A12 Chelmsford to A120 widening scheme

9.30 Supplementary Arboricultural Survey Report

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A12 Chelmsford to A120 widening scheme
Development Consent Order 2022

Supplementary Arboricultural Survey Report

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CONTENTS

APPENDICES

LIST OF TABLES

Acronyms and Abbreviations

ADB	Ash die back
AHC	Ash health class
AIA	Arboricultural Impact Assessment
AMS	Arboricultural Method Statement
CA	Conservation Area
DCO	Development Consent Order
DBH	Diameter at breast height
DEFRA	Department for Environmental, Food & Rural Affairs
EIA	Environmental Impact Assessment
ES	Environmental Statement
GPS	Global positioning system
LNR	Local Nature Reserve
LPA	Local Planning Authority
MAGIC	Multi-Agency Geographical Information for the Countryside
NNNPS	National Networks National Policy Statement
NSIP	Nationally Significant Infrastructure Project
RPA	Root protection area
SSSI	Site of Special Scientific Interest
TCP	Tree Constraints Plan
TPO	Tree Preservation Order

1 Executive Summary

1.1.1 This report presents the results of additional arboricultural surveys undertaken in 2023 along the gas main diversion (Little Braxted to Springfield AIA2, defined within Chapter 2 The proposed scheme of the Environmental Statement [APP-069]), on land not covered by the original suite of surveys reported in Appendix 8.4 Arboriculture impact assessment of the Environmental Statement [APP-122]. It presents an evaluation of present arboricultural features based on recent surveys.

1.1.2 The arboricultural survey has been carried out in accordance with BS 5837:2012 'Trees in Relation to Design, Demolition and Construction-Recommendations' (British Standards Institution, 2012).

1.1.3 The survey records all trees within the survey area (incorporating the pipeline diversion corridor and a 15m buffer on either side) and all those which may be affected by any development proposals within the site boundary. The parameters reported include species, crown spread and Root Protection Area (RPA). The survey area is shown on the Tree Constraints Plan (Appendix G).

1.1.4 The RPA of any given tree is the area of ground around that tree which should not be disturbed by excavation, compaction, changes in level or other construction/demolition operations. The extent of the RPA is calculated in accordance with BS 5837:2012 and is an important metric for understanding the impact a proposal will have on tree removal and retention.

1.1.5 No part of the site is listed in the Ancient Woodland Inventory held by Natural England.

1.1.6 A black poplar (*Populus nigra*) [T2077] tree was recorded within the survey area which would qualify as a veteran tree under veteran tree assessment methodologies. At the time of writing this report, this tree is not shown on the Woodland Trust's Ancient Tree Inventory. Please refer to Section 2.8 and 2.10 of this report for additional information regarding this tree.

1.1.7 The survey has identified five Category A individual trees, 63 Category B individual trees and 19 Category C individual trees. Whilst trees have been singled out and given individual categories, they are components of a managed woodland. As a cohesive group, this woodland is Category A (with individuals, irrespective of category important elements within this woodland) and is considered a high-quality arboricultural feature that should be fully considered within design. It should be noted that dead and declining trees are an important component of a resilient and biodiverse woodland.

1.1.8 The majority of the trees in the survey area are protected by Maldon District Council Tree Preservation Order (Ref 07/22) as a woodland group. A woodland Tree Preservation Order protects all trees within the area indicated on the schedule irrespective of size, including the woodland floor regeneration.

2 Introduction

2.1 Background

2.1.1 The A12 Chelmsford to A120 widening scheme (the 'proposed scheme') comprises improvements to the A12 between junction 19 (Boreham interchange) and junction 25 (Marks Tey interchange), a distance of approximately 24km, or 15 miles. The proposed scheme involves widening the A12 to three lanes throughout (where it is not already three lanes) with two new sections of three-lane dual carriageway, between junctions 22 and 23 and between junctions 24 and 25. It also includes safety improvements, including closing off existing private and local direct accesses onto the main carriageway, and alterations and improvements for walkers, cyclists and horse riders to existing non-vehicular routes along the A12.

2.1.2 There are various gas mains that would be affected by the proposed scheme and would therefore need to be diverted from their existing location to avoid clashes with the proposed scheme. The works to widen the A12 as part of the proposed scheme would cause two principle pinch-points that would require diversion of the existing gas main into a new corridor. The two principle pinch-points are:

a. where the gas main passes between the A12 and the existing housing and church by Maldon Road

b. where the gas main passes between the A12 and Whetmead Local Nature Reserve (LNR).

2.1.3 The proposed scheme is classed as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act (2008), triggering the need to apply for a Development Consent Order (DCO). A DCO application was submitted to the Planning Inspectorate by National Highways in August 2022 and was accepted by the Planning Inspectorate on 12 September 2022. The application was supported by an Environmental Statement which included Appendix 8.4 Arboricultural Impact Assessment [APP-122].

2.2 Purpose of this Report

2.2.1 A gap was identified in existing tree survey data (Appendix 8.4 Arboriculture Impact Assessment of the Environmental Statement [APP-122]) during detailed design of the gas main diversion route in the vicinity of Isham Chase and representations made during on-going engagement with landowners and stakeholders. This report presents the results of additional arboricultural surveys carried out on 13 and 14 February 2023 at Isham Chase.

2.3 Methodology and Scope

2.3.1 The tree survey was conducted in line with the methodology detailed within BS 5837:2012 (British Standards Institution, 2012) and involved the surveying of trees as individuals or groups of trees within the survey area extents (forming

the survey area). The information collected and methodology used is summarised in Appendix A (Tree Survey Methodology).

2.3.2 Trees are reported as individuals or groups. Tree locations were determined on site using digital survey software and hardware which use a combination of aerial imagery and the device's inbuilt Global Position System (GPS). The National Tree Map spatial dataset was used to assist with the location of specific tree stems where possible, due to no topographical data being available at the time of the survey. Trees plotted with the internal GPS can be assumed to have an accuracy of +/- 5 m.

2.3.3 Trees were categorised using BS 5837 (British Standards Institution, 2012) into four categories (A, B, C, U) and for trees in categories A-C, they also qualified under three subcategories (1, 2, 3). A summary of this classification can be seen in Appendix C.

2.3.4 The tree survey data are shown in **Error! Reference source not found.** (Tree Survey Schedule) and were used to produce a Tree Constraints Plan (TCP) in **Error! Reference source not found.**, which depicts the existing rooting area and canopy constraints posed by the trees within the survey area.

2.4 Limitations and Assumptions

2.4.1 No soil survey data are included in this report.

2.4.2 Indicative RPAs have been calculated for tree groups based on the maximum stem diameter taken for each group.

2.4.3 No data for individual trees within surveyed groups were recorded except where a tree was deemed notable within a group.

2.4.4 First branch height and direction were not recorded for individual trees or groups.

2.4.5 Where access was restricted, tree measurement data have been estimated to the best of the surveyor’s ability from the nearest vantage point. This has been indicated within the Tree Survey Schedule (Appendix E) with the use of an ‘#’ next to the tree number.

2.4.6 The health and condition of trees can change rapidly and all trees, even healthy ones, are at risk from unpredictable climatic and man-made events. This report is based on the observed health and structural condition of the trees at the time of survey by suitably qualified inspectors. The health, condition and safety of trees should be checked on a basis commensurate with the level of risk, as recommended in Common Sense Risk Management of Trees (National Tree Safety Group, 2011). The tree survey conducted for this report is not a tree health and safety survey and should not be used as such.

2.4.7 An RPA provides a notional circular buffer around a given stem based on the stem diameter taken at 1.5m. However, this is not necessarily representative of a tree root system e.g. the roots may extend beyond the RPA boundary on one side and remain inside it on the opposite. The root network extent is dependent on many factors including species, age, soil conditions, topography and exposure. The assessment has not taken consideration of these factors and shows RPAs as an indicative circular form as per the BS5837:2012 guidance.

Ash Dieback

2.4.8 Ash die back (ADB) also known as Chalara or Chalara dieback of ash, is a disease of ash trees caused by a fungus called *Hymenoscyphus fraxineus*. ADB causes leaf loss, crown dieback and bark lesions in affected trees. Once a tree is infected the disease is usually fatal, either directly or indirectly by weakening the tree to the point where it succumbs more readily to attacks by other pests or pathogens, especially Armillaria fungi, or honey fungus.

2.4.9 It has caused widespread damage to ash populations in continental Europe, where experience indicates that it can kill young ash trees quite quickly, while older trees can resist it for some time, until prolonged exposure or another pest or pathogen attacking them in their weakened state, eventually causes them to succumb.

2.4.10 It is becoming increasingly difficult to assign ash trees a retention category using the BS5837:2012 standards. The general advice from public bodies is to retain ash trees and see how the disease develops within the local population. However, if clear signs of ADB are found on sites, it is likely that most of the ash trees on that site will succumb in a relatively short period. It would be unreasonable to consider an ash tree a significant constraint to a site, if it is to die within a short period of time.

2.4.11 Evidence from other parts of the country suggest that infected trees rapidly lose structural integrity and are more prone to branch shedding and total collapse. Furthermore, ash, as a species is known for its inability to retain even small deadwood, which it sheds regularly as it appears in the crown.

2.4.12 The Tree Council has produced a document giving guidance on how to deal with ADB to tree owners and managers. ‘Ash dieback: an Action Plan Toolkit (Summer 2019)1’. This document gives guidance on assessing the danger posed by the trees infected by ADB. As suggested in the document, the Suffolk County Council Ash Health Assessment System2 below has been adopted. The system categorises ash trees with the symptoms in 4 categories:

- Ash Health Class (AHC) 1 – 100 – 75% Canopy healthy (Vitality Class 0)
- Ash Health Class (AHC) 2 – 75% -50% Canopy healthy (Vitality Class 1)
- Ash Health Class (AHC) 3 – 50% - 25% Canopy healthy (Vitality Class 2)
- Ash Health Class (AHC) 4 – 25% - 0% Canopy healthy (Vitality Class 3).

2.4.13 Many local authorities have concluded that any trees which fall within AHC 3 and 4 require management and it seems reasonable to follow a similar system. The priority of that management depends on the severity of the tree’s decline with trees progressing from AHC 2 into AHC 3 requiring work as part of a

[redacted]

[2] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.suffolk.gov.uk/assets/planning-waste-and-environment/suffolks-countryside-and-wildlife/Chalara-Action-Kit.pdf

program of regular works. As the trees progress (decline) towards class 4, action becomes more urgent to abate any hazard, assuming the tree is in a high risk area.

2.5 Site Observations and the Tree Survey

2.5.1 The site is located south east of Witham, Essex. The nearest address for the site is Blue Mills Hill, Witham CM8 3LH. Grid reference for the centre of the survey area is TL 83285 13570. The general location of the site is shown in Plate 1 below.

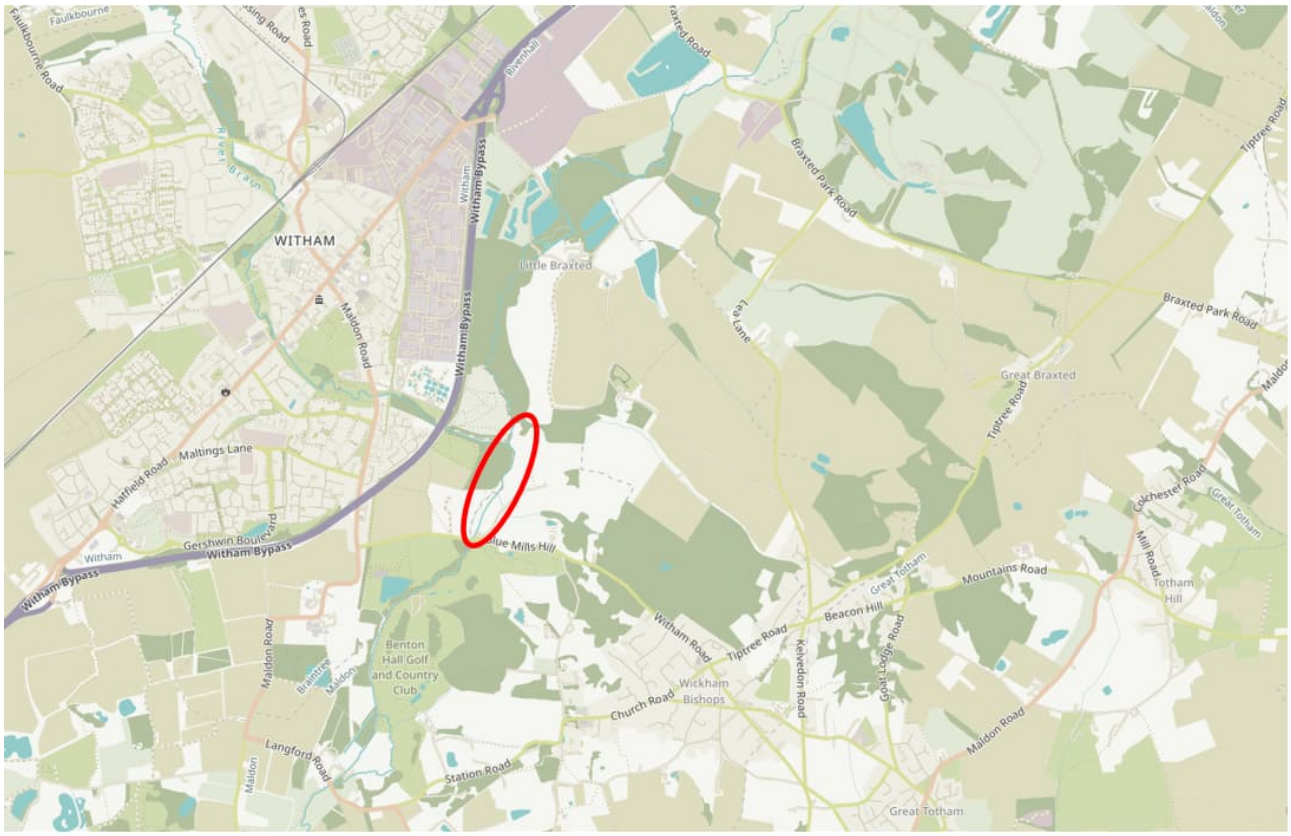


Plate Error! Use the Home tab to apply 0 to the text that you want to appear here.**- 1 General Location**

General site location, centre of the site, red circle (not to scale) © OpenStreetMap contributors

2.5.2 The survey area is made up of multiple residential land parcels, with public access limited to the existing Public Right of Way in the eastern field. The majority of the survey area is made up of various areas of woodland. Surveyors were at times escorted by the landowners, as well as appointed contactor staff members. Visibility on the day of the survey was generally clear, with limited cloud cover. The survey area has very high tree cover throughout, with a variety of species observed.

2.6 Tree Preservation Order and Conservation Areas

2.6.1 The majority of the trees in the survey area are protected by Maldon District Council Tree Preservation Order (Ref 07/22) as a woodland group. A woodland Tree Preservation Order protects all trees within the area indicated on the schedule irrespective of size, including the woodland floor regeneration.

2.6.2 There are four types of Tree Preservation Order (TPO);

- Individual trees TPO – specify the exact position, number and species of the protected trees;
- Tree Group TPO (Group TPO) – specify the exact position, number and species of the protected trees;
- Woodland (TPO) – Protect all trees within demarked area, young and old, including the woodland floor regeneration; and
- Area TPO – Protects trees within a demarked area that were present at the time the TPO was confirmed (trees younger than the date of the TPO are not covered).

2.6.3 The TPO prohibits the topping, lopping, damaging, wilful destruction and uprooting of the trees covered by the TPO without prior consent of the Local Authority before the DCO is approved. This includes any works identified in the preliminary management recommendations in the Tree Survey Schedule **Error! Reference source not found.** and any work proposed in close proximity that may have an impact on both above and/or below parts of these trees.

2.6.4 The need to obtain consent to work on TPO trees from the Local Authority is provided by the deemed consent provisions under the DCO.

2.6.5 None of the survey area is within a Conservation Area.

2.7 Ancient Woodland

2.7.1 No part of the site is listed in the Ancient Woodland Inventory, as shown on the Multi-Agency Geographical Information for the Countryside (MAGIC) website (www.magic.defra.gov.uk). This 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.

2.8 Ancient and Veteran Trees

2.8.1 The Ancient Tree Inventory (Woodland Trust, 2021) was checked on 20 February 2023 for the presence of verified veteran/ancient trees within the survey area. National Policy Statement for National Networks (Department of Transport, 2014) refers to veteran trees as "*irreplaceable habitat*" and states "*The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss* […] *Where such trees would be affected by development proposals, the applicant should set out*

proposals for their conservation or, where their loss is unavoidable, the reasons for this".

2.8.2 The assessment of potential veteran (ancient and notable) trees has been based on the guidance provided by the Ancient Tree Forum and the Woodland Trust, specifically the document *Practical Guidance, Ancient Tree Guide 4: What are ancient, veteran, and other trees of special interest, November 2008, Woodland Trust*[3] and the species-specific guidance on the Ancient Tree Inventory website[4].

2.8.3 No trees within the survey area appeared within this inventory. A single black poplar [T2077] (*Populus nigra*) was identified in the survey area which is considered veteran. While this tree has not been registered on the Ancient Tree Inventory, it is the professional view of the arboriculturalist who carried out the survey that this tree would qualify as a veteran tree under veteran tree assessment. Section 2.10.3 contains additional information regarding this tree.

2.8.4 There are also multiple pedunculate oak (*Quercus robur*) [T2045 & T2078] notable trees within the survey area that are considered to be the next generation of veteran trees. These are referred to in the tree survey schedule as transitional veterans, but for the purpose of this assessment, have not been considered as such as they do not meet the Woodland Trust criteria. These trees have had no additional RPA buffer placed upon them. Please refer to Section 2.10.5 for further information on additional notable trees.

2.9 Tree Survey Results and Plans

2.9.1 The site was visited and surveyed by a qualified arboriculturalist on Wednesday 15 and Thursday 16 February 2023. The full findings of the tree survey are presented in the Tree Survey Schedule in Appendix E.

2.9.2 Table 1, below, summarises the total number of trees surveyed and their relative BS5837:2012 categories.

Table 1 - Summary of arboricultural features included in the survey

BS5837:2012 Category	Trees	Tree Groups	SUB TOTALS
A	5	0	**5**
B	63	6	**69**
C	19	7	**26**
U	2	0	**2**
SUB TOTALS	**89**	**13**	**102**

- 'A' grade trees are of high quality and value and should be retained.

[3] [redacted]

[4] [redacted]

- ‘B’ grade trees are of moderate quality and value and should be considered for retention where possible, although care should be taken to avoid misplaced retention. Any scheme should consider the retention and protection of trees, but also the tree’s future growth.
- The ‘C’ grade trees are of low quality and value and should not place a constraint on the proposals.
- From an arboricultural point of view, the ‘U’ grade trees cannot realistically be considered for retention as a living tree in the context of the current land use due to their low life expectancy of less than 10 years in their current poor condition.

2.10 Tree Observations

2.10.1 While the purpose of the visit was to collect further information about specific trees within the woodland, it should be noted that regardless of the location of those trees surveyed individually and their resultant category grading, the area surveyed is formed of cohesive woodland groups that are Category A quality under BS5837:2012 categorisation. The only exception to this is a land parcel to the north of the survey area, where multiple collapsed willows are located (G2110 & G2103). This entire area has been assessed as Category C, as it was unmanaged, and contained trees universally of Category C status. This area contrasted with the managed formal woodland elsewhere within the survey area.

2.10.2 An important component of a high-quality, biodiverse woodland is trees of varying ages and species as well as declining and dead trees (with a figure of around 10% often quoted as a desirable amount for the latter). While such trees individually assessed under BS5837:2012 may only warrant a C or U Category as part of the woodland ecosystem they are vitally important, and this should be considered when reviewing individual tree categories within the larger woodland groups. Similarly, BS5837:2012 recommends trees with a stem diameter at breast height (dbh) of 150mm or less should be given a C category, but such trees in woodlands form a vital cohort of future replacement trees or components of the understory and shrub layer found in well-structured woodland. This report has followed the BS5837:2012 guidance for assessing individual trees.

2.10.3 A potential veteran black poplar (T2077) is located on the margins on the Blackwater River. Although not recorded on the Ancient Tree Inventory, the survey identifies that this tree qualifies as a veteran tree under a veteran tree assessment (as specified by the Woodland Trust). For this reason, the additional RPA has been applied to this feature, as per the methodology in the Arboricultural Impact Assessment submitted as Appendix 8.4 in the Environmental Statement [APP-122] and Natural England and Forestry Commission standing advice.

2.10.4 Black poplar can be difficult to identify successfully due to a large number of hybridisations that occur. However it is understood that there are two black poplar (*Populus nigra betulifolia*) in the vicinity one of which was identified as such by Ken Adam BSBI (Botanical Society of Britain and Ireland) through DNA

testing[5]. Both trees are similar in age class, structure, and physiology. With consideration of this, and their relative proximity to one another, it has been assumed that both trees are black poplar.

2.10.5 An informal boundary runs north to south through the woodland. It is understood that the existing stock fence is not representative of exact boundaries, and that it is marked more accurately by the mature row of hornbeam (*Carpinus betulus*), ash (*Fraxinus excelsior)* and oak (*Quercus* sp.) that are sporadically placed along this boundary line. These notable mature features are surrounded with early mature broadleaf species, and as such are in finer structural condition than they otherwise may have been without the additional woodland planting. It is considered that the surrounding woodland has offered improved growing conditions and shelter to these more established boundary features.

2.11 Summary

2.11.1 The information supplied in this section may be used to inform design for any planned works within the survey area concerned with the gas main diversion.

2.11.2 No part of the site is listed in the Ancient Woodland Inventory.

2.11.3 A tree within the study area is assumed to be a black poplar (T2077) and is considered a veteran tree under veteran tree assessment methodologies. At the time of writing this report, this tree is not indicated on the Woodland Trust's Ancient Tree Inventory. Section 2.8 and 2.10 contain additional information regarding this tree.

2.11.4 The survey has identified five individual Category A individual trees, 63 Category B individual trees and 19 Category C individual trees. Whilst trees have been singled out and given individual categories, they are components of a managed woodland. As a cohesive group, this woodland is Category A (with individuals, irrespective of category important elements within) and is considered a high-quality arboricultural feature that should be fully considered within design. It should be noted that dead and declining trees are an important component of a resilient and biodiverse woodland.

2.11.5 The majority of the trees in the study area are protected by Maldon District Council Tree Preservation Order (Ref 07/22) as a woodland group. A woodland Tree Preservation Order protects all trees within the area indicated on the schedule irrespective of size, including the woodland floor regeneration.

2.11.6 The design team will maintain contact with the project arboriculturist throughout the planning and design stage for the relevant arboricultural constraints identified in this document to be considered by the emerging designs and to be addressed at the appropriate point.

2.11.7 Impacts to the trees, as outlined within Appendix 8.4 Arboriculture Impact Assessment of the Environmental Statement [APP-122] could alter with any changes to the current design proposals. Tree impacts will therefore be

[5] [redacted]

reviewed as the design process progresses with all relevant parties informed of the changes, as appropriate.

2.11.8 The following commitments within the Register of Environmental Actions and Commitments, appended to the first iteration of the First Iteration Environmental Management Plan [APP-185] are relevant:

2.11.9 Commitment LV4 states *'Existing vegetation within the Order Limits including temporary works areas would be retained as far as reasonably practicable. Particular attention would be given to the retention of mature vegetation including the following, which would be retained in accordance with, as a minimum, the Retained and Removed Vegetation Plans [APP-035 and AS-017]. Vegetation to be removed is shown on the same plan.*

- *Ancient, veteran and notable trees (both verified and potential)*
- *Trees subject to tree preservation orders*
- *Specimen trees*
- *Category A and B trees*
- *Important hedgerows*
- *Ancient woodlands*

All trees to be retained would be protected throughout the construction period in accordance with BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.'

2.11.10 Commitment LV5 states *'Works to Tree Preservation Orders, veteran, ancient and notable trees would be supervised by the Ecological Clerk of Works (ECoW) and supported by an experienced arboriculturist. In the event tree canopy pruning is required to facilitate the works, this would be undertaken by qualified and competent staff working to BS 3998:2010 Tree work – Recommendations.'*

2.11.11 Commitment LV6 states *'An Arboricultural Method Statement and Tree Protection Plan would be prepared during the detailed design phase, refined following final design agreement and in place prior to works affecting trees commencing and appended to the EMP. The Arboricultural Method Statement and Tree Protection Plan would include areas of special measures to protect and retain features that would be subject to encroachment and localised removal. This would be based on the special measure areas, construction exclusion zones and outline tree protection measures presented within the Arboricultural Impact Assessment (Appendix 8.4 of the Environmental Statement [APP-122]).'* The information contained in this report will be used to inform the production of that document.

3 References

3.1.1 Woodland Trust. 2021. Ancient Tree Inventory. [online] Available at: <[redacted]> [Accessed 21 Feb 2023].

3.1.2 British Standards Institution. 2010. *BS 3998:2010. Trees Work – Recommendations.* London: British Standards Institution. 3rd ed. [hard copy] London: British Standards Institution.

3.1.3 British Standards Institution. 2012. *BS 5837:2012. Trees in relation to design, demolition and construction – Recommendations.* 4th ed. [ebook] London: British Standards Institution. [online] Available at: https://beta.bathnes.gov.uk/sites/default/files/2020-01/BS5837%202012%20Trees.pdf [Accessed 1 September 2021].

3.1.4 Lonsdale, D., 1999. *Principles of tree hazard assessment and management*. London: TSO.

3.1.5 Mattheck, C. and Breloer, H., 1994. *The body language of* trees. London: Stationery Office.

3.1.6 Ministry of Housing, Communities & Local Government. 2021. National Planning Policy Framework. [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf [Accessed 13 October 2021]

3.1.7 National Tree Safety Group. 2011. Common sense risk management of trees. Edinburgh: Forestry Commission.

Appendix A. Survey Methodology

Parameters Recorded	Collection Methodology
Tree location	Handheld tablet with GPS functionality.
Crown spread, clearance and first branch break/direction	Metres measured with laser measure, direction with compass
Height and diameter	Clinometer and diameter tape at 1.5 meters above ground
Structural and physiological condition	External visual tree assessment (from the ground) – The Body Language of Trees, Research for Amenity Trees No 4 (Mattheck and Breloer, 1994)
Root Protection Area (RPA)	Calculation method in BS 5837:2012 (British Standards Institution, 2012)

Appendix B. Comprehensive Glossary of Arboricultural Terms

- AIA: Arboricultural Impact Assessment.
- AMS: Arboricultural Method Statement.
- Ancient tree: An ancient tree is exceptionally valuable attributed with great age/size/cultural heritage/biodiversity value as a result of significant wood decay and the habitat created from the ageing process. All ancient trees are veteran trees with very few trees of any species reaching the ancient life-stage.
- Bark: A term usually applied to all the tissues of a woody plant lying outside the vascular cambium.
- Buttress zone: The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of their junction.
- Canker: A lesion formed by the death of bark and cambium often due to fungal or bacterial infection.
- Condition: An indication of the physiological vitality of the tree. Where the term ‘condition’ is used in a report, it should not be taken as an indication of the stability of the tree.
- Conservation Area: A designated area that requires notice (currently six weeks) to be given to the local planning authority prior to the commencement of any tree works.
- Construction exclusion zone: Area based on the Root Protection Area (in square metres) to be protected during development, by the use of barriers and/or ground protection.
- Crown/Canopy: The main foliage bearing section of the tree.
- Crown lifting: A term used to describe the removal of limbs and small branches to a specified height above ground level.
- Deadwood: Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard.
- Dieback: The death of parts of a woody plant, starting at shoot-tips or root-tips.

- Diameter at Breast Height (DBH): Stem diameter measured at a height of 1.5 metres (UK) or the nearest measurable point. Where measurement at a height of 1.5 metres is not possible, another height may be specified.
- Habit: The overall growth characteristics, shape of the tree and branch structure.
- Hazard beam: An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting.
- Minor deadwood: Dead wood of a diameter less than 25mm and or unlikely to cause significant harm or damage upon impact with a target beneath the tree.
- Notable: Notable trees are usually mature trees which may stand out in the local environment because they are large in comparison with other trees around them
- Pollarding: is the removal of the tree canopy, back to the stem or primary branches. Pollarding may involve the removal of the entire canopy in one operation or may be phased over several years. The period of safe retention of trees having been pollarded varies with species and individuals. It is usually necessary to re-pollard on a regular basis, annually in the case of some species.
- Primary branch: A major branch, generally having a basal diameter greater than 0.25 x stem diameter.
- Pruning: The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs.
- Root protection area (RPA): An area of ground surrounding a tree that contains sufficient rooting volume to ensure the tree's survival, calculated with reference to Table 2 of BS5837 (2005).
- Snag/stub: In woody plants, a portion of a cut or broken stem, branch or root which extends beyond any growing-point or dormant bud; a snag usually tends to die back to the nearest growing point.
- Stem/s: The main supporting structure/s, from ground level up to the first major division into branches.
- Topping: In arboriculture it is the removal of the crown of a tree, or of a major proportion of it.
- Tree Preservation Order (TPO): Is an order made by the local authority and placed upon individual trees, groups of trees or areas of trees. The local authority must usually grant permission prior to any works undertaken to affected trees.

- Veteran tree: A loosely defined term for an old specimen that is of interest biologically, culturally or aesthetically because of its age, size or condition and which has usually lived longer than the typical upper age range for the species concerned.

Appendix C. Cascade Chart of Tree Quality Assessment (taken from BS5837:2012)

Category and definition	Criteria (including subcategories where appropriate)		
Trees unsuitable for retention (see note)			
Category U			
Those 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 that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline Trees infected with pathogens of significance to health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality. NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve.		
Trees to be considered for retention			
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values including conservation**
Category A			
Trees of high quality with an remaining estimated life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran or semi-formal arboricultural trees or wood-pasture)
Category B			
Trees of moderate quality with an remaining estimated life expectancy of at least 20 years	Trees that might be included in Category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such as they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	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	Trees with material conservation or other cultural value
Category C			
Trees of low quality with an remaining estimated life expectancy of at least 10 years, or younger trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value

Appendix D. Tree Survey Schedule Key

Column Header	Explanation
Tree ID	T – Tree G – Group/Hedgerow/Woodland
Diameter at breast height (DBH)	Tree stem diameter measured at 1.5m from the ground. This reported figure relates to either single stemmed trees or the calculated DBH for multi-stemmed trees. In some instances, DBH will be taken from a different height as specified in 'Observations'.
Canopy spread – N E S W	Canopy extents from main stem of individual tree will be shown using cardinal points in metres i.e. N (north) 7, E (east) 6, S (south) 5, W (west)7. Single largest canopy extent reported for groups/woodland/hedgerows.
Age Class	Young (Y) – A tree in the first quarter of its life span. Semi Mature (SM) – A tree in the latter stages of its first quarter, well established. Early Mature (EM) – A tree halfway through its life span, significant further growth potential. Mature (M) – A tree at or near its potential maximum size which is still growing vigorously in its third quarter of life span. Over Mature (OM) – A tree in decline in its final quarter of life span. Potential Veteran (V) – A tree which, because of its age, size, and condition, is of exceptional biodiversity, cultural or heritage value
Structural condition (S)	Good (G) - No signs of decay or structural weakness. Fair (F) - Minor defects not causing structural weakness. Poor (P) - Severe decay in the main stem or branches/structurally weak.
Physiological condition (P)	Good (G) - Showing no adverse risk of failure/defects.

Column Header	Explanation
	Fair (F) - Showing minor signs of deterioration. Poor (P) - Unlikely to recover to a good condition.
High Value Tree Status	Ancient woodland (AW) - Areas of woodland that have persisted since 1600 in England. […] They are relatively undisturbed by human development. As a result, they are unique and complex communities of plants, fungi, insects and other microorganisms. Potential ancient (PA) – A tree that can be argued would meet the criteria to be added to the Ancient Tree Inventory database under assessment. These trees are exceptionally valuable attributed with great age/size/cultural heritage/biodiversity value as a result of significant wood decay and habitat created from the ageing process. All ancient trees are veteran trees with very few trees of any species reaching the ancient life-stage. Potential veteran (PV) - A tree which can be argued would meet the criteria to be added to the Ancient Tree Inventory database under assessment, because of its age, size, and condition, is of exceptional biodiversity, cultural or heritage value. Verified veteran (VV) - A tree that has been verified by the Ancient Tree Inventory, because of its age, size, and condition. The tree is of exceptional biodiversity, cultural or heritage value.
Estimated Remaining Contribution (ERC)	<10 - Less than 10 years of normal life expectancy remaining. 10+ - Between 10 and 20 years of normal life expectancy remaining. 20+ - Between 20 and 40 years of normal life expectancy remaining. 40+ - Tree would normally expect to live for more than 40 more years.
Root Protection Area (RPA)	Root Protection Area dimensions as calculated using formulae in BS5837:2012. Applied as either radially from an individual tree stem (individually surveyed trees) or as an offset from the canopy extents of a collective feature (tree group, hedgerow, or woodland).

Appendix F. Tree Survey Schedule

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2003	Common alder (Alnus glutinosa)	17	100	4	4	4	4	EM	Fair	Fair		Condition considered typical of species and age. Die-back – minor.	20+	C3	1.2
T2004	Willow sp. (Salix sp.)	13	707	7	7	0	0	EM	Fair	Fair		Broken branch. Deadwood – Minor. Shedding limb / limbs - Minor	40+	B3	8.5
T2005	Willow sp. (Salix sp.)	7	100	5	5	5	5	Y	Fair	Fair		Condition considered typical of species and age	20+	C2	1.2
T2006	Willow sp. (Salix sp.)	13	707	7	7	0	0	EM	Fair	Fair		Condition considered typical of species and age. Bark wound – Minor. Shedding limb / limbs - Historic	40+	B3	8.5
T2007	Willow sp. (Salix sp.)	14	460	7	7	7	7	M	Fair	Fair		Condition considered typical of species and age. Decay – Minor. Bark wound - Minor	40+	B2	5.5

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2008	Willow sp. (Salix sp.)	3	100	1	1	1	0	EM	Fair	Fair		Condition considered typical of species and age	20+	C3	1.2
T2009	Willow sp. (Salix sp.)	16	650	7	7	7	7	M	Fair	Fair		Condition considered typical of species and age. Bark wound – Minor. Bark exudation. Deadwood - Minor	40+	B3	7.8
T2010	Willow sp. (Salix sp.)	15	450	6	6	6	6	EM	Fair	Fair		Condition considered typical of species and age. Deadwood – Minor.	20+	C3	5.4
T2011	Willow sp. (Salix sp.)	9	500	6	6	6	6	EM	Fair	Fair		Condition considered typical of species and age. Bark wound – Minor. Bark exudation. Deadwood - Minor	40+	B2	6.0
T2012	Silver birch (Betula pendula)	13	250	4	4	4	4	EM	Fair	Fair		Condition considered typical of species and age. Decay – Minor. Deadwood - Minor	20+	C2	3.0

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2013	Common ash (Fraxinus excelsior)	9	350	4	4	4	4	EM	Fair	Fair		Condition considered typical of species and age. Deadwood - Minor	20+	C2	4.2
T2014	Willow sp. (Salix sp.)	9	500	5	5	5	5	EM	Fair	Fair		Stems - Co-dominant. Bark wound – Mammal. Condition considered typical of species and age	40+	B3	6.0
T2015	Willow sp. (Salix sp.)	9	500	6	6	6	6	EM	Fair	Fair		Condition considered typical of species and age. Deadwood - Minor	40+	B2	6.0
T2016	Willow sp. (Salix sp.)	9	500	6	6	6	6	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	6.0
T2017	Swamp cypress (Taxodium distichum)	8	100	4	4	4	4	SM	Fair	Fair		Planted by landowner as pair. Slightly suppressed by adjacent Willow. Condition considered typical of species and age	40+	B2	1.2

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2018	Common hawthorn (Crataegus monogyna)	4	150	2	2	2	2	EM	Fair	Fair		Condition considered typical of species and age. Bark wound - Minor	20+	C2	1.8
T2019	Willow sp. (Salix sp.)	15	450	7	7	7	7	EM	Poor	Poor		Tree in mass decline.	< 10	U	5.4
T2020	Common alder (Alnus glutinosa)	14	650	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B3	7.8
T2021	Contorted Willow (Salix matsudana)	10	400	6	6	6	0	SM	Fair	Fair		Stem bifurcates at ground level. Deadwood – Minor. Condition considered typical of species and age	40+	B2	4.8
T2022	Goat Willow sp. (Salix sp.)	5	400	5	5	5	5	SM	Fair	Fair		Historic stem removal over path.	20+	C2	4.8

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2023	Common ash (Fraxinus excelsior)	14	800	7	7	7	7	M	Fair	Fair		Condition considered typical of species and age. Ash Health Class 1 (100% - 75% Canopy)	40+	B3	9.6
T2024	Common ash (Fraxinus excelsior)	14	800	7	7	7	7	M	Fair	Fair		Condition considered typical of species and age. Ash Health Class 1 (100% - 75% Canopy)	40+	B3	9.6
T2025	Willow sp. (Salix sp.)	5	250	4	4	4	4	SM	Fair	Fair		Dead tree	20+	C3	3.0
T2026	English oak (Quercus robur)	14	800	7	7	7	7	M	Fair	Fair		Condition considered typical of species and age	40+	B3	9.6
T2027	Common ash (Fraxinus excelsior)	21	860	6	6	6	6	M	Fair	Fair		Fused limb / limbs. Shedding limb / limbs – Minor. Die-back – minor. Ash Health Class 1 (100% - 75% Canopy)	40+	B3	10.3

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2028	Elder (Sambucus nigra)	3	100	2	2	2	2	Y	Fair	Fair		Condition considered typical of species and age	20+	C2	1.2
T2029	Willow sp. (Salix sp.)	11	420	5	5	5	5	EM	Fair	Fair		Condition considered typical of species and age	40+	B3	5.0
T2030	Willow sp. (Salix sp.)	7	200	5	5	5	5	M	Fair	Fair		Condition considered typical of species and age. Die-back - Minor	40+	B3	2.4
T2031	Willow sp. (Salix sp.)	11	450	4	4	4	4	SM	Fair	Fair		Condition considered typical of species and age	20+	C3	5.4
T2032	Common ash (Fraxinus excelsior)	11	240	5	5	5	5	EM	Fair	Fair		Condition considered typical of species and age	20+	C2	2.9

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2033	English oak (Quercus robur)	14	680	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B3	8.2
T2034	English oak (Quercus robur)	14	240	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	20+	C2	2.9
T2035	English oak (Quercus robur)	14	240	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	20+	C2	2.9
T2036	Willow sp. (Salix sp.)	8	230	5	5	5	5	SM	Fair	Fair		Condition considered typical of species and age	20+	C2	2.8
T2037	Willow sp. (Salix sp.)	8	550	5	5	5	5	SM	Fair	Fair		Condition considered typical of species and age	20+	C2	6.6

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2038	English oak (Quercus robur)	14	680	7	7	7	7	M	Fair	Fair		Condition considered typical of species and age. Deadwood – Minor. Bark wound – Minor.	40+	B3	8.2
T2039	Willow sp. (Salix sp.)	13	920	9	9	9	9	M	Fair	Fair		Deadwood – Minor. Condition considered typical of species and age	40+	B3	11.0
T2040	English oak (Quercus robur)	18	800	464	4	4	4	M	Fair	Fair		Deadwood – Minor. Access to inspect base - Restricted / obscured	40+	B2	9.6
T2041	English oak (Quercus robur)	16	778	6	6	6	6	M	Fair	Fair		Condition considered typical of species and age. Deadwood – Minor. Bark wound – Minor.	40+	B1	9.3
T2042	Willow sp. (Salix sp.)	14	550	5	5	5	5	SM	Fair	Fair		Condition considered typical of species and age	20+	C2	6.6

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2043	English oak (Quercus robur)	14	750	7	7	6	6	M	Fair	Fair		Condition considered typical of species and age. Bark wound – Minor.	40+	B2	9.0
T2044	English oak (Quercus robur)	16	495	4	4	4	4	M	Fair	Fair		Condition considered typical of species and age	40+	B1	5.9
T2045	English oak (Quercus robur)	23	1080	9	9	9	9	M	Fair	Fair		Transitional Veteran and Notable tree. Root damage - Mammal. Decay - Minor. Form - Spreading crown. Deadwood – Major. transitional veteran. Stag-headed crown. Good reaction wood / Adaptive growth. Shedding limb / limbs – Recent. Hazard beam crack	40+	A3	13.0
T2046	English oak (Quercus robur)	14	750	7	7	6	6	EM	Fair	Fair		Slight lean to west. Condition considered typical of species and age	40+	B2	9.0

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2047	English oak (Quercus robur)	14	400	4	4	4	4	EM	Fair	Fair		Condition considered typical of species and age.	40+	B2	4.8
T2048	Scots pine (Pinus sylvestris)	7	250	6	6	6	6	SM	Fair	Fair		Condition considered typical of species and age	40+	B1	3.0
T2049	English oak (Quercus robur)	10	500	5	5	5	5	EM	Poor	Poor		Dead tree	< 10	U	6.0
T2050	Scots pine (Pinus sylvestris)	7	250	6	6	6	6	SM	Fair	Fair		Condition considered typical of species and age	40+	B1	3.0
T2051	Willow sp. (Salix sp.)	14	550	5	5	5	5	SM	Fair	Fair		Condition considered typical of species and age	20+	C2	6.6

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2052	Hornbeam (Carpinus betulus)	13	610	5	2	6	6	M	Fair	Fair		Notable tree. Remnant hornbeam on stock fence line. Deadwood- Moderate. Phototrophic growth observed.	40+	A3	7.3
T2053	Willow sp. (Salix sp.)	14	550	5	5	5	5	SM	Fair	Fair		Condition considered typical of species and age	20+	C2	6.6
T2054	English oak (Quercus robur)	14	680	7	7	7	7	M	Fair	Fair		Condition considered typical of species and age	40+	B3	8.2
T2055	English oak (Quercus robur)	14	700	5	7	7	7	SM	Fair	Fair		Condition considered typical of species and age	40+	B2	8.4
T2056	English oak (Quercus robur)	14	760	7	7	7	7	M	Fair	Fair		Condition considered typical of species and age	40+	B2	9.1

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2057	English oak (Quercus robur)	14	450	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age. Bark wound – Minor.	40+	B2	5.4
T2058	Field maple (Acer campestre)	16	647	6	6	6	6	M	Fair	Fair		Notable tree. Mature field maple on fence line. Potentially part of original hedge features.	40+	A3	7.8
T2059	English oak (Quercus robur)	14	450	7	7	7	7	EM	Fair	Fair		Ivy or climbing plant. Condition considered typical of species and age	40+	B2	5.4
T2060	English oak (Quercus robur)	14	500	7	7	7	7	EM	Fair	Fair		Ivy or climbing plant. Condition considered typical of species and age	40+	B2	6.0
T2061	English oak (Quercus robur)	14	450	4	4	4	4	EM	Fair	Fair		Dead tree	40+	B2	5.4

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2062	Scots pine (Pinus sylvestris)	7	250	6	6	6	6	SM	Fair	Fair		Condition considered typical of species and age	40+	B1	3.0
T2063	Scots pine (Pinus sylvestris)	7	250	6	6	6	6	SM	Fair	Fair		Condition considered typical of species and age	40+	B1	3.0
T2064	English oak (Quercus robur)	14	500	7	7	7	7	EM	Fair	Fair		Ivy or climbing plant. Condition considered typical of species and age	40+	B2	6.0
T2065	Hornbeam (Carpinus betulus)	13	450	4	4	4	4	EM	Fair	Fair		Notable tree. Condition considered typical of species and age	40+	B2	5.4
T2066	Willow sp. (Salix sp.)	18	1500	7	7	7	7	M	Fair	Fair		Deadwood- Moderate.	40+	B3	18.0

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2067	Hornbeam (Carpinus betulus)	14	636	6	6	6	6	M	Fair	Fair		Notable tree. Condition considered typical of species and age	40+	B1	7.6
T2068	English oak (Quercus robur)	14	450	4	4	4	4	EM	Fair	Fair		Dead tree	40+	B1	5.4
T2069	English oak (Quercus robur)	14	540	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	6.5
T2070	English oak (Quercus robur)	14	200	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	2.4
T2071	English oak (Quercus robur)	14	200	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	2.4

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2072	Hornbeam (Carpinus betulus)	18	595	7	8	7	7	EM	Fair	Fair		Notable tree. Competition - Adjacent trees. Leaning trunk. Deadwood-Moderate.	40+	B2	7.1
T2073	English oak (Quercus robur)	14	490	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	5.9
T2074	English oak (Quercus robur)	14	600	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	7.2
T2075	English oak (Quercus robur)	14	530	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	6.4
T2076	English oak (Quercus robur)	14	450	7	7	7	7	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	5.4

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2077	Black poplar (Populus nigra)	17	1360	14	14	9	9	V	Fair	Fair	PV	Potential veteran. Adventitious roots – Aerial. Adventitious roots – Basal. End-loaded limb / limbs. Shedding limb / limbs – Recent. Subsiding limb / limbs '. Tree has self braced some heavy loaded limbs. Aerial and standing deadwood. Large cavity at base being used by otters. Desiccated fungal brackets at basal cavity. Hazard beam crack	40+	A3	16.3
T2078	English oak (Quercus robur)	22	1170	9	9	9	9	M	Fair	Fair		Transitional Veteran and notable tree. Root damage - Mammal . Decay - Minor . Form - Spreading crown . Deadwood – Major. Stag-headed crown. Good reaction wood / Adaptive growth. Shedding limb / limbs- Historic. Measured at 1m height due to crown break.	40+	A1	14.0

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2079	Common ash (Fraxinus excelsior)	14	950	7	7	7	7	M	Fair	Fair		Located behind stock fence, limited view of tree and canopy.	40+	B2	11.4
T2080	English oak (Quercus robur)	17	300	5	5	5	5	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	3.6
T2081	English oak (Quercus robur)	17	300	5	5	5	5	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	3.6
T2082	English oak (Quercus robur)	17	300	5	5	5	5	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	3.6
T2083	English oak (Quercus robur)	17	495	5	5	5	5	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	5.9

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2084	English oak (Quercus robur)	17	350	5	5	5	5	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	4.2
T2085	English oak (Quercus robur)	14	350	5	5	5	5	EM	Poor	Poor		Dead tree.	< 10	U	4.2
T2086	English oak (Quercus robur)	17	500	5	5	5	5	EM	Fair	Fair		Condition considered typical of species and age	40+	B2	6.0
T2087	Common ash (Fraxinus excelsior)	18	440	6	6	6	6	EM	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B2	5.3
T2088	English oak (Quercus robur)	19	600	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B2	7.2

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2089	English oak (Quercus robur)	19	600	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B3	7.2
T2090	Willow sp. (Salix sp.)	11	500	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B2	6.0
T2091	Field maple (Acer campestre)	11	500	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B2	6.0
T2092	English oak (Quercus robur)	19	600	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B2	7.2

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2093	English oak (Quercus robur)	19	600	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B3	7.2
T2094	English oak (Quercus robur)	19	600	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B3	7.2
T2095	English oak (Quercus robur)	19	600	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B3	7.2
T2096	English oak (Quercus robur)	19	600	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B3	7.2

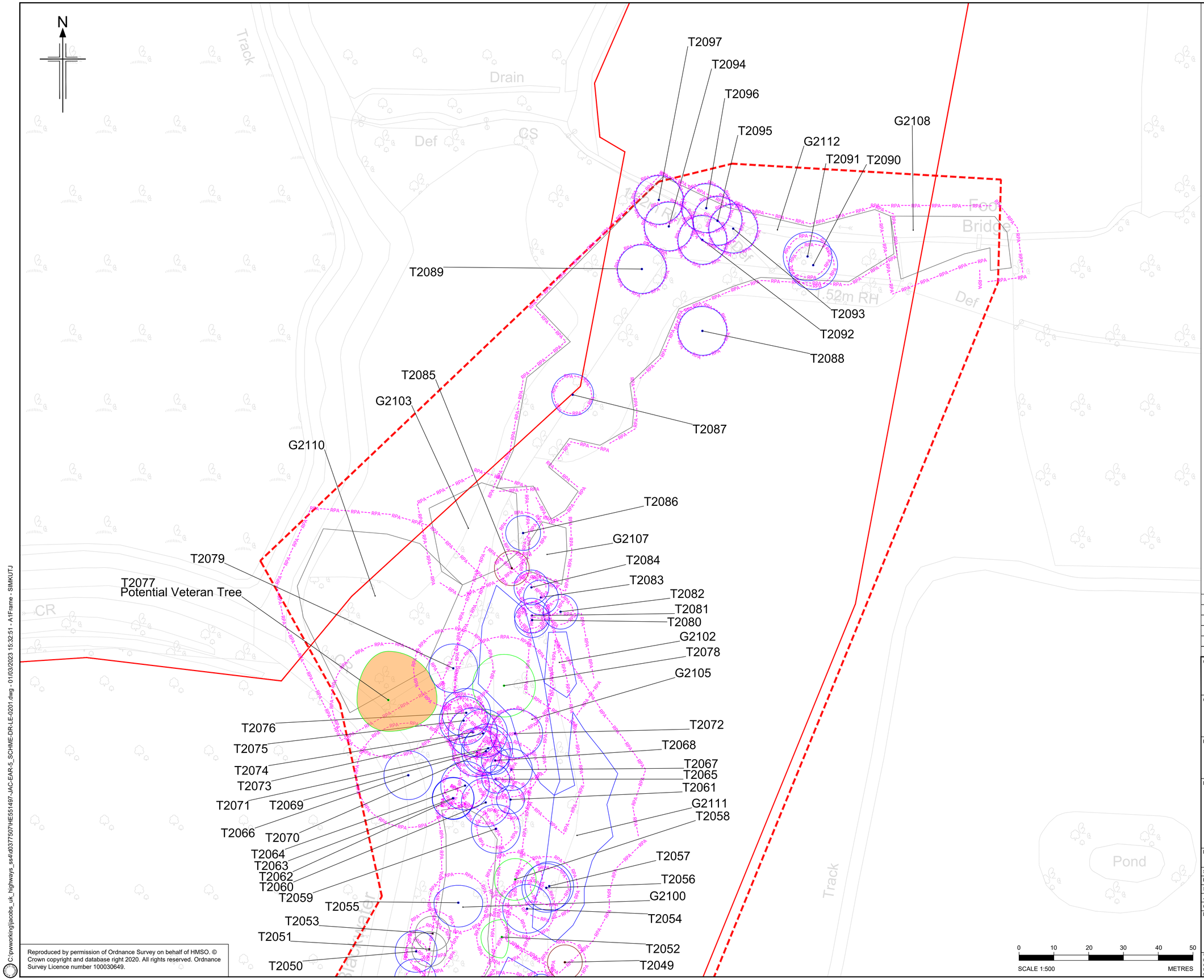
Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
T2097	English oak (Quercus robur)	19	600	7	7	7	7	M	Fair	Fair		Set with dense blackthorn mass. No access to stems. Tree has been plotted using National Tree Map data points. All measurements estimated.	40+	B3	7.2
G2100	Hazel sp. (Corylus sp.) Hornbeam (Carpinus betulus) English oak (Quercus robur), Common hawthorn (Crataegus monogyna) Common alder (Alnus glutinosa)	7	110	3	3	3	3	Y	Fair	Fair		Woodland group of similar size and age class. Average DBH taken majority of scrub species stems undersized	10+	C2	1.3
G2101	Blackthorn (Prunus spinosa) willow (Salix sp.)	13	350	4	4	4	4	EM	Fair	Fair		Dense scrub area with no access to trees, which have been individually surveyed from distance.	20+	B3	4.2

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
G2102	English oak (Quercus robur)	14	440	5	5	5	5	EM	Fair	Fair		Collection of oaks within close proximity to one another within woodland	20+	B2	5.3
G2103	Blackthorn (Prunus spinosa) Goat willow (Salix caprea)	8	250	4	4	4	4	SM	Fair	Fair		Partially collapsed riparian woodland group. Lower value dense riparian scrub to rear of land parcel	10+	C2	3.0
G2104	English oak (Quercus robur) Hornbeam (Carpinus betulus) Elder (Sambucus nigra)	16	350	6	6	6	6	SM	Fair	Fair		Woodland group of similar size and age class. Average dbh taken majority of scrub species stems undersized	20+	B3	4.2
G2105	English oak (Quercus robur)	16	550	7	7	7	7	EM	Fair	Fair		Oak group located near stock fence on boundary line.	20+	B2	6.6
G2106	English oak (Quercus robur)	14	450	6	6	6	6	EM	Fair	Fair		Characteristics typical of age and species.	20+	B2	5.4

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
G2107	Elder (Sambucus nigra) Goat willow (Salix caprea)	4	120	2	2	2	2	Y	Fair	Fair		Scrub group.	10+	C2	1.4
G2108	Blackthorn (Prunus spinosa) Common hawthorn (Crataegus monogyna) English oak (Quercus robur)	9	260	4	4	4	4	EM	Fair	Fair		average DBH taken. Field boundary vegetation. Sparse in places	10+	C2	3.1
G2109	Elder (Sambucus nigra) Blackthorn (Prunus spinosa)	11	340	5	5	5	5	EM	Fair	Fair		Woodland group of similar size and age class. Average DBH taken majority of scrub species stems undersized	10+	C2	4.1
G2110	Willow (Salix sp.)	11	480	5	5	5	5	EM	Fair	Fair		Collapsed low grade willow group. Limited access due to flooding. Saturated ground throughout.	10+	C3	5.8

Tree Ref. No.	Species	Height	DBH (mm)	N	E	S	W	Age class	Struc cond.	Physiol cond.	High Value Tree Status	General Observations and Comments	ERC	Category grading	RPA radius (m)
G2111	English oak (Quercus robur)	13	600	7	7	7	7	M	Fair	Fair		Woodland group of similar size and age class. Average DBH taken majority of scrub species stems undersized. Shelter belt tree showing signs of photographic growth	20+	B2	7.2
G2112	Blackthorn (Prunus spinosa)	8	75	1	1	1	1	Y	Fair	Fair		Most stems undersized but obscuring individual trees within.	10+	C2	0.9

Appendix G. Tree Constraints Plan



LEGEND

- Order Limits
- Agreed Study Area
- Individual Tree Stem
- Category A Canopy
- Category B Canopy
- Category C Canopy
- Category U Canopy
- Root Protection Area
- Potential Veteran / Ancient Tree
- Verified Veteran / Ancient Tree

NOTES:

1. The original of this drawing was produced in colour - a monochrome copy should not be relied upon.
2. Tree locations are determined on site using digital survey software and hardware which use a combination of aerial imagery and the devices inbuilt Global Position System (GPS). Trees plotted with the internal GPS can be assumed to have an accuracy of +/- 5 m. This drawing should be reconciled with a topographic survey once available.
3. Category grading of Individual Tree Stems is indicative of actual size of stem surveyed on site. In some instances, the category grading of stems may not always be visible due to scaling.
4. Refer to arboricultural report produced by Jacobs titled TR01600/EXAM/9.30.
5. Check all dimensions on site.
6. Do not scale from this drawing.
7. Report any discrepancies and omissions to Jacobs.

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	01/03/23	SUITABLE FOR INFORMATION	JS	PS	PS	SL

Contractor: COSTAIN

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www.jacobs.com

Client: national highways

Project: REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing title: SUPPLEMENTARY TREE CONSTRAINTS PLAN SHEET 1 0F 2

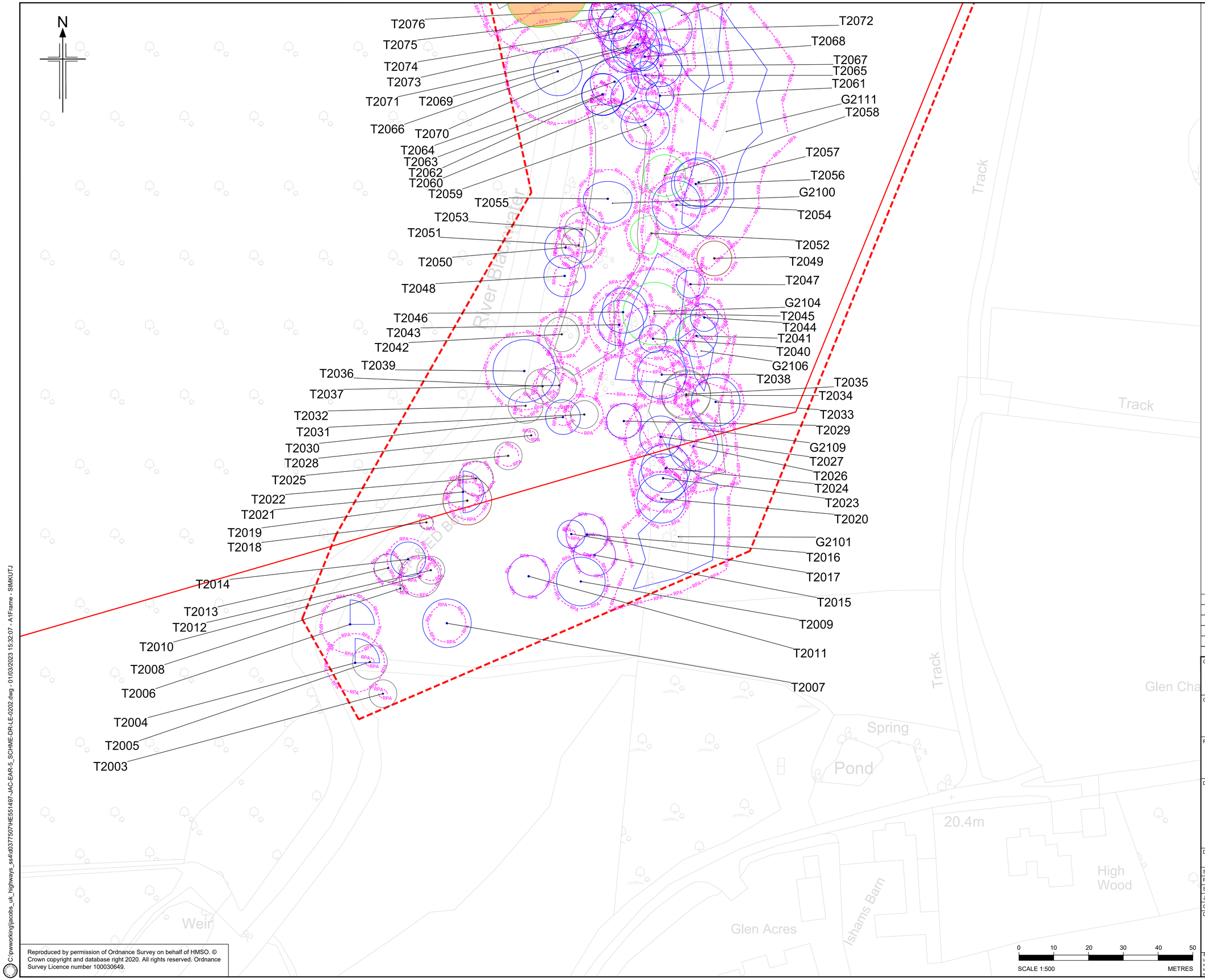
Drawing status: S2 - SUITABLE FOR INFORMATION

State Code	Construction Preparations
Project Stage	PCF 4
Scale	1:500
Jacobs No.	
Client no.	HE551497

DO NOT SCALE

Rev P01

Drawing number
PIN | Originator | Volume
HE551497 - JAC - EAR -
Location | Type | Role | Number
5_SCHME -DR-LE-0201



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0 10 20 30 40 50

SCALE 1:500 METRES

LEGEND

- Order Limits
- Agreed Study Area
- Individual Tree Stem
- Category A Canopy
- Category B Canopy
- Category C Canopy
- Category U Canopy
- Root Protection Area
- Potential Veteran / Ancient Tree
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NOTES:

1. The original of this drawing was produced in colour - a monochrome copy should not be relied upon.
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Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Appr'd
P01	01/03/23	SUITABLE FOR INFORMATION	JS	PS	PS	SL

Contractor: COSTAIN

Designer: Jacobs
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Client: national highways

Project
REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing title
SUPPLEMENTARY TREE CONSTRAINTS PLAN
SHEET 2 0F 2

Drawing status
S2 - SUITABLE FOR INFORMATION

State Code	Construction Preparations	
Project Stage	PCF 4	
Scale	1:500	DO NOT SCALE
Jacobs No.		Rev P01
Client no.	HE551497	

Drawing number
PIN HE551497 - Originator JAC - Volume EAR -
Location 5_SCHME - Type DR - Role LE - Number 0202