

P/2017/00426
Received 19/04/2017



St Modwen

Bramshall Road, Uttoxeter

Arboricultural Assessment

October 2016

FPCR Environment and Design Ltd

Registered Office: Lockington Hall, Lockington, Derby DE74 2RH

Company No. 07128076. [T] 01509 672772 [F] 01509 674565 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

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Rev	Issue Status	Prepared / Date	Approved/Date
-	Draft	EC / 23.02.16	HCK / 24.02.16
-	Final	EC / 26.02.16	HCK / 26.02.16
A	Final	EC / 14.09.16	HCK / 14.09.16
B	Final	EC / 11.10.16	HCK / 11.10.16

CONTENTS

1.0 INTRODUCTION..... 2

2.0 METHODOLOGY 3

3.0 RESULTS 6

4.0 ARBORICULTURAL IMPACT ASSESSMENT (AIA) 7

5.0 TREE PROTECTION MEASURES..... 9

6.0 CONCLUSION11

TABLES

Table 1: Summary of Trees by Retention Category

FIGURES

Figure 1: Location Plan (4348-A-01_A)

Figure 2: Tree Survey Plan (4348-A-02_B)

Figure 3: Tree Retention Plan (4348-A-03_C)

APPENDICES

Appendix A: Tree Schedule

Appendix B: Protective Fencing Specifications

1.0 INTRODUCTION

- 1.1 This report has been prepared by FPCR Environment and Design Limited on behalf of St Modwen to present the findings of an arboricultural assessment and survey of trees located at Bramshall Road, Uttoxeter, (hereafter referred to as the site), Grid Ref SK 073 345 as shown in Figure 1. The latest tree survey was carried out on the 19th January 2016.
- 1.2 An initial survey of trees on the site was carried out during May 2013 for a larger outline application area and the original tree numbers have been used within this report for consistency.
- 1.3 The tree survey and assessment of existing trees has been carried out in accordance with guidance contained within British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (hereafter referred to as BS5837). The guidelines set out a structured assessment methodology to assist in determining which trees would be deemed either as being suitable or unsuitable for retention.
- 1.4 The guidance also provides recommendations for considering the relationship between existing trees and how those trees may integrate into designs for development; demolition operations and future construction processes so that a harmonious and sustainable relationship between any retained trees and built structures can be achieved.
- 1.5 The purpose of the report is therefore to firstly present the results of an assessment of the existing trees' arboricultural value, based on their current condition and quality and to secondly provide an assessment of impact arising from the proposed development of the site for residential use.
- 1.6 This report has been produced to accompany a Reserved Matters 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.
- 1.7 The site comprises pastureland situated to the east of the town of Uttoxeter and comprises a portion of the larger outline application area for the Parks Farm development. Residential dwellings abut a portion of the site's eastern boundary and to the north and west are further open fields used as pasture. Established native hedgerows bound the majority of the fields within which are located a number of larger proportioned trees.
- 1.8 Following consultation with the Local Planning Authority, East Staffordshire District Council, it is understood that there are no Tree Preservation Orders or Conservation Area Designations that would apply to any trees present on, or in close proximity to the assessment site and therefore at the time of writing there would not be any statutory constraints to the development in respect of trees.
- 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 arboriculturist and recorded information relating to all those trees within the site and those adjacent to the site which may be of influence to any proposals. Trees were assessed for their arboricultural quality and benefits within the context of proposed development in a transparent, understandable and systematic way.
- 2.2 Trees have been assessed as groups where it has been determined appropriate. The term group has been applied where trees form cohesive arboricultural features either aerodynamically, visually or culturally including biodiversity or habitat potential for example parkland or wood pasture. An assessment of individual trees within the groups has been made where there has been a clear need to differentiate between them for example. in order to highlight significant variation between attributes including physiological or structural condition or where a potential conflict may arise.
- 2.3 Trees have been divided into one of four categories based on Table 1 of BS5837, '*Cascade chart for tree quality assessment*'. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below). Category U trees are those which would be lost in the short term for reasons connected with their physiology or structural condition. They are, for this reason not considered in the planning process on arboricultural grounds. Categories A, B & C are applied to trees that should be 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 trees 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 the 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 should 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. 4348-A-01_A) 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 4348-A-02_B). The positions of trees are based on a topographical / land survey, as far as possible, supplied by the client. The crown spread, root protection area and shade pattern (where appropriate) are indicated on this plan.
- 2.16 As part of the Arboricultural Impact Assessment, the Tree Retention Plan, Figure 3 (drawing no 4348-A-03_C) 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 that are to be removed or retained as part of the proposed development and also trees considered unsuitable for retention through the assessment process (Category U).

Tree Constraints and Root Protection Area (RPA)

- 2.17 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 (RPA). The RPA has been calculated in accordance with section 4.6 of BS5837 and requires suitable protection in order for the tree to be incorporated into any future scheme.

- 2.18 Where groups of trees have been assessed, the RPA has been shown based on the maximum sized tree in any one group and so may exceed the RPA required for some of the individual specimens within the group.
- 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 twenty two individual trees, one group of trees and eight hedgerows were surveyed as part of the arboricultural assessment tree numbers have been retained from the original outline application for consistency. Trees were surveyed as individual trees and groups/blocks of trees where examples are clearly present as such per the description. Refer to Figure 2 – Tree Survey Plan (drawing no 4348-A-02) and Appendix A – Tree Schedule for full details of the trees included in this assessment.
- 3.2 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	T81, T93, T98	3	TG14	1
Category A (High Quality / Value)	T73, T75	2		0
Category B (Moderate Quality / Value)	T71, T72, T74, T90, T94, T95, T102, T110	8		0
Category C (Low Quality / Value)	T76, T77, T78, T91, T92, T97, T99, T100, T101	9	H1, H2, H3, H4, H5, H6, H7, H8	8

Results Summary

- 3.3 The site housed a number of high and moderate quality mature trees mostly situated along the hedgerows of the field boundaries. The most dominant species present is English oak *Quercus robur*, other species included common ash *Fraxinus excelsior* and crab apple *Malus sylvestris*.
- 3.4 As would be expected with trees in this environment, individual examples showed evidence of storm damaged branch material, dead wood and occasional branch failures and the individual specimens were categorised accordingly. As a result of these minor defects individual specimens may require remedial tree surgery should these be retained within close proximity to residential dwellings or publicly accessible areas.
- 3.5 T97 an over mature crack willow pollard had partially collapsed with the stem having split and hollowed. Although possessing a sizable stem diameter for the species T97 was not considered to have a sufficient amount or quality of the attributes of veteran trees nor the minimum number of characteristic features pertaining to veteran trees thus would not be regarded as a tree of this status.

- 3.6 Due to its deteriorating physical conditions, T97 was assessed as being category C, and should it be retained for its contribution to the sites overall bio-diversity, would require re-pollarding.
- 3.7 Originally assessed as a group TG14 now comprises a single mature crack willow positioned on the site's eastern boundary. This remaining specimen was in a poor condition at the time of the assessment with a large stem having failed at the base leaving a substantial tear wound. TG14 would be unlikely remain intact beyond 10 years and as such was considered as unsuitable for retention (category U).
- 3.8 Two further individual trees T93 and T98 were also assessed as being unsuitable for retention as a result of significant defects and a future life expectancy of less than 10 years and as such should not form material consideration within the design process.
- 3.9 Hedgerows on site all comprises hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa* the majority of which had been regularly maintained by means of flail mowing. The presence of large gaps and the limited landscape value of these hedgerow from an arboricultural perspective resulted in them all being considered retention category C

4.0 ARBORICULTURAL IMPACT ASSESSMENT (AIA)

- 4.1 The following paragraphs present a summary of the tree survey and discussion of particular trees and groups recorded in the context of any proposed development in the form of an Arboricultural Impact Assessment in accordance with section 5.4 of BS5837. Any final tree retentions will need to be reconciled with the advice contained within this report.
- 4.2 The AIA has been based upon the Site Layout and seeks to outline the relationship between the proposals and the existing trees and hedgerows. The above drawing for the Reserved Matters application shows the proposals for a residential development indicating the position of individual dwellings, internal road layout, provision of green space and flood attenuation. 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 The proposals have where practicable, attempted to retain category A and B specimens and have incorporated these into the proposals mostly as part of the supporting green infrastructure. However for a feasible layout to be achieved a small number of tree losses would be necessary internally to the site, the large majority of which with the exception of T94 and T95 were assessed as being of low arboricultural value.
- 4.4 Trees considered as retention category U should all be removed in the interests of safety on arboricultural grounds and should therefore not be material considerations within the development.
- 4.5 The proposed development has retained a large majority of the higher quality and mature existing trees and has incorporation these retained specimens into the supporting 'Green Infrastructure' requiring no excavation or construction within the indicative root protection area and as such there should be no major objections from an arboricultural perspective.
- 4.6 It will be necessary to ensure that the prescribed root protection areas for all retained trees is adequately protected by the erection of the requisite tree protection barrier whilst allowing sufficient access/construction zone for the implementation of the proposed layout.

New Tree Planting

- 4.7 There are several areas of open space within which new tree planting has been illustrated and this new tree planting should form an integral part of the development proposals. New tree planting should be appropriate for the future use of the site and it is recommended that any supporting landscaping scheme should seek to provide an adequate quantity of tree planting to suitably mitigate for the loss of trees required to facilitate the development.
- 4.8 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. 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).
- 4.9 Species choices should be selected on the basis of their suitability for the final site use. Careful consideration would need to be given to the following: ultimate height and canopy spread, form, habit, density of crown, potential shading effect, colour and maintenance requirements in relation to both the built form of the new development and existing properties.
- 4.10 The landscaping scheme should consider providing tree planting in the following situations; new amenity planting as part of any proposed road infrastructure; private gardens; areas of incidental open space; larger areas of open space; and structural buffer planting where appropriate.
- 4.11 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

- 4.12 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.
- 4.13 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.
- 4.14 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 RPA for all retained trees can be appropriately protected through the erection of the requisite tree protection barriers. Measures to protect trees should follow the guidance in BS5837 and will be applied where necessary for the purpose of protecting trees within the site whilst allowing sufficient access for the implementation of the proposed layout. These have been broadly summarised below.
- 5.2 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

- 5.3 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.
- 5.4 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.
- 5.5 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.
- 5.6 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.
- 5.7 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

- 5.8 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.
- 5.9 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.

- 5.10 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.
- 5.11 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 as part of a site specific Arboricultural Method Statement and in accordance with the guidance contained within BS5837.
- 5.12 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 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

- 5.13 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.
- 5.14 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 to be a construction exclusion zone.
- 5.15 Wide or tall loads etc. should not come into contact with retained trees. Banks-man should supervise transit of vehicles where they are in close proximity to retained trees.
- 5.16 Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree bole. No concrete mixing should be done within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.
- 5.17 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.
- 5.18 Notice boards, telephone cables or other services should not be attached to any part of a retained tree.
- 5.19 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).
- 5.20 Any trees which are to be retained and whose RPAs may be affected by the development should be monitored to identify any alterations in quality with time and to assess and undertake any remedial works required as a result.

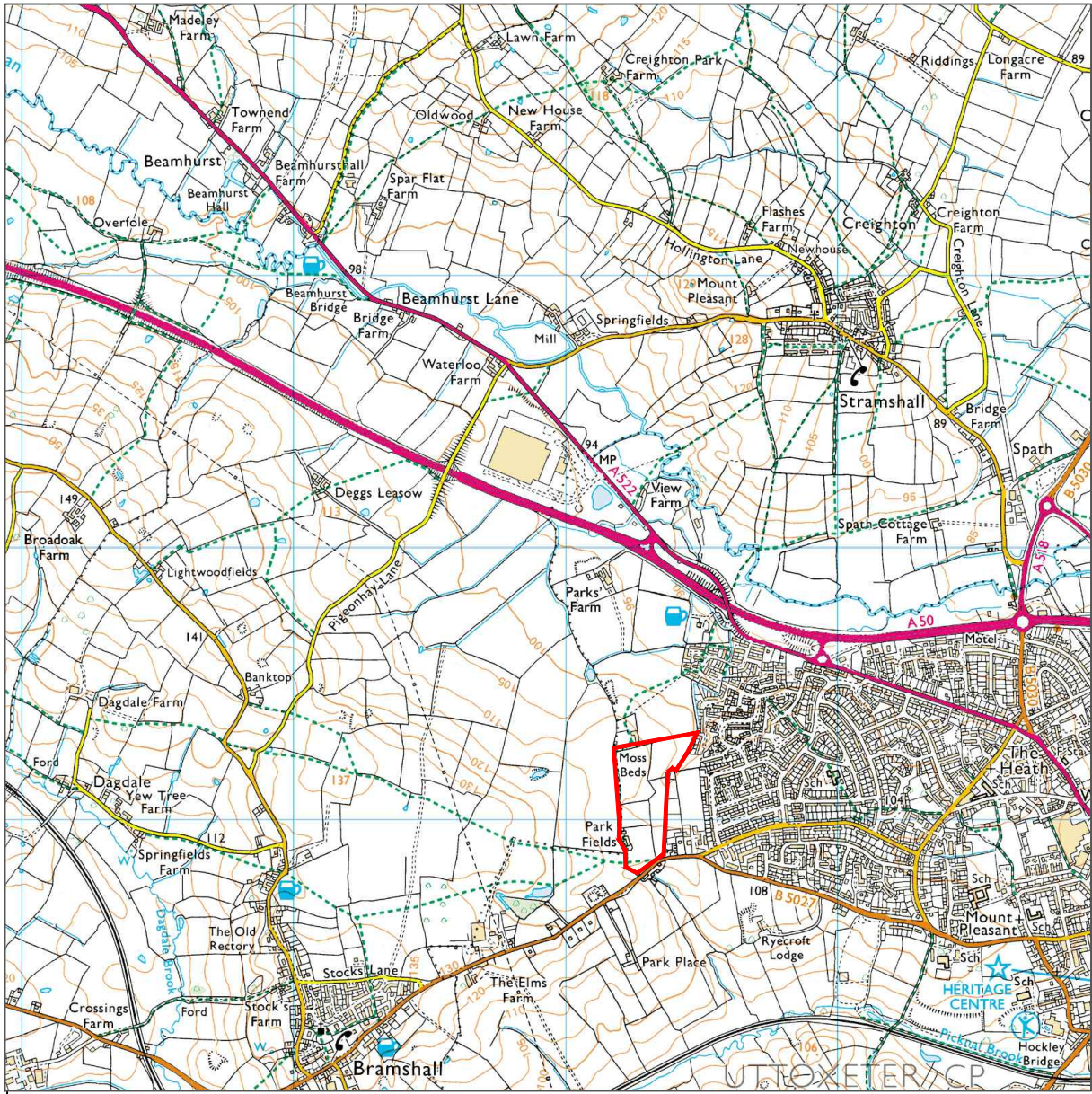
Protection for Aerial Parts of Retained Trees

- 5.21 Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment as part of the construction works it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obvious problem branches. This is termed as 'access facilitation pruning' within BS5837 and any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist.

- 5.22 It is strongly advised that a pre-commencement site meeting is held with contractors who are responsible for operating machinery, as described above, to firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact.
- 5.23 In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with British Standard 3998:2010 to correct the damage, upon completion of development.

6.0 CONCLUSION

- 6.1 Only minimal tree losses would occur to facilitate the development as per proposed layout and of these losses mostly were of low arboricultural quality, hence should not raise objection from an arboricultural perspective. These losses would be more than adequately mitigated for through new tree planting which will provide a net gain in tree cover across the site, as part of the overall green infrastructure proposals supporting the development.
- 6.2 Trees that are to be retained, will in most cases be retained to form part of landscaped buffers or be retained within open spaces thereby reducing conflicts commonly associated with mature trees being retained adjacent to properties. Tree surgery may however be required to address issues of dead / defective branch material in line with public safety.
- 6.3 Provided retained trees are adequately protected during construction work by the requisite tree protection barriers, existing retained trees will be successfully integrated with the development proposals, and overall therefore along with new tree planting to ensure a future generation of trees within the development, the proposals should be considered as positive from an arboricultural perspective.



KEY



Assessment Boundary

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- FPCR Environment and Design Ltd
- Lockington Hall
- Lockington
- Derby DE74 2RH

t: 01509 672772
 f: 01509 674565
 e: mail@fpcr.co.uk
 w: www.fpcr.co.uk

client
St Modwen

project
**Bramshall Road
 Uttoxeter**

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**ASSESSMENT BOUNDARY PLAN
 FIGURE 1**

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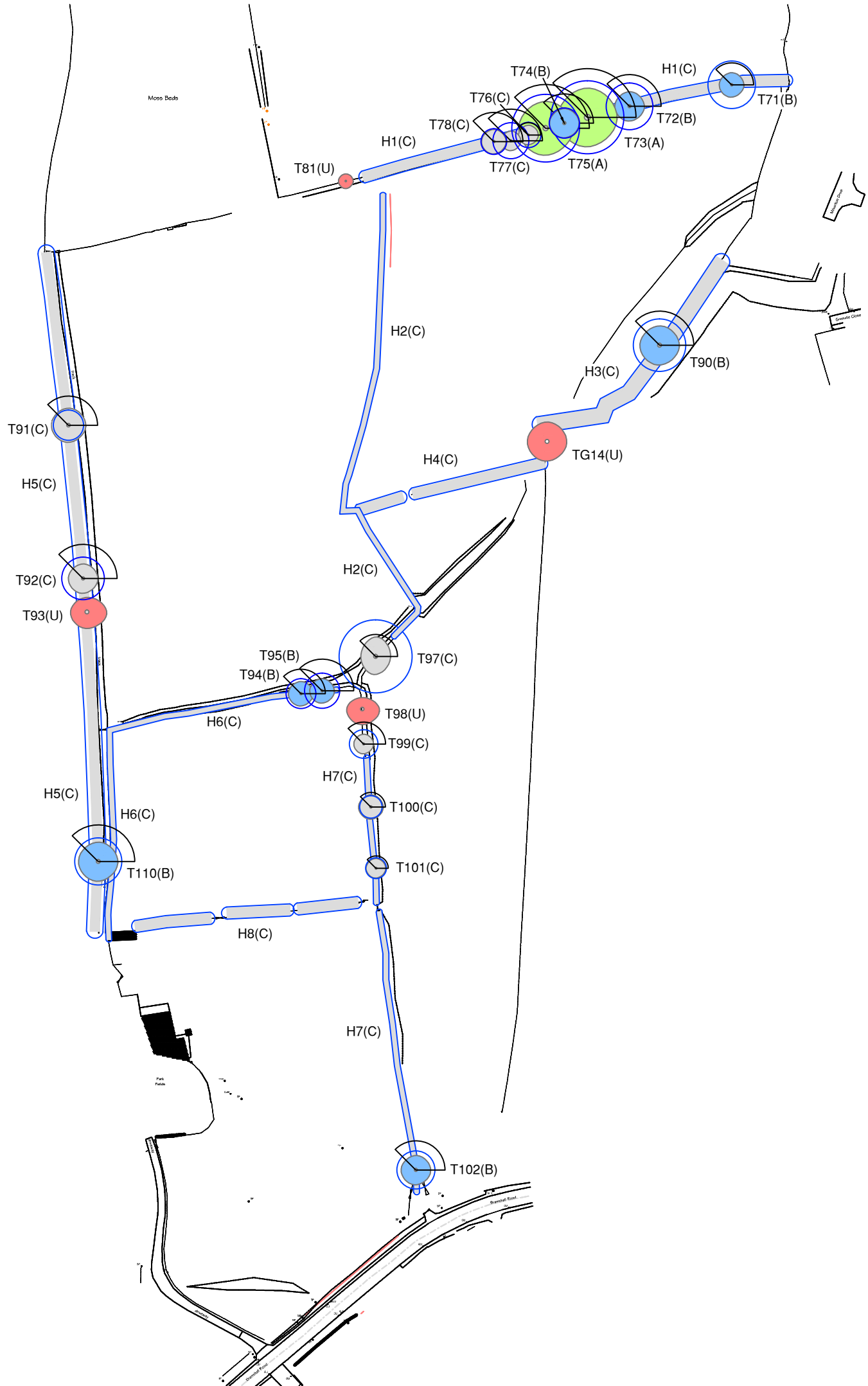
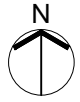
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





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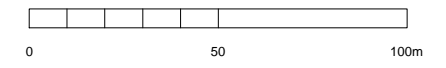
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KEY

-  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)
-  Hedgerow (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)

Scale 1:2000 @ A3



NOTES

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


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

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

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t: 01509 672772
 f: 01509 674565
 e: mail@fpcr.co.uk
 w: www.fpcr.co.uk

client
St Modwens

project
**Bramshall Road
Uttoxeter**

drawing title
**TREE SURVEY PLAN
FIGURE 2**

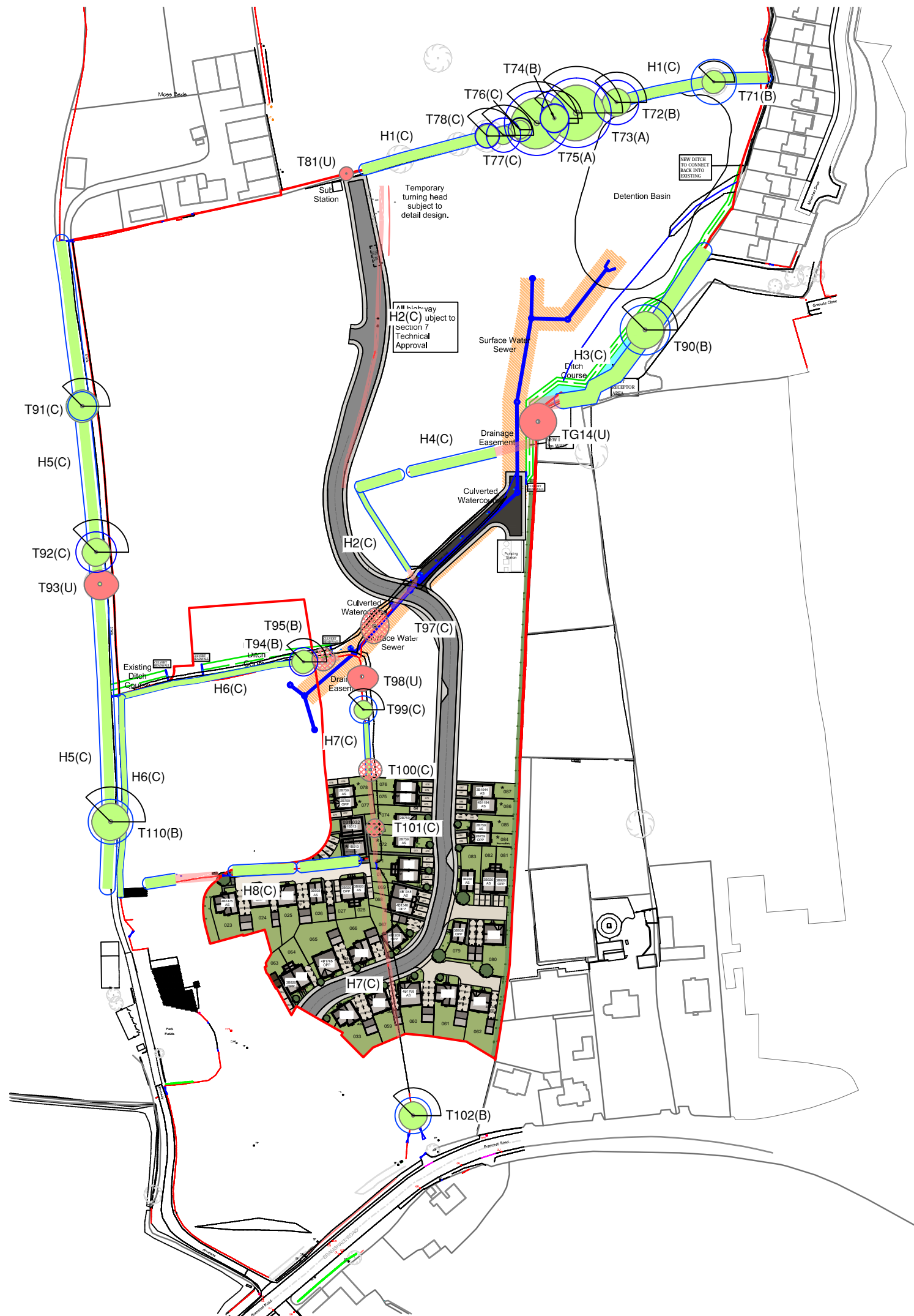
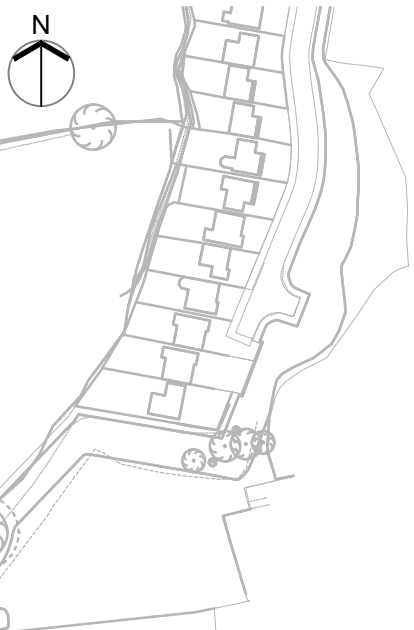
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drawn
EC

date
October 2016

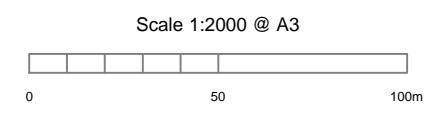
drawing number
4348-A-02

rev
B



KEY

- Tree/Group to be Retained
- Tree/Group to be removed to facilitate the proposals
- Category U - Unsuitable for retention on arboricultural grounds
- Hedgerow Proposed to be Retained
- Hedgerow 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

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

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

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

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rev	date	description	by
-	23.02.16	40623 001 K Site Layout	EC
A	14.09.16	40776 019 H Site Layout	EC
B	11.10.16	Amendments	EC
C	11.10.16	Amendments	EC

masterplanning ■
 environmental assessment ■
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 urban design ■
 ecology ■
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FPCR Environment and Design Ltd
 Lockington Hall
 Lockington
 Derby DE74 2RH

t: 01509 672772
 f: 01509 674565
 e: mail@fpcr.co.uk
 w: www.fpcr.co.uk

client
St Modwens

project
**Bramshall Road
Uttoxeter**

drawing title
**TREE RETENTION PLAN
FIGURE 3**

scale
1:2000 @ A3

drawn
EC

date
October 2016

drawing number
4348-A-03

rev
C

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	<ul style="list-style-type: none"> The RPA Radius column provides the extent of an equivalent circle from the centre of the stem (m). The RPA is calculated using the formulae described in paragraph 4.6.1 of British Standard 5837: 2012 and is indicative of the rooting area required for a tree to be successfully retained. Tree roots extend beyond the calculated RPA in many cases and where possible a greater distance should be protected. Where veteran trees have been identified the RPA has been calculated in accordance with Natural England guidance i.e. 15x the stem diameter, uncapped.
Stem Dia. - Diameter measured (mm) in accordance with Annex C of the BS5837	SM: Semi-mature trees less than 1/3 life expectancy	F - Fair: Trees with minor rectifiable defects or in the early stages of stress from which it may recover	
Crown Radius - Measured using a digital laser clinometer radially from the main stem (m)	EM: Early mature trees 1/3 – 2/3 life expectancy	P - Poor: Trees with major structural and/or physiological defects such that it is unlikely the tree will recover in the long term	
Abbreviations est - Estimated stem diameter avg - Average stem diameter for multiple stems upto - Maximum stem diameter of a group	M: Mature trees over 2/3 life expectancy	D - Dead: This could also apply to trees in an advanced state of decline and unlikely to recover	
	OM: Over mature declining or moribund trees of low vigour	The BS category particular consideration has been given to the following <ul style="list-style-type: none"> The health, vigour and condition of each tree The presence of any structural defects in each tree/group and its future life expectancy The size and form of each tree/group and its suitability within the context of a proposed development The location of each tree relative to existing site features e.g. its screening value or landscape features Age class and life expectancy 	
	V: Veteran tree possessing certain attributes relating to veteran trees		

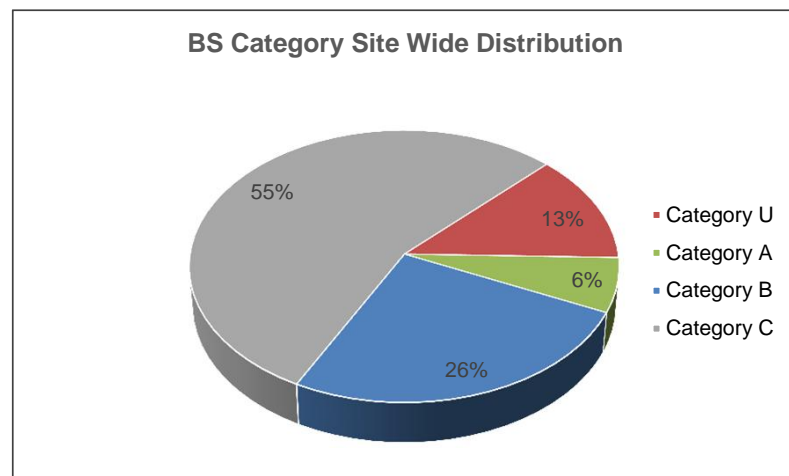
Structural Condition
<p>The following is an example of considerations when inspecting structural condition:</p> <ul style="list-style-type: none"> The presence of fungal fruiting bodies around the base of the tree or on the stem, as they could possibly indicate the presence of possible internal decay Soil cracks and any heaving of the soil around the base Any abrupt bends in branches and limbs resulting from past pruning Tight or weak 'V' shaped forks and co-dominant stems Hazard beam formations and other such biomechanical related defects (as described by Claus Mattheck, Body Language of Trees HMSO Research for Amenity Trees No. 4 1994) Cavities as a result of limb losses or past pruning Broken branches or storm damage Damage to roots Basal, stem or branch / limb cavities Crown die-back or abnormal foliage size and colour

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

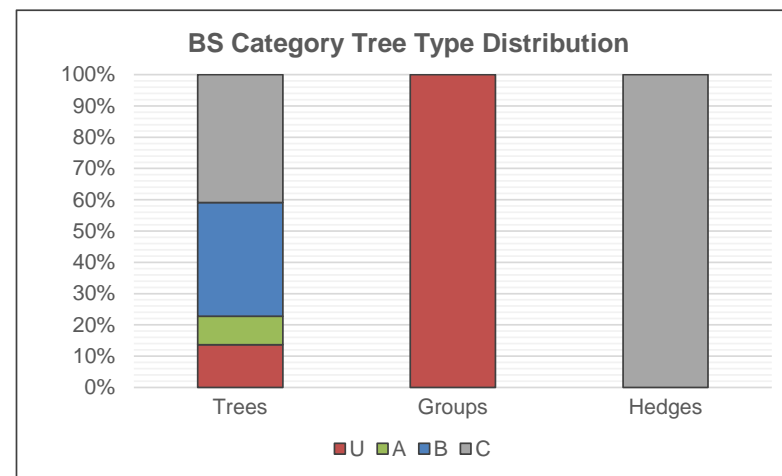
Appendix Summary

	Individual Trees	Totals	Tree Groups and Hedgerows	Totals
Category U	T81, T93, T98	3	TG14	1
Category A	T73, T75	2		0
Category B	T71, T72, T74, T90, T94, T95, T102, T110	8		0
Category C	T76, T77, T78, T91, T92, T97, T99, T100, T101	9	H1, H2, H3, H4, H5, H6, H7, H8	8
	Total	22	Total	9

BS Category Site Wide Distribution shows the proportion of trees assessed in each category across the whole site which allows an interpretation of the site's overall quality.



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



Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
INDIVIDUAL TREES										
T71	Oak <i>Quercus robur</i>	9	820	5	M	F	Gnarled looking appearance Epicormic growth on the main stem Occluded wire in the lower stem Minor dead wood Waterlogged ground at base	304	9.8	B (i)
T72	Oak <i>Quercus robur</i>	13	800	6	M	G	Twisted / s-shaped stem form - leaning to the east before correcting to an upright form Occluded wire in the lower stem Broken branches noted in crown Minor dead wood	290	9.6	B (i)
T73	Oak <i>Quercus robur</i>	20	1290	12	M	G	Stem sub-divides from 2m above ground level into a multiple leaders form Minor dead wood Occluded wire in the lower stem Low crown form	707	Capped at 15m	A (i)
T74	Oak <i>Quercus robur</i>	12	520	6	EM	F	Occluded wire in the lower stem Suppressed specimen Interlocked crown with T73 and T75	122	6.2	B (i)
T75	Oak <i>Quercus robur</i>	18	1160	11	M	G	Multi leadered form Major dead wood Occluded wire in the lower stem Low crown form	609	13.9	A (i)
T76	Crab apple <i>Malus domestica M. sylvestris</i>	5	280 240 220	4	EM	F	Multiple leaders from 0.5m with included union Die back noted in crown with minor dead wood Suppressed specimen low crown form Crossing and rubbing branches	83	5.2	C (i)
T77	Ash <i>Fraxinus excelsior</i>	13	490 370	4	EM	F	Twin stemmed from ground level with included union Low crown form Crossing stem point at 2m where wood has fused together Large basal sucker	171	7.4	C (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T78	Ash <i>Fraxinus excelsior</i>	12	380 260	5	EM	F	Twin stemmed from 0.5m Numerous crossing and rubbing branches Minor dead wood Occluded wire in the lower stem	96	5.5	C (i)
T81	Crab apple <i>Malus domestica M. sylvestris</i>	5	250 250 250	3	M	F	Multiple stemmed form Single stem has been removed A further stem has been heavily reduced Occluded wire in the lower stem	N/A	N/A	U
T90	Oak <i>Quercus robur</i>	14	900	8	M	G	Storm damaged branch material Major dead wood, old branch tear wounds and branch stubs Burred stem Low crown Prominent root buttresses	366	10.8	B (i)
T91	Ash <i>Fraxinus excelsior</i>	12	410 320	7	M	F	Multiple stemmed from old stool Base is partially rotten Minor dead wood and broken branches Animal burrows / activity at base Exposed roots on track side	122	6.2	C (i)
T92	Oak <i>Quercus robur</i>	14	730	6	EM	G	Tree located on the trackside Minor growth of epicormic shoots on lower stem and branches Minor dead wood and broken branches	241	8.8	C (i)
T93	Ash <i>Fraxinus excelsior</i>	13	780	N - 5 S - 6 E - 6 W - 8	M	P	Fruiting bodies of <i>Inonotus hispidus</i> on main stem Dense ivy to 7m extending along all primary lateral branches Die back noted in crown Lrge lever arm branch above access track Past pruning of branches lowest hanging over the track	N/A	N/A	U
T94	Oak <i>Quercus robur</i>	10	510	5	EM	G	Hedgerow tree Moderate quantity of dead wood throughout of minor nature Broken branches Light ivy growth on lower stem	118	6.1	B (i)

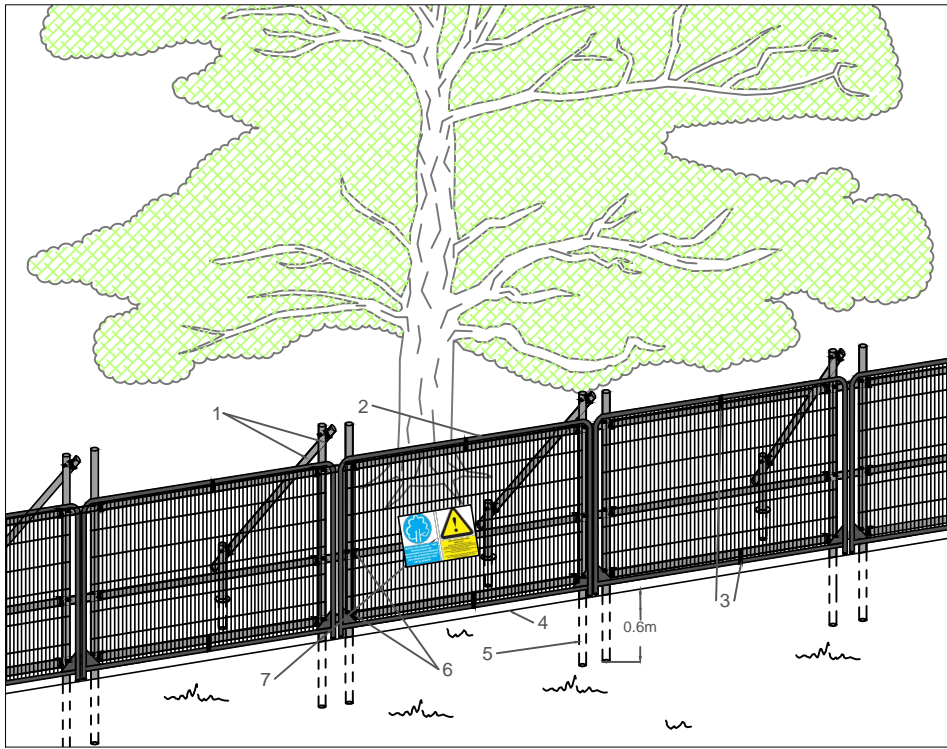
Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T95	Oak <i>Quercus robur</i>	13	600	5	EM	G	Small quantity of minor dead wood and occasional broken branches Base obscured by vegetation Light ivy growth on the main stem to approximately 5m above ground level	163	7.2	B (i)
T97	Crack willow <i>Salix fragilis</i>	9	est 1500	N - 8 S - 7 E - 5 W - 5	OM	P	Large old pollard Severely structurally impaired condition Regrowth from stem of approximately 6 stems Structurally collapsed and split open Evidence of physical degeneration to the internal heartwood North side of crown - limbs touch the ground	707	Capped at 15m	C (i)
T98	Ash <i>Fraxinus excelsior</i>	12	510	N - 4 S - 6 E - 7 W - 6	M	P	Minor die back noted in crown Old raised shallow bank has exposed roots Inonotus hispidus bracket noted on the lower stem Light ivy cover on main stem	N/A	N/A	U
T99	Alder <i>Alnus glutinosa</i>	9	360 340	4	EM	F	Old laid specimen - two remaining lead stems Stems separated by 1m and joined by a trunk section Bark wound noted on main stem Exposed heartwood	111	5.9	C (i)
T100	Crab apple <i>Malus domestica M. sylvestris</i>	6	380	5	EM	F	Leaning stem Minor dead wood Typically characteristic for the species Branch socket cavities on the stem Crossing and rubbing branches	65	4.6	C (i)
T101	Crab apple <i>Malus domestica M. sylvestris</i>	5	360	4	M	F	Leaning stem Past pruning evident to lower branches Typically characteristic for the species Broken branches and dead wood present	59	4.3	C (i)
T102	Oak <i>Quercus robur</i>	12	650	6	EM	F	Small amount of minor dead wood Low crown Minor dead wood Evenly balanced crown form Ganoderma bracket noted at base	191	7.8	B (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T110	Oak <i>Quercus robur</i>	15	810	8	M	F	Storm damaged branch material Major dead wood, old branch tear wounds and branch stubs Obscured base Crown extends above access track	297	9.7	B (i)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
GROUPS OF TREES										
TG14	Crack willow <i>Salix fragilis</i>	20	800	8	M	P	Large specimens located on the site boundary Northerly and southerly specimens have failed Only the central specimen remains intact Twin stemmed in form with only single stem remaining Large tear wound at base with exposed heartwood Central specimen houses ivy growth to 7m	N/A	N/A	U

Hedge No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
HEDGEROWS										
H1	Hawthorn Crataegus monogyna Blackthorn Prunus spinosa Holly Ilex aquifolium	4	150 150	2	M	P	Unmaintained hedgerow Sporadic appearance Large gaps present	20	2.5	C (ii)
H2	Hawthorn Crataegus monogyna Blackthorn Prunus spinosa Holly Ilex aquifolium	1.5	70 70	1	EM	F	Maintained hedgerow Typical form Gaps present	4	1.2	C (ii)
H3	Hawthorn Crataegus monogyna Blackthorn Prunus spinosa Holly Ilex aquifolium Ash Fraxinus excelsior Alder Alnus glutinosa	6	200 200	3	EM	F	Unmaintained hedgerow Sporadic appearance Self seeded specimens Dense undergrowth and ivy cover through out Dead and failed trees noted Large gaps present	36	3.4	C (ii)
H4	Hawthorn Crataegus monogyna Blackthorn Prunus spinosa Holly Ilex aquifolium	4	150 150	2	M	P	Unmaintained hedgerow Sporadic appearance Dense ivy cover through out Large gaps present	20	2.5	C (ii)
H5	Hawthorn Crataegus monogyna Blackthorn Prunus spinosa Holly Ilex aquifolium Ash Fraxinus excelsior	6	200 200	3	EM	F	Unmaintained hedgerow Sporadic appearance Self seeded specimens Past pruning for adjacent access track Large gaps present	36	3.4	C (ii)

Hedge No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
H6	Hawthorn Crataegus monogyna Blackthorn Prunus spinosa Holly Ilex aquifolium	1.5	70 70	1	EM	F	Maintained hedgerow Typical form Large gaps present	4	1.2	C (ii)
H7	Hawthorn Crataegus monogyna Blackthorn Prunus spinosa Holly Ilex aquifolium	1.5	70 70	1	EM	F	Maintained hedgerow Typical form Large gaps present Out grown forms to south up to 6m in height	4	1.2	C (ii)
H8	Hawthorn Crataegus monogyna Blackthorn Prunus spinosa Holly Ilex aquifolium	4	150 150	2	M	P	Unmaintained hedgerow Sporadic appearance Large gaps present	20	2.5	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



Above ground stabilising systems

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

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

NOTES

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 ecology ■ Lockington Hall
 architecture ■ Lockington
 arboriculture ■ Derby DE74 2RH

t: 01509 672772
 f: 01509 674565
 e: mail@fpcr.co.uk
 w: www.fpcr.co.uk

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APPENDIX B PROTECTIVE FENCING SPECIFICATIONS