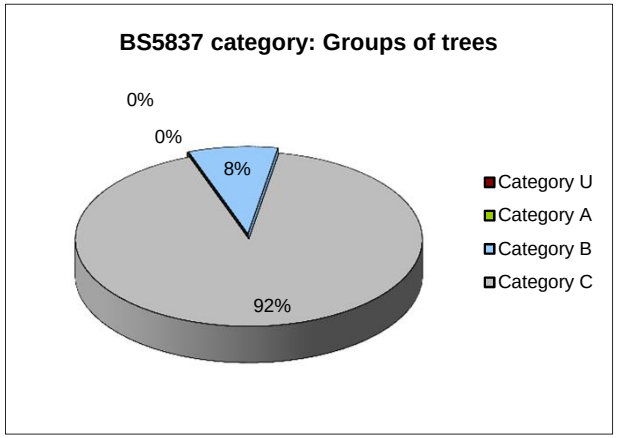
Structural Condition
The following has been considered when inspecting structural condition: • The presence of fungal fruiting bodies around the base of the tree or on the stem, as they could possibly indicate the presence of possible internal decay. • Soil cracks and any heaving of the soil around the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

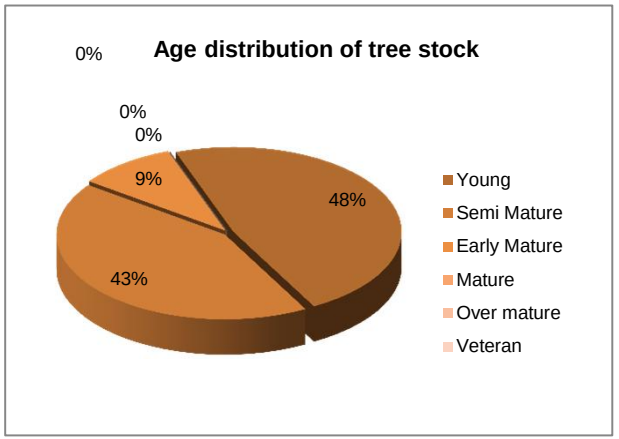
Quality Assessment of Retention Category
Category U - Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.
Category A - Trees of high quality with an estimated remaining life expectancy of at least 40 years.
Category B - Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
Category C - Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.
Sub-categories: (i) - Mainly arboricultural value (ii) - Mainly landscape value (iii) - Mainly cultural or conservation value

Appendix A - Summary

	Individual Trees	Totals	Tree Groups and Hedgerows	Totals
Category U		0		0
Category A		0		0
Category B		0	TG4	1
Category C	T1, T2, T3	3	TG1, TG2, TG3, TG5, TG6, TG7, TG8, TG9, TG10, TG11, TG12	11
	Total	3	Total	12





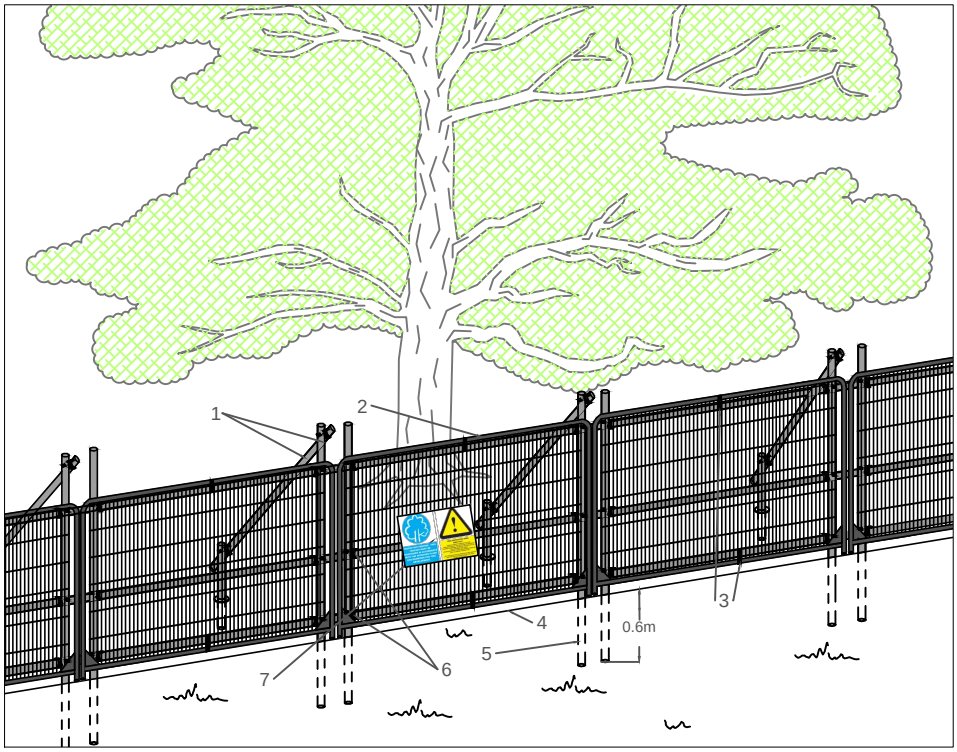


Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
INDIVIDUAL TREES										
T1	Goat Willow Salix caprea	5	170 120 100 100 70	3	EM	F	Situated next to existing access road Multi stemmed from base Crossing and rubbing branches with crown Wilting leaves noted at time of survey	31	3.1	C (i)
T2	Goat Willow Salix caprea	4	200 150 100	3	SM	F	Situated within field parcel Likely self seeded Multi stemmed from base Crossing and rubbing branches within crown	33	3.2	C (i)
T3	Silver Birch Betula pendula	9	260	2.5	SM	F	Adjacent to pond on bank Leaning stem to north east No major defect noted	31	3.1	C (i)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
GROUPS OF TREES										
TG1	Ash Fraxinus excelsior rack Willow Salix fragilis Goat Willow Salix caprea Hawthorn Crataegus monogyna	5	upto 200 200	3	SM	F	Unmaintained tree group Situated next to existing access road Broken branches noted likely as a result of vehicle damage Outgrown forms	36	3.4	C (ii)
TG2	Ash Fraxinus excelsior Goat Willow Salix caprea Hawthorn Crataegus monogyna Silver Birch Betula pendula Apple Malus domestica	6	upto 250	3	SM	F	Unmaintained tree group Close spacing between trees Interlocking crowns Over head lines above crowns Unmaintained forms	28	3.0	C (ii)
TG3	Ash Fraxinus excelsior Blackthorn Prunus spinosa English Oak Quercus robur Field Maple Acer campestre Goat Willow Salix caprea Hawthorn Crataegus monogyna Silver Birch Betula pendula Hazel Corylus avellana Mountain Ash Sorbus aucuparia	4	upto 200	2	SM	F	Planted tree group situated along field boundary Close spacing between trees Interlocking crowns Unmaintained forms	18	2.4	C (ii)

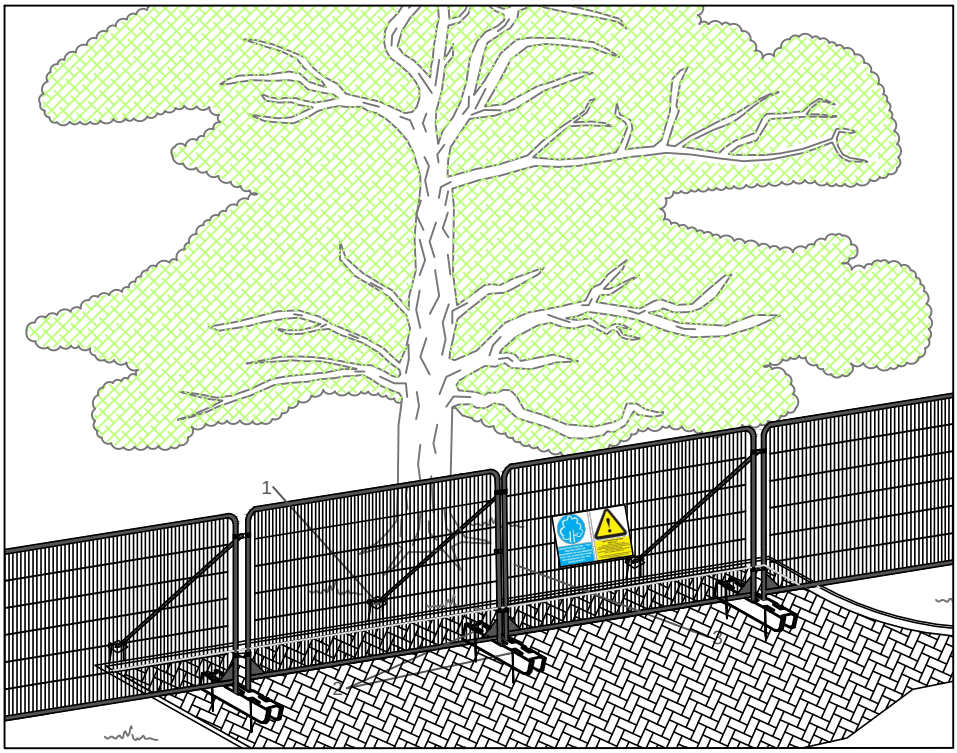
Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
TG4	Scots Pine Pinus sylvestris Ash Fraxinus excelsior Crack Willow Salix fragilis English Oak Quercus robur Field Maple Acer campestre Goat Willow Salix caprea Hawthorn Crataegus monogyna Silver Birch Betula pendula Aspen Populus tremula Hazel Corylus avellana White Willow Salix alba	6	upto 200	2	SM	F	Planted tree group situated along field boundary Close spacing between trees Interlocking crowns Unmaintained forms	18	2.4	B (ii)
TG5	Goat Willow Salix caprea Hawthorn Crataegus monogyna Silver Birch Betula pendula"	4	upto 6x 50	3	SM	F	Sporadic self seeded tree group around area of disused land Unmaintained forms	7	1.5	C (ii)
TG6	Goat Willow Salix caprea Silver Birch Betula pendula	5	upto 250 250	4	EM	F	Sporadic self seeded tree group Unmaintained forms Larger goat willow displayed twin stemmed form with an included union	57	4.2	C (ii)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
TG7	Alder Alnus glutinosa Goat Willow Salix caprea Silver Birch Betula pendula English Oak Quercus robur	5	140 70 50	2	Yng	P	Self seeded in amongst the planted trees Dense with Alder saplings Multi-stemmed forms	12	2.0	C (i)
TG8	Crack Willow Salix fragilis Silver Birch Betula pendula	5	7x 50	3	Yng	P	Multi-stemmed at the base Dense basal suckers on the willow One birch	8	1.6	C (i)
TG9	3x Goat Willow Salix caprea 5x English Oak Quercus robur	3	70	1	Yng	P	Appear to be planted oak Sporadic group	2	0.8	C (i)
TG10	Aspen Populus tremula Field Maple Acer campestre Silver Birch Betula pendula English Oak Quercus robur	5 - 8	upto 240	1 - 2	Yng	P	Most stems only 100mm diameter One dead specimen Dense with Aspen saplings	26	2.9	C (i)
TG11	Aspen Populus tremula Field Maple Acer campestre Silver Birch Betula pendula English Oak Quercus robur Alder Alnus glutinosa Goat Willow Salix caprea	5	100	1	Yng	P	Wet ground within group Dense with Aspen saplings	5	1.2	C (i)
TG12	Alder Alnus glutinosa Goat Willow Salix caprea Silver Birch Betula pendula	4	60	0.5	Yng	P	Small group adjacent to end of pond Dense with Alder saplings	2	0.7	C (i)



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