

Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area - Environmental Statement Volume 4 Appendix B.2: Arboriculture Assessment

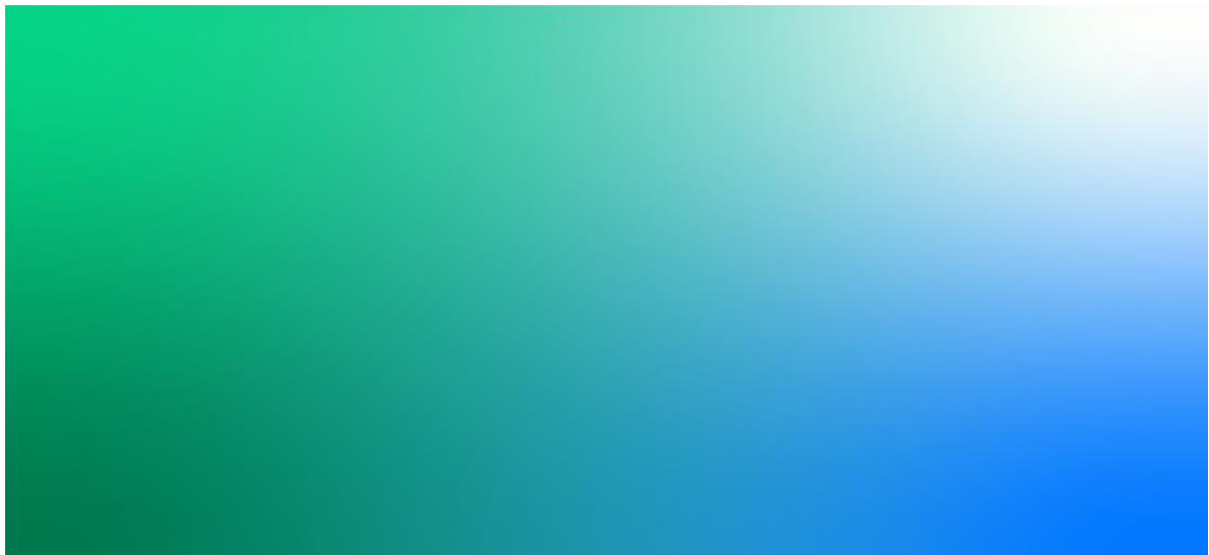
United Utilities Water Limited

Haweswater Aqueduct Resilience Programme

Planning Application Document RVBC-P&R-APP-RP-002 / ES-TA-B-2
February 28, 2025



Water for the North West



Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area - Environmental Statement Volume 4 Appendix B.2: Arboriculture Assessment

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Assessment

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Acronyms and Abbreviations

ACoW	Arboricultural Clerk of Works
AIA	Arboricultural Impact Assessment
ADB	Ash Dieback
AHC	Ash Health Class
AMS	Arboricultural Method Statement
BS	British Standard
BSI	British Standards Institution
CA	Conservation Area
DBH	Diameter at Breast Height
ECOW	Environmental Clerk of Works
GPS	Global Positioning System
Jacobs	Jacobs U.K. Limited
PRoW	Public Right of Way
RPA	Root Protection Area
TPO	Tree Preservation Order
TRRPP	Tree Retention, Removal and Protection Plan

Glossary

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.
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	Stem diameter measured at a height of 1.5 m (UK) or the nearest measurable point. Where measurement at a height of 1.5 m is not possible, another height may be specified.
Minor deadwood	Dead wood of a diameter less than 25 mm 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.
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	An area of ground surrounding a tree that contains sufficient rooting volume to ensure the tree's survival, calculated with reference to BS 5837:2012 ¹ .
Stem(s)	The main supporting structure(s), from ground level up to the first major division into branches.
Tree Preservation Order	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	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. There are a number of definitions for veteran trees.

¹ British Standards Institution (2012). BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations. [Online] Available at: <https://knowledge.bsigroup.com/products/trees-in-relation-to-design-demolition-and-construction-recommendations/standard> [Accessed: December 2024].

1. Introduction

1.1 Purpose of Report

- 1) Jacobs U.K. Limited (Jacobs) was commissioned by United Utilities Water Limited to prepare a British Standard (BS) 5837:2012 Arboricultural Assessment (consisting of a tree survey, Arboricultural Impact Assessment and Arboricultural Method Statement) for the Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area (hereafter known as the Alternative Facility). This appendix has been produced with reference to BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.²
- 2) This study is supported by the following appendices:
 - Appendix A Tree Survey Methodology
 - Appendix B Cascade Chart of Tree Quality Assessment (Taken from BS 5837:2012)
 - Appendix C Tree Survey Schedule Key
 - Appendix D Tree Survey Schedule
 - Appendix E Tree Constraints Plan
 - Appendix F Tree Retention, Removal and Protection Plan
 - Appendix G Suggested Tree Protection Specification
 - Appendix H Suggested Tree Protection Signage.

1.2 The Alternative Facility

- 3) As part of the Haweswater Aqueduct Resilience Programme, a vehicle marshalling, park and ride facility and parking area was identified and consented. The proposed location for this facility is no longer available for the duration of the works, so an alternative location for the facility is required.
- 4) The proposal is to combine the HGV Marshalling Area and staff park and ride facility at one location (noting that the consented P&R / HGV facility is sited either side of West Bradford Road to the north-west). From the Alternative Facility, marshalled HGVs and construction personnel in minibuses would proceed in a general northerly direction along local roads, via the consented Ribble Crossing and Waddington village, to the Newton-in-Bowland, Bonstone and Braddup compounds.
- 5) It is anticipated that the Alternative Facility would be constructed on open land that is currently under agricultural pasture and occupies approximately 3.78 ha.³ The nature and scope of the Alternative Facility is described in Chapter 3 Description of the Alternative Facility.
- 6) The planning application boundary is shown in Appendix E Tree Constraints Plan of this document. Note the survey area may differ from the planning application boundary. The survey area for this Alternative Facility included a large buffer beyond the planning application boundary.

² British Standards Institution (2012). *Op. cit.*

³ The total area provided includes not only the agricultural land on which the Alternative Facility would be located, but also highways-related works on Pimlico Link Road.

1.3 Methodology and Scope

- 7) The tree survey was conducted in line with the methodology detailed within BS 5837:2012⁴ and involved surveying trees as individuals or groups of trees within an agreed study area (forming the survey area). The information collected and methodology used are summarised in Appendix A Tree Survey Methodology of this document.
- 8) Trees are reported as individuals or groups. Tree locations were determined on site using digital survey software and hardware which use a combination of georeferenced topographical survey, aerial imagery and the device's inbuilt Global Positioning System (GPS). The survey accuracy of trees plotted with the internal GPS is assumed to be +/- 5 m.
- 9) Trees were categorised using BS 5837:2012 into four categories (A, B, C, U). Trees in categories A-C qualified under three subcategories (1, 2, 3). A summary of this classification can be seen in Appendix C Tree Survey Schedule Key.
- 10) The tree survey data were shown in Appendix D Tree Survey Schedule and used to produce a Tree Constraints Plan (see Appendix E of this document), which depicts the existing rooting area and canopy constraints posed by the trees within the survey area.

1.4 Limitations and Assumptions

- 11) Limitations to the tree survey include the following key points:
- While a topographical survey was provided, the tree location data were incomplete and in places, inaccurate. Trees have been aligned with topographical data where the data appeared to be correct, during the on-site survey
 - No soil survey data are included in this report. Due to the potential variances of soil type across a site it is considered to be more appropriate to obtain this information from a suitably qualified professional
 - Indicative Root Protection Areas (RPAs) have been calculated for tree groups based on the maximum stem diameter taken for each group
 - No data for individual trees within surveyed groups were recorded. An exception to this was when a tree was deemed notable within a group
 - First branch height and direction were not recorded for individual trees or groups. This information was not considered necessary to inform design
 - Where access was restricted, tree measurement data have been estimated. This has been indicated within Appendix D Tree Survey Schedule with the '#' symbol next to the tree number
 - 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 preferably on an annual basis, commensurate with the level of risk as recommended by the National Tree Safety Group⁵. The tree survey conducted for this report is not a tree health and safety survey and should not be used as such

⁴ British Standards Institution (2012). *Op. cit.*

⁵ National Tree Safety Group (2024). Common Sense Risk Management of Trees. [Online] Available at: <https://ntsgroup.org.uk/wp-content/uploads/2024/10/NTSG-full-guidance.pdf> [Accessed: December 2024].

- A RPA provides a notional circular buffer around a given stem based on the stem diameter taken at 1.5 m height. However, this is not necessarily representative of a tree root system as 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, etc. The assessment has not taken consideration of these and shows RPAs as an indicative circular form as per the BS 5837:2012 guidance.⁶

Ash Dieback

- 12) Ash Dieback (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.
- 13) 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.
- 14) It is becoming increasingly difficult to assign ash trees a retention category using the BS 5837:2012 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.
- 15) 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.
- 16) The Tree Council has produced a document⁷ on how to deal with ADB, for tree owners and managers, giving guidance on assessing the danger posed by infected trees. As suggested in the document, Jacobs has adopted the Suffolk County Council Ash Health Assessment System⁸ below. The system categorises ash trees with the symptoms in four categories:
 - Ash Health Class (AHC) 1 – 100%–75% Canopy healthy (Vitality Class 0)
 - AHC 2 – 75%–50% Canopy healthy (Vitality Class 1)
 - AHC 3 – 50%–25% Canopy healthy (Vitality Class 2)
 - AHC 4 – 25%–0% Canopy healthy (Vitality Class 3).
- 17) 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 programme 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.

⁶ British Standards Institution (2012). *Op. cit.*

⁷ The Tree Council (2019). Ash Dieback: an Action Plan Toolkit. [Online] Available at: <https://treecouncil.org.uk/guidance-resources/ash-dieback-action-plan-toolkit-for-england-and-wales/> [Accessed: December 2024].

⁸ The Tree Council (2019). Ash Tree Assessment. [Online] Available at: <https://treecouncil.org.uk/wp-content/uploads/2019/12/Suffolk-Canopy-Description.pdf> [Accessed: December 2024].

- 18) Due to the rapid change in tree health associated with ADB infections, it is strongly recommended that a resurvey of all ash trees recorded in this survey is conducted before any detailed design work and associated specific tree retention methods are considered.

2. Desk Study

2.1 Tree Preservation Orders and Conservation Areas

- 19) A Tree Preservation Order (TPO) and Conservation Area (CA) check was conducted, contacting Ribble Valley Borough Council on 1 July 2024 to identify the presence of TPOs and CAs within the survey area extents. The Tree Officer confirmed there are none present within the survey area. The survey area is not covered by a CA.

2.2 Ancient Woodland

- 20) No part of the site is listed in the Ancient Woodland Inventory, as shown on the Multi-Agency Geographical Information for the Countryside (MAGIC) website⁹.

2.3 Ancient and Veteran Trees

- 21) The Ancient Tree Inventory¹⁰ was checked on 16 December 2024 for the presence of verified veteran/ancient trees within the survey area. The National Planning Policy Framework¹¹ refers to veteran trees as '*irreplaceable habitat*' which due to their '*age, size and condition, is of exceptional biodiversity, cultural or heritage value*'.
- 22) Jacobs arboriculturists base their assessment of potential veteran (ancient and notable) trees on the guidance documents 'What are ancient, veteran, and other trees of special interest?'¹² and 'Ancient and other veteran trees: further guidance on management'¹³ and the species-specific guidance on the Ancient Tree Inventory website¹⁴.
- 23) Of particular importance is the guidance by David Lonsdale¹⁵ in which a chart of girth in relation to age and developmental classification of trees (Figure 1.3 therein) gives important guidance on tree stem sizes and thresholds, providing an indication as to the tree's status. It is recognised that other factors can influence a tree's size, so this is taken in balance with other factors identified in the guidance documents described above.
- 24) No trees within the planning application boundary appeared within this inventory. However, during survey, Jacobs qualified arboriculturists did identify a number of trees which they considered ancient or veteran as well as a number of trees that would be considered 'locally notable'.
- 25) A notable tree is defined by Lonsdale as '*trees qualifying for this category are usually very large but might not qualify as ancient or veteran. Notable trees have been defined as mature and*

⁹ Natural England (2024). Multi-Agency Geographical Information for the Countryside. [Online] Available at: <https://magic.defra.gov.uk/> [Accessed: December 2024].

¹⁰ Woodland Trust (2024). Ancient Tree Inventory. [Online] Available at: <https://ati.woodlandtrust.org.uk/> [Accessed: December 2024].

¹¹ Ministry of Housing, Communities and Local Government (2024). National Planning Policy Framework. [Online] Available at: https://assets.publishing.service.gov.uk/media/67a610df6006e4154dc498a0/NPPF_December_2024.pdf [Accessed: December 2024].

¹² Woodland Trust and Ancient Tree Forum (2008). Practical Guidance, Ancient Tree Guide 4: What are ancient, veteran, and other trees of special interest? [Online] Available at: <https://www.woodlandtrust.org.uk/media/1836/what-are-ancient-trees.pdf> [Accessed: January 2025].

¹³ Lonsdale, D. (ed.) (2013). Ancient and other veteran trees: further guidance on management. [Online] Available at: https://ancienttreeforum.co.uk/wp-content/uploads/2015/02/ATF_book.pdf [Accessed: January 2025]

¹⁴ Woodland Trust (n.d.). Species guides. [Online] Available at: <https://ati.woodlandtrust.org.uk/how-to-record/species-guides/> [Accessed: January 2025].

¹⁵ Lonsdale, D. (ed.) (2013). *Op. cit.*

often magnificent, standing out locally because they are larger than other trees around them'.¹⁶
A tree which is currently notable is in the early stages of becoming an ancient. Whilst not given the same level of protection as veteran and ancient trees, they should be considered some of the most important trees on site and should be protected accordingly.

26) The trees identified as notable/veteran/ancient are set out in Table 2.1.

Table 2.1: Ancient and Veteran Trees

Survey Reference	Species	Stem Diameter (mm)	Discussion
T004	Beech	1,510	A tree of considerable stature. Storm-damaged canopy on the north-east with subsequent pruning leading to decay forming in stem. On north-western side of lower stem, small open cavity appears to lead to hollowing. Canopy showing early signs of retrenchment. Tree appears in 1880s maps as a mature tree. Lonsdale ¹⁷ suggests a tree of this girth is veteran, possibly ancient. Despite the relative lack of veteran features, this tree is considered a veteran tree.
T021	Beech	1,360	A significant tree growing on the embankment of the sunken track (which may help to age it). Tree is in remarkably good structural condition considering its size and age. Lonsdale suggests a tree of this size is veteran/notable. The lack of veteran features means the tree is less able to meet the NPPF's definition of a veteran as having great size, age and veteran features. However, the tree is likely the same age as T004 and on balance it is considered it should be treated as a veteran tree.
T033, T036, T038, T039	Sycamore	1,100, 1,170, 1,000, 1,100	All large mature trees in excellent health, though T038 did have some basal decay which it appeared to be compartmentalising well. All lacked any significant veteran features. Lonsdale suggests these trees are locally notable.
T034	Ash	1,100 (estimated under ivy)	A substantial tree suffering from advanced ADB, and moribund. There is considerable decay and hollowing in the lower stem with a large open cavity. Substantial ivy of considerable age is supported by the tree. Numerous veteran features including canopy dieback and decay. Lonsdale suggests tree lacks the girth to be considered a veteran, but it is locally notable.
T041	Ash	1,460	A huge tree that dominates the small derelict building alongside. Tree has advanced ADB and is moribund. Dieback and deadwood, as well as a number of cavities are all present as veteran features. Lonsdale suggests this tree is veteran, possibly ancient. On balance, this tree is considered veteran. It should be noted this tree is in considerable physiological and structural decline and would pose a high risk of danger in adverse weather conditions.

¹⁶ Lonsdale, D. (ed.) (2013). *Op. cit.*

¹⁷ Lonsdale, D. (ed.) (2013). *Op. cit.*

3. Site Observations and the Tree Survey

3.1 Site Location

- 27) The Alternative Facility is located off Pimlico Link Road, Clitheroe. The nearest address for the site is Pimlico Link Road, Clitheroe BB7 1QW. UK Grid reference for the site entrance is SD 76151 42505. The general location of the site is shown in Volume 3, Figure 1.1.

3.2 Site Observations

- 28) The survey area is generally flat. Immediately beyond the northern boundary the land drops steeply to Worston Brook watercourse. A Public Right of Way (PRoW) runs along the northern boundary, in a sunken track and affords users good views of the majority of trees present on the site. Pimlico Link Road crosses part of the survey area and is lined on both sides by dense woodlands, with an opening in these tree belts at the current field access on the west side of the road. The trees on the bank falling to the watercourse are visible from footpaths to the north. The large trees located in the gap within the highway tree belts are prominent to road users, though only seen relatively briefly by most, due to the speed of traffic on this stretch of road.

3.3 Tree Survey Results and Plans

- 29) The site was visited and surveyed by a qualified Jacobs arboriculturist on 6 November 2024.
- 30) The full findings of the tree survey are presented in Appendix D Tree Survey Schedule and Appendix E Tree Constraints Plan of this document.
- 31) Table 3.1 summarises the total number of trees surveyed and their relative BS 5837:2012¹⁸ categories within or immediately adjacent to the planning application boundary.

Table 3.1: Summary of Arboricultural Features Included in the Survey

BS 5837:2012 Category	Trees	Tree Groups	Subtotals
A	14	1	15
B	13	2	15
C	18	7	25
U	5	0	5
Subtotals	50	10	60

- 32) The following points apply to the arboricultural features included in the survey:
- 'A' grade trees are of high quality and value and should be retained
 - '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. The project should consider the retention and protection of trees, but also the trees' future growth
 - 'C' grade trees are of low quality and value and should not place a constraint on the proposals
 - From an arboricultural point of view, a 'U' grade tree cannot realistically be considered for retention as a living tree in the context of current land use, due to low life expectancy (less

¹⁸ British Standards Institution (2012). *Op. cit.*

than 10 years) in the current poor condition. Therefore, arboriculturally, such trees are generally not considered a constraint to development proposals.

3.4 General Tree Observations

- 33) The main arboricultural interest of the survey area lies in the trees which bound the fields to the south-west of Pimlico Link Road. Beech T004 is a particularly impressive tree which meets the definition of veteran, as set out in Table 2.1. While the trees located on the sloping land which falls to Worston Brook are outside the planning application boundary, their size and scale mean they may influence construction and design considerations within the planning application boundary. The bank contains a mix of mature oak (*Quercus* spp.), sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*) and beech (*Fagus sylvatica*) with an understory of mature hawthorn (*Crataegus monogyna*). Heavily grazed, it lacks any woodland floral structure, but the principal trees of the grouping are clearly of good age judging by the size of their stems and their height.
- 34) Beech T021 is located on the planning application boundary, within the fence line that surrounds the site. This is another significant tree and is in excellent health and vigour. Where the sunken track that runs down this boundary moves away from the river slope, the woodland (G010) ends and the track becomes a tree-lined lane. Close to an existing gate in the proposed planning application boundary are several very large beech trees (T027, T029, T030) which are in a very poor condition structurally. T027 is in particularly poor condition, being moribund and having a significant region of *Kretzschmaria deusta*-induced decay at its base. Should one of these trees fall, it could easily topple across the planning application boundary.
- 35) Where the sunken track enters a lane (through a small gate) the survey area contains several significant sycamore trees (T033, T036, T038, T039) which are all of a size and stature to make them locally notable. T038 had some decay at the base, but the tree appeared to have compartmentalised this decay well, and it seems of limited significance. However, the tree was ivy clad, and further investigation of the significance of this decay is advisable.
- 36) Ash tree T034 is a significant tree, of considerable age. Unfortunately, this tree is suffering from advanced ADB and is moribund. There is considerable deadwood throughout the canopy and the lower stem is hollow with an open decay pocket. The categorisation of such trees is extremely difficult within the BS 5837 framework. While the tree is locally notable, its extremely limited lifespan and location directly over a public footpath make it a future foreseeable risk under a tree owner's duty of care. While outside the planning application boundary, it is large enough to shed limbs onto the Alternative Facility site.
- 37) Ash tree T041 also illustrates the difficulty of assigning BS 5837:2012 categories to trees with ADB. A huge tree, T041 is moribund and structurally declining. While every effort should be made to retain it if safe to do so, it poses a minor risk to users of the footpath and to the structure, New House, it grows above.
- 38) Beech T046 and T047 are two isolated mature trees in the extreme south of the Alternative Facility site. Their canopies are showing the impact of storms, but they are in good health and vigour and are important A category trees.
- 39) Pimlico Link Road is lined with woodland belts. These contain a mix of broadleaved species none of which, at least within influencing distance of the road, are of any great arboricultural quality.
- 40) None of the groups appear to have had any recent canopy management, and as such many trees are growing with canopies that are beginning to encroach into the highway. Similarly, in places, young natural regeneration is colonising the verges immediately adjacent to the

highway. Removal of these self-sets and pruning of the more mature trees would be standard highways practice, and carried out correctly would have no negative impact on the trees' health or quality.

- 41) All the roadside groups contain ash. These, as with many others in the area are severely impacted by ADB. T050 is a particularly prominent example. Almost completely dead, this tree contains significant deadwood and poses a risk to both highway users and users of the public footpath. The selective removal of ash trees from these roadside groups would be beneficial and would also open space in the groups to allow surrounding trees to increase their own canopies.
- 42) It should be noted this survey is a BS 5837:2012¹⁹ survey intended to inform design; it is not a duty of care survey intended to discharge the landowner's/manager's duty to take reasonable care to prevent injury from their trees. A number of trees were identified during this survey that gave concern about public safety and should be reassessed as part of a duty of care survey, commissioned by the landowner/manager and informed by their acceptance of risk. Further guidance on this subject can be found on the National Tree Safety Group website²⁰.

¹⁹ British Standards Institution (2012). *Op. cit.*

²⁰ National Tree Safety Group (2024). National Tree Safety Group website. [Online] Available at: <https://ntsgroup.org.uk/> [Accessed: December 2024].

4. Arboricultural Impact Assessment

4.1 Introduction

- 43) British Standard BS 5837:2012²¹ states '*The [Arboricultural Impact] assessment should take account of the effects of any tree loss required to implement the design, and any potentially damaging activities proposed in the vicinity of retained trees. Such activities might include the removal of existing structures and hard surfacing, the installation of new hard surfacing, the installation of services, and the location and dimensions of all proposed excavations or changes in ground level, including any that might arise from the implementation of the recommended mitigation measures. In addition to the impact of the permanent works, account should be taken of the buildability of [the Alternative Facility] in terms of access, adequate working space and provision for the storage of materials, including topsoil.*'
- 44) With reference to the above, this report will assess the Alternative Facility impact on the arboricultural constraints present on site and summarise trees lost, trees at risk of removal and impacts on trees retained which may be compromised by activities on site.
- 45) There are no published criteria, guidance, or methodologies for the assessment of effects of development on forestry, trees or woodland, therefore this assessment has been based upon professional judgement of the arboriculturist and the criteria contained within the Forestry Commission's Environmental Impact Assessments for Woodland²². More information pertaining to this can be found in Section 4.5.1.
- 46) This Arboricultural Impact Assessment (AIA) has been prepared following site-based observations, a desktop study of the survey data and consideration of the development proposals. In particular, it relates to the baseline arboricultural assessment and constraints information, which is overlaid onto the proposed Alternative Facility. The resulting drawing, a Tree Retention, Removal and Protection Plan (TRRPP) (presented in Appendix F of this document), shows the impact on arboricultural features on the site.
- 47) Trees have a finite reserve of energy, made each year, throughout the spring/summer seasons, which is utilised for biological processes such as growth and defence against pests or diseases.
- 48) Any scheme in proximity to trees has the potential to cause harm to those trees unless control measures are identified and acted upon; as such it is essential to consider the relationship between the Alternative Facility and the retained trees to identify what precautions are necessary and proportionate. The Alternative Facility has the potential to impact upon the above ground (canopy, stems, and branches) and below ground (rooting environment) parts of the trees.
- 49) Whilst some clear and obvious physical damage can occur to trees during the construction phase, such as to stems and branches, other impacts are not always so immediately evident, such as damage to the soil structure by compaction and or changes in ground levels causing root damage, altering the water table, and affecting moisture availability.
- 50) Assessment of the impact of the proposals has been determined following consideration of the constraints each surveyed item poses by virtue of its position, branch spread and designated RPA.

²¹ British Standards Institution (2012). *Op. cit.*

²² Forestry Commission (2023). Environmental Impact Assessments for woodland. [Online] Available at: <https://www.gov.uk/guidance/environmental-impact-assessments-for-woodland> [Accessed: December 2024].

- 51) Where trees are surveyed as groups, individual stem locations are often not indicated on topographical surveys, or it is impracticable to plot by other means. Therefore, when groups need to be partially removed it is not possible to accurately display the removals on a plan, as removals are dependent on a tree's location within a group and its proximity to proposed works. Removal of trees from within groups should be marked up by the Arboricultural Clerk of Works (ACoW) on site prior to site clearance works. This process is greatly assisted by the setting out of the development by the construction team.

4.2 Partial Removal of Groups

- 52) This report contains groups and woodlands plotted as per the guidance given in Section 4.4.2.3 of BS 5837:2012²³:
- 'Trees growing as groups or woodland should be identified and assessed as such where the arboriculturist determines that this is appropriate. However, an assessment of individuals within any group should still be undertaken if there is a need to differentiate between them, e.g. in order to highlight significant variation in attributes (including physiological or structural condition). NOTE The term "group" is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally, including for biodiversity (e.g. parkland or wood pasture), in respect of each of the three subcategories.'*
- 53) It is often not practical to plot individual trees due to size of area, accuracy of GPS below tree canopies or time constraints. Because individual stem locations are often absent from tree groups, the area of partial removal of a group canopy should be considered indicative.
- 54) The final refinement of retained canopy edges can only be achieved on site, between a topographical surveyor, ACoW, and principal contractor. Where access is agreed with the relevant owner(s) of third-party land, the identification of individual trees within influencing distance of the site, and capture of respective RPA should be completed, with trees for removal being clearly marked. The topographical surveyor should then set out the alignment of tree protection measures as per an approved Arboricultural Method Statement (AMS). The process of the identification of trees, tree removal and setting out of tree protection measures should be carried out before any construction works commence, including the delivery of materials, plant, or installation of construction compounds.
- 55) Jacobs arboriculturists attended the site to review the constructability of the Alternative Facility and removals required. As a result, the TRRPP indicates provisionally, the required tree removals and pruning. However, the points raised above remain true. The final marking of trees to be removed would need to be decided upon by the Project Arboriculturist/ACoW (if different) with the assistance of a topographical surveyor to set out the tree protection fencing alignment and footprint of any construction activity.

4.3 Impact Assessment

4.3.1 Trees Requiring Removal for Reasons of Sound Arboricultural Management

- 56) The BS 5837:2012 compliant survey identified a total of five U category individual trees, the condition of which was considered to be impaired to such an extent that they cannot realistically be expected to be retained as living trees in the context of the current land use for

²³ British Standards Institution (2012). *Op. cit.*

longer than 10 years. Three of these trees are within the planning application boundary of the Alternative Facility, and would be removed for reasons of health and safety. The retention of trees outside of the planning application boundary is at the discretion of the relevant landowner. In addition to the individual trees, the roadside groups G007, G008, G009 contain ash trees heavily infected with ADB. Where these trees are within the planning application boundary of the site, and falling distance of the road, they would be felled during the tree works identified as required for highways visibility.

4.3.2 Tree and Group Impacts

- 57) The 'Partial Removal' impact relates only to groups of trees and hedgerows requiring only some of the feature to be removed to facilitate the proposals.
- 58) The 'Encroached' impact relates to trees that can be retained during and after the implementation of the design proposals but may require protection/mitigation measures to be employed prior to the construction phase of the Alternative Facility.
- 59) It is the view of Jacobs arboriculturists that trees indicated as encroached are viable for retention (in most cases) if provided with adequate protection prior to and/or during construction. To ensure these trees are protected, Jacobs has prepared an AMS, presented in Section 6.

Table 4.1: Individually Surveyed Tree Impacts (AIA Results)

BS 5837:2012 Grades	Removals	Encroached	No Impacts	Subtotals
A	0	1	13	14
B	1	0	12	13
C	2	1	15	18
U	3	1	1	5
Subtotals	6	3	41	50

Table 4.2: Surveyed Tree Group Impacts (AIA Results)

BS 5837:2012 Grades	Removals	Encroached	Partial Removal	No Impacts	Subtotals
A	0	0	0	1	1
B	0	1	1	0	2
C	0	1	3	3	7
Subtotals	0	2	4	2	10

4.3.3 Facilitation Pruning

- 60) The trees, hedgerows and groups shown in Table 4.3 require facilitation pruning to allow the successful delivery of the development proposals. If carried out to BS 3998:2010 Tree Work Recommendations²⁴, Jacobs considers these trees can be retained with no long-term detrimental impact on health, form or life expectancy.

²⁴ British Standards Institution (2010). BS 3998:2010 Tree Work. Recommendations. [Online]. Available at: <https://knowledge.bsigroup.com/products/tree-work-recommendations?version=standard> [Accessed: December 2024].

Table 4.3: Facilitation Pruning

Tree/Group Reference Number	Specification
G002	Selective removal of stems to create working corridor to install outfall pipe.
G007, G008, G009	As per the extents indicated on the highways general arrangement drawing (Pimlico Link Road), all trees would be pruned to give 3 m clearance from a vertical line drawn vertically upwards from the back of the existing kerb. Any branches and self-set trees within the area defined by a line drawn vertically upwards 3 m behind the existing roadside kerb and the kerb line itself would be removed. Where trees needed to be felled to ground level, the stumps shall be retained and allowed to re-coppice as appropriate. This may require follow up seasonal pruning, depending on the vigour of any regrowth. Where appropriate, heavily infected ash trees which pose a risk of falling on the highway shall be removed in the same initial felling/pruning operation.

4.3.4 Trees Compromised but Possible to Retain

- 61) BS 5837:2012²⁵ guides the arboriculturist to select a tree either for retention or removal depending on how much of its rooting area may be lost during construction activities. However, it may not always be necessary to remove such trees, but rather to accept that they may experience some physiological damage, while their retention would be beneficial for a number of reasons, including standing deadwood, seed sources or the potential that the damage may not be fatal.
- 62) A decision to retain a tree such as this needs to balance the tree owner's duty of care with the potential benefits.
- 63) As part of the Alternative Facility, Jacobs considers the trees detailed in Table 4.4 could be retained, despite potentially suffering some damage to their rooting environment.

Table 4.4: Compromised but Retainable Trees

Tree/Group Reference Number	Specification
T039 Sycamore	Indicative alignment of drainage outfall pipeline removes approximately 20% of RPA. This pipe can be micro-sited during detailed design/construction to minimise root loss. Excavation for pipe to be undertaken under arboricultural supervision. The arboriculturist to advise on any mitigation required once the potential root loss has been quantified.
T041 Ash	A U-category veteran outside of the planning application boundary. The alignment of the outfall pipe passes through the veteran RPA (calculated as 15 x dbh) of this tree. Any impact is considered minimal as the tree is moribund with a limited life expectancy.
T049 Ash	This tree is growing on an embankment alongside a long-established track. The tree has ADB and is moribund, with limited life expectancy. The impact of the soil storage in this area is considered minimal, and this tree can be retained as a declining habitat tree.
G003 Hawthorn	Some of the theoretical RPA of these trees is located outside protective fencing. However, the previous land use means significant extensive rooting is unlikely and the potential impact on the group is considered minor.
G004 Hawthorn	Some of the theoretical RPA of these trees is located outside protective fencing. However, a wet ditch running between the trees and the site means significant extensive rooting is unlikely and the potential impact on the group is considered minor.

²⁵ British Standards Institution (2012). *Op. cit.*

4.4 Discussion of Removals

- 64) Three of the trees identified for removal are Category U and are in such a condition that they need to be removed for site and public safety. T042 is a dead ash tree alongside a PRoW and within the working area required to install the Site Drainage Attenuation Area. T043 is another ash close to T042. It is currently AHC 3 and ivy clad, and for the safety of the PRoW users, it should be felled. T050 is a roadside ash which is moribund and in poor structural condition. As well as being within falling distance of the highway it is located directly adjacent to a stile on the PRoW.
- 65) T001 is a C category sycamore which has been heavily pruned previously and as a result has a poor form. Its loss is not considered significant.
- 66) T044 is a B category, multi-stemmed sycamore growing in the old hedge line alongside the PRoW. It appears to have been coppiced in the past, likely when the hedgerow was laid, and is now a 19 m tall mature tree. Its B category was given for its future potential life span rather than any particular merit, and due to its location, which is surrounded by other trees, its removal would have minimal impact on the treescape.
- 67) T045, a C category holly is a component of hedgerow G002. A section of G002, along with T045 requires removing to provide working space to install the drainage outfall pipeline. G002 is a gappy hedge, and the creation of a new gap would not have a significant impact on its current form. The Alternative Facility mitigation includes replanting and reinforcing the internal hedgerow G003, so any impact would be relatively short term as new planting matures to fill gaps created.
- 68) The drainage outfall pipeline from the Site Drainage Attenuation Area would pass through the RPA of T039, an A category sycamore, and T041, a U category ash tree. T039 and T041 would be retained. The current alignment is indicative, and the final route would be micro-sited to minimise any impacts on trees in this area. T039 is a mature, vigorous tree, and any impact from root severance is expected to be relatively minor. Works in this area would be undertaken under arboricultural supervision and should significant root damage occur to either tree, the arboriculturist would prepare a schedule of mitigation works.
- 69) The roadside groups G007, G008 and G009 all require pruning to give suitable visibility splays for the site entrance. Pruning would be relatively minor, 3 m back from the rear of the kerb and in most cases would just consist of pruning tree branches. There is the occasional self-set tree within this band of clearance. In these cases, the trees would be felled to ground level and allowed to re-coppice. Any ash trees suffering from ADB within the planning application boundary and within falling distance of the road would be felled for public safety. Such works are typical of highways maintenance works, and the impact on the tree groups is considered minor, if works are carried out to BS 3998:2010²⁶.

4.5 Significance of Impact

4.5.1 Method

- 70) A BS 5837:2012²⁷ arboricultural impact assessment has been carried out for trees present across the site. This methodology evaluates the direct and indirect effects of the Alternative Facility and where necessary, recommends mitigation.

²⁶ British Standards Institution (2010). *Op. cit.*

²⁷ British Standards Institution (2012). *Op. cit.*

- 71) BS 5837:2012 is the accepted standard for the management of trees on development sites. The standard offers advice on the assessment of impacts of a scheme on trees, based on a tree survey carried out to the same BS 5837 specifications. However, the standard gives no guidance on the assessment of the significance of any arboricultural impact.
- 72) To ensure clarity and consistency, Jacobs has adopted a similar approach to evaluating impacts on the arboricultural resource present on site as would be used in undertaking an Environmental Impact Assessment. The methodology used assesses the sensitivity of the receptor and the magnitude of change to give the significance of any affect.
- 73) There are no published criteria, guidance or methodologies for the assessment of effects of development on forestry, trees or woodland. The Forestry Commission published Environmental Impact Assessments for Woodland²⁸ in February 2023; however, this is concerned with forestry operations and is not relevant to trees on development sites. As a result, the assessment of effects is based on professional judgement, with reference to:
- The sensitivity of the tree population present, taking account of the degree and rate of change in the tree population, both in the recent past and that anticipated in the near future, and therefore the susceptibility/vulnerability of the tree population to change
 - The quality of the tree population (based on the categorisation method outlined in BS 5837:2012, broadly based on amenity value and useful life expectancy)
 - The extent to which the tree population is rare or distinctive and the value attributed to it through designations
 - Magnitude of change and extent of tree removal, impact of proposed development on retained trees and impact of any required tree work
 - Duration and reversibility – timescale of effect (days/weeks/months/years) until recovery. Permanent effects are described as such, and likelihood of recovery is detailed where appropriate
 - Adverse/beneficial – whether the effect is beneficial or detrimental to the feature.
- 74) The effect of tree removal is normally considered to be of an adverse nature; however, indirect beneficial effects in some areas may arise where the introduction of a proposed development allows for the removal of ecologically habitat-poor or discretionary trees. This may be followed up by detailed landscape masterplans, ecological and woodland management plans or schemes of compensatory planting to replace lost trees with more beneficial individuals.

4.5.2 Discussion and Conclusion of Significance

- 75) The tree population surveyed within the study area is considered to be of medium to high sensitivity due to the presence of a number of veteran trees as well as the mature nature of the A category woodland group G010. A number of iterations of the site layout and the planning application boundary were produced, prior to adoption of the planning application boundary, to minimise the impact on trees by excluding them, and their RPAs from the Alternative Facility planning application boundary. Therefore, all of the veteran trees and all the B category trees are now located outside of the planning application boundary (though in some cases still within influencing distance). Therefore, the sensitivity of the trees located within the planning application boundary (the majority of which are C category) is considered low.
- 76) The Alternative Facility would require the removal of one B category tree, two C category trees, three U category trees and the pruning and partial removal of three C category groups and one

²⁸ Forestry Commission (2023). *Op. cit.*

B category group. The U category trees would not have been expected to survive longer than 10 years irrespective of the proposals, so their loss is considered inconsequential. The pruning of the roadside groups is relatively minor and could also be expected to be required irrespective of the proposal to maintain highways clearances, therefore the magnitude of change is considered low.

- 77) The overall magnitude of the tree removals is considered low as few trees are to be removed, and any changes in tree numbers and form (as a result of pruning) would be limited to a very local level.
- 78) The significance of the effect of the Alternative Facility on the tree resource within the study area is considered Not Significant, in the context of the EIA Regulations.
- 79) The planning application boundary includes a section of highway and its verges which contain trees. During the operation of the site, the applicant may be considered to hold a duty of care for the trees which fall within the boundary. As such, works have been identified to discharge this duty by removing trees which are deemed to pose a risk to the public and where such actions would be regarded as reasonable. The removal of these trees is not specifically required to facilitate the development but is a consequence of the applicant becoming the Duty of Care holder²⁹ which requires the removal of unsafe trees for the safe operation of the new facility. This has resulted in the requirement for a number of U category trees within the planning application boundary (including unplotted ash trees with ADB in the roadside groups) being removed. As U category trees are not expected to survive longer than 10 years irrespective of what happens on site, the loss of these trees is considered of no significance.

²⁹ National Tree Safety Group (2024). *Op. cit.*

5. Conclusions and Recommendations

- 80) The Alternative Facility requires the removal of one B category tree, two C category trees, three U category trees and the partial removal/pruning of three C category groups and one B category group.
- 81) Considerable effort has gone into designing the site layout and associated planning application boundary to minimise the impact on trees, in particular a number of veteran trees on the northern boundary.
- 82) The impact of the Alternative Facility on the tree population has been assessed as not significant in the context of EIA regulations. During the Alternative Facility's operational phase, the applicant would have a duty of care for trees present on site, so additional tree removals, particularly of ash trees with ADB, might be required. Such works would be expected to occur irrespective of development of the site and are therefore not regarded as significant.
- 83) Jacobs has prepared an AMS and a TRRPP for the Alternative Facility. This is presented in Section 6 onwards. The AMS and TRRPP specify specific tree protection measures to protect retained trees on site and should be implemented as soon as works begin on site.
- 84) An ACoW should be present on site at appropriate times to monitor the adoption of the AMS and ensure the appropriate protection of trees.
- 85) Additional visits are recommended post construction to identify any physiological and/or structural defects that may have been caused by the works.

5.1 Arboricultural Action Required – Next Steps

- 86) Table 5.1 lists the standard elements, as referenced in BS 5837:2012³⁰, recommended to satisfy planning requirements for the Alternative Facility and to ensure appropriate tree protection is considered and applied throughout the duration of the works.

Table 5.1: Follow Up Arboricultural Input Relating to the Alternative Facility

Recommended Arboricultural Input	Purpose	Timing
AIA, AMS and TRRPP revisions	Further detail of impacts on key areas OR Whenever a design change/addition is finalised or proposed.	Following any change in the design. The process could be either desktop based or require further site visits, depending on the scope of the original survey.
On site monitoring	To ensure protection measures and the method statement are being implemented correctly.	At agreed intervals before and during the construction phase of the Alternative Facility.

- 87) It is recommended to maintain contact with the Project Arboriculturist throughout the planning and detailed design stage for the relevant additional input to be addressed at the appropriate point.
- 88) Impacts to the trees, as outlined within this AIA report, could alter with any changes to the current design proposals. Tree impacts should therefore be reviewed as the design process progresses with all relevant parties informed of the changes, where appropriate.

³⁰ British Standards Institution (2012). *Op. cit.*

6. Arboricultural Method Statement

6.1 Introduction

- 89) The most important and effective process in terms of preventing damage to trees on a construction site, is the timely erection of tree protection fencing. This must be erected as the first operation on site, for example, before construction access, before contractors' site cabins, and before trenching for service runs.
- 90) However, it is noted that the fencing provides an unnecessary and potentially dangerous restriction to essential tree works and therefore tree works can be carried out before fencing is erected.
- 91) To protect retained trees and hedges correctly throughout the construction process, tree protection measures should be removed in the exact opposite order and methodology they were installed so that one of the last actions on site is the removal of the tree protection measures.

6.2 General

- 92) This AMS has been prepared for the planning application stage of the design process, and once the enabling works plans are finalised, subject to planning consent, it should be reviewed so that it is tailored specifically to the Alternative Facility. An AMS should always be read alongside the TRRPP, which indicates the alignment of Tree Protection Fencing, Construction Exclusion Zones and other specific site methodologies. The TRRPP can be found in Appendix F of this document.

6.2.1 Phasing

- 93) Detailed below is the phasing programme which must be followed by the contractor throughout the life of the Alternative Facility to ensure that trees are protected in accordance with the AMS.

Phase 1 – Pre-development

- Pre-commencement site meeting with client, contractor, local planning authority (LPA), engineer and Project Arboriculturist/ACoW and Environmental Clerk of Works
- Pegging out of construction areas, haul roads, site compounds and welfare facilities
- With reference to the TRRPP (Drawings RVBC-P&R-ARB-3 and RVBC-P&R-ARB-4 presented in Appendix F of this document) and in consultation with client, contractor, LPA and the Alternative Facility arboriculturist, confirm trees to be removed, trees to be retained and any tree works
- Install site weldmesh fencing e.g. 'Paladin'-type or temporary tree protection fencing (on 'Paladin' fencing alignment) as per Appendix G Suggested Tree Protection Specification of this document
- Install ground protection measures (if required)
- Carry out approved tree removal and pruning (see Section 6.4 for the recommended time of year).

Phase 2 – Development/construction

- Establish site compound – location for cabins, car park and the storage of materials
- Carry out initial ground works and services installations
- Undertake main development construction.

Phase 3 – Post-development

- Carry out soft landscaping (e.g. proposed replanting, grass reinstatement etc.)
- Remove protective fencing
- Remove ground protection (if necessary)
- Carry out ground decompaction and reinstatement.

6.3 Pre-Commencement

- 94) It is advised that a pre-commencement site meeting is held with contractors who are responsible for operating machinery on site. The meeting would firstly highlight the potential for damage occurring to tree crowns, but thereafter ensure that extra care is applied when manoeuvring any machinery within close proximity of retained trees to prevent any contact with the tree and consequent damage to crown, stem or roots.
- 95) For clarity, prior to any construction or development work proceeding, the alignment of the protective fencing and the RPAs of any individual trees to be retained which are not able to be protected by fencing should be marked out using the distances provided in the table within Appendix D Tree Survey Schedule. Marking out should be completed or approved by a person with arboricultural expertise as individual trees will have root zones that may be affected by local conditions and allowances would need to be made to accommodate this. This may be done prior to, or during, the pre-commencement site meeting.

6.4 Access Facilitation Pruning

- 96) The trees, hedgerows and groups shown in Table 6.1 require facilitation pruning to allow the successful delivery of the development proposals. If carried out to BS 3998:2010³¹, Jacobs considers these trees can be retained with no long-term detrimental impact on health, form or life expectancy.

Table 6.1: Facilitation Pruning

Tree/Group Reference Number	Specification
G002	Selective removal of stems to create working corridor to install outfall pipe.
G007, G008, G009	As per the extents indicated on the highways general arrangement drawing (Pimlico Link Road) all trees would be pruned to give 3 m clearance from a vertical line drawn vertically upwards from the back of the existing kerb. Any branches and self-set trees within the area defined by a vertical line drawn vertically upwards 3 m behind the existing roadside kerb and the kerb line itself would be removed. Where trees needed to be felled to ground level, the stumps shall be retained and allowed to re-coppice as appropriate, this may require follow up seasonal pruning, depending on the vigour of any regrowth. Where appropriate, heavily infected ash trees which pose a risk of falling on the highway shall be removed in the same initial felling/pruning operation.

³¹ British Standards Institution (2010). *Op. cit.*

- 97) All tree works should be carried out in accordance with BS 3998:2010.
- 98) The facilitation pruning should be carried out on site by a suitably qualified and experienced arborist before construction or demolition operations commence on site. The facilitation pruning can run concurrent with operations to erect tree protection fencing as long as this can be co-ordinated such that neither presents a hazard to the other.
- 99) Trees on site which are not to be retained can be removed as part of the facilitation pruning (or earlier if the appropriate planning consent is confirmed). To avoid mistakes, the individual trees to be removed should be identified and marked by a person with arboricultural expertise.
- 100) Any tree works undertaken must take account of all protected species of flora and fauna and comply with all appropriate legislation. This includes The Wildlife and Countryside Act 1981³² as amended by the Countryside and Rights of Way Act 2000³³ which provides statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions and advice from an ecologist should be obtained before undertaking any works that might constitute an offence.
- 101) It is recommended that any trees that require removal or significant canopy works should be checked in advance of works by an ecologist to ensure there is no possibility of any disturbance to nesting birds or roosting bats.

6.5 Tree Protection Fencing and the Construction Exclusion Zone

- 102) The development design prepared for the site indicates that a number of trees within the site are being retained. In addition, there are several trees off site but within 15 m of the planning application boundary. All these trees need to be protected from all construction operations by a protective barrier (fencing to BS 5837:2012³⁴) which creates a sacrosanct Construction Exclusion Zone.
- 103) The alignment of the protective barrier is based on the calculated extent of the RPA in accordance with BS 5837:2012. The detailed alignment of tree protection fencing is indicated on the TRRPP.
- 104) In principle, protective fencing should be erected before any construction operations start on site and should be removed only on completion of all construction/decommissioning works on site. In a phased project there may be a need to alter or remove/reposition fencing as the project progresses. The planning of these works should be the result of discussions between the Project Arboriculturist and construction team and no tree should be left unprotected during construction works.
- 105) For the Alternative Facility, site fencing would form suitably robust tree protection fencing if erected before construction work commences on site. If the phasing of the works does not allow this, then temporary tree protection fencing would need to be provided in certain areas until such time as it can be replaced with 'Paladin' fencing or solid plywood panel hoarding. The alignment of this temporary fencing, should it be required, is shown on the TRRPP.
- 106) Where the outfall from the Site Drainage Attenuation Area is to be installed, temporary fencing is required during the period of installation and removal. This fencing only needs to be present during the duration of the works and can be removed once works are complete. This is also the

³² Wildlife and Countryside Act 1981. [Online] Available at: <https://www.legislation.gov.uk/ukpga/1981/69> [Accessed: December 2024].

³³ Countryside and Rights of Way Act 2000. [Online] Available at: <https://www.legislation.gov.uk/ukpga/2000/37/contents> [Accessed: December 2024].

³⁴ British Standards Institution (2012). *Op. cit.*

case for the protection of the RPAs of T046 and T047 during the period of the construction and removal of the soil storage mound. BS 5837:2012 clause 6.2.2.3 specifies an alternative protective barrier where site circumstances and associated risk of damage incursion into the RPA do not necessitate the default level of protection. This can include 2 m tall, welded mesh panels (e.g. Heras fencing) on rubber or concrete feet to protect from cars, vans, pedestrians and manually operated plant. The alternative specification for the protective barrier should only be used if it were agreed with the LPA.

- 107) All weather notices should be placed on fencing to indicate that operations are not permitted within the fenced area, for example "CONSTRUCTION EXCLUSION ZONE – NO ACCESS" or similar (see Appendix H Suggested Tree Protection Signage of this document).
- 108) Once set up, fences should not be removed or altered without prior consultation with the Project Arboriculturist.
- 109) The presence of long grass and other vegetation in the Construction Exclusion Zone is a welcome indicator that the protected area has been left undisturbed. However, on occasion, and certainly towards the end of the project, it is acceptable to cut the vegetation by handheld strimmer or scythe taking care not to work within 300 mm of the tree trunk (to avoid damaging the bark). Vegetation within 300 mm of the trunk can be cut with non-mechanised shears.

6.6 Installation of Power Supply and Services and Outfall Pipe

- 110) Any underground power supplies, services and the outfall pipe from the Site Drainage Attenuation Area routed through the RPA should be installed in accordance with BS 5837:2012³⁵ clause 7.7.2 and National Joint Utilities Group's Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees³⁶. The preference is for all excavations to be completed by hand within an RPA. If this is not possible, then the smallest toothless bucket should be used removing small amounts of soil at each pass. If a root is encountered, it should be exposed by hand and a suitable course of action agreed with the Project Arboriculturist.
- 111) Should roots between 10–25 mm in diameter be encountered, these would be retained undamaged wherever possible and protected from desiccation/frost by damp hessian sacking or a similar protective material until the excavation is backfilled. Roots below 10 mm in diameter may be trimmed back neatly in line with the edge of the excavation trench using secateurs.

6.7 Construction Within RPA

- 112) No substances that are potentially injurious to plant tissue (including diesel, bitumen, concrete, mortar, and other phytotoxic materials) shall be stored, discharged, prepared or used, where direct contact, infiltration or runoff might reasonably be considered liable to harmfully affect existing root growth or other parts of retained trees.
- 113) Where chemicals are stored, it is now standard practice to have emergency spillage kits available to minimise the impacts of any accidental spillages to the local environment. All vehicle washing or any other activity where potentially harmful chemicals are used shall have the provision to contain any accidental spillage. This can be achieved using suitable soil

³⁵ British Standards Institution (2012). *Op. cit.*

³⁶ National Joint Utilities Group (2007). Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees. [Online] Available at: <https://streetworks.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf> [Accessed: December 2024].

bunding or using a supporting timber framework sealed with heavy duty plastic sheeting. All fuel supplies would be double banded. Drip mats and trays would be provided for machinery as appropriate.

6.8 Fence Construction Within RPAs

- 114) Where fence posts need to be installed within RPAs, excavations should be minimal and carried out using handheld tools. Fence posts should be erected at least 1 m from trees and using metal post support spikes or if using concrete mix, post holes should be lined with an impermeable membrane to prevent contact between tree roots and potentially damaging chemicals in the concrete.
- 115) The proposed fence alignment should allow for a minimum distance of 500 mm between the tree stems and the fence, providing sufficient room for the future increase of the stem diameter and minimising the risk of potential conflicts between the fence structure and the tree stem.

6.9 Root Pruning

- 116) The specific need for root pruning has not been identified in any areas of the Alternative Facility though a number of retained trees have minor incursions into their theoretical RPA which means root severance may be required. In most cases, should tree roots be uncovered during excavation works then they are most likely to belong to trees removed during the site clearance. Should it be clear that an uncovered root is associated with a retained tree then the following steps should be taken.
- 117) Minor roots (less than 25 mm in diameter) should be cleanly severed with a sharp pruning saw, leaving as small a final cut wound as possible. Roots larger than 25 mm diameter should be carefully exposed by hand. Once exposed, the Environmental Clerk of Works or the Project Arboriculturist should be contacted for advice on how to proceed. If it is considered the removal of the root would not have a destabilising or detrimental impact on the parent tree, then it can be cleanly severed with a sharp pruning saw. A photographic record of any root pruning should be taken, along with its location marked clearly on a site plan.
- 118) If it is considered an unacceptable risk to sever the root, then it should be reburied or wrapped in damp hessian to prevent desiccation whilst the project team works through options for dealing with the situation. In certain cases, this may require the removal of the parent tree.

6.10 Changes of Level Within RPAs

- 119) Generally, the levels within the RPA or protected area should not be changed. Tree roots are considered to be, in the main, within the top 600 mm of the soil. Obviously, any excavation into this would remove part of the root system and potentially affect the vigour or stability of the tree. Conversely, any additional material built up above ground level would compact the soil beneath it, potentially compacting all the air pores in the 600 mm depth of soil that most roots are in, effectively suffocating the roots and thus affecting the vigour or stability of the tree.
- 120) On occasion, additional soil may be gently spread by hand within the RPA for example, to marry levels in small areas between raised levels of no-dig construction and the existing levels. The maximum depth of this would be 150 mm, reducing to nil. However, it is not generally acceptable, in large areas of the RPA to raise the level as a blanket. Any areas which would need to be raised are to be agreed with the LPA prior to construction. Specifically, there would be no mechanical equipment within the RPA/protected area to spread, compact, or level out soil levels as this would compact the soil.

6.11 Soil Improvements and Mulching

- 121) To compensate for root damage and stress caused by construction activities, it is recommended that the RPA of tree T038 should be mulched. The materials that may be used for mulching include coarsely divided plant matter, such as wood chip, pulverised bark, or leaf mould, any of which may be combined with well-rotted animal manure. The mulched area should extend over as much of the root system as can be allowed by other site-usage requirements. The depth of an organic mulch should not be so much as to inhibit aeration of the root system or to cause overheating of uncomposted material (normally no more than 80 mm to 100 mm). The mulch should be periodically replenished as it decomposes, so that it does not become depleted.

7. Arboricultural Site Supervision

- 122) Protection of trees on development sites is an iterative process which does not end with the finalisation of arboricultural reports.
- 123) The contractor would appoint a suitably qualified ACoW. The ACoW maybe different to the Project Arboriculturist who worked with the design team to develop this document and advise on tree issues during the design phases. The ACoW role is to adapt and update the AMS and TRRPP (working with the Project Arboriculturist as appropriate) as the Alternative Facility is delivered, to provide pragmatic and deliverable tree protection on site. As such, the AMS and TRRPP should be seen as live documents, which are subjected to continual revision.
- 124) The ACoW should arrange to make regular visits to the site to attend pre-commencement meetings, at key stages of the development (such as checking the erection of tree protection fencing) and to resolve any issue arising on site.
- 125) Records of any visits should be kept in the site diary and as brief site report documents. If requested, details of site visits should be made available to the LPA.
- 126) Should non-compliance be observed during site visits, the ACoW should have the ability to halt work until the issues can be rectified, and the relevant persons informed.

Appendix A. Tree Survey Methodology

Table A.1: Tree 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 m above ground
Structural and physiological condition	External visual tree assessment (from the ground) ³⁷
RPA	Calculation method in BS 5837:2012 ³⁸

³⁷ Mattheck and Breloer (1994). *The Body Language of Trees*, Research for Amenity Trees No 4. The Stationery Office, London.

³⁸ British Standards Institution (2012). *Op. cit.*

Appendix B. Cascade Chart of Tree Quality Assessment (Taken from BS 5837:2012)

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 C. Tree Survey Schedule Key

Column Header	Explanation
Tree ID	T – Tree G – Group/Hedgerow/Woodland H – Hedgerow
Diameter at breast height (DBH)	Tree stem diameter measured at 1.5 m from the ground. This reported figure relates to either single-stemmed trees or the calculated DBH for multi-stemmed trees. In some instances, DBH would 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 e.g., N (north) 7, E (east) 6, S (south) 5, W (west) 7. Single largest canopy extent reported for groups/woodland/hedgerows.
Crown Clearance	To inform on ground clearance.
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. Fair (F) – Showing minor signs of deterioration. Poor (P) – Unlikely to recover to a good condition.
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 BS 5837:2012 ³⁹ . 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).

³⁹ British Standards Institution (2012). *Op. cit.*

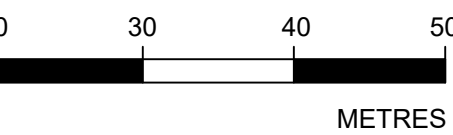
Appendix D. Tree Survey Schedule

Client: United Utilities Water Limited					Site: Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area													
Date of Survey:		06/11/2024			Prepared by		Jacobs U.K. Limited											
Tagged		No			Weather		Dry and mild											
Reference No.	Species		Height (m)	Stem Diameter (mm)	Branch Spread (m)				Canopy Clearance (m)	Life Stage	Physiological Condition	Structural Condition	Comments / Notes	Management Recommendations (Priority)	Estimated Remaining Contribution (Years)	Category Grading	AIA	Root Protection Radius (m)
	Common	Latin			North	East	South	West										
T001	Sycamore <i>Acer pseudoplatanus</i>		12	520	6	6	2	6	0	Mature	Fair	Fair	Heavily pruned on south side of canopy unbalanced crown	Fell tree for new entrance	10+	C2	Complete Removal	6.24
T002	Common ash <i>Fraxinus excelsior</i>		7	100	2	2	2	2	0	Early-mature	Poor	Poor	ADB AHC 3	No Work Recommended	10+	C2	Retain	1.2
T003	Sycamore <i>Acer pseudoplatanus</i>		15	560	6	6	6	6	0	Mature	Fair	Fair	Growing on bank	No Work Recommended	20+	B2	Retain	6.72
T004	Beech <i>Fagus sylvatica</i>		25	1510	12	12	12	12	0	Veteran	Fair	Fair	Veteran Tree - Some decay in large pruning wound at 18m with rot pocket forming. Possible bat roost on lower west side, Significant tree. RPA calculated x15 uncapped	No Work Recommended	40+	A1	Retain	22.65
T005	Common hawthorn <i>Crataegus monogyna</i>		9	280	3	3	3	3	0	Early-mature	Fair	Fair	Typical thorn	No Work Recommended	10+	C2	Retain	3.36
T006	Beech <i>Fagus sylvatica</i>		22	1100	9	9	9	9	0	Late-mature	Fair	Fair	Very large mature tree on road side assume road was built on previous RPA	No Work Recommended	40+	A1	Retain	13.2
T007	Common ash <i>Fraxinus excelsior</i>		12	260	3	3	3	3	0	Early-mature	Poor	Poor	No Significant Faults Observed	No Work Recommended	10+	C2	Retain	3.12
T008	Beech <i>Fagus sylvatica</i>		10	90	2	2	2	2	0	Semi-mature	Fair	Fair	No Significant Faults Observed	No Work Recommended	10+	C2	Retain	1.08
T009	Beech <i>Fagus sylvatica</i>		24	75	9	9	9	9	0	Mature	Fair	Fair	In good condition on a bank	No Work Recommended	40+	A2	Retain	0.9
T010	English oak <i>Quercus robur</i>		20	610	6	6	6	6	0	Mature	Fair	Fair	No Significant Faults Observed	No Work Recommended	40+	A2	Retain	7.32
T011	Beech <i>Fagus sylvatica</i>		19	720	7	7	7	7	0	Mature	Fair	Poor	Large mature tree significant storm damage with some decay	No Work Recommended	20+	B2	Retain	8.64
T012	Beech <i>Fagus sylvatica</i>		19	750	7	7	7	7	0	Mature	Fair	Poor	Stem located down bank	No Work Recommended	20+	B2	Retain	9
T013	Sycamore <i>Acer pseudoplatanus</i>		14	350	5	5	5	5	0	Mature	Fair	Fair	Field side of fence	No Work Recommended	20+	B2	Retain	4.2
T014	Common hawthorn <i>Crataegus monogyna</i>		4	220	3	3	3	2	0	Mature	Fair	Fair	No Significant Faults Observed	No Work Recommended	10+	C2	Retain	2.64
T015	Beech <i>Fagus sylvatica</i>		20	700	7	7	7	7	0	Mature	Fair	Fair	River bank eroding root plate on north	No Work Recommended	40+	A2	Retain	8.4
T016	Beech <i>Fagus sylvatica</i>		20	400	6	6	6	6	0	Mature	Fair	Fair	No Significant Faults Observed	No Work Recommended	20+	B2	Retain	4.8
T017	Sycamore <i>Acer pseudoplatanus</i>		20	660	7	7	7	7	0	Mature	Fair	Fair	No Significant Faults Observed	No Work Recommended	20+	B2	Retain	7.92
T018	Common holly <i>Ilex aquifolium</i>		7	438.75 250 300 200	3	1	3	2	0	Mature	Fair	Fair	Pruned on field side	No Work Recommended	10+	C2	Retain	5.27
T019	Beech <i>Fagus sylvatica</i>		24	890	7	7	7	7	0	Mature	Fair	Fair	No Significant Faults Observed	No Work Recommended	40+	A1	Retain	10.68
T020	English oak <i>Quercus robur</i>		20	600	5	5	5	5	0	Mature	Fair	Fair	Growing on crest of bank some hollowing of roots	No Work Recommended	20+	B2	Retain	7.2
T021	Beech <i>Fagus sylvatica</i>		24	1360	13	13	13	13	0	Veteran	Good	Good	Stem diameter suggests veteran tree, though lacking significant veteran features. Growing on fence line, significant tree	No Work Recommended	40+	A1	Retain	15

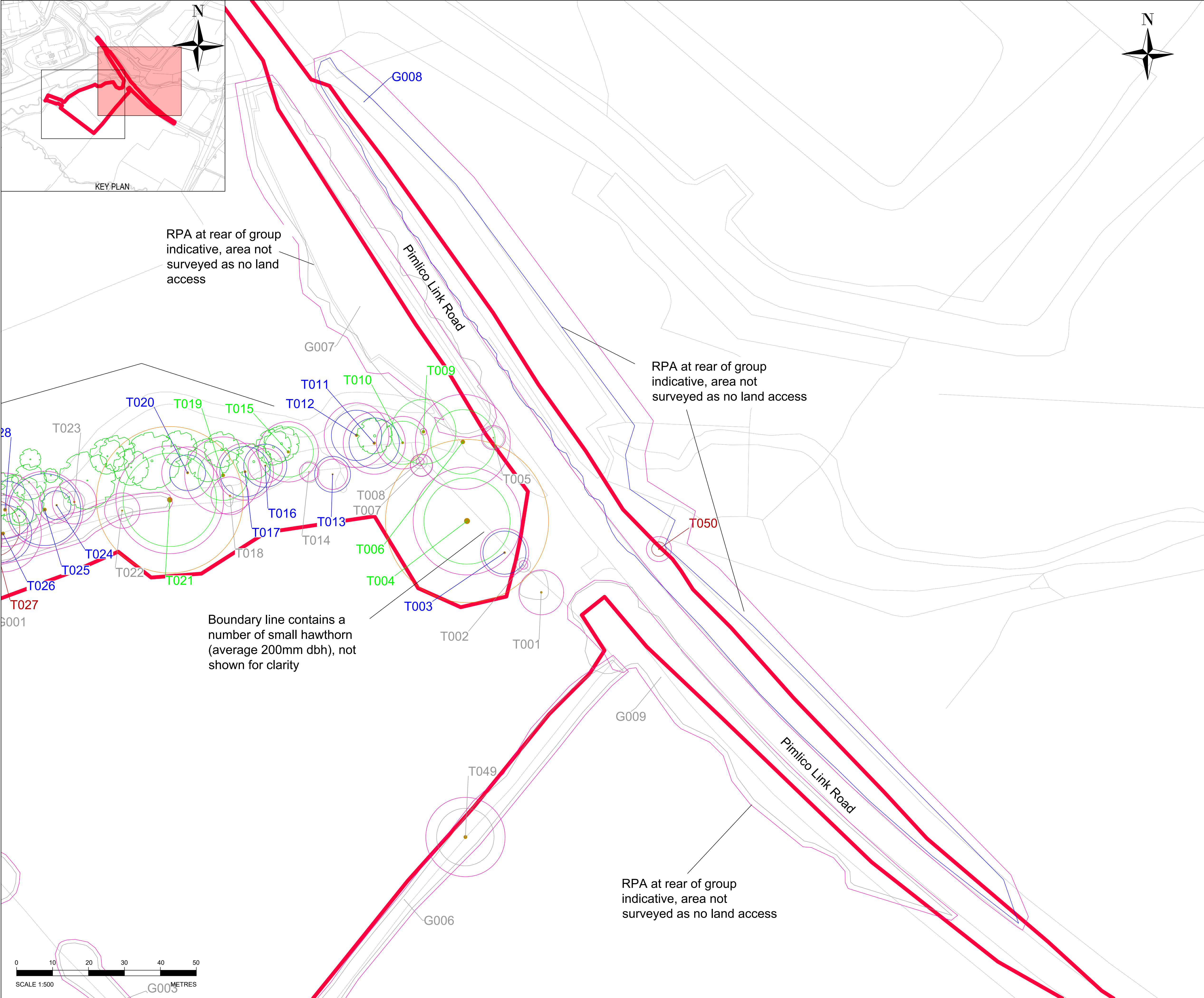
Reference No.	Species		Height (m)	Stem Diameter (mm)	Branch Spread (m)				Canopy Clearance (m)	Life Stage	Physiological Condition	Structural Condition	Comments / Notes	Management Recommendations (Priority)	Estimated Remaining Contribution (Years)	Category Grading	AIA	Root Protection Radius (m)
	Common	Latin			North	East	South	West										
T022	Common ash <i>Fraxinus excelsior</i>		14	410	1	3	3	1	0	Early-mature	Poor	Poor	ADB suppressed by larger tree	No Work Recommended	10+	C2	Retain	4.92
T023	Sycamore <i>Acer pseudoplatanus</i>		18	510	3	3	3	3	0	Mature	Fair	Fair	Next to collapsed section of bank sparse	No Work Recommended	10+	C2	Retain	6.12
T024	English oak <i>Quercus robur</i>		18	420	4	0	0	0	0	Mature	Fair	Fair	Suppressed canopy	No Work Recommended	20+	B2	Retain	5.04
T025	Beech <i>Fagus sylvatica</i>		22	890	10	10	10	10	0	Late-mature	Fair	Poor	Fungal fruiting bodies at base scarring on main stem spray mark at base marked for felling?	No Work Recommended	20+	B2	Retain	10.68
T026	Beech <i>Fagus sylvatica</i>		22	890	8	8	8	8	0	Late-mature	Fair	Fair	Large basal decay pocket occluding and natural bracing	No Work Recommended	20+	B2	Retain	10.68
T027	Beech <i>Fagus sylvatica</i>		22	850	8	8	8	8	0	Late-mature	Fair	Poor	Kretz decay on almost half of lower stem up to 1 m bark damage on the other side	No Work Recommended	<10	U	Retain	10.2
T028	Beech <i>Fagus sylvatica</i>		22	850	8	8	8	8	0	Late-mature	Fair	Poor	Column of decay running down main stem from 15m with significant dead limb tree in over all good health	No Work Recommended	20+	B2	Retain	10.2
T029	Common ash <i>Fraxinus excelsior</i>		20	970	10	10	10	10	0	Late-mature	Poor	Poor	ADB AHC 3 growing on ridge former coppice?	No Work Recommended	10+	C2	Retain	11.64
T030	English oak <i>Quercus robur</i>		10	450	0	7	1	1	0	Mature	Fair	Fair	Suppressed and hugely biased canopy	No Work Recommended	10+	C2	Retain	5.4
T031	Beech <i>Fagus sylvatica</i>		20	700	7	7	7	7	0	Late-mature	Poor	Poor	Significant die back and deadwood in canopy	No Work Recommended	10+	C2	Retain	8.4
T032	Beech <i>Fagus sylvatica</i>		20	750	7	7	7	7	0	Late-mature	Poor	Poor	Significant die back and deadwood in canopy moribund	No Work Recommended	10+	C2	Retain	9
T033	Sycamore <i>Acer pseudoplatanus</i>		20	1100	10	10	10	10	0	Mature	Fair	Fair	Growing on sunken lane side	No Work Recommended	40+	A2	Retain	13.2
T034	Common ash <i>Fraxinus excelsior</i>		20	1100	12	12	12	12	0	Late-mature	Poor	Poor	Massive basal decay ivy on stem ADB AHC 3/4 moribund	No Work Recommended	10+	C2	Retain	13.2
T035	Sycamore <i>Acer pseudoplatanus</i>		25	890	8	8	8	8	0	Mature	Fair	Fair	Growing on bank of sunken lane	No Work Recommended	40+	A2	Retain	10.68
T036	Sycamore <i>Acer pseudoplatanus</i>		25	1170	8	8	8	8	0	Mature	Fair	Fair	Growing on bank of sunken lane	No Work Recommended	40+	A2	Retain	14.04
T037	Common holly <i>Ilex aquifolium</i>		10	320.16 150 200 200	4	4	4	4	0	Early-mature	Fair	Fair	Growing below sycamore on fence line	No Work Recommended	10+	C2	Retain	3.84
T038	Sycamore <i>Acer pseudoplatanus</i>		25	1000	8	8	8	8	0	Mature	Fair	Fair	Growing on bank of sunken lane decay pocket at base but tree appears to have compartmentalised this	No Work Recommended	40+	A2	Retain	12
T039	Sycamore <i>Acer pseudoplatanus</i>		25	1100	8	8	8	8	0	Mature	Fair	Fair	Growing on bank of sunken lane	No Work Recommended	40+	A2	Retain	13.2
T040	Common ash <i>Fraxinus excelsior</i>		20	1000	7	0	0	0	0	Late-mature	Poor	Poor	Woodpecker hole and potential hollowing of co dominant main stem at 6 to 10 m	No Work Recommended	10+	C2	Retain	12
T041	Common ash <i>Fraxinus excelsior</i>		22	1460	11	0	0	0	0	Veteran	Poor	Poor	Veteran Tree - Huge tree close to derelict building, ADB AHC 4, significant deadwood	No Work Recommended	<10	U (noting Tree is veteran)	Retain	15
T042	Common ash <i>Fraxinus excelsior</i>		10	410	2	2	2	2	0	Mature	Dead	Poor	Dead ivy	Fell tree to allow construction	<10	U	Complete Removal	4.92
T043	Common ash <i>Fraxinus excelsior</i>		10	410	2	2	2	2	0	Mature	Poor	Poor	ADB AHC 3 ivy	Fell tree to allow construction	<10	U	Complete Removal	4.92
T044	Sycamore <i>Acer pseudoplatanus</i>		19	782.05 480 480 320 220	8	8	8	8	220	Mature	Fair	Fair	Large mature coppice	Fell tree to allow construction	20+	B2	Complete Removal	9.38

Reference No.	Species		Height (m)	Stem Diameter (mm)	Branch Spread (m)				Canopy Clearance (m)	Life Stage	Physiological Condition	Structural Condition	Comments / Notes	Management Recommendations (Priority)	Estimated Remaining Contribution (Years)	Category Grading	AIA	Root Protection Radius (m)
	Common	Latin			North	East	South	West										
T045	Common holly <i>Ilex aquifolium</i>		7	8x212.13	2	2	2	2	0	Early-mature	Fair	Fair	No Significant Faults Observed	Fell tree to allow construction	10+	C2	Complete Removal	2.55
T046	Beech <i>Fagus sylvatica</i>		20	830	5	8	8	8	0	Mature	Fair	Fair	Open grown tree	No Work Recommended	40+	A2	Retain	9.96
T047	Beech <i>Fagus sylvatica</i>		25	1130	12	12	12	12	0	Mature	Fair	Fair	Open grown tree some storm damage in canopy but healthy	No Work Recommended	40+	A2	Retain	13.56
T048	European Larch <i>Larix decidua</i>		19	650	7	7	7	7	0	Mature	Fair	Fair	Storm battered canopy	No Work Recommended	20+	B2	Retain	7.8
T049	Common ash <i>Fraxinus excelsior</i>		18	920	8	8	8	8	0	Mature	Poor	Poor	ADB AHC 3 significant deadwood growing on old bank side	No Work Recommended	10+	C2	Retain	11.04
T050	Common ash <i>Fraxinus excelsior</i>		15	290	2	2	2	2	0	Early-mature	Poor	Poor	AHC 4 moribund	Fell tree forpublic safety	<10	U	Complete Removal	3.48
GROUPS																		
Reference No.	Species		Height (m)	Stem Diameter (mm)	Branch Spread (m)				Canopy Clearance (m)	Life Stage	Physiological Condition	Structural Condition	Comments / Notes	Management Recommendations (Priority)	Estimated Remaining Contribution (Years)	Category Grading	AIA	Root Protection Radius (m)
	Common	Latin			North	East	South	West										
G001	Linear group of Common hawthorn <i>Crataegus monogyna</i>		350	350	As per plan				0	Mature	Generally Fair	Generally Fair	Out grown remains of boundary hedges. All show evidence of past management including laying. Lots of decay in stems. Occasional other species, but hawthorn dominated. Feature is discontinuous in places	No Work Recommended	20+	C2	Retain	As per plan
G002	Linear group of Common hawthorn <i>Crataegus monogyna</i>		350	350	As per plan				0	Mature	Generally Fair	Generally Fair	Out grown remains of boundary hedges. All show evidence of past management including laying. Lots of decay in stems. Occasional other species, but hawthorn dominated. Feature is discontinuous in places	Prune roadside trees to give 3m clearance from rear of kerb, fell and diseased ash trees within falling distance of road	20+	C2	Partial Removal	As per plan
G003	Linear group of Common hawthorn <i>Crataegus monogyna</i>		350	350	As per plan				0	Mature	Generally Fair	Generally Fair	Out grown remains of boundary hedges. All show evidence of past management including laying. Lots of decay in stems. Occasional other species, but hawthorn dominated. Feature is discontinuous in places	No Work Recommended	20+	C2	Retain	As per plan
G004	Linear group of Common hawthorn <i>Crataegus monogyna</i>		350	350	As per plan				0	Mature	Generally Fair	Generally Fair	Out grown remains of boundary hedges. All show evidence of past management including laying. Lots of decay in stems. Occasional other species, but hawthorn dominated. Feature is discontinuous in places	No Work Recommended	20+	C2	Retain	As per plan
G005	Linear group of Common hawthorn <i>Crataegus monogyna</i>		10	400	As per plan				0	Mature	Generally Fair	Generally Fair	2 very large old hedging trees growing as a small group	No Work Recommended	20+	B2	Retain	As per plan
G006	Linear group of Common hawthorn, crab apple <i>Crataegus monogyna, Malius sp.</i>		350	350	As per plan				0	Mature	Generally Fair	Generally Fair	Out grown remains of boundary hedges. All show evidence of past management including laying. Lots of decay in stems. Occasional other species, but hawthorn dominated. Feature is discontinuous in places	No Work Recommended	20+	C2	Retain	As per plan
G007	Roadside group of sycamore, oak, willow, ash <i>Acer pseudoplatanus, Quercus spp, Salix spp, Faxinus excelsior</i>		16	400	As per plan				0	Mature	Generally Fair, except ash	Generally Fair, except ash	Only road facing trees surveyed, Road side tree planting, dominated by sycamore but a mix of species. Larger trees located on the face of the bank, but smaller regeneration up to the VRS. Individual trees of limited arboricultural value. Canopies encroaching towards the highway. Ash all heavily infected with ADB	Prune roadside trees to give 3m clearance from rear of kerb, fell and diseased ash trees within falling distance of road	20+	C2	Partial Removal	As per plan
G008	Roadside group of sycamore, oak, willow, ash <i>Acer pseudoplatanus, Quercus spp, Salix spp, Faxinus excelsior</i>		16	400	As per plan				0	Mature	Generally Fair, except ash	Generally Fair, except ash	Only road facing trees surveyed, Road side tree planting, dominated by sycamore but a mix of species. Larger trees located on the face of the bank, but smaller regeneration up to the VRS. Individual trees of limited arboricultural value. Canopies encroaching towards the highway. Ash all heavily infected with ADB	Prune roadside trees to give 3m clearance from rear of kerb, fell and diseased ash trees within falling distance of road	20+	C2	Partial Removal	As per plan
G009	Roadside group of sycamore, oak, willow, ash <i>Acer pseudoplatanus, Quercus spp, Salix spp, Faxinus excelsior</i>		16	400	As per plan				0	Mature	Generally Fair, except ash	Generally Fair, except ash	Only road facing trees surveyed, Road side tree planting, dominated by sycamore but a mix of species. Larger trees located on the face of the bank, but smaller regeneration up to the VRS. Individual trees of limited arboricultural value. Canopies encroaching towards the highway. Ash all heavily infected with ADB	Prune roadside trees to give 3m clearance from rear of kerb, fell and diseased ash trees within falling distance of road	20+	C2	Partial Removal	As per plan
G010	Woodland group of <i>Acer pseudoplatanus, Quercus spp, Salix spp, sycamore, oak, ash, beech, Faxinus excelsior, Fagus sylvatica, Crataegus monogyna</i>		20	600	As per plan				1	Mature	Generally Fair, except ash	Generally Fair, except ash	Woodland group growing on steep slope down to the river, along side a sunken lane. Grazed with no understory. Majority of trees are mature and contain deadwood. Trees within influencing distance of site boundary plotted as individuals	No Work Recommended	40+	A1	Retain	As per plan

Appendix E. Tree Constraints Plan



SCALE 1:500	SHEET SIZE A1
DRAWING NUMBER RVBC-P&R-ARB-1	REVISION P01



General Notes

1. All dimensions are in millimeters unless noted otherwise.
2. All levels are in metres relative to Ordnance Datum Newlyn (mAOD) unless noted otherwise.
3. All co-ordinates are in metres relative to Ordnance national grid.
4. Do not scale from this drawing. All dimensions must be checked/verified on site.
5. The original of this drawing was produced in colour—a monochrome copy should not be relied upon
6. Please see tree schedule in relevant Jacobs arboricultural report for further details of trees and groups

Veteran tree RPA

Canopy

Stem

Root Protection Area

BS5837:2012 Category's

Category C tree		Category C Group
Category B tree		Category B Group
Category A tree		Category A Group
Category U tree		Category U Group
Tree within group		

Tree and Group label colour also reflects BS5837:2012 category

Planning Application Boundary

CURRENT ISSUE INFORMATION

P01	PS	DK	DK	SH	Final Issue	28/02/25
VERSION	AUTH	CHKD	REVD	APRV	REASON FOR ISSUE	DATE

SUITABILITY CODE	SUITABILITY DESCRIPTION
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United Utilities
Water for the North West

UNITED UTILITIES WATER LIMITED

HAWESWATER AQUEDUCT RESILIENCE PROGRAMME

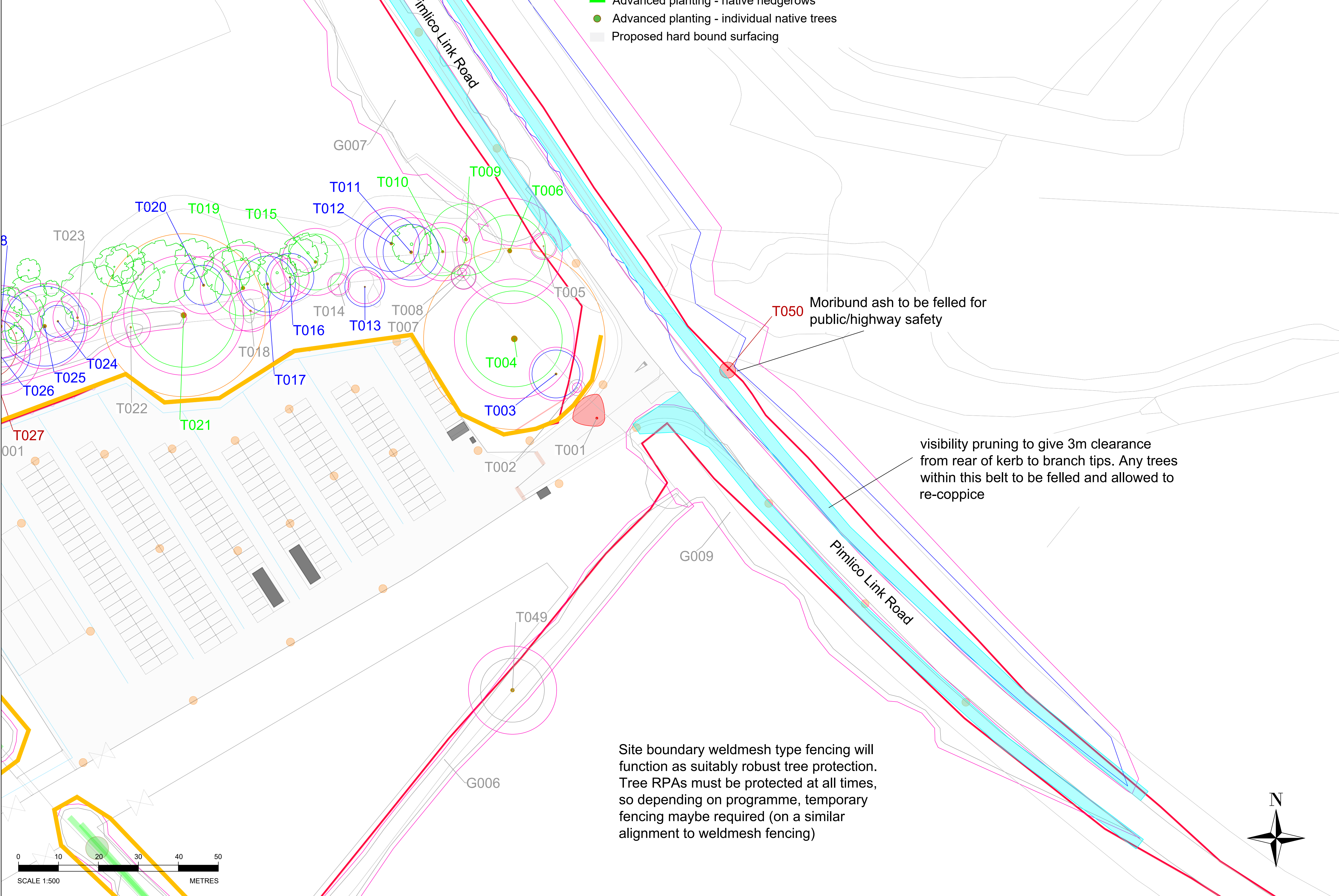
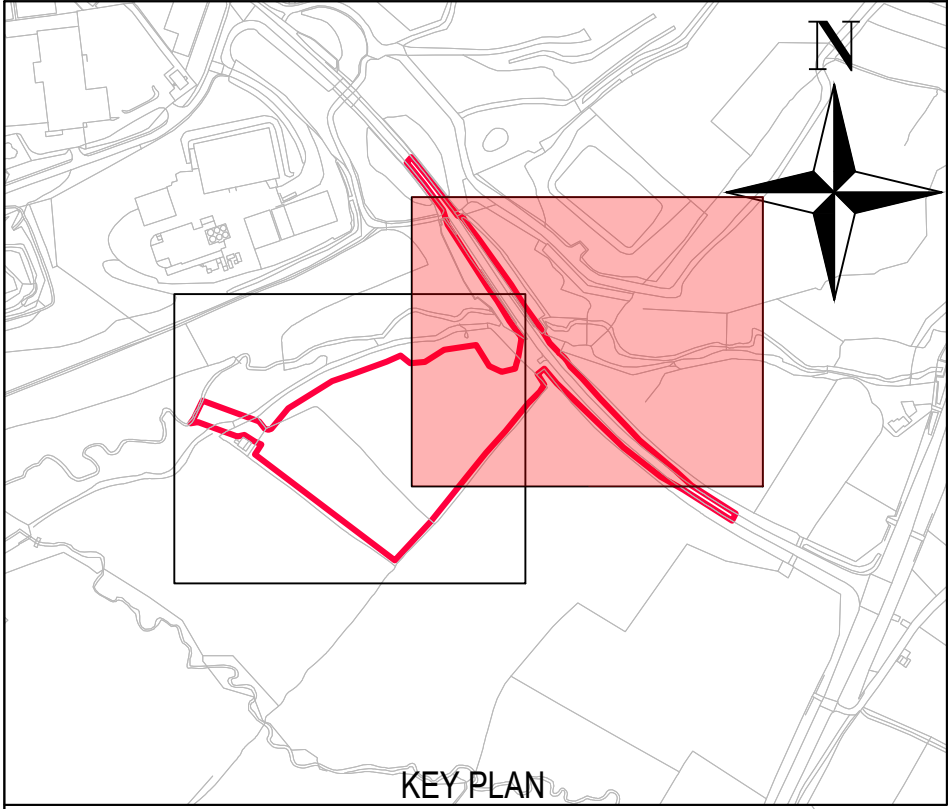
ALTERNATIVE TEMPORARY PARK AND RIDE AND HEAVY GOODS

VEHICLE MARSHALLING AREA

TREE CONSTRAINTS PLAN 2 of 2

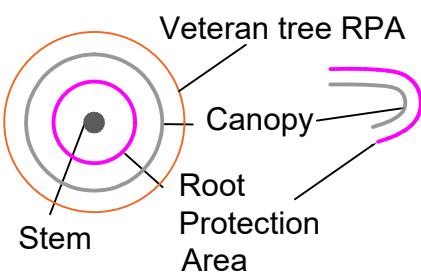
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DRAWING NUMBER RVBC-P&R-ARB-2	REVISION P01

Appendix F. Tree Retention, Removal and Protection Plan



- KEY**
- Planning Application Boundary
 - Temporary site buildings
 - Proposed Site Drainage Attenuation Area
 - Surface water drainage pipes
 - Car parking spaces
 - Screen Hoarding
 - Indicative location of Proposed Lighting Column
 - Goalpost structure to allow safe passage of vehicles under Overhead Powerlines
 - Goalpost with secure Weldmesh (Paladin) Gate
 - Advanced planting - native hedgerows
 - Advanced planting - individual native trees
 - Proposed hard bound surfacing

- General Notes**
- All dimensions are in millimeters unless noted otherwise.
 - All levels are in metres relative to Ordnance Datum Newlyn (mAOD) unless noted otherwise.
 - All co-ordinates are in metres relative to Ordnance national grid.
 - Do not scale from this drawing. All dimensions must be checked/verified on site.
 - The original of this drawing was produced in colour– a monochrome copy should not be relied upon
 - Please see tree schedule in relevant Jacobs arboricultural report for further details of trees and groups



- BS5837:2012 Category's**
- Category C tree
 - Category B tree
 - Category A tree
 - Category U tree
 - Tree to be removed
 - Group to be removed
 - Tree within group

- Tree Protection Fencing**
- Alignment of temporary Tree Protection Fencing if site Paladin fencing is not erected before construction commences - can be removed when superseded
 - Area of highway tree pruning

CURRENT ISSUE INFORMATION									
P01	PS	DK	DK	SH	Final Issue				28/02/25
VERSION	AUTH	CHKD	REVD	APRV	REASON FOR ISSUE				DATE

SUITABILITY CODE	SUITABILITY DESCRIPTION
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Jacobs.

UNITED UTILITIES WATER LIMITED
HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
ALTERNATIVE TEMPORARY PARK AND RIDE AND HEAVY GOODS
VEHICLE MARSHALLING AREA
TREE RETENTION, REMOVAL & PROTECTION PLAN 2 OF 2

SCALE 1:500	SHEET SIZE A1
DRAWING NUMBER RVBC-P&R-ARB-4	REVISION P01

Appendix G. Suggested Tree Protection Specification

Default Tree Protection Specifications (taken from pages 20-21 of BS 5837:2012⁴⁰)

Figure 2 Default specification for protective barrier

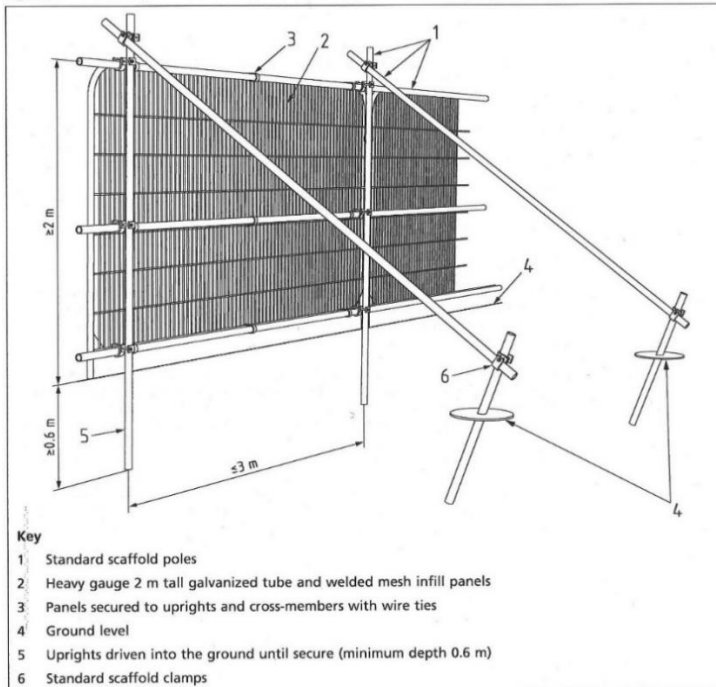
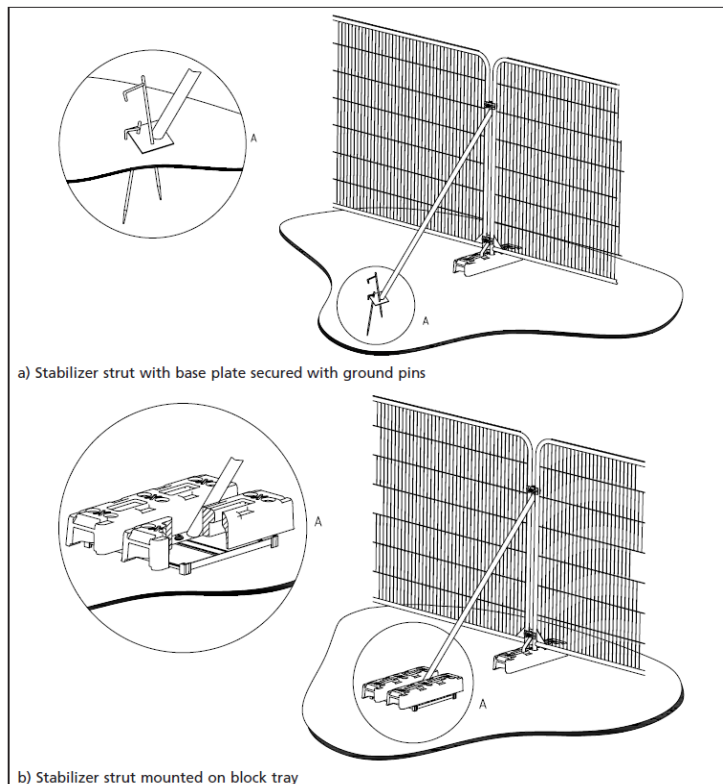


Figure 3 Examples of above-ground stabilizing systems



⁴⁰ British Standards Institution (2012). *Op. cit.*

Appendix H. Suggested Tree Protection Signage

