

**Annex E:
Arboricultural Assessment**

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Hallam Land Management

Land off Carr Road, Deepcar

Arboricultural Assessment

May 2021

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CONTENTS

1.0 INTRODUCTION 2

2.0 PLANNING POLICY 3

3.0 SURVEY METHODOLOGY 4

4.0 RESULTS..... 10

5.0 ARBORICULTURAL IMPACT ASSESSMENT 14

6.0 NEW TREE AND HEDGEROW PLANTING..... 17

7.0 TREE PROTECTION MEASURES 19

TABLES

- Table 1: Summary of Trees by Retention Category
- Table 2: Summary of Impact on Tree Stock
- Table 3: Example of Calculating Soil Volume for New Tree Planting

PLANS

- Tree Survey Plans (7301-T-03, 7301-T-04 & 7301-T-05)
- Tree Retention Plans (7301-T-06, 7301-T-07 & 7301-T-08)
- Tree Retention Plans - Revised Illustrative Masterplan - April 2021 (7301-T-09, 7301-T-10 & 7301-T-11)

APPENDICES

- Appendix A: Tree Schedule
- Appendix B: Protective Fencing Specifications
- Appendix C: Veteran Tree Schedule

1.0 INTRODUCTION

- 1.1 This report has been prepared by FPCR Environment and Design Limited on behalf of Hallam Land Management to present the findings of an Arboricultural Assessment and survey of trees located at Land off Carr Road, Deepcar (hereafter referred to as the site), OS Grid Ref SK 278 975.
- 1.2 The survey was carried out on 12th January 2021.

Scope of Assessment

- 1.3 The tree survey and assessment of existing trees has been carried out in accordance with guidance contained within British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (hereafter referred to as BS5837). The guidelines set out a structured assessment methodology to assist in determining which trees would be deemed either as being suitable or unsuitable for retention.
- 1.4 The guidance also provides recommendations for considering the relationship between existing trees and how those trees may integrate into designs for development; demolition operations and future construction processes so that a harmonious and sustainable relationship between any retained trees and built structures can be achieved.
- 1.5 The purpose of the report is therefore to firstly, present the results of an assessment of the existing trees' arboricultural value, based on their current condition and quality and to secondly, provide an assessment of impact arising from the proposed development of the site.
- 1.6 This report has been produced to accompany an outline 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.

Site description

- 1.7 The site is positioned on the southern edge of Deepcar, between Carr Road and Hollin Busk Lane and is currently used as grazing land. The site is in an elevated position but not exposed fully to the prevailing winds, being below the crest of the hill that runs along the southern edge of Stocksbridge and Deepcar. The tree stock assessed was mainly early mature with some mature and over mature specimens in occasional pockets, though most were positioned outside the site within Fox Glen adjacent to the northern site's boundary. Included within the assessment were numerous trees within highway verges of the surrounding road network.

2.0 PLANNING POLICY

National Planning Policy Framework 2019

- 2.1 National Planning Policy is defined by the National Planning Policy Framework (NPPF). This sets out the Government's most current and up to date planning policies for England and how these should be applied. The current NPPF is dated February 2019.
- 2.2 Paragraph 11 of the NPPF states that there is a presumption in favour of sustainable development and states that for decision making, the LPA should be '*c) approving development proposals that accord with an up-to-date development plan without delay*'. In the absence of a development plan or the development plan is out of date, the acting LPA should grant planning consent so far as the development proposals do not breach the policies and guidance outlined in the NPPF.
- 2.3 In relation to arboriculture, the NPPF also states that:
- *175(c) 'development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons, and a suitable compensation strategy exists'*.
- and provides specific guidance that:
- *175(d) 'development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity'*.
- 2.4 Examples of what is deemed to be '*wholly exceptional*' are included within Footnote 58 and provides the examples of '*infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat*'.

Statutory Considerations

- 2.5 Local authorities have a Duty under the Town and Country Planning Act to create Tree Preservation Orders (TPO) to protect and preserve specific trees and woodlands that bring significant amenity benefit to a particular site or location. Under a TPO it is a criminal offence to cut down, top, lop, uproot or willfully destroy a tree protected by that Order, or to cause or permit such actions, if carried out without the prior written consent of the acting LPA. Anyone found guilty of such an offence is liable and in serious cases, may result in prosecution and incur an unlimited fine.
- 2.6 No direct consultation with the Local Planning Authority has taken place, however, it is understood having used the online search facility on the website for the Local Planning Authority, Sheffield City Council, it is understood that there is a Tree Preservation Order, namely TPO 808/20, which applies to trees present adjacent to the assessment site and further details are given in Chapter 3. Before any tree works are undertaken confirmation of the online information should be sought from the Local Authority.

- 2.7 Information provided on Tree Preservation Orders is accurate to the date of this assessment and cannot be assumed to remain unchanged. The last check was carried out on the 18th January 2021.

Non-Statutory Considerations

- 2.8 To compile existing baseline information on relevant arboricultural considerations information was requested from both statutory and non-statutory nature conservation organisations. The Multi Agency Geographic Information for the Countryside (MAGIC)¹ website identified Fox Glen (W1) as being included within the following:
- The Priority Habitat Inventory, Deciduous Woodland
 - The National Forestry Inventory
- 2.9 The Priority Habitat Inventory is a spatial dataset that describes the geographic extent and location of Natural Environment and Rural Communities Act (2006) Section 41 habitats of principal importance.²
- 2.10 The deciduous woodland inventory is a rolling programme designed to provide accurate information about the size, distribution, composition and condition of forests and woodlands.³
- 2.11 Priority habitat designation and inclusion within the National Forestry Inventory does not provide any statutory protection.

3.0 SURVEY METHODOLOGY

- 3.1 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 has recorded information relating to all those trees within the site and those adjacent to the site which may be of influence to any proposals. Trees were assessed for their arboricultural quality and benefits within the context of the proposed development in a transparent, understandable and systematic way.
- 3.2 Trees have been assessed as groups, hedgerows or woodland 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.
 - 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.

¹ <http://magic.defra.gov.uk/>

² Contains public sector information licensed under the Open Government Licence v3.0.

³ <https://www.forestresearch.gov.uk/tools-and-resources/national-forest-inventory/>

- For the purposes of this assessment woodland is described as a habitat where ‘trees are the dominant plant form. The individual tree canopies generally overlap and interlink, often forming a more or less continuous canopy’⁴. Woodlands, however, are not just formed of trees and generally include a great variety of other plants. These will include ‘mosses, ferns and lichens, as well as small flowering herbs, grasses and shrubs’⁵.

3.3 An assessment of individual trees within groups, hedgerows or woodland 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.

Ancient and Veteran Trees

3.4 Veteran trees and Ancient Woodland are important components of the landscape, their importance can be for several reasons including that of their ecological, social, cultural and historic value.

3.5 Veteran Trees and Ancient Woodlands are material considerations within the planning process and their importance is specifically recognised within the National Planning Policy Framework (NPPF) 2019, which defines the terms ancient or veteran tree as:

‘A tree which, because of its age, size and condition, is of exceptional biodiversity, cultural or heritage value. All ancient trees are veteran trees. Not all veteran trees are old enough to be ancient but are old relative to other trees of the same species. Very few trees of any species reach the ancient life-stage.’⁶

3.6 Various published methodologies are currently available which, due to the complexity and subjectivity of the process of defining and assessing these trees, often have conflicting definitions. This assessment, and the criteria used for defining ancient/veteran trees and the identification of attributable ancient/veteran features, has been based on a range of currently published guidance and resources.

Veteran Trees

3.7 The definition of a veteran tree has been based on Lonsdale (2013) as a tree:

‘which has survived various rigours of life and thereby shows signs of ancientness, irrespective of its age’.

3.8 However, for the purpose of the BS5837:2012 assessment, to qualify as a veteran tree, the tree concerned requires a stem girth which is considered large for its species (within the range set out in Fig. 1 below) and shows signs of crown retrenchment and evidence of decay processes in stem, branches or roots such as dead and decaying wood or fungal fruiting bodies of heart-rot (wood decay) species. These trees should also possess significant amounts of dead wood in the crown or fallen about the ground beneath the trees crown.

⁴ http://www.countrysideinfo.co.uk/woodland_manage/whatis.html

⁵ http://www.countrysideinfo.co.uk/woodland_manage/whatis.html

⁶ Ministry of Housing, Communities and Local Government. (2019). *National Planning Policy Framework*. London: Ministry of Housing, Communities and Local Government.

- 3.9 In principle, reference has also been made to Owen & Alderman (2008) and Reed, H. (2000). *Veteran Trees: A Guide to Good Management*. English Nature and more recently Lonsdale, D (ed.) (2013) *Ancient and other Veteran Trees: Further Guidance on Management*, The Tree Council & Ancient Tree Forum for guidance on the recognition of both ancient and veteran trees.
- 3.10 Level 3 of the Specialist Survey Method (SSM) of de Berker & Fay (2004)⁷ has also been utilised for gathering survey information as this provides a standardised framework for recording characteristic ancient/veteran features.

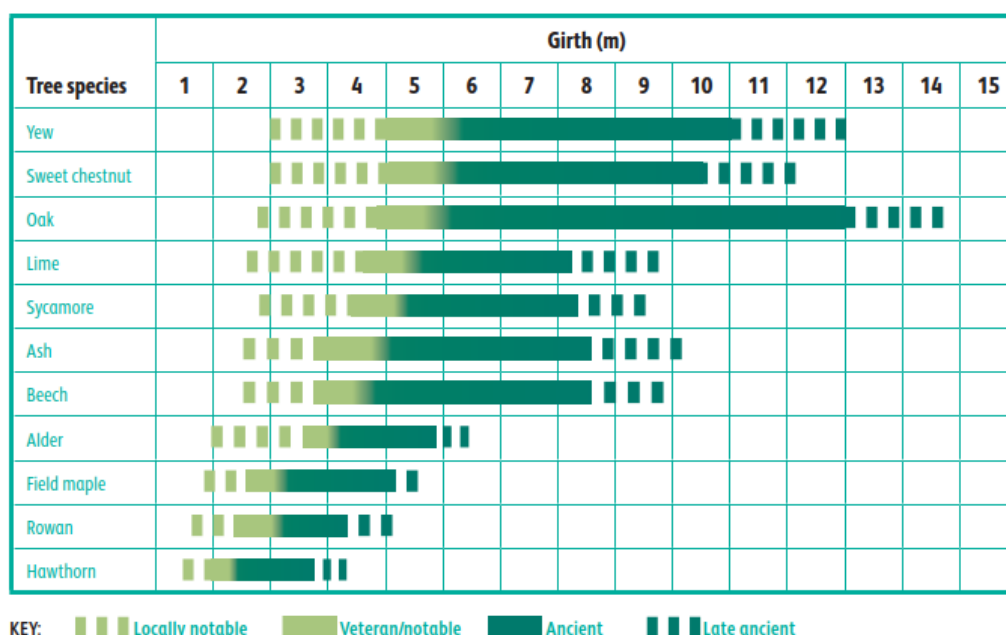


Figure 1: The chart of girth in relation to age and development classification of trees, as shown in Lonsdale (2013)⁸.

Ancient Woodland

- 3.11 Ancient woodland in England is defined as an area that has been continuously wooded since at least 1600 AD. ‘Continuously wooded’ does not require there to have been a continuous cover of trees and shrubs across the entire area. Habitats such as glades, deer lawns, rides, ponds and streams, as well as gaps created by natural occurrences, and forestry may all occur within woodland.
- 3.12 Ancient woodland includes both ancient semi-natural woodland and plantations on ancient woodland sites:
- Ancient semi-natural woodland (ASNW) is where the stands are composed predominantly of trees and shrubs native to the site that do not obviously originate from planting. However, woodlands with small planting of trees native to the site would still be included in this category. The stands may have been managed by coppicing or pollarding or the tree and shrub layer may have grown up by natural regeneration.

⁷ de Berker, N., & Fay, N. (2004). English Nature Research Report Number 529 – Evaluation of the Specialist Survey Method for Veteran Tree Recording. Bristol: Treework Environmental Practice.
⁸ Lonsdale, D. (Ed.). 2013). Ancient and other veteran trees: further guidance on management. London: The Tree Council.

- Plantations on ancient woodland sites (PAWS) these are areas of ancient woodland where the former native tree cover has been felled and replaced by planted trees, predominantly of species not native to the site. These sites often retain some of the ancient woodland features such as soils, ground flora, fungi and woodland archaeology.

BS5837 Categories

- 3.13 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).
- 3.14 Category U trees are those which would be lost in the short term for reasons connected with their physiology or structural condition. They are, for this reason not considered in the planning process on arboricultural grounds. Categories A, B and C are applied to trees that should be of material considerations in the development process. Each category also having one of three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural or conservation values accordingly.
- 3.15 **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.
- 3.16 **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.
- 3.17 **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.

3.18 **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.

Site Plans

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

3.20 As part of this assessment, a Tree Retention Plan has been prepared to show the proposed layout in relation to the existing tree cover allowing an assessment of any potential conflicts. The plan also identifies which trees would be required to be removed or retained as part of the proposed development.

Tree Constraints and Root Protection Areas

3.21 Below ground constraints to future development are represented by tree roots and the soil environment in which they grow which needs to be protected if the tree is to be retained. Tree rooting systems are essential for the uptake of water and nutrients, serving the storage of carbohydrates for the future growth and function of the tree, and form structural anchorage and support for the stem and crown. The perceived rooting area of the tree; referred to as the root protection area (RPA) needs to be protected if the tree is to be retained.

- 3.22 The RPA is a notional area considered to be the minimum zone that must be protected to avoid any adverse impacts on retained trees. The RPA has been calculated in accordance with Annex C, D and Section 4.6 of BS5837:2012 and requires suitable protection in order for the tree to be successfully incorporated into any future scheme. As such, the RPA of existing trees is an important material consideration when considering site constraints and planning development activities.
- 3.23 Where applicable the shape of the Root Protection Area has been modified to consider 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. Where groups of trees have been assessed, the Root Protection Area has been shown based on the maximum sized tree in any one group and so may exceed the Root Protection Area required for some of the individual specimens within the group. Further detailed inspection of the individual trees forming a group may be required where development impacts upon the group.
- 3.24 Whilst it is generally accepted that a tree's roots may extend far greater distances than the notional RPA, with the distribution of the root system relating directly to the availability of suitable conditions for growth (namely oxygen, water and nutrients), with roots predominantly located in the upper 1,000 mm of the soil horizon; the RPA offers an accepted protective buffer from development.
- 3.25 Above ground constraints such as the current 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 indicates their potential area of shading influence.

Considerations and Limitations of the Tree Survey

- 3.26 The survey was completed from ground level only and from within the boundary of the site. Aerial tree inspections or an assessment of 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.
- 3.27 The statements made in this report regarding assessed trees does not take into account the effects of extreme / adverse weather conditions, changes in land use prior to the site's development, unforeseen accidents or anti-social behaviors, such as vandalism, which occur since the date of the survey. As such, the assessment of tree condition given within applies to the date of survey and cannot be assumed to remain unchanged.
- 3.28 It will be necessary to review all comments and observations made within this report, in accordance with sound arboricultural practice, within two years of the date of survey (unless explicitly stated elsewhere within this report). Further review may also be necessary where site conditions change or works to trees are carried out which have not been specified in detail within this report.
- 3.29 Hedgerows are identified as a Habitat of Principal Importance (HPI) as listed within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The tree survey conducted, 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.

- 3.30 It may be necessary during detailed design to undertake further assessment and accurate positioning of woody species within tree groups and hedgerows to assist structural calculations for foundation design of structures in accordance with current building regulations. The exact position of individual trees or species included as part of a tree group should be checked and verified on site prior to any decisions for foundation design, tree operations or construction activity being undertaken. Further survey work would be required for calculating foundation depths in accordance with NHBC Chapter 4.2 Building near Trees.

4.0 RESULTS

- 4.1 A total of sixty-seven individual trees, seven groups of trees, three hedgerows and a woodland were surveyed as part of the Arboricultural Assessment. Trees were surveyed as individual trees, groups of trees and woodland where examples are clearly present as per the description. Refer to the Tree Survey Plan and Appendix A – Tree Schedule for full details of the trees included in this assessment. The table below summarises the trees assessed.

Tree Schedule

- 4.2 Appendix A presents details of any individual trees, groups, hedgerows and woodlands 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.
- 4.3 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.

Results Summary

- 4.4 The elevated position of the site meant that many trees within the site and along the boundaries with Carr Road and Hollin Busk Lane were stunted in height only, due to the prevailing winds. The tree stock was however generally in good health and even ornamental highway specimens had become well established. The site is currently being used as grazing land and very few trees were present within the field parcels because of this past land use. Boundary trees provided the highest quality specimens with the large northern boundary woodland and several of the outlying trees being considered of high quality. Several of the trees have been discussed in more detail following the table below, owing to their physical condition or arboricultural significance.

Table 1: Summary of Trees by Retention Category

	Individual Trees	Total	Groups, Hedgerows and Woodland	Total
Category U - Unsuitable		0		0
Category A (High Quality / Value)	T26, T42, T43, T44, T62, T64, T65, T66, T70	9	G1, W1	2
Category B (Moderate Quality / Value)	T6, T7, T8, T10, T11, T12, T13, T14, T15, T20, T21, T23, T24, T35, T36, T47, T48, T49, T50, T51, T58, T60, T61, T63, T67, T68, T69	27	G4, G5, G7, H1, H2, H3	6
Category C (Low Quality / Value)	T1, T2, T3, T4, T9, T16, T17, T18, T19, T22, T25, T27, T28, T29, T30, T31, T32, T33, T34, T37, T38, T41, T45, T46, T52, T53, T54, T55, T56, T57, T59	31	G2, G6	2

- 4.5 The northern boundary presented a continuous tree line, with the main woodland (W1) which extends north east, referred to locally as Fox Glen. The woodland has developed on the banks of Clough Dike and there are numerous paths both informal and formal along with benches and a seating area to promote public access. W1 consisted of mature examples of Ash *Fraxinus excelsior*, English oak *Quercus robur* and Sycamore *Acer pseudoplatanus* forming the upper canopy over an understorey of native woodland species including young self-set hawthorn *Crataegus monogyna* and sycamore along with early mature examples of holly *Ilex aquifolium* and hornbeam *Carpinus betulus*.
- 4.6 The Multi Agency Geographic Information for the Countryside (MAGIC)⁹ website identifies Fox Glen as being included on the Priority Habitat Inventory - Deciduous Woodland (England) and W1 was recorded as high quality and retention Category A.
- 4.7 W1 is not identified as Ancient Woodland according to Multi Agency Geographic Information for the Countryside (MAGIC) website. It is also not listed on the Natural England Open Data¹⁰ as Ancient Woodland.
- 4.8 From the perspective of future development of the site the stems of the trees along the site boundary were recorded as a separate group (G4). This is to enable a full impression of the trees along this boundary to be understood and provide accurate constraints, with many of the large diameter woodland trees generally being set back from the site's boundary. The exceptions to this were picked out individually as T39 and T40.
- 4.9 T39 and T40 were both large sycamore specimens situated 4m from the site boundary which presented larger stems than other trees along the boundary and within G4. The trees displayed typical minor defects, however, they formed part of the wider woodland and due to their age and size were considered Category A, sub-category (ii).

⁹ <http://magic.defra.gov.uk/>

¹⁰ https://naturalengland-defra.opendata.arcgis.com/datasets/a14064ca50e242c4a92d020764a6d9df_0?geometry=-1.593%2C53.472%2C-1.560%2C53.477

- 4.10 Group G5 was also situated along the northern boundary but was separate from the woodland and likely originated as a hedgerow. The management of this group had lapsed, and the trees have suffered as a result. G5 was considered Category B for its moderate arboricultural and landscape value.
- 4.11 To the west of the woodland, set on the outer edge, were three large ash specimens, T42, T43 and T44. Two of these specimens T42 and T44 were considered veteran trees, as part of this initial assessment, due to the presence of veteran features, which include dead wood, rot holes, hollowing and bark wounds. However, where this initial assessment has identified veteran trees, further survey work of those trees and their communities would be advised.
- 4.12 T42, situated at the top of a steep bank which led down to Clough Dike had a large basal cavity with progressive hollowing noted, which appeared to extend up the main stem from ground level. The crown of T42 was fully formed and although dead wood was present it was not considered that the tree had a large quantity of dead wood and the crown displayed no obvious retrenchment.
- 4.13 T44, situated at the bottom of the bank adjacent to Clough Dike, and possibly just beyond the site boundary, displayed hollowing of the main stem with several open and accessible cavities, along with significant storm damage and a reduced crown. T44 was considered in a state of extensive decline and had a reduced life expectancy but presented more veteran features than T42 and it is considered that the greater the number and extent of these features present within a given tree, the greater the ecological habitat value.
- 4.14 This initial assessment, based on a range of currently published guidance and resources, did not record any further veteran trees within the site and no further veteran trees were recorded within the wider Fox Glen (W1) following a walk over survey carried out on 12th January 2021.
- 4.15 From an ecological perspective veteran trees provide a rare and specialist niche habitat and therefore preservation of this habitat is considered highly important. Veteran trees and many of their associated specialised species are becoming increasingly rare within the landscape and therefore some veteran tree landscapes and their associated species are now protected, both nationally and Europe wide through the Natura 2000 Directive. Considering their importance to the ecology and biodiversity of the immediate area both T42 and T44 should be retained as part of any future development of the site, and both were recorded as retention Category A(iii).
- 4.16 To afford these trees greater protection the RPA of these veteran trees has been calculated in accordance with the guidelines detailed within Ancient and other Veteran Trees: Further Guidance on Management (Lonsdale, D (ed.) (2013). The Tree Council & Ancient Tree Forum. The RPA is defined as a distance equal to 15 times the trees stem diameter, or five metres beyond the canopy, whichever is the greater (Read, 2000). This is also in accordance with Government guidance within the NPPF for buffer zones and veteran trees.
- 4.17 T43, was positioned just outside the site, at the bottom of the steep bank and against the woodland edge. The specimen was not considered to possess enough features to fall into the veteran criteria, however It was a tree in good health that formed a clear end to the woodland and was also recorded as being of high quality and retention Category A.

- 4.18 Within the site itself, were a small number of trees positioned along field boundaries formed of dry-stone walls, namely T38, T41 and T46. These trees were all considered to be Category C, mainly due to their small size but also poor forms and the potential to cause damage to these dry-stone walls, a distinct feature of the site.
- 4.19 Along some stretches of the site boundary were residential properties. Here the boundary of the site was often composed of ornamental species, walls and hedgerows and many of the immediate neighbours were screened from the site at ground level. The trees and hedgerows along these borders were therefore generally worthy of Category B, sub-category (ii) for their landscape benefit.
- 4.20 G1, a mixed species group within the garden of a property on Carr Road comprising of mature specimens of beech *Fagus sylvatica*, sycamore *Acer pseudoplatanus* and ash *Fraxinus excelsior* and was considered of higher value and retention Category A. G1 is also afforded protection by a Tree Preservation Order (TPO 808/20). The trees identified within the TPO are protected by law from felling or uprooting, pruning including 'topping/lopping' and willful damage or destruction.
- 4.21 The assessment boundary included many sections of the highway verge which were mainly grassland with occasional street trees. The trees on Carr Road, appeared to be self-seeded and were of lower quality and smaller proportions, these were all therefore considered Category C, with many being situated beneath overhead lines or had established close to drystone walls. Hollins Busk Lane however had a mix of moderate and low-quality trees. The Category B specimens were generally flowering cherry species which had likely been planted on the opposite side of the road to the site.
- 4.22 The small section of highway at the junction of Coal Pit Lane and Hollins Busk Lane was also included within the assessment and this area housed seven trees within the highway verge and one specimen within the curtilage of a property on the corner. There were five specimens considered to be Category B due to their maturity and well-formed crowns; all of these were positioned along Coal Pit Lane.

5.0 ARBORICULTURAL IMPACT ASSESSMENT

- 5.1 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.
- 5.2 The AIA has been separated into two sections with paragraphs 5.4 to 5.14 based upon the Illustrative Masterplan dated December 2019 and seeks to outline the relationship between the proposals and the existing trees and hedgerows. Paragraphs 5.15 to 5.20 are based upon the revised Illustrative Masterplan dated April 2021 and outlines how changes have improved any potential impacts to trees.
- 5.3 The drawings show the proposals for an outline residential development with associated open space and drainage provision. An overlay of the layout has been incorporated in the Tree Retention Plan to assist in identifying the relationship and any potential conflicts between the proposals and the existing trees and hedgerows. Several of the impacts have been discussed in more detail following the table below.

Table 2: Summary of Impact on Tree Stock

	Trees to be Retained	Total	Trees to be Removed in full or part	Total
Category U - Unsuitable				
Category A (High Quality / Value)	T26, T42, T43, T44, T62, T64, T65, T66, T70, G1, W1	11		
Category B (Moderate Quality / Value)	T6, T7, T8, T10, T11, T12, T13, T14, T15, T20, T21, T23, T24, T35, T36, T47, T48, T49, T50, T51, T58, T60, T61, T63, T67, T68, T69, G5, G7, H1, H2, H3	32	G4,	1
Category C (Low Quality / Value)	T1, T2, T3, T4, T9, T16, T17, T18, T19, T22, T25, T45, T52, T53, T54, T59, G2, G6	18	T27, T28, T29, T30, T31, T32, T33, T34, T37, T38, T41, T46, T55, T56, T57,	15

- 5.4 The most important features from an arboricultural perspective are both situated outside the application boundary to the north. W1, a category A woodland along the northern boundary, at this outline stage, has been provided sufficient stand off and will be successfully integrated with the proposed development.
- 5.5 Two trees T42 and T44, considered of veteran status are also to be retained with the proposed layout providing a more than adequate standoff which encompasses the entire extended buffer zone and RPA's within green space. The green infrastructure within this area also illustrates a boundary hedgerow which will provide both a physical and visual boundary between the development edge and the undisturbed land.

- 5.6 With regards to T42 and T44 it is important to highlight that the RPA's have been plotted as a circle on a flat 2D plain whereas in reality these trees are positioned on a steep sloped terrain. This means that it is unlikely that the full extent of rooting material from these trees extends to that which is illustrated. The layout provides a buffer which is in accordance with Government guidance found within the NPPF and will not pose both direct and indirect impacts to these trees.
- 5.7 The Tree Retention Plan Drainage (7301-T-08) identifies a proposed drainage outfall linking a SUDS Basin in the north of the site to Clough Dike within the woodland. The full extent of these construction works, and the detailed design of this outfall will be provided at the detailed consent stage, though the indicative details have been considered. The indicative proposals have identified a proposed route which will consist of a series of open overland cascading channels and culverted sections.
- 5.8 Due to the presence of numerous mature trees and woodland understorey the design of this outfall has been constraint lead with trees individually identified within this area. The removal of some form of tree cover and vegetation is likely to be unavoidable but will comprise of low-level material such as holly, hawthorn and bramble scrub. Through the careful design and an engineered solution it is considered that the construction of the drainage channel can be achieved with minimal impacts to the existing tree cover and should avoid the removal of any mature trees.
- 5.9 Due to the presence of established mature trees along the woodland edge to the south and in between the basin to the watercourse, encroachment upon root protection areas will be unavoidable and it is advised at the appropriate stage of the design process an Arboricultural Method Statement is produced. This will ensure the protection and successful retention of trees and specify all works to be supervised by a suitably qualified Arboricultural Consultant.
- 5.10 The 2019 Illustrative Masterplan has also identified two footpath links between the site and the existing public footpath within W1. The design and position of these footpath links has yet to be determined but it is considered through careful design and using an engineered solution these links could be provided with minimal impacts, requiring only a small section of G4 be removed. New tree planting which has been illustrated along this boundary would mitigate for the removal of any tree cover within G4, require to provide these links.
- 5.11 The proposals have shown a single vehicular access point into the site, from Carr Road to the east along with proposed pedestrian improvement and the creation of a footway along this section of the boundary. These highway improvements will require the removal of all trees from along this section of boundary (T27-T34 and T55-T57). All eleven of these trees are Category C being self-seeded specimens which could not be allowed to reach mature proportions due to their proximity to the carriageway and the presence of overhead lines and a dry-stone wall. The loss of this tree cover could be easily mitigated through new tree planting, with the Illustrative Masterplan showing new tree planting along this section of the boundary within the site.

- 5.12 The main development parcel and housing plots are cited away from the edges of the site which will enable the retention of all the boundary trees, except those noted above for access, but will require the removal of three trees; T38, T41 and T46 which were located within the site. These specimens were all considered Category C and were small trees whose loss would be replaced by the landscape proposals. Drystone walls across the site have been shown as retained and would form a feature to the new development. The removal of these three trees is advised to avoid any potential damage to the walls as these trees mature.
- 5.13 T37, another low-quality tree will be removed to facilitate the drainage attenuation within the northern parcel. The loss of this tree will be mitigated for by new planting across the site.
- 5.14 The TPO tree group adjacent to Carr Road is shown to be unaffected by the development and being situated north of any proposed property should not result in any excess shading and future pressure to prune.

Further Works Completed for Appeal

- 5.15 The following paragraphs present a summary of the further works completed for the appeal and how they relate to trees. An overlay of the revised Illustrative Masterplan April 2021 has been incorporated in Tree Retention Plans 7301-T-09, 7301-T-10 and 7301-T-11, to assist in identifying the relationship and any potential conflicts between the revised proposals and the existing trees and hedgerows.
- 5.16 The revised Illustrative Masterplan - April 2021 has similarly allowed for the retention of all high-quality trees and would result in limited arboricultural impacts. Where the revised layout differs from what was shown previous, this is a betterment for retained trees and hedgerows.
- 5.17 The revised scheme has removed pedestrian links from the development into Fox Glen, discussed within paragraph 5.10 above. The provision of these pedestrian links would likely have required the removal of a small number of trees from G4 and the use of an engineered solution, to reduce any potential damage to surrounding tree roots. By removing these links this will result in less arboricultural impact.
- 5.18 The illustrative internal road alignment has also been amended to now avoid the RPA of T66, a high-quality Category A tree and tree group G4, recorded on the edge of Fox Glen. Although illustrative at this stage, the revised Illustrative Masterplan shows that it should be feasible for internal roads to avoid the RPA's of retained trees.
- 5.19 An overlay of the revised drainage layout (19535-RLL-21-XX-DR-C-203) has been incorporated in the Tree Retention Plan 7301-T-11. The amendments to the size and shape of the proposed SUDS basin would be less likely to result in any impact to retained trees, from what was shown previously and is discussed within paragraphs 5.7, 5.8 and 5.9.
- 5.20 The proposed basin has been moved away from retained trees showing no changes in ground level within RPA's, and although the outfall to Clough Dyke is still required. As previously discussed, it is considered that through careful design and an engineered solution, the construction of this drainage channel can be achieved with minimal impacts to the existing tree cover and should avoid the removal of any mature tree.

Discussion

- 5.21 In conclusion for arboriculture, the proposals have allowed for the retention of all high-quality trees and would result in limited arboricultural impacts. The offsite woodland has been provided sufficient stand off from the proposals and although could be affected by a proposed drainage outfall, it is considered through careful design and an engineered solution that any impact to this woodland would be minimal.
- 5.22 Both veteran trees will be retained with no impacts from the development and is therefore in accordance with paragraph 175C of the NPPF.

Tree Management

- 5.23 All retained trees should be subjected to sound arboricultural management as recommended within section 8.8.3 of BS5837 *Post Development Management of Existing Trees*, where there is a potential for public access in order to satisfy the landowner's duty of care. Additionally, inspections annually and following major storms should be carried out by an experienced arboriculturist or arborist to identify any potential public safety risks and to agree remedial works as required.
- 5.24 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.

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.

6.0 NEW TREE AND HEDGEROW PLANTING

- 6.1 As part of the Illustrative Masterplan an adequate quantity of structured tree planting has been demonstrated predominantly within or close to hard landscaped areas, alongside the primary access roads within the roadside verges, residential gardens and around the site boundary. The purpose and function of this new tree planting should be understood from the start of any design stages so that key objectives from a landscape perspective can also be achieved.

Trees

- 6.2 The landscaping scheme should consider the use of both native tree species (for their low maintenance requirements and nature conservation value) and ornamental species (for their contribution to urban design and amenity value). Species choices should be selected on the basis of their suitability for the final site use. Furthermore, during the design process consultation should be made with the Local Planning Authority to obtain information on their tree strategy and incorporate the planting proposals with any local policies and initiatives and/or Biodiversity Action Plans (BAP).

- 6.3 In line with the NPPF all schemes should aim achieve a net gain in biodiversity value. Nationally recognised biodiversity metrics allow for the inclusion of, not limited to, newly planted scattered trees, woodlands and hedgerows as a means of compensating for loss of habitat as part of the development. Tree and shrub planting can therefore be used to contribute to this biodiversity gain.
- 6.4 To maximise biodiversity value (and contribution to net gain) native species or varieties should be specified. Such provisions can be incorporated into both the hard and soft landscaping of the scheme. It is recommended that tree and hedgerow specifications are made following consultation with guidance published by the Local Planning Authority.
- 6.5 When deciding upon suitable tree species, careful consideration would need to be given to the following: ultimate height and canopy spread, form, habit, density of crown, potential shading effect, colour, water demand, soil type and maintenance requirements in relation to both the built form of the new development and existing properties.
- 6.6 Through careful species selection, the landscape scheme shall reduce the risk of trees being removed in the future on the grounds of nuisance. Nuisance can be perceived in a number of ways and vary from person to person however most commonly, within the context of trees, low overhanging branches, excessive shading, seasonal leaf fall and the misinformed perception that trees close to buildings cause damage.

Hedgerows

- 6.7 Hedgerows are identified as a Habitat of Principle Importance (HPI) as listed within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Consequently, it is important that the proposed scheme delivers a net gain in terms of linear hedgerows through new planting to compensate for any losses. Species should be native, and characteristic of the locality.
- 6.8 Recommended species for native hedgerow planting are as follows:
- *Crataegus monogyna*
 - *Prunus spinosa*
 - *Cornus sanguinea*
 - *Corylus avellana*
 - *Acer campestre*
 - *Euonymus europaeus*

Rooting Environment and Soil Volumes

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

- 6.10 The planting of trees within confined urban environments should consider the use of appropriately designed planting pits specifically engineered to promote tree health and longevity. Crucially the aim will be to provide an adequate volume of quality soil for roots to suitably develop by calculating the amount of available soil volumes needed and selecting species whose mature size is compatible with the site. This is an integral component of the planning stage (Lindsey & Bassuk, 1991). One researched method of calculating the minimum required soil volume is as follows:

Table 3: Example of Calculating Soil Volume for New Tree Planting (Source: CIRIA C712 and Calculating Target Soil Volumes – Green Blue Urban)

Projected canopy area of mature tree (m) x depth 0.6m		
Calculation 1	Projected mature canopy diameter (metres)	= 3 (Diameter)
Calculation 2	Projected mature canopy area (square metres), (n x Radius ²)	= 7.1 (Area)
Calculation 3	Target soil volume (cubic metres), (Area x 0.6m)	= 4.24 (Volume)
	Target soil volume	= 4.24m ³

General Planting Recommendations

- 6.11 Wherever possible, following discussions with the developer and utility companies, common service trenches should be specified to minimise land take associated with underground service provision and facilitation access for future maintenance.
- 6.12 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.

7.0 TREE PROTECTION MEASURES

- 7.1 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

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

- 7.4 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.
- 7.5 Where it has been agreed, construction access may take place within the root protection area if suitable ground protection measures are in place. This may comprise single scaffold boards over a compressible layer laid onto a geo-textile membrane for pedestrian movements. Vehicular movements over the root protection area will require the calculation of expected loading and the use of proprietary protection systems.
- 7.6 Confirmation that trees protective fencing or other barriers have been set out correctly should be gained prior to the commencement of site activity.

Tree Protection Barriers

- 7.7 Tree protection fencing should be fit for the purpose of excluding any type of construction activity and suitable for the degree and proximity of works to retained trees. Barriers must be maintained to ensure that they remain rigid and complete for the duration of construction activities on site.
- 7.8 In most situations, fencing should comprise typical construction fencing panels attached to scaffold poles driven vertically into the ground. For particular areas where construction activity is anticipated to be of a more intense nature, supporting struts, acting as a brace should be added and fixed into position through the application of metal pins driven into the ground to offer additional resistance against impacts.
- 7.9 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.
- 7.10 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

- 7.11 Once the areas around trees have been protected by the barriers, any works on the remaining site area may be commenced providing activities do not impinge on protected areas.
- 7.12 All weather notices should be attached to the protective fencing to indicate that construction activities are not permitted within the fenced area. The area within the protective barriers will then remain a construction exclusion zone throughout the duration of the construction phase of the proposed development. Protection fencing signs can be provided upon request.
- 7.13 Wide or tall loads etc should not come into contact with retained trees. Banksman should supervise transit of vehicles where they are in close proximity to retained trees.

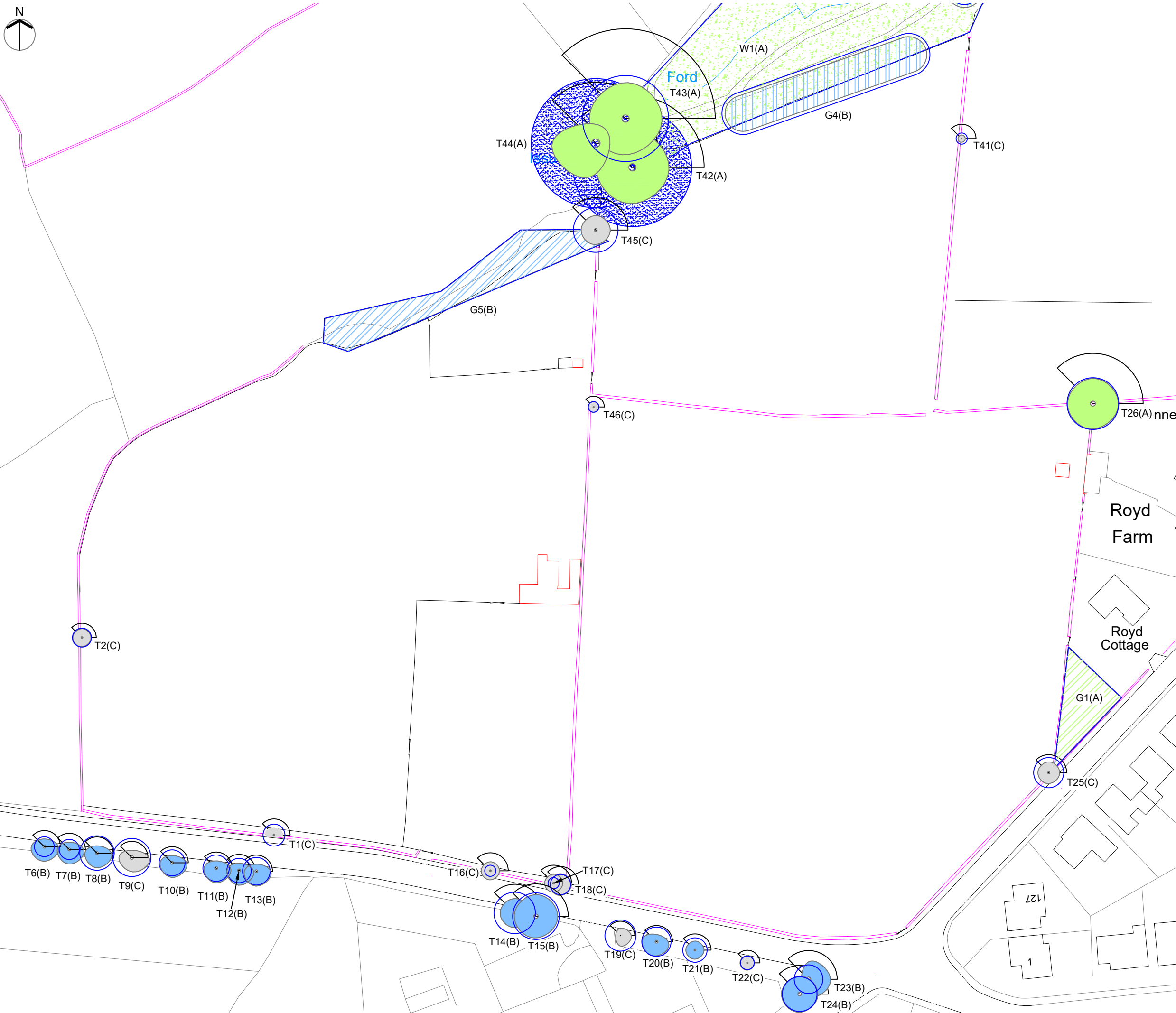
- 7.14 Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree stem. No concrete should be mixed within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.
- 7.15 No fires will be lit where flames are anticipated to extend to within 5m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire.
- 7.16 Notice boards, telephone cables or other services should not be attached to any part of a retained tree.
- 7.17 Any trees which need to be felled adjacent to or are present within a continuous canopy of retained trees, must be removed with due care (it may be necessary to remove such trees in sections).

Protection of Trees Close to the Site











- 7.18 Several trees were located on the boundaries of the site and therefore the root protection area and crown spread of these trees will need to be protected in the same way as all the retained trees within the site. All trees located outside the boundaries of the assessment site yet within proximity to works should be adequately protected during the development by barriers or ground protection around the calculated root protection area.
- 7.19 Any trees which are to be retained and whose Root Protection Areas may be affected by the development should be monitored, during and after construction, to identify any alterations in quality with time and to assess and undertake any remedial works required as a result.

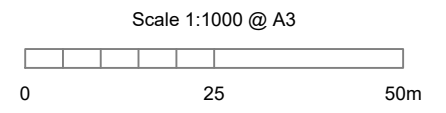
Protection for Aerial Parts of Retained Trees

- 7.20 Where it is deemed necessary to operate wide or tall plant within proximity to trees it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obstructive branches as any such equipment would have potential to cause damage to parts of the crown material, i.e., low branches and limbs, of retained trees within the protective barriers. This is termed as 'access facilitation pruning' within BS5837. Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturist.
- 7.21 A pre-commencement site meeting with contractors who are responsible for operating machinery is advised 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.
- 7.22 In the event of having caused any branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with British Standard 3998:2010 and in agreement with the Local Planning Authority prior to correcting the damage, upon completion of development.



KEY

-  Category U - Trees / Groups Unsuitable for Retention (BS 5837:2012)
-  Category A - Trees / Groups of High Quality (BS 5837:2012)
-  Category B - Trees / Groups of Moderate Quality (BS 5837:2012)
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-  Veteran Tree Root Protection Area (in accordance with Ancient and Other Veteran Trees: Further Guidance on Management)
-  Individual / Group Number and BS5837:2012 Category
-  Indicative Shade Pattern (in accordance with BS5837:2012 where appropriate)



NOTES

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**Land at Deepcar
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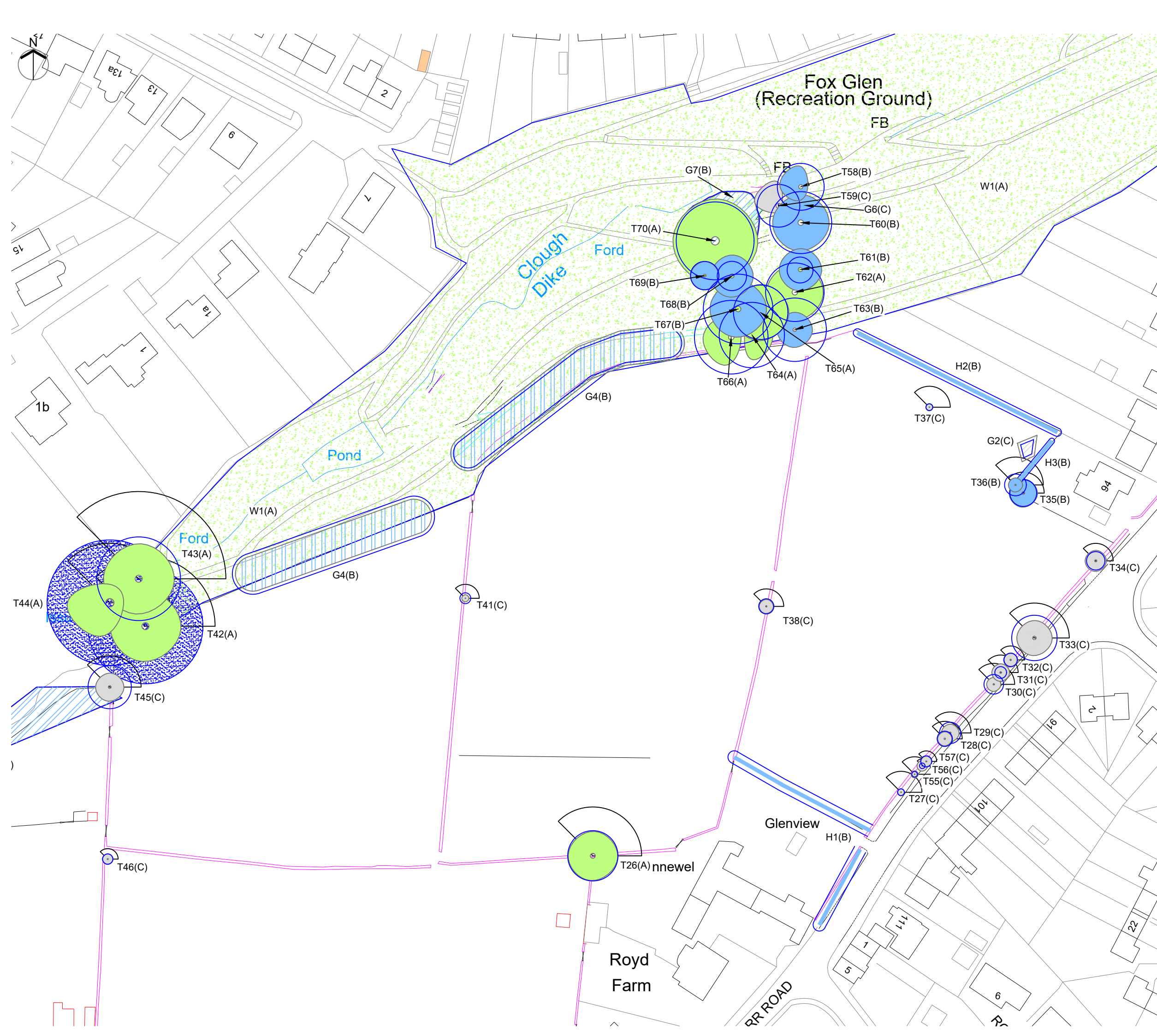
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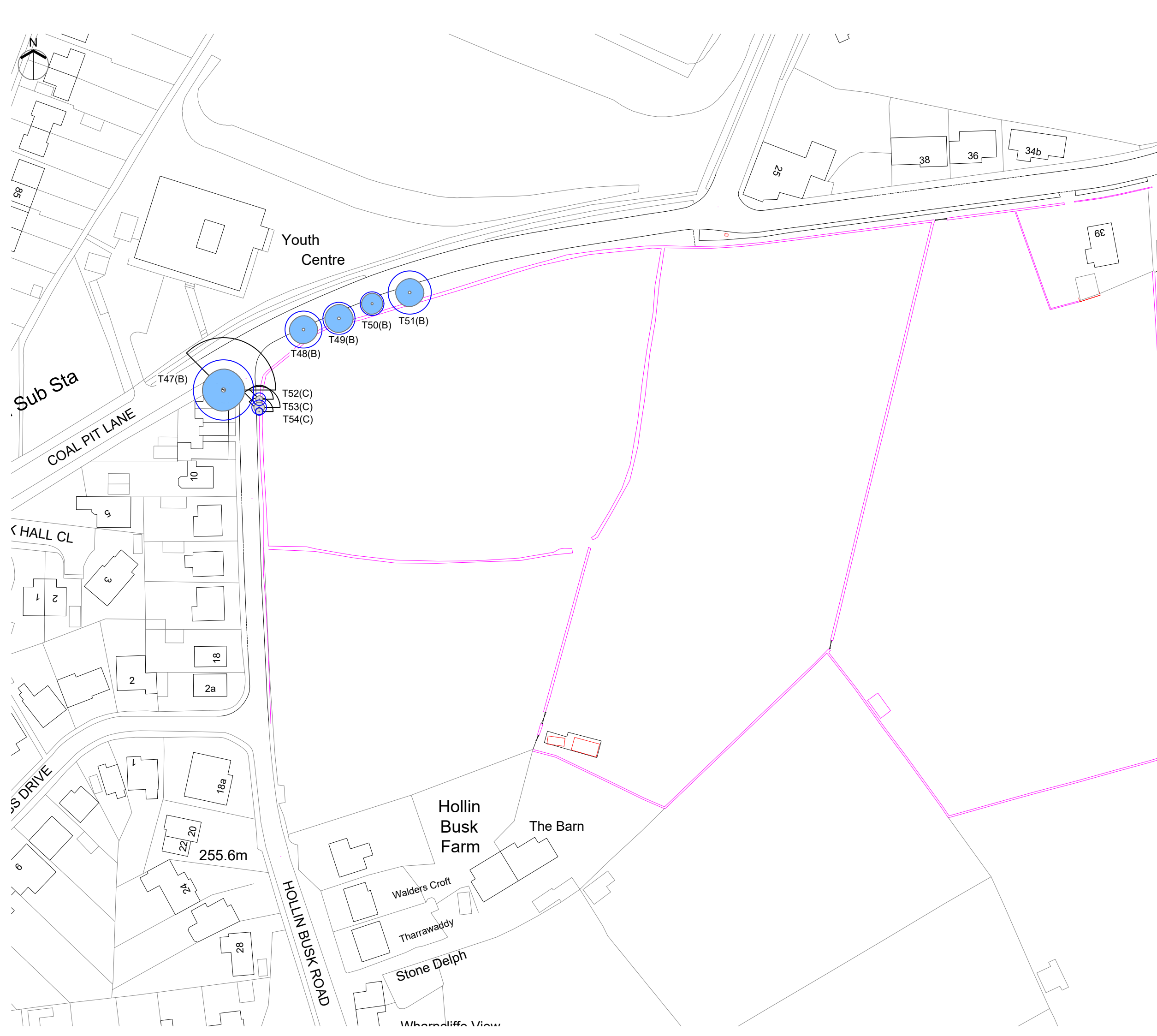
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








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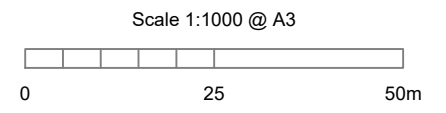
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client
Hallam Land Management

project
**Land at Deepcar
 Sheffield**

drawing title
TREE SURVEY PLAN

scale
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drawn/checked
 EC / TCB

date
 January 2021

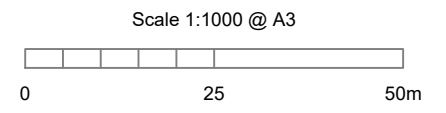
drawing number
7301-T-05

rev
A



KEY

- Tree/Group to be Retained
- Tree/Group to be removed to facilitate the proposals
- Category U - Unsuitable for retention on arboricultural grounds
- Hedgerow Proposed to be Retained and Incorporated into the New Development
- Hedgerow Proposed to be Removed to Facilitate the Development upon Approval of the Application
- Root Protection Area (Shown for retained trees only)
- Veteran Tree Root Protection Area (in accordance with Ancient and Other Veteran Trees: Further Guidance on Management)
- Individual / Group Number and BS Category
- Individual / Group Number to be Removed and BS 5837:2012 Category
- Indicative Shade Pattern (in accordance with BS5837:2012 where appropriate)



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-	15.01.21	First Issue	EC
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- masterplanning
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- landscape design
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project
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Sheffield**

drawing title
TREE RETENTION PLAN

scale
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EC / TCB











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drawing number
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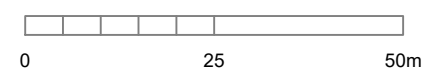
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A

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client
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project
**Land at Deepcar
Sheffield**

drawing title
TREE RETENTION PLAN

scale
1:1000 @ A3

drawn/checked
EC / TCB










date
January 2021

drawing number
7301-T-07

rev
A

Fox Glen (Recreation Ground)

FB

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client
Hallam Land Management

project
**Land at Deepcar
Sheffield**

drawing title
**TREE RETENTION PLAN
DRAINAGE**

scale
1:500 @ A3

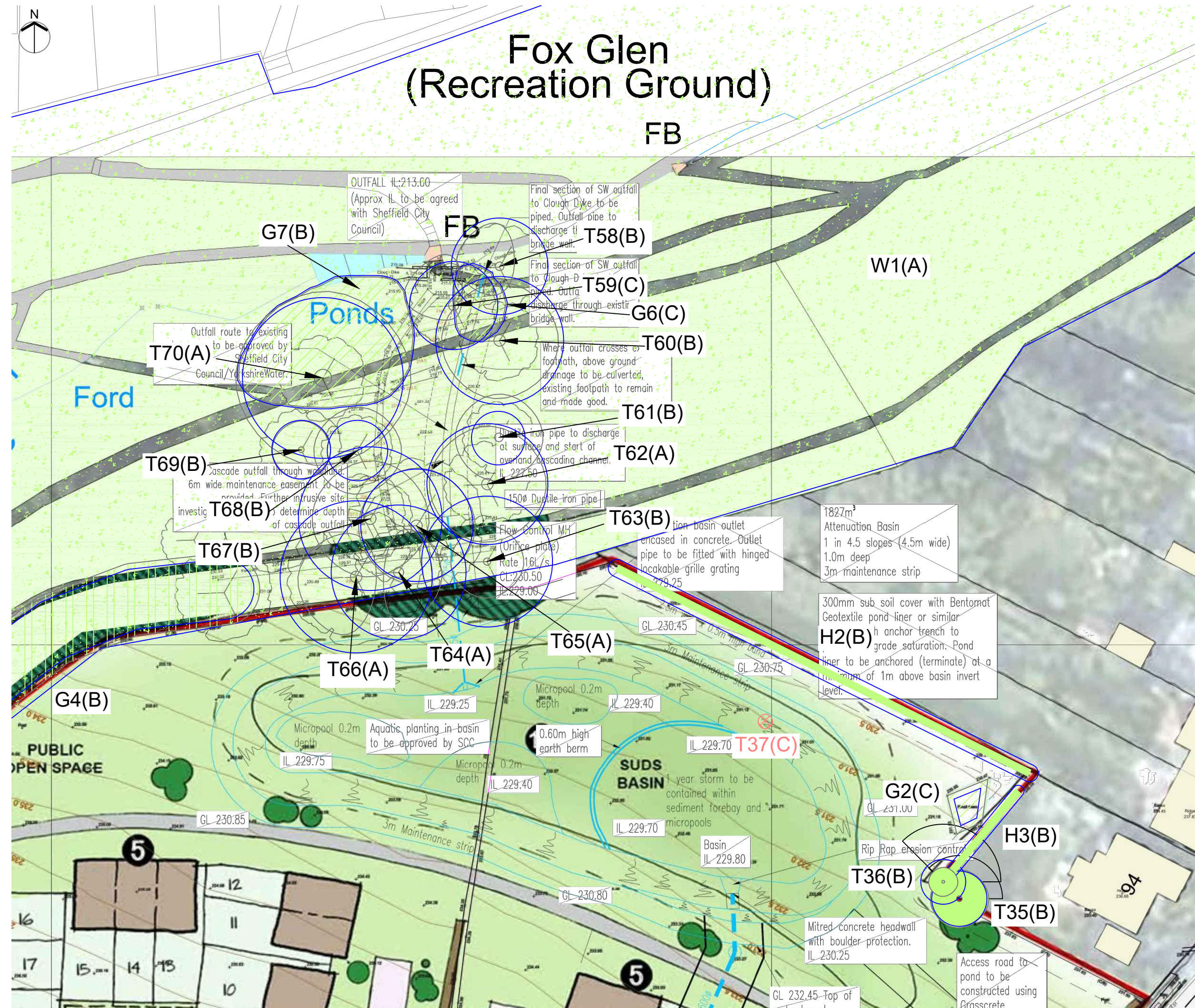
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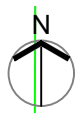
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


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7301-T-08

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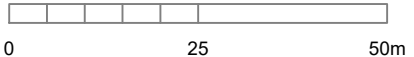
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Hallam Land Management

project
**Land at Deepcar
Sheffield**

drawing title
**TREE RETENTION PLAN
REVISED ILLUSTRATIVE MASTERPLAN**

scale
1:1000 @ A3

drawn/checked
EC / TCB

date
May 2021

drawing number
7301-T-09











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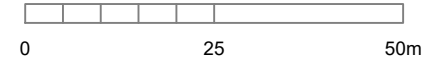


Fox Glen (Recreation Ground)

KEY

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project
**Land at Deepcar
Sheffield**

drawing title
**TREE RETENTION PLAN
REVISED ILLUSTRATIVE MASTERPLAN**

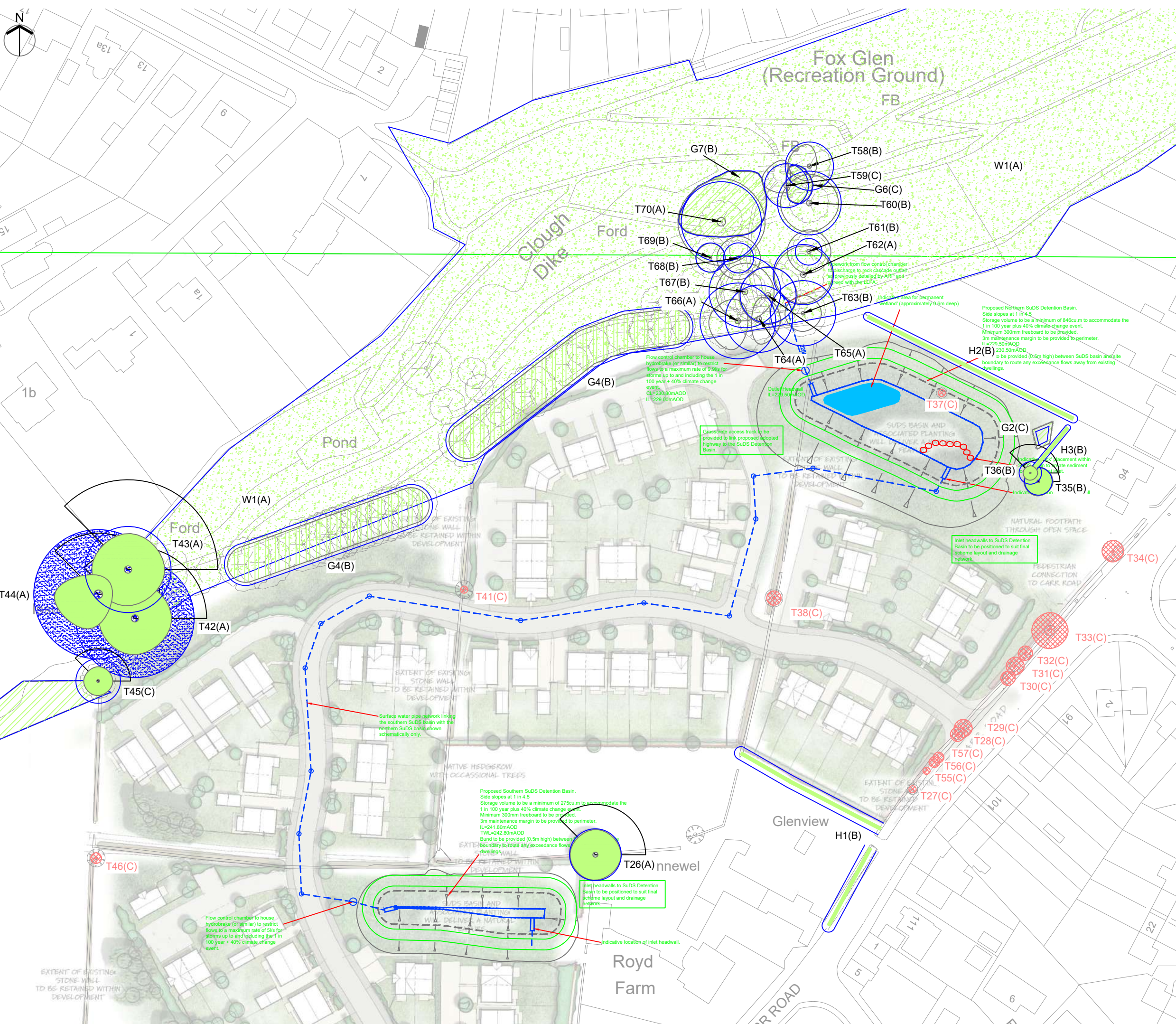
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May 2021

drawing number
7301-T-10

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







Fox Glen (Recreation Ground)

FB

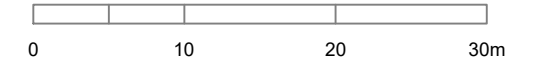
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Ford

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**TREE RETENTION PLAN - DRAINAGE
REVISED ILLUSTRATIVE MASTERPLAN**

scale
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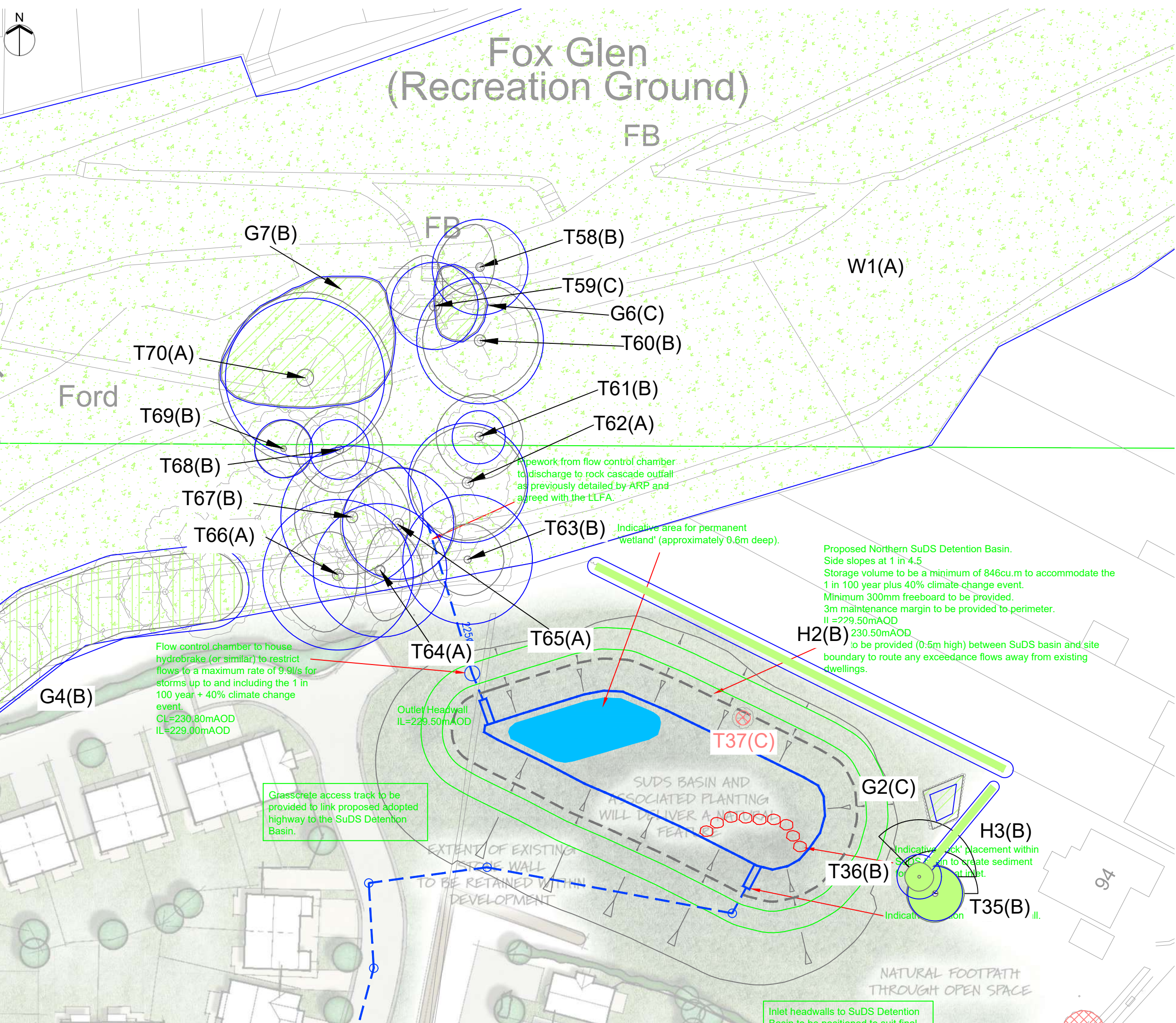
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May 2021

drawing number
7301-T-11

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Appendix A - Tree Schedule

Measurements	Age Classes	Quality Assessment of BS Category	ULE (relates to BS Category)
Height - Measured using a digital laser clinometer (m)	YNG: Establishing, typically with good vigour and fast growth rates and strong apical dominance; c. less than 1/3 life expectancy	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.	<10 years
Stem Dia. - Diameter measured (mm) in accordance with Annex C of the BS5837	SM: Semi-mature trees less than 1/3 life expectancy	Category A - Trees of high quality with an estimated remaining life expectancy of at least 40 years.	40+ years
Crown Radius - Measured using a digital laser clinometer radially from the main stem (m)	EM: Established, typically vigorous and increasing in apical height and lateral spread; 1/3 - 2/3 life expectancy. Offers landscape significance	Category B - Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.	20-40 years
Abbreviations est - Estimated stem diameter avg - Average stem diameter for multiple stems upto - Maximum stem diameter of a group	M: Fully established over 2/3 life expectancy, generally good vigour and achieving full height potential with crown still spreading	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.	10-20 years
	OM: Fully mature, at the extremes of expected life expectancy, vigour decreasing, declining or moribund	Sub-categories: (i) - Mainly arboricultural value (ii) - Mainly landscape value (iii) - Mainly cultural or conservation value	
	V: biological, cultural or aesthetic value comprising niche saproxylic habitat. Individuals of large proportions (stem girth) in comparison to trees of the same species/surviving beyond the typical age range for their species.	The BS category particular consideration has been given to the following: <ul style="list-style-type: none"> • 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 	

Structural Condition	Physiological Condition
Good - No significant structural defects	Good - No significant health problems
Fair - Structural defects that can be remediated	Fair - Symptoms of ill-health that can be remediated
Poor - Significant defects beyond remediation, present a risk of failure in the foreseeable future	Poor - Significant ill-health. Unlikely the tree will recover in the long term
Dead - Dead tree with structural integrity of tree severely compromised	Advanced Decline / Dead - Advanced state of decline and unlikely to recover or Dead

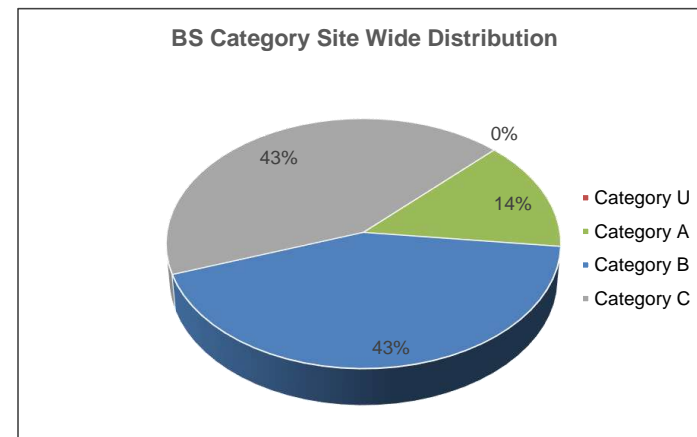
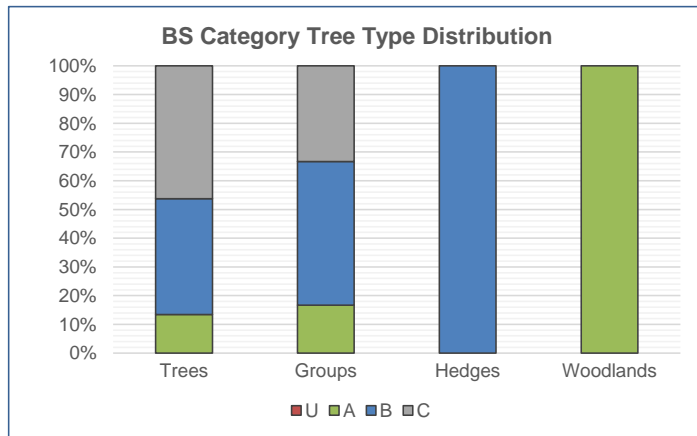
Root Protection Area (RPA)
<ul style="list-style-type: none"> • The RPA Radius column provides the extent of an equivalent circle from the centre of the stem (m). • The RPA is calculated using the formulae described in paragraph 4.6.1 of British Standard 5837: 2012 and is indicative of the rooting area 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.

Appendix Summary

	Individual Trees	Totals	Tree Groups and Hedgerows	Totals
Category U		0		0
Category A	T26, T42, T43, T44, T62, T64, T65, T66, T70	9	G1, W1	2
Category B	T6, T7, T8, T10, T11, T12, T13, T14, T15, T20, T21, T23, T24, T35, T36, T47, T48, T49, T50, T51, T58, T60, T61, T63, T67, T68, T69	27	G4, G5, G7, H1, H2, H3	6
Category C	T1, T2, T3, T4, T9, T16, T17, T18, T19, T22, T25, T27, T28, T29, T30, T31, T32, T33, T34, T37, T38, T41, T45, T46, T52, T53, T54, T55, T56, T57, T59	31	G2, G6	2
	Total	67	Total	10

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

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.



Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
INDIVIDUAL TREES										
T1	Hawthorn <i>Crataegus monogyna</i>	4.5	180 150 100	N - 2.5 S - 0.5 E - 2.5 W - 2.5	M	F	Broken branches evident Crossing and rubbing branches Flail damage evident Low crown form Multi stemmed from base	29	3.1	C (i)
T2	Hawthorn <i>Crataegus monogyna</i>	4	220	2.5	M	F	Broken branches evident Browsing damage noted on main stem Crossing and rubbing branches Compaction at base	22	2.6	C (i)
T3	Japanese Cherry <i>Prunus spp.</i>	7	430	N - 3 S - 5 E - 5 W - 5	M	F	Branch stubs evident on road side likely vehicle damage Multi leadered form with crossing and rubbing stems Pruning wounds noted Occluded bark between leaders Mower damage to roots	84	5.2	C (i)
T4	Elder <i>Sambucus nigra</i>	3	8x 70	2	EM	P	Dense undergrowth at the base Multi stemmed from base Dead stems	18	2.4	C (i)
T5							Number no longer in use			
T6	Japanese Cherry <i>Prunus spp.</i>	4.5	230	N - 3.5 S - 4 E - 4 W - 2	EM	G	Pruning wounds noted Typical crown form Leaning from prevailing wind	24	2.8	B (ii)
T7	Japanese Cherry <i>Prunus spp.</i>	4.5	230	N - 3.5 S - 4 E - 4 W - 2	EM	G	Pruning wounds noted Typical crown form Leaning from prevailing wind	24	2.8	B (ii)
T8	Japanese Cherry <i>Prunus spp.</i>	4.5	280 290	N - 3.5 S - 4 E - 4 W - 2	EM	G	Pruning wounds noted Typical crown form Leaning from prevailing wind	74	4.8	B (ii)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T9	Japanese Cherry Prunus spp.	4.5	310 320	N - 3.5 S - 5 E - 4 W - 2	EM	F	Pruning wounds noted Typical crown form Leaning from prevailing wind bark wound at 1.5m Exposed heartwood	90	5.3	C (i)
T10	Japanese Cherry Prunus spp.	4.5	300	N - 3.5 S - 4 E - 4 W - 2	EM	G	Pruning wounds noted Typical crown form Leaning from prevailing wind	41	3.6	B (ii)
T11	Japanese Cherry Prunus spp.	4.5	200 170 120 100	N - 3.5 S - 4 E - 4 W - 2	EM	G	Pruning wounds noted Typical crown form Leaning from prevailing wind Broken branches on road side likely vehicle damage	42	3.7	B (ii)
T12	Japanese Cherry Prunus spp.	4.5	280	N - 3.5 S - 4 E - 4 W - 2	EM	G	Pruning wounds noted Typical crown form Leaning from prevailing wind	35	3.4	B (ii)
T13	Japanese Cherry Prunus spp.	4.5	320	N - 3.5 S - 4 E - 4 W - 2	EM	G	Pruning wounds noted Typical crown form Leaning from prevailing wind	46	3.8	B (ii)
T14	Ash Fraxinus excelsior	8	350 330	4	M	F	Basal suckers present Branch stubs evident Pruning wounds noted Twin stemmed from base	105	5.8	B (i)
T15	Ash Fraxinus excelsior	9	540	6	M	G	Basal suckers present Minor dead wood evident in the crown (<75mm) Pruning wounds noted Minor dead wood noted in crown	132	6.5	B (i)
T16	Ash Fraxinus excelsior	5	130	2.5	SM	G	Basal suckers present No major defects were noted Growing from base of wall	8	1.6	C (i)
T17	Ash Fraxinus excelsior	5	130	2.5	SM	G	Basal suckers present No major defects were noted Growing from base of wall	8	1.6	C (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T18	Ash <i>Fraxinus excelsior</i>	5	140 190	3	SM	G	Basal suckers present No major defects were noted Growing from base of wall	25	2.8	C (i)
T19	Japanese Cherry <i>Prunus spp.</i>	4	360	N - 2 S - 3 E - 3 W - 0	EM	G	Broken branches evident Pruning wounds noted Recent excavation at base Leaning from prevailing wind	59	4.3	C (i)
T20	Japanese Cherry <i>Prunus spp.</i>	4.5	240 240	N - 3.5 S - 4 E - 4 W - 2	EM	G	Pruning wounds noted Typical crown form Leaning from prevailing wind Basal suckers noted	52	4.1	B (ii)
T21	Japanese Cherry <i>Prunus spp.</i>	4.5	170 170 150	2.5	EM	G	No major defects were noted Typical crown form	36	3.4	B (i)
T22	Hawthorn <i>Crataegus monogyna</i>	3.5	100 100 70	2	M	F	Broken branches evident Crossing and rubbing branches Low crown form	11	1.9	C (i)
T23	Japanese Cherry <i>Prunus spp.</i>	8	330	N - 5 S - 5 E - 6 W - 2	EM	F	Bark wounds noted Branch stubs evident Pruning wounds noted Suppressed crown	49	4.0	B (i)
T24	Japanese Cherry <i>Prunus spp.</i>	8	280 290	5	EM	F	No major defects were noted Twin stemmed from base with touching stems Typical crown form	74	4.8	B (i)
T25	Horse Chestnut <i>Aesculus hippocastanum</i>	5	350	3	EM	F	Branch stubs evident Low crown form Topped ay 1.5m Pruning wounds noted Situating offsite Pruned to clear phone lines	55	4.2	C (i)
T26	Sycamore <i>Acer pseudoplatanus</i>	14	est 600	7	M	G	Base obscured Even crown form No major defects were noted Situating offsite Unable to gain access	163	7.2	A (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T27	Ash Fraxinus excelsior	6	120	1	SM	F	Beneath power lines	7	1.4	C (i)
T28	Swedish Whitebeam Sorbus intermedia	5	130 100 90	2	SM	F	Bark wounds noted Even crown form Multi leadered form Adjacent to power lines and pole	16	2.2	C (i)
T29	Ash Fraxinus excelsior	6	150 130 130 90	2.5	SM	P	Bark wounds noted Branch stubs evident Minor dead wood evident in the crown (<75mm) Multi stemmed from base Beneath power lines	29	3.0	C (i)
T30	Ash Fraxinus excelsior	6	180 130 70	2	SM	P	Bark wounds noted Crown had been topped Minor dead wood evident in the crown (<75mm) Multi stemmed from base Beneath power lines	25	2.8	C (i)
T31	English Oak Quercus robur	5	180	2.5	SM	P	Situated within site Beneath power lines occluded wire fence at 1m Wall bulging at base	15	2.2	C (i)
T32	English Oak Quercus robur	4	160	2	SM	P	Situated within site Beneath power lines Wall bulging at base	12	1.9	C (i)
T33	Sycamore Acer pseudoplatanus	10	6x 220	5	M	P	Bark wounds noted Basal suckers present Branch stubs evident Crown had been topped Minor dead wood evident in the crown (<75mm) Multi stemmed from base Overhead cables	131	6.5	C (i)
T34	English Oak Quercus robur	5	220	3	SM	G	No major defects were noted Overhead cables Past pruning with branch stubs over footpath	22	2.6	C (i)
T35	English Oak Quercus robur	6	320	4	SM	G	Broken branches evident No major defects were noted Situated offsite	46	3.8	B (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T36	Norway Spruce Picea abies	8	260	2	SM	F	Base obscured Branch stubs evident No major defects were noted Situated offsite	31	3.1	B (i)
T37	Ash Fraxinus excelsior	6	80	1	SM	P	Bark wounds noted Browsing damage noted on main stem	3	1.0	C (i)
T38	Hawthorn Crataegus monogyna	5	120 100 90	2	EM	F	Broken branches evident Browsing damage noted on main stem Low crown form Multi stemmed from base	15	2.2	C (i)
T39							Number no longer in use			
T40							Number no longer in use			
T41	Hawthorn Crataegus monogyna	4	130	1	EM	F	Browsing damage noted on main stem	8	1.6	C (i)
T42	Ash Fraxinus excelsior	17	1100	10	V	F	Basal cavity observed Branch socket cavities observed Branch stubs evident Even crown form Major dead wood evident in the crown (>75mm) Multi leadered form Growing at top of bank exposed root buttresses Cavity 450mm x 500mm	855	16.5	A (iii)
T43	Ash Fraxinus excelsior	25	est 1000	10	M	G	Light ivy cover Minor dead wood evident in the crown (<75mm) No major defects were noted Growing at base of bank adjacent to stream	452	12.0	A (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T44	Ash <i>Fraxinus excelsior</i>	20	est 1200	N - 5 S - 10 E - 4 W - 12	V	P	Basal cavity observed Branch stubs evident Dense undergrowth at the base Lateral lever arm observed Major dead wood evident in the crown (>75mm) Specimen in extensive decline Storm damage present Main stem hollow to 4m with large entrance Lever arm to West attached at 4m Large dead stubs	1018	18.0	A (iii)
T45	Ash <i>Fraxinus excelsior</i>	9	190 230 240 220 270	4	EM	P	Branch stubs evident Multi stemmed from base Pruning wounds noted Waterlogged ground Rubble and rubbish at base	121	6.2	C (i)
T46	Hawthorn <i>Crataegus monogyna</i>	3	50 100 50	1.5	SM	F	Bark wounds noted Branch stubs evident	7	1.5	C (i)
T47	Sycamore <i>Acer pseudoplatanus</i>	15	est 720	6	M	G	Even crown form Minor dead wood evident in the crown (<75mm) No major defects were noted Overhead cables Pruning wounds noted Light ivy on main stem In garden of property	235	8.6	B (i)
T48	Sycamore <i>Acer pseudoplatanus</i>	13	440	4	M	G	No major defects were noted Pruning wounds noted Damage to roots for recent road surfacing works	88	5.3	B (i)
T49	Sycamore <i>Acer pseudoplatanus</i>	9	380	4	M	G	No major defects were noted Pruning wounds noted	65	4.6	B (i)
T50	Sycamore <i>Acer pseudoplatanus</i>	8	280	3	M	G	No major defects were noted Pruning wounds noted	35	3.4	B (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T51	Sycamore Acer pseudoplatanus	14	520	4	M	G	No major defects were noted Pruning wounds noted	122	6.2	B (i)
T52	Sycamore Acer pseudoplatanus	4	150	1	SM	F	Pruning wounds noted Beneath over head Situating within narrow verge likely self seeded	10	1.8	C (i)
T53	Sycamore Acer pseudoplatanus	6	120 130	1.5	SM	F	Pruning wounds noted Beneath over head Situating within narrow verge likely self seeded	14	2.1	C (i)
T54	Sycamore Acer pseudoplatanus	4	90	1	SM	F	Pruning wounds noted Beneath over head Situating within narrow verge likely self seeded	4	1.1	C (i)
T55	Sycamore Acer pseudoplatanus	5	70	1	SM	F	Self set at base of wall Beneath over head lines	2	0.8	C (i)
T56	English Oak Quercus robur	2	70	1.5	SM	P	Multi leaedered Beneath over head lines	2	0.8	C (i)
T57	Ash Fraxinus excelsior	3	7x 50	1.5	SM	P	Multi stemmed from base Situating beneath over head lines	8	1.6	C (i)
T58	Ash Fraxinus excelsior	18	560	N - 6 S - 4 E - 2 W - 6	M	F	Etiolated form Minor dead wood evident in the crown (<75mm) Situating on steep bank of water course	142	6.7	B (i)
T59	Ash Fraxinus excelsior	18	510	N - 7 S - 2 E - 1 W - 7	M	F	Etiolated form Broken branches and branch stubs Minor dead wood evident in the crown (<75mm) Situating at the foot of steep bank adjacent to footpath	118	6.1	C (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T60	Ash Fraxinus excelsior	14	740	8	M	F	Branch stubs evident Broken branches evident Dense ivy cover on main stem Minor dead wood evident in the crown (<75mm) Multi leadered form Situated on steep bank	248	8.9	B (i)
T61	Hornbeam Carpinus betulus	10	310	6	EM	F	Branch stubs evident Broken branches evident Low crown form Minor dead wood evident in the crown (<75mm) Multi leadered form Situated on steep bank	43	3.7	B (i)
T62	Ash Fraxinus excelsior	16	700	8	M	F	Basal suckers present Branch stubs evident Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) No major defects were noted Situated on steep bank	222	8.4	A (i)
T63	Sycamore Acer pseudoplatanus	16	630 420	5	M	F	Basal suckers present Branch stubs evident Minor dead wood evident in the crown (<75mm) Multi leadered form No major defects were noted Situated to the top of steep bank adjacent to footpath Low crown to the south	259	9.1	B (i)
T64	Sycamore Acer pseudoplatanus	17	780	N - 6 S - 7 E - 6 W - 2	M	F	Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) No major defects were noted Situated to the top of steep bank adjacent to footpath Low crown to the south Prominent buttress roots	275	9.4	A (i)
T65	Ash Fraxinus excelsior	18	650	8	M	F	Branch stubs evident Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) No major defects were noted Situated on steep bank adjacent to footpath	191	7.8	A (i)

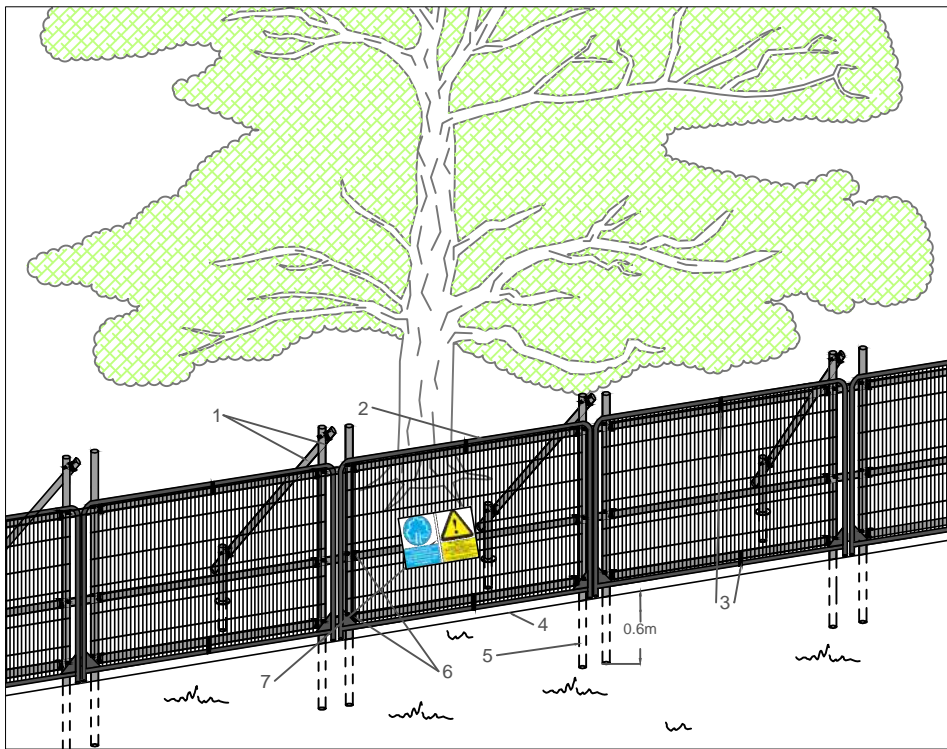
Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T66	Sycamore Acer pseudoplatanus	17	880	N - 6 S - 8 E - 3 W - 8	M	F	Basal suckers present Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) No major defects were noted Situated to the top of steep bank adjacent to footpath Low crown to the south Prominent buttress roots	350	10.6	A (i)
T67	Sycamore Acer pseudoplatanus	18	640 530	8	M	F	Basal suckers present Minor dead wood evident in the crown (<75mm) Twin stemmed from base Situated on steep bank adjacent to footpath	312	10.0	B (i)
T68	Hornbeam Carpinus betulus	10	350	6	EM	F	Epicormic growth evident within the crown Low crown form Minor dead wood evident in the crown (<75mm) No major defects were noted Situated on steep bank adjacent to footpath Low crown over footpath which may require pruning	55	4.2	B (i)
T69	English Oak Quercus robur	14	340	4	EM	F	Branch stubs evident Broken branches evident Epicormic growth evident within the crown Etiolated form Minor dead wood evident in the crown (<75mm)	52	4.1	B (i)
T70	English Oak Quercus robur	18	930	12	M	F	Branch stubs evident Broken branches evident Epicormic growth evident within the crown Hazard beam present Lateral lever arm observed Minor dead wood evident in the crown (<75mm) Multi leaded form No major defects were noted Large spreading oak tree adjacent to footpath Under storey of Holly to north	391	11.2	A (i)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
GROUPS OF TREES										
G1	Ash Fraxinus excelsior Beech Fagus sylvatica Hawthorn Crataegus monogyna Horse Chestnut Aesculus hippocastanum Sycamore Acer pseudoplatanus	14	est 500	6	EM / M	F / G	Branch stubs evident Interlocking crowns Minor dead wood evident in the crown (<75mm) No major defects were noted Past pruning noted with topped trees noted in group	113	6.0	A (ii)
G2	Wild Cherry Prunus avium	8	100	2	SM	P	Single stem forms Suckered from old stump Some multi stemmed	5	1.2	C (ii)
G3							Number no longer in use			
G4	Ash Fraxinus excelsior Hawthorn Crataegus monogyna	16	350 350	5	EM	F	Forms part of wider woodland Tree cover along edge of site Broken branches evident Dense ivy cover on main stem Dense undergrowth at the base Even crown form Minor dead wood evident in the crown (<75mm)	111	5.9	B (ii)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
G5	Elder Sambucus nigra Hawthorn Crataegus monogyna Hazel Corylus avellana Holly Ilex aquifolium Mountain Ash Sorbus aucuparia	5	est 10x 80	3	EM / M	F	Coppiced form Sporadic group Possibly lapsed hedge on top of bank Provides screening value	29	3.0	B (ii)
G6	Hawthorn Crataegus monogyna Sycamore Acer pseudoplatanus Holly Ilex aquifolium	5	avg 100	1	Yng	F	Interlocking crowns Low crown form Understory growth between T1 & T2	5	1.2	C (ii)
G7	Holly Ilex aquifolium	10	avg 180	2	EM / M	F	Crossing and rubbing branches Interlocking crowns Low crown form Under storey around T13	15	2.2	B (ii)

Hedge No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
HEDGEROWS										
H1	Leyland Cypress <i>Cupressocyparis leylandii</i>	4	est 150	0.5	EM	G	Maintained hedgerow Solid screening value	10	1.8	B (ii)
H2	Leyland Cypress <i>Cupressocyparis leylandii</i>	1.5	avg 100	0.5	SM	G	Maintained hedgerow Situated offsite	5	1.2	B (ii)
H3	Beech <i>Fagus sylvatica</i>	2	est 70	0.5	EM	G	Maintained hedgerow Situated offsite	2	0.8	B (ii)

Wood No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
WOODLANDS										
W1	Ash Fraxinus excelsior Elder Sambucus nigra English Oak Quercus robur Goat Willow Salix caprea Hawthorn Crataegus monogyna Horse Chestnut Aesculus hippocastanum Sycamore Acer pseudoplatanus Mountain Ash Sorbus aucuparia	16	up to 800	6	EM / M	F / G	Off site woodland with stream through the centre Trees situated on steep banks Public footpaths throughout woodland with public areas Broken branches evident Failed trees Minor dead wood evident in the crown (<75mm) Typical defects noted Overhang of site 3m	290	9.6	A (ii)



Standard specification for protective barrier

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



Above ground stabilising systems

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

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

NOTES

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APPENDIX B PROTECTIVE FENCING SPECIFICATIONS

Appendix C - Veteran Tree Schedule

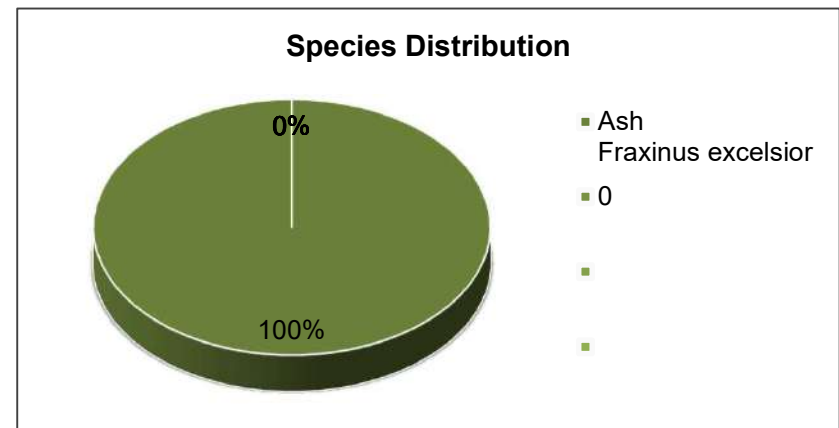
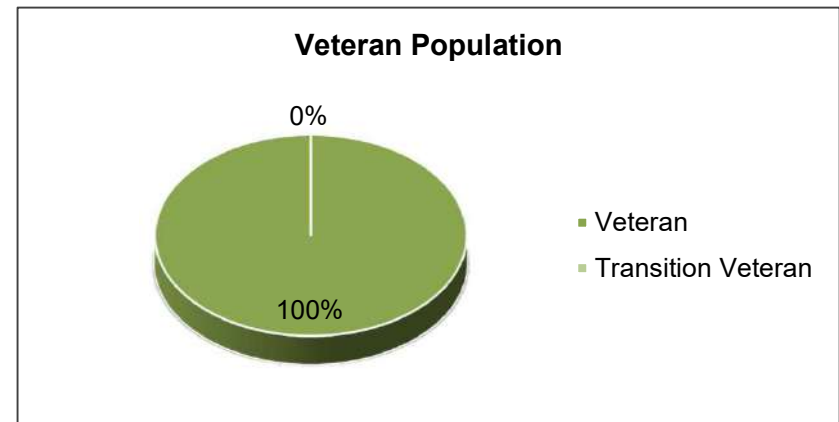
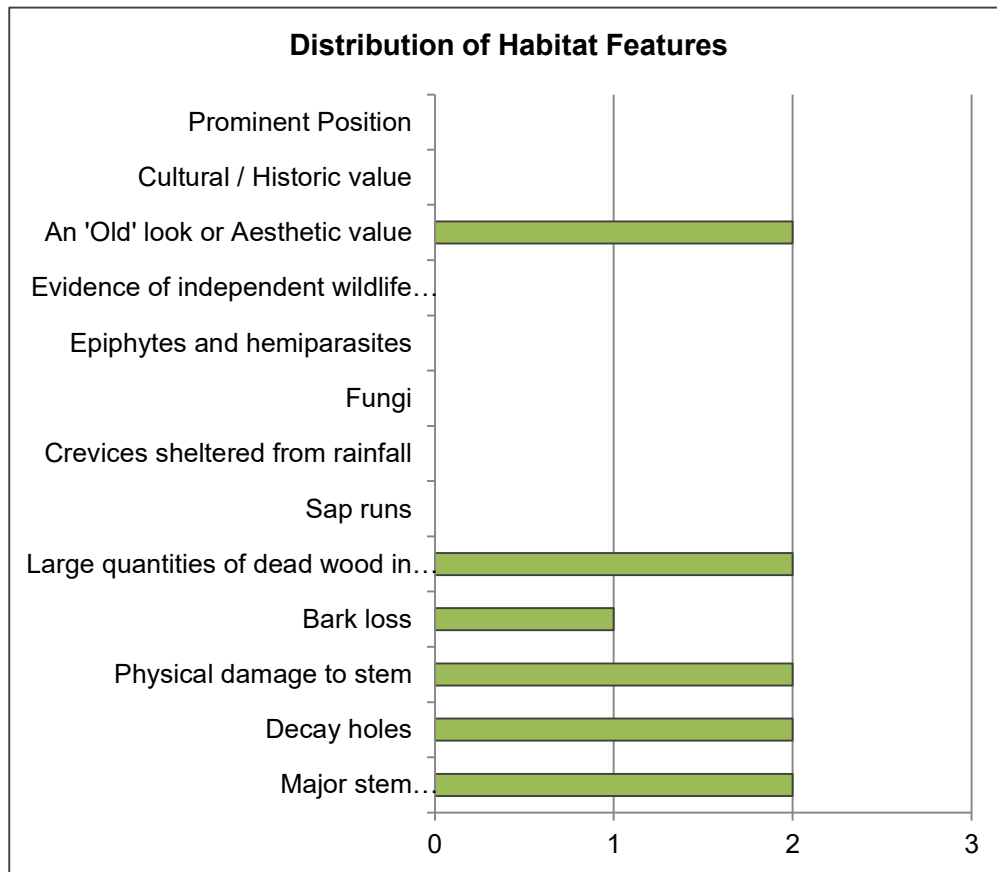
Key	Dimensions and Habitat Features		Associated Wildlife	Aesthetics
Tree considered Veteran	DBH (mm) - Stem diameter measured at 1.5m above ground level in mm	Major trunk cavities - Cavity to exceed 30% of stem diameter or to be progressively developing	Crevices sheltered from rainfall - Dry, potential invertebrate habitat	An old look or Aesthetic value - Striking form or particularly gnarled
Tree considered Future Veteran	Large girth for species - as described by the Veteran Tree Initiative	Large quantities of dead wood in canopy - More than 50% of crown dead or dying back	Evidence of independent wildlife species - Droppings, nests, pellets	Cultural/historic value - Parkland tree, field or road marker
		Physical damage to trunk - Often as a result of storm damage	Fungi - Polypores or Basidiomycetes on or around tree	Prominent Position - Visually prominent in its landscape
		Decay Holes - Branch socket cavities on limbs or main stem	Epiphytes or Hemiparasites - lichen, liverworts, ivy, mistletoe	
		Epicormic Growth - Strong vigorous epicormic growth present about the tree		
		Bark Loss - Bark missing from main stem in large quantities		
		Sap Runs - Either from cracks in bark or cavities		

This document should be read in conjunction with the Arboricultural Assessment. The National Planning Policy Framework, a key government policy document, stresses the importance of Ancient and Veteran trees. From an ecological perspective veteran trees provide a rare and very specialist niche habitat and therefore preservation of this habitat is considered highly important. It would therefore be recommended that a detailed assesment be undertaken of the veteran habitat and this schedule should only be used as a guide to the presence of veteran trees on the site.

Distribution of Habitat Features - Displays the total of each habitat feature present in the surveyed tree cover. The proportion of trees with these features can be used to determine the condition and risks to the veteran tree stock.

Veteran Population - Provides the mix of Veteran/Future Veteran and non-veteran specimens across the surveyed tree stock.

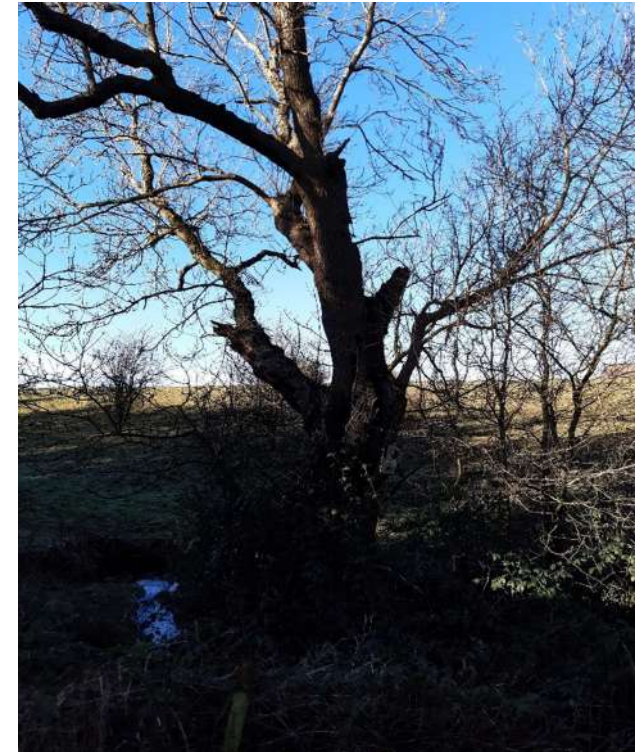
Species Distribution - Shows the proportion of Veteran and Future Veterans for each species found during the assessment.



Identification		Dimensions				Habitat Features							Associated Wildlife				Aesthetics		
Tree No	Species	Large girth for species	Girth (cm)	Measurement height (m)	Form	Major stem cavities / hollowing	Decay holes	Physical damage to stem	Bark loss	Epicormic Growth	Large quantities of dead wood in canopy	Sap runs	Crevices sheltered from rainfall	Fungi	Epiphytes and hemiparasites	Evidence of independent wildlife species	An 'Old' look or Aesthetic value	Cultural / Historic value	Prominent Position
T42	Ash Fraxinus excelsior	Yes	345.5	1.3	M	✓	✓	✓		✓	✓						✓		
T44	Ash Fraxinus excelsior	Yes	376.9	1.3	M	✓	✓	✓	✓	✓	✓						✓		



T42 & T44



**Annex F:
Local Wildlife Assessment Summary (May 2021)**

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May 2021

Technical Note: Updated Botanical Assessment - Drainage Outfall Through Fox Glen.

7301 – Land off Carr Road, Deepcar

FPCR Environment and Design Ltd. (FPCR) were commissioned by Hallam Land Management Ltd. to update the botanical assessment for the land effected by a proposed drainage outfall from the proposed balancing facility within the proposed development site to the Clough Dike. The implementation of this drainage outfall requires the completion of some limited works in Fox Glen Local Wildlife Site (LWS).

A full assessment of the proposed works was submitted to Sheffield City Council (SCC) in November 2017 (CD1.17c: Appendix 5) and a draft Construction & Environmental Management Plan has been produced and the proposed methods cover these works (Proof of Evidence (PoE) Kriston Harvey: Appendix K).

Methodology

The woodland was surveyed on 20th April 2021 by Ian Hunter (Principal Ecologist, FPCR). Ian has been awarded a Level 5 Field Identification Skill Certificate (FISC) from Botanical Society of Britain and Ireland (BSBI).

The survey methods employed followed those detailed in the 'Fox Glen Woodland Survey of Potential Drainage Route' (CD1.17c: Appendix 5).

Results

No substantive changes to the habitats or species assemblage was recorded during the completed survey.

The southern boundary of the woodland in the survey area is formed by a drystone wall with a surfaced path a few feet inside the wood running parallel with the wall. From this path there is a steep north facing slope running down to Clough Dike in the valley bottom. Oak was characteristic of the canopy, predominantly sessile *Quercus petraea* but with some pedunculate *Q. robur* recorded, downy birch *Betula pubescens* and beech *Fagus sylvatica* are present as minor components. A healthy understory is present comprising of hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, rowan *Sorbus aucuparia* and locally frequent holly *Ilex aquifolium*.

The upper and mid slope bramble *Rubus fruticosus* agg. was frequent within the field layer, often forming extensive patches, between which areas of creeping soft-grass *Holcus mollis*, interspersed with bluebells *Hyacinthoides non-scriptus*, broad buckler-

fern *Dryopteris dilatata* and honeysuckle *Lonicera periclymenum*, are present. Additionally, a single colony of wood anemone *Anemone nemorosa* is present in this area.

At the base of the slope the stream is heavily modified, but away from the built structures the bankside vegetation comprises, opposite-leaved golden-saxifrage *Chrysosplenium oppositifolium*, common bistort *Bistorta officinalis*, dog's mercury *Mercurialis perennis*, yellow archangel *Lamiastrum galeobdolon*, meadowsweet *Filipendula ulmaria* and hart's-tongue fern *Asplenium scolopendrium* all recorded.

Discussion

The proposed work to construct and maintain a drainage system through Fox Glen Wood to discharge into Clough Dike would have no more than a negligible adverse impact on the features for which the woodland has been afforded the non-statutory designation as a Local Wildlife Site.

The proposals would potentially have an impact on the small population of bluebell within the proposed area of works where the drainage channel would be located. This impact could however be mitigated by re-planting any uprooted bulbs into undisturbed areas adjacent to the working area.

**Appendix G –
Static Detector Summary**

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Annex G: Static Detector Results

2018 – Spring, Summer & Autumn Static Results

Recording Period	Unit No.	Start Date	End Date	Survey Hours	Total Av. per hour	Total Registrations	Common Pipistrelle			Pipistrelle Species			Myotis Species			Noctule			Soprano Pipistrelle			Nyctalus Species			Nyctalus / Eptesicus			Brown Long-eared		
							Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
Autumn	15	27/09/2018	02/10/2018	66:49:43	93.762	6266	6038	3583	90.351	82	42	1.227	126	79	1.885	8	5	0.120	12	6	0.180	0	0	0.000	0	0	0.000	0	0	0.000
Autumn	7	27/09/2018	02/10/2018	66:49:43	1.721	115	96	57	1.437	13	8	0.195	1	1	0.015	4	3	0.060	1	1	0.015	0	0	0.000	0	0	0.000	0	0	0.000
Autumn	16	27/06/2018	02/07/2018	40:17:27	9.556	385	313	97	7.769	3	2	0.074	26	8	0.645	38	24	0.943	4	2	0.099	1	1	0.025	0	0	0.000	0	0	0.000
Summer	12	26/06/2018	01/07/2018	40:12:27	26.687	1073	1055	329	26.239	2	1	0.050	8	3	0.199	7	2	0.174	1	1	0.025	0	0	0.000	0	0	0.000	0	0	0.000
Summer	13	23/05/2018	28/05/2018	42:42:35	88.247	3769	3382	0	79.186	262	0	6.134	8	0	0.187	81	0	1.897	14	0	0.328	15	0	0.351	4	0	0.094	3	0	0.070
Spring	8	23/05/2018	28/05/2018	42:42:35	7.258	310	303	169	7.094	1	1	0.023	0	0	0.000	5	4	0.117	1	1	0.023	0	0	0.000	0	0	0.000	0	0	0.000

2021 – Spring Static Results

Recording Period	Unit No.	Start Date	End Date	Survey Hours	Total Av. per hour	Total Registrations	Common Pipistrelle			Pipistrelle Species			Myotis Species			Noctule			Soprano Pipistrelle			Nyctalus Species			Nyctalus / Eptesicus			Brown Long-eared					
							Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour			
Spring	4	09.05.21	14.05.21	46:07:10	8.174	377	368	153	7.979	1	1	0.22	1	1	0.022	3	2	0.065	3	3	0.065	1	1	0.022	0	0	0.00	0	0	0.00	0	0	0.00
Spring	6	09.05.21	14.05.21	46:07:10	2.971	137	125	71	2.710	10	3	0.217	1	1	0.022	1	1	0.022	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00

**Appendix H –
Water vole, White Clawed Crayfish and Otter**

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Hallam Land Management

Land off Carr Road, Deepcar

WATER VOLE, OTTER & WHITE CLAWED CRAYFISH REPORT

May 2021

FPCR Environment and Design Ltd

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CONTENTS

1.0 INTRODUCTION 2

2.0 RELEVANT LEGISLATION 2

3.0 METHODOLOGY..... 3

4.0 RESULTS..... 5

5.0 DISCUSSION..... 9

FIGURES

Figure 1: Site Location and Survey Area within Fox Glen Wood

Figure 2: Habitats Plan

PLATES

Plate 1: Habitat 1.

Plate 2: Habitat 2

Plate 3: Habitat 3

Plate 4: Habitat 4

1.0 INTRODUCTION

- 1.1 This document has been prepared by FPCR Environment and Design Limited on behalf of Hallam Land Management. The report provides details of a survey for water voles *Arvicola amphibious*, otters *Lutra lutra* and white-clawed crayfish *Austropotamobius pallipes* at a site located off Carr Road, Deepcar.
- 1.2 The survey completed in 2018 were undertaken in response to a request by Sheffield City Council and are submitted to inform a proposed planning application (Planning Reference 17/04673/OUT) for a residential development of the above site. The updated survey completed in April 2021 were undertaken to assist the inspector determining the planning appeal associated to this planning application.
- 1.3 The site is located in the south west of the Deepcar area. Hollin Busk Lane and Carr Road border the site to the southwest and southeast. The northern boundary is bordered by Fox Glen Wood Local Wildlife Site (LWS) and grassland fields. The wider countryside is agricultural with numerous woodland blocks and the Peak District National Park extending away to the west.
- 1.4 The surveys were undertaken in a watercourse known as Clough Dyke within Fox Glen (Central Grid Reference SK 278 976). Figure 1 shows the location of the proposed development in relation to Fox Glen.
- 1.5 All surveys were undertaken on 24th April 2018 and 20th April 2021.

2.0 RELEVANT LEGISLATION

Water Voles

- 2.1 Water voles are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:-
 - Intentionally kill, injure or take (capture) water voles;
 - Possess or control live or dead water voles or derivatives;
 - Intentionally or recklessly damage, destroy and obstruct access to any structure or place used by water voles for shelter or protection;
 - Intentionally or recklessly disturb water voles whilst they are using such a place;
 - Sell water voles or offer to expose for sale or transport for sale;
 - Publish or cause to publish any advertisement which conveys the buying or selling of water voles.
- 2.2 Water voles are listed as a Species of Principal Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Otters

- 2.3 Otters are fully protected under Schedule 5 of the Wildlife & Countryside Act 1981 (*as amended*) due to the protection afforded to their places of shelter and protection. They are afforded protection under Section 9 parts 4(a) and 4(b). This makes it an offence to:
- Intentionally or recklessly kill, injure or take these species;
 - Possess or control live or dead these species or derivatives;
 - Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection;
 - Intentionally or recklessly disturb these species whilst occupying a structure or place used for that purpose;
 - Sell these species or offer or expose for sale or transport for sale; and
 - Publish or cause to be published any advertisement which conveys the buying or selling of these species.
- 2.4 Otter is also protected by the Conservation of Habitats and Species Regulations 2017. In effect this legal protection makes it an offence to deliberately:
- Kill, take or injure an otter;
 - Damage or destroy an otter's place of shelter; and
 - Disturb an otter whilst using such a place.
- 2.1 If impacts to otters or their places of rest or shelter cannot be avoided a European Protected Species Licence (EPSL) from Natural England is required (licenses cannot be obtained to provide protection against offences under the Wildlife & Countryside Act 1981 (*as amended*)).
- 2.2 Otter is also listed as a Species of Principal Importance under Section 41 of the Natural Environment and rural Communities (NERC) Act 2006.

White-clawed crayfish

- 2.3 This species is protected under Schedule 5 of the Wildlife and Countryside Act 1981 (*as amended*) from taking and sale. Where any action is required that may lead to the removal of crayfish from their habitat ("taking"), such as bank excavation or direct crayfish removal from any area of works, a licence may be required under Section 16(3) of the Act.
- 2.4 The white-clawed crayfish is also listed on the IUCN Red Data List, Appendix III of the Bern Convention and Annexes II and V of the Habitats Directive. This species is also listed as a Species of Principal Importance under Section 41 of the Natural Environment and rural Communities (NERC) Act.

3.0 METHODOLOGY

- 3.1 The surveys were undertaken on 24th April 2018 and 20th April 2021. The survey was conducted during suitable weather conditions comprising little / no wind or rain.
- 3.2 The survey considered the entire length of Clough Dyke within Fox Glen.

- 3.3 The source of the Clough Dyke is at the south-western extreme of Fox Glen and is culverted under Wood Royd Road to the north-east of the Glen. The total survey area was approximately 525m.

Field Survey

Water Vole

- 3.4 Standard methodology outlined within Strachen *et al* (2011)¹ was used which involved searching the banks/margins of the drains and ditches for evidence of:
- *Latrines* - distinct piles of water vole droppings found near nest sites, at the ranges of territorial boundaries and where the animals enter and leave the water;
 - *Burrows* - burrow entrances are typically wider than high with a diameter between 4-8cm. Generally these burrow entrances are located at the water's edge;
 - *Feeding Stations* - areas with distinct neat piles of chewed lengths of vegetation cut at 45 degrees along pathways or haul out platforms along the water's edge;
 - *Footprints* - identifiable prints in soft margins of the watercourse;
 - *Runways* - low tunnels that are pushed through the vegetation and often leading to burrows or feeding stations.
- 3.5 Descriptions of the watercourse were also made to aid any enhancement or mitigation recommendations required.

Otter

- 3.6 Survey methodology attempted to determine the status of otters. The methodology followed that of the full survey detailed in the New Rivers and Wildlife Handbook (RSPB/NRA, 1995).
- 3.7 Due to the unlikely event of actual observation, the survey concentrated on locating field signs indicating otter presence or use. Such field signs include:
- *Spraints* – characteristic sweet-smelling, black tar-like (where fresh/relatively recent i.e. within a few weeks) or grey crumbly (when old) faecal deposits usually containing fish scales, bones and occasionally invertebrate exoskeleton and bird feathers.
 - *Footprints* – In good substrate typically asymmetrical and showing five toes arched around a large pad and, depending on substrate, webbing and claw marks. Poorer, generally coarser substrates do not often enable the identification of otter footprints.
- 3.8 Additional signs of otter presence may occur, although without additional evidence are usually not conclusive proof of current otter presence:
- *Feeding remains* – Remains of fish
 - *Slides/haul-outs* – Routes into and out of the water, which are usually associated with terrestrial routes such as short cuts around meanders or along traditionally, used otter paths/routes.

¹ Strachen, R, Moorhouse, T and Gelling, M (2011) Water Vole Conservation Handbook. Third edition

- *Couches/hovers* – above ground resting place. Usually associated with cover such as dense scrub, rushes or reed, flood debris or fallen trees. Many couches are rarely used whilst others more so. Difficult to prove use without radio tracking.
- *Holts* – below ground resting site usually associated with sprainting. Sometimes used with greater frequency than couches and can be important for breeding (natal holts) where other signs are usually absent. Notoriously difficult to find or prove without radio tracking.

3.9 Descriptions of the watercourse were also made to aid any enhancement or mitigation recommendations required.

White-clawed crayfish

3.10 The survey was carried out by a licensed ecologist (Natural England Licence No. 2016-22651-CLS-CLS) using the methodology outlined in *Guidance of works affecting white clawed crayfish, Peay, S 2000*². Survey methods comprised of:

- Manually searching under all suitably large cobbles, boulders, woody debris and any other suitable refuge material on the stream bed; and
- Sweep netting under overhanging banks and in submerged vegetation.

3.11 Smith *et al.* (1996)³ identified the key bankside habitat features that determine success of white-clawed crayfish populations (aside from water chemistry) as being:

- Presence of vertical banks;
- Canopy overhanging the channel over 0.5m from the water surface; and
- Tree roots projecting into the water.

4.0 RESULTS

Field Survey

Habitat Assessment

4.1 The source of Clough Dyke is at the south-westerly extreme of Fox Glen Wood and at the north-eastern extreme of the Glen the watercourse is culverted. On both survey occasions, the entire length of the watercourse, approximately 500m, was surveyed (Figure 2, Habitats Plan).

4.2 The watercourse was seen to have four main habitats (Figure 2, Habitats Plan); all habitat types are described below:

- Habitat 1: 75m from the culvert upstream of the brook. The water course was approximately 5cm deep and 2m wide. Water flow would be described as medium with substrate mainly mud and was heavy with silt. The banks comprised of bare ground with little vegetation. There was approximately 75% shading over the water column. Small number of holes were present within the bank of this habitat.

² Peay S. (2000) Guidance of works affecting white-clawed crayfish. English Nature FIN/CON/139

³ Smith GRT, Learner MA, Slater FM & Foster J (1996) Habitat features important for the conservation of the native crayfish *Austropotamobius pallipes* in Britain. Biological Conservation 75, pp 239-246.



Plate 1: Habitat 1.

- Habitat 2: Approximately 250m of the remaining watercourse. The watercourse depth varied between 5-30cm, with a majority between 5-10cm. The watercourse was approximately 0.5-1m wide. A few deep pools, with slow-flow were present but overall the water flow was medium-fast. The substrate was gravel with medium size boulders and cobbles. The banks were steep and comprised of rocks, ivy, bramble and moss. There was approximately 75% shading over the water column. There were a small number of undercut banks, but in general the sides were almost vertical.



Plate 2: Habitat 2.

- Habitat 3: Approximately 30m from the source to downstream and within the central area of the water course. The watercourse was approximately 5cm deep and 0.5-1m wide. Water flow would be described as glide with substrate of bedrock, with very few boulders. The banks were steep and comprised of rocks, ivy, bramble and moss. There was approximately 75% shading over the water column. There were a few undercut banks.



Plate 3: Habitat 3.

- Habitat 4: Towards the west of the water course a dammed area that was heavily vegetated. Water flow was slow and approximately 30cm deep. Sides were stone and vertical. There was approximately 75% shading over the water column. There were no undercut banks.



Plate 4: Habitat 4.

Water Vole

- 4.3 No evidence confirming the presence of water vole was recorded within the survey area.
- 4.4 A few small bankside holes were present throughout the survey area (mainly within habitat 1) but these are not thought to be made by water vole due to their small size and no other evidence of occupation by water vole was identified along the watercourse.

Otter

- 4.5 No otter spraints and footprints were recorded during the survey.
- 4.6 No signs of otter holts or couches were present within the survey area.

White-clawed crayfish

- 4.7 No evidence of white-clawed crayfish was recorded in any of the four habitat sites surveyed, although suitable refugia in the form of boulders, pebbles, woody debris, tree roots and undercut banks were present.

Survey Effort / Timing

- 4.8 Table 1, below, provides full details of survey effort expended in relation to the white-clawed crayfish presence / likely absence surveys. The survey effort is broadly based on *Guidance of works affecting white clawed crayfish, Peay, S 2000*⁴ which recommends that:

“Selective searching for 45 minutes or more will be needed to detect a population at low density, even where conditions are suitable for manual searching.”

- 4.9 The survey team comprised two experienced surveyors working from downstream to upstream, undertaking manual searches simultaneously. Total survey time was 180 minutes for each surveyor and survey time in any given habitat was proportionate to the number of potential refuges available / searchable. Rather than selective searching (as described in the above guidance), all potential refuges within the channel which could be lifted, were searched for crayfish presence.

In-Stream Habitat Type Reference (see Figure 2)	Number of Constituent Habitat Patches Within Habitat Type	Total Length of Habitat Patch (m)	Main Potential Refuge Features	Total Habitat Survey Time Per Surveyor (minutes)
1	1	75m	Bank holes	15
2	3	250m: 115m+105m+30m	In stream: numerous cobbles / boulders. Banks: Boulders.	120
3	2	150m: 90m+60m	In-stream: occasional boulders. Banks: occasional boulders.	30

⁴ Peay S. (2000) Guidance of works affecting white-clawed crayfish. English Nature FIN/CON/139

In-Stream Habitat Type Reference (see Figure 2)	Number of Constituent Habitat Patches Within Habitat Type	Total Length of Habitat Patch (m)	Main Potential Refuge Features	Total Habitat Survey Time Per Surveyor (minutes)
4	1	25m	In-stream: very occasional cobbles / boulders. Banks: very occasional cobbles / boulders.	15

- 4.10 Given the above information, and as the survey time is effectively doubled due to the presence of two surveyors, it is considered that the survey effort undertaken, by far, exceeds that recommended in the above guidance to enable the detection of this species, even where it occurs at low density.

5.0 DISCUSSION

- 5.1 No evidence confirming the presence of water vole, otter and white-clawed crayfish was recorded in the Clough Dike during the course of the surveys.

Water Vole

- 5.2 The habitat along the length of the survey area was considered to provide some suitability for water vole given its nature, however the connectivity to water bodies in the local area is poor as the Dike's source is within the west of the Glen and the Dike is culverted to the east of the Glen. It is therefore very unlikely that the nature of the habitat is suitable to sustain a population of the species.
- 5.3 Fox Glen has been designated a LWS and water voles were presented within the designation, however consultation records from Sheffield Biological Records Centre do not show any records of water vole within the Dike, and no signs were identified over the survey.

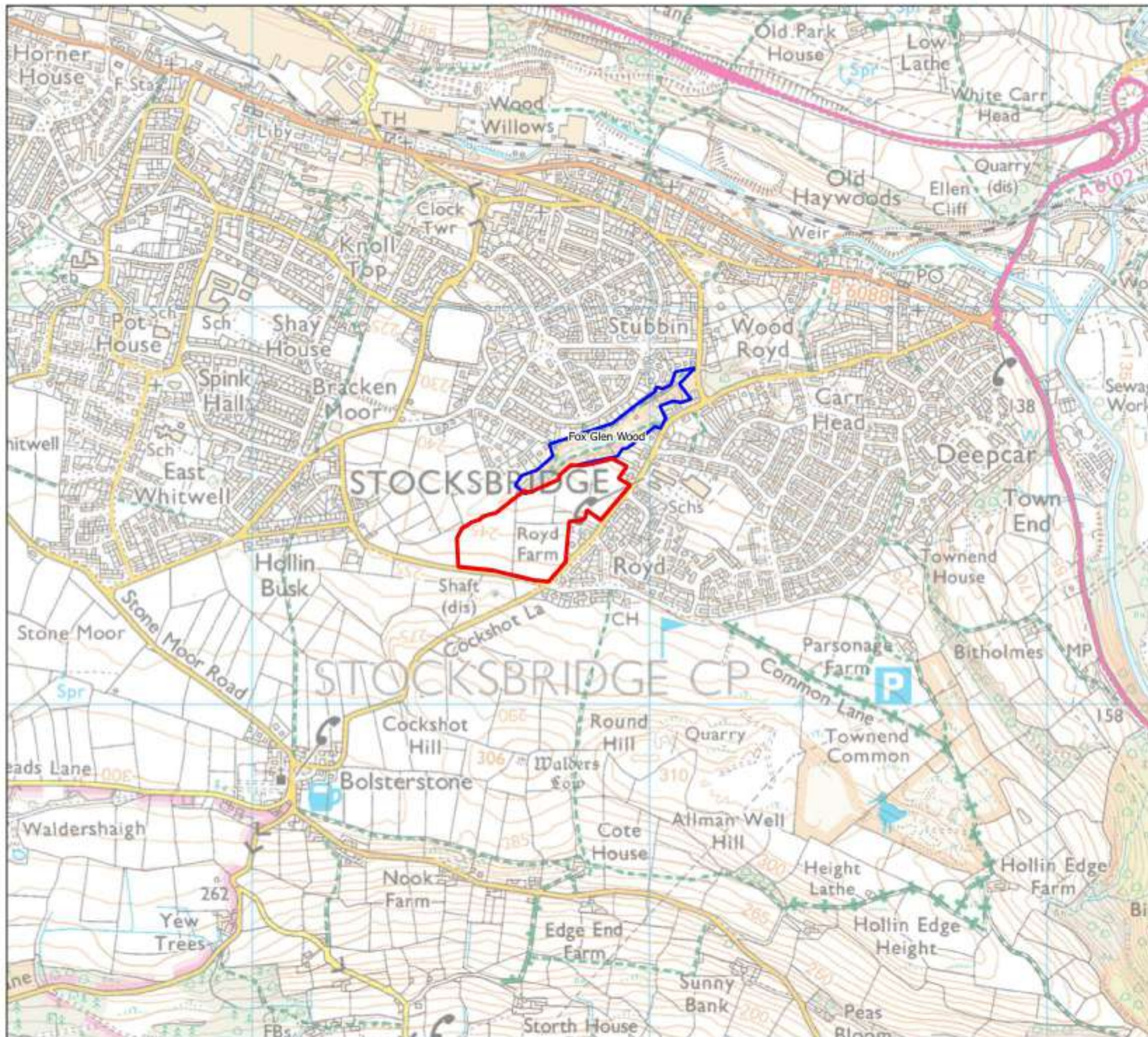
Otter

- 5.4 Otters have large ranges which they regularly travel in search of food. However, there was no evidence of otter in the Dike during the survey. Therefore, the presence of otter has not been identified as a statutory ecological constraint.

White-clawed Crayfish

- 5.5 No white-clawed crayfish were observed at the time of the survey. Habitat sections 2-4 provided potential refuge habitat with boulders, cobbles, woody debris and small areas of emergent vegetation throughout the survey area but no evidence of white clawed crayfish were identified

over the survey. Habitat 1 was not suitable for the species with the exception of small holes in the bank. However, should this species be present within the watercourse, evidence of occupation would have been confirmed during the manual search. From these results white clawed crayfish has not been identified as a statutory ecological constraint.



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Key

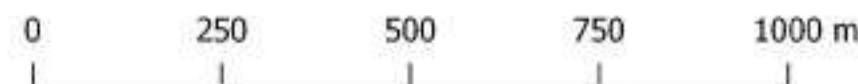
- Site Boundary
- Fox Glen Wood

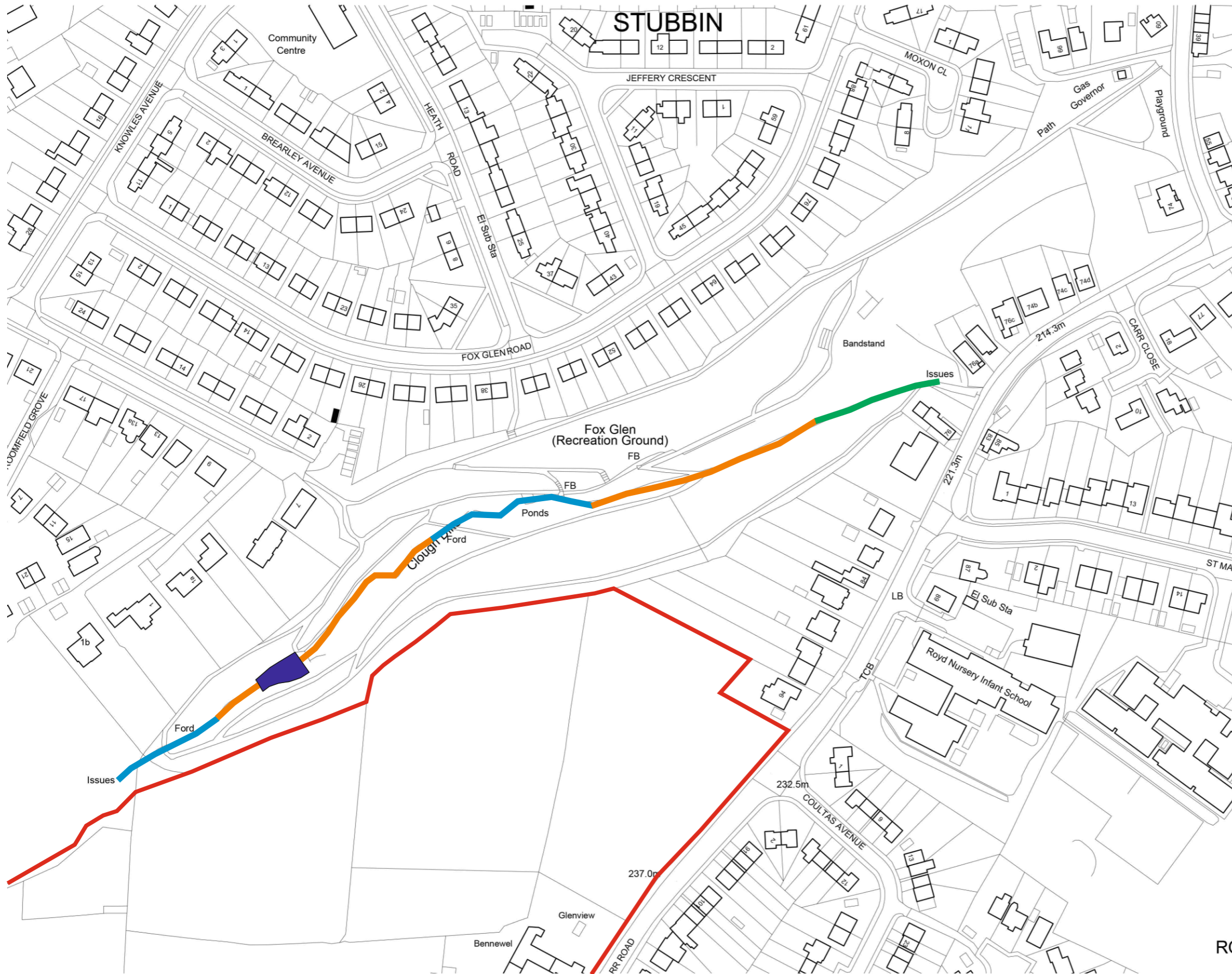
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SITE LOCATION AND SURVEY AREA WITHIN FOX GLEN WOOD

Scale of Map: 1:10,000
Date: 1/5/2018

Figure 1 7301 - E - 01





- Habitat 1
- Habitat 2
- Habitat 3
- Habitat 4

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 Land off Carr Road, Deepcar

fpcr HABITATS PLAN

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Figure 2