



ARBORICULTURAL REPORT & Impact Assessment to BS 5837:2012 at:

***Kirkby Substation
(cable area route):
Land at Cut Lane,
Knowsley
L33 7TT***

Prepared for: *Envams*

Report Date: *September 2025*

Reference: *AWA6835*

Executive Summary

This report provides independent arboricultural advice in accordance with BS 5837:2012, regarding trees at the site in the context of a proposed National Grid infrastructure development.

A total of 34 items of woody vegetation were surveyed, comprising individual trees and tree groups. Of these: 1 is high value (Category A), 4 are moderate value (Category B), and 29 are low value (Category C).

The proposed development will require the removal of 2 low-value trees and 1 moderate value individual trees and the selective removal of trees within 6 lower value groups. This will result in a moderate negative arboricultural impact.

The layout of the development has been designed to minimise encroachment into Root Protection Areas (RPAs). Mitigation measures, including protective fencing are recommended where necessary.

The scheme presents an opportunity for new tree planting as part of a landscape strategy, offering mitigation for the removals and long-term enhancement of the site's tree cover.

Contents

1. Introduction.....	4
1.1 Instructions and Brief	4
1.2 Survey Details	4
2. The Site.....	5
2.1 Location and Description	5
3. The Trees.....	6
3.1 Legal	6
3.2 Tree Survey Results	7
3.3 Photographs	9
4. Arboricultural Impact Assessment	10
4.1 Proposed New Development.....	10
4.2 Direct Impacts.....	10
4.3 Indirect Impacts	11
4.4 Suitable Mitigation	11
4.5 Protection of the Retained Trees.....	12
5. Summary of Tree Impacts	13
6. Signature	14
Appendix 1: Authors Qualifications & Experience.....	16
Appendix 2: Survey Methodology and Limitations	17
Appendix 3: Explanation of Tree Descriptions	18
Appendix 4: Tree Data	19
Appendix 5: Tree Constraints Plan.....	20
Appendix 6: Tree Impacts Plan	21

1. Introduction

1.1 Instructions and Brief

- 1.1.1 We have been instructed by Envams to visit the site and prepare our findings in a report. The assessment and report have been prepared to support a planning application for a battery energy storage system (BESS) on land approximately 1 km east of Knowsley Industrial Estate which is on the eastern edge of Kirkby. Close connection to the National Grid substation will be provided via the existing substation located approximately 630 m to the south west of the site. The cable route linking the Proposed Development to this substation is included within the red line boundary and is the subject of this assessment and report.
- 1.1.2 The report is required in accordance with BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*, to provide detailed, independent, arboricultural advice on the trees present, in the context of potential development.

1.2 Survey Details

- 1.2.1 The survey took place during August 2025.
- 1.2.2 The trees were surveyed visually from the ground using “Visual Tree Assessment” techniques and in accordance with the guiding principles of British Standard 5837:2012. Any additional off-site trees that could impact a new development design have been included in the tree survey parameters. The tree positions were plotted on an Ordnance Survey map base-layer using enhanced GPS technology (1-2m accuracy), data from Bluesky International Ltd’s National Tree MapTM, and a laser distance measurer.
- 1.2.3 This report has been prepared by Adam Winson, Chartered Arboriculturist, MSc, BSc (Hons), MICFor, MArborA, Principal and Director of AWA Tree Consultants Ltd. The tree survey data collection was carried out by Sophie Beckerman, BA (Hons), Dip. Arboriculture Level 4, PTI (Lantra), QTRA registered, Arboriculturist at AWA Tree Consultants Ltd.
- 1.2.4 Full qualifications and experience are included within **Appendix 1**. Explanatory details regarding the survey methodology are included within **Appendix 2**. A full explanation of the tree data can be found at **Appendix 3**. Full details of all the trees surveyed are found in **Appendix 4**. For tree locations please refer to the Tree Constraints Plan at **Appendix 5** and for detail of the impacts of the new development refer to the Tree Impacts Plan at **Appendix 6**.

2. The Site

2.1 Location and Description

- 2.1.1 The site is located to the west of Hewitt's Lane in Knowsley.
- 2.1.2 The site comprises a parcel of land surrounding an electrical substation. The A580 lies just to the south of the site and an industrial site borders it to the west. Agricultural fields lie to the east just beyond Hewitt's Lane.
- 2.1.3 The approximate area of the survey is highlighted in the (2024 Google Earth) image below:



3. The Trees

3.1 Legal

- 3.1.1 The following advice is for guidance purposes only. Some trees are protected by legislation, and it is essential that the legal status of trees is established prior to carrying out works to them. Unauthorised work to protected trees could lead to prosecution, resulting in enforcement action such as fines or a criminal record. Tree Preservation Orders, Conservation Areas, Planning Conditions, Felling Licences or Restrictive Covenants legally protect many trees in the UK.
- 3.1.2 Due to the large potential penalties for illegally carrying out work to protected trees, before authorising any tree works a check should be made with the Local Planning Authority to see if the trees are covered by a Tree Preservation Order or if they are within a Conservation Area. If either applies, then statutory permission is required before any works can take place (unless such work is approved as part of full planning permission).
- 3.1.3 The Multi-Agency Geographical Information for the Countryside (MAGIC) website was used to search for areas of ancient woodlands listed on the Ancient Woodland (DEFRA 2021), and a check for catalogued Ancient and Veteran trees using the woodland trust ancient tree inventory (ATI) (Woodland Trust 2021).
- 3.1.4 It was confirmed that there are no designated ancient woodlands or veteran or ancient trees within the survey area.
- 3.1.5 Trees provide a wide range of habitats for many species, some of which are legally protected such as bats, nesting birds, badgers and dormice. It is essential that appropriate care is taken to ensure that this legislation is not contravened.
- 3.1.6 When appointing a tree surgeon, only properly qualified and experienced companies should be used, who have adequate Public Liability and Employer's Liability Insurance.
- 3.1.7 All tree work should be carried out according to British Standard 3998:2010 Tree Work - Recommendations.

3.2 Tree Survey Results

- 3.2.1 The tree survey revealed 34 items of woody vegetation, comprised of 27 individual trees and 7 tree groups or hedges.
- 3.2.2 Of the surveyed trees: 1 tree is retention category 'A', 3 trees and 1 tree group is retention category 'B', and 29 trees and tree groups are retention category 'C' (explanatory details regarding the retention categories are included at Appendix 3).
- 3.2.3 Full details of the surveyed trees, tree groups and hedges are provided in the attached tree data schedule at Appendix 4. General comments are provided below:
- 3.2.4 The significant tree cover consists mainly of woodland groups which extend beyond the survey area. Many of these have been planted, likely for screening purposes. Within these groups is a species mix of varying age categories. Some larger and higher value trees are situated along the stream that runs from east to west through the site.
- 3.2.5 Species diversity at the site is relatively good. The dominant species are Willow, Oak, Cherry, Birch and Alder with occasional Sycamore and Hawthorn.
- 3.2.6 Most of the trees are young to semi-mature with only occasional early mature to mature trees.
- 3.2.7 The site's most significant trees are mature Oaks T25, T27, T28 and T31. Many of these are heavily ivy clad, preventing detailed inspection and accurate measurements. T25, T27 and T28 are on the edge of the stream bank, and the flow of the water has eroded the bank and exposed the root system. It is likely that these roots are often waterlogged. In spite of this the trees are in good physiological health and have good long-term prospects and are retention category B.
- 3.2.8 Oak T31 is the largest of these and is set slightly away from the water's edge with few exposed roots. This is in good structural health with good long-term prospects and is retention category A.
- 3.2.9 G13 is a group of young Oak, likely planted when the site was established. Dense brambles around the base made many of these trees inaccessible, and some of the stems were plotted approximately. These Oaks appear to be in good physiological and good structural health and are likely to have good prospects. Collectively they are retention category B, with many individually also category B.
- 3.2.10 G1 is a semi-mature mixed species group of predominantly Cherry, Alder, Willow and Oak. These were likely planted for screening purposes, and

some trees still have tree ties attached. Unofficial footpaths through the group have compacted the soil and utilities infrastructure has likely damaged some roots. The northeastern edge of this group is predominantly young, likely self-set specimens, with semi- and early-mature likely planted trees extending up banking to the southwest beyond the survey area. This group offers good screening and is retention category C. Within this group larger individual trees were also plotted.

- 3.2.11 The remaining trees within the site are of low value and should not pose any significant constraint on the development potential of the site.
- 3.2.12 Some trees were covered in dense Ivy or were inaccessible (as detailed in Appendix 4). In such cases measurements were estimated and the condition values are indicative only.
- 3.2.13 The tree Root Protection Area (RPA) for each tree has been plotted as a polygon centred on the base of the stem. Due to the presence of roads, structures, topography (and past tree management) the RPA is likely to be a simplified representation of the tree roots actual morphology and disposition. However, detailed modifications to the shape of the RPA would largely be based on conjecture and so have been avoided.
- 3.2.14 Some lower value tree, hedge and shrub groups do not have RPAs detailed on tree plans. The detailed extent and spread of these low value groups, in conjunction with the tree schedule, is sufficient to assess the associated potential constraints.

3.3 Photographs



Photo 1: G1 from northeast



Photo 2: G1 young trees on northeastern edge of group.



Photo 3: Oak with G13



Photo 4: T25 from north



Photo 5: T27 from south



Photo 6: G22 and G23 from west

4. Arboricultural Impact Assessment

4.1 Proposed New Development

- 4.1.1 It is proposed to build a new battery energy storage system (BESS) with associated access. The development proposals have been provided by my client and inform this arboricultural impact assessment and the Tree Impacts Plan at Appendix 6.

4.2 Direct Impacts

- 4.2.1 From assessing the new development proposals, 3 trees will require removal to facilitate the development as they are situated in the footprint of the development or their retention and protection throughout the development is not suitable.
- 4.2.2 The trees that require removal to facilitate the development are T8, T24 and T27.
- 4.2.3 T8 and T24 are multi-stemmed Goat Willow, a species that is short lived and has low arboricultural value. Due to their low value the removal of these trees will have only a negligible negative arboricultural impact.
- 4.2.4 Oak T27 is a category B tree with good long term prospects, although it has some structural defects. The removal of this tree will have a moderate negative arboricultural impact. Replacement planting within the site will go some way towards mitigating the loss of this tree.
- 4.2.5 6 tree groups require partial removal to facilitate the development. G1, G13, G20, G21, G23 and G22 require a strip of trees removing to allow space for the development. With the exception of G13, these are all low value retention category C groups with little arboricultural value. Most of these groups will remain intact, lessening the visual and arboricultural impact of the removal of a limited number of trees within them.
- 4.2.6 G13 is collectively of moderate arboricultural value. The removal of approximately half of this group will have a moderate arboricultural impact. However, these are generally young Oaks and will be replaceable in a relatively short time frame, and their loss can be mitigated by replacement planting in other areas of the site.
- 4.2.7 2 trees require pruning works to facilitate the development. T25 and T28 require the crowns lifting and cutting back to give 3m clearance from the proposed works.
- 4.2.8 Whilst the required pruning works are likely to involve the removal of larger

diameter branches, Oak is a species which should be able to tolerate this work with only minor negative impact, and the benefits of retaining these category B trees greatly outweigh any negative impacts on the health of these trees resulting from the pruning.

4.3 Indirect Impacts

- 4.3.1 The tree Root Protection Area (RPA) detailed on the Tree Plans at Appendices 5 and 6, has been used as a layout design tool, to inform on the area around a tree where the protection of the roots and soil structure is treated as a priority.
- 4.3.2 Potentially damaging activities are proposed in the vicinity of retained trees. The new infrastructure encroaches close to and into the edge of the RPA of T25, T28, T30 and T31.
- 4.3.3 Construction within the RPA, can have negative impacts on tree roots. However, the encroachment is very minor, and the detailed RPA for these trees is likely to be a slightly exaggerated representation of the trees' actual rooting area. In addition it is likely that the existing topography and the deep sided stream to the north of T28, T30 and T31 will have significantly reduced root growth into the works area and as such it is unlikely that significant roots will be within these areas. The retained tree should therefore remain largely unaffected by the works, provided care is taken during the development.
- 4.3.4 The encroachment into the RPA of T25 is more significant. However, the encroachment is likely to be relatively minor given the width of the easement, and it is likely that T25 will tolerate these works. It is recommended to review the health of this tree once works are completed.
- 4.3.5 All the retained trees have been assessed as suitable for retention in terms of BS5837 (2012) section 5 "Proximity of structures to trees."
- 4.3.6 The buildability of the proposed development has been assessed in terms of access, adequate working space and provision for the storage of materials, including topsoil, in relation to the trees.

4.4 Suitable Mitigation

- 4.4.1 New tree planting throughout the site has the potential to mitigate for the required tree removals and, in the longer term, has the potential to improve the site's tree cover.

4.5 Protection of the Retained Trees

- 4.5.1 To ensure the successful retention of trees during the development process, all trees identified for retention must be physically protected from the outset of site preparation through to final landscaping. This protection should be in accordance with section 6.1 of BS:5837:2012 – Trees in Relation to Design, Demolition and Construction – Recommendations.
- 4.5.2 The primary method of protection will be the installation of tree protection fencing, constructed in line with the specification shown in BS 5837:2012.
- 4.5.3 This fencing must be installed prior to the commencement of any site clearance, demolition, or construction activity and remain in place for the duration of all potentially damaging operations.
- 4.5.4 The protected areas must be treated as construction exclusion zones. No materials, spoil, or equipment should be stored within these zones, and no access should be permitted.
- 4.5.5 Ground levels within the RPAs should be left unaltered, and care must be taken to avoid compaction of the soil structure, which could have long-term impacts on tree health.
- 4.5.6 An associated Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP) detailing protective fencing locations and specifications, construction methods close to the retained trees, and any required site monitoring, has been provided.
- 4.5.7 The AMS and TPP explain how and when the protection measures will be installed and maintained throughout the development. They are designed to be referenced for practical guidance on how to protect the retained trees at the site to ensure contractors do not accidentally damage trees during construction.

5. Summary of Tree Impacts

Tree/Group Ref	Value	Impact Type	Description of Impact	Impact Level	Mitigation / Solution
G1 G20 G21 G22 G23	C (Low)	Direct – Partial removal	Within footprint of development area	Negligible	Mitigation planting
G13	B (Moderate)	Direct – Partial removal	Within footprint of development area	Moderate	Mitigation planting
T8 T24	C (Low)	Direct - Removal	Within footprint of development area	Negligible	Mitigation planting
T27	B (Moderate)	Direct – removal	Within footprint of development area	Moderate	Mitigation planting
T25 T28	B (Moderate)	Direct – Pruning	Clearance required	Minor	Pruning to BS 3998:2010
T25	B (Moderate)	Indirect - RPA Incursion	Encroachment into RPA	Minor	Carry out risk assessment within 3 years of completion of works
T28	B (Moderate)	Indirect - RPA Incursion	Encroachment into RPA	Negligible	N/A
T30	C (Low)	Indirect - RPA Incursion	Encroachment into RPA	Negligible	N/A
T31	A (High)	Indirect - RPA Incursion	Encroachment into RPA	Negligible	N/A

6. Signature

I trust this report provides all the required information.

Signed



.....

Adam Winson, Chartered Arboriculturist, MSc, BSc (Hons), MICFor, ACIEEM

2nd September 2025

**AWA Tree Consultants Limited
Union Forge
27 Mowbray Street
Sheffield
S3 8EN**

www.awatrees.com



Our Charity Partner: Kids Plant Trees

At AWA Tree Consultants, we are proud to partner with the local charity, Kids Plant Trees. This collaboration allows us to support a cause that reflects our commitment to trees and the environment while making a positive impact on local communities.

Kids Plant Trees is a grassroots charity dedicated to improving tree equity by planting trees in underserved areas with limited green spaces, often in communities facing higher levels of deprivation.

We are proud to support their mission to create greener, healthier environments for future generations.



Appendices

Appendix 1: Authors Qualifications and Experience

Appendix 2: Survey Methodology and Limitations

Appendix 3: Explanation of Tree Descriptions

Appendix 4: Tree Data

Appendix 5: Tree Constraints Plan

Appendix 6: Tree Impacts Plan

Appendix 1: Authors Qualifications & Experience

Adam Winson: Chartered Arboriculturist, MSc, BSc (Hons), MICFor, MArborA, ACIEEM, QTRA Registered

Adam is the company Director and Principal Consultant. He has a mix of the highest-level academic qualifications and relevant work experience. He has worked within the tree care profession for over 20 years and was awarded an MSc in Arboriculture and Urban Forestry, with distinction. Adam is a Chartered Arboriculturist and a Registered Consultant with the Institute of Chartered Foresters, a Professional Member of the Arboricultural Association and he has original research published by the UK Forestry Commission. His work ranges from individual expert tree inspections to managing trees on major infrastructure projects. His work often involves trees with preservation orders or litigation, and he has appeared as a tree expert, at planning appeal hearings up to the crown court. Adam also regularly undertakes locum Tree Officer work for several Local Planning Authorities.

James Brown: BSc (Hons) Arboriculture, MArborA, PTI (Lantra), QTRA Registered

James is a highly experienced and qualified Arboricultural Consultant. He has a BSc (Hons) in Arboriculture, attaining first class honours, as well as being awarded the Institute of Chartered Foresters student award. He is a Professional Member of the Arboricultural Association, an Associate of the Institute of Chartered Foresters, and he is working towards becoming a Chartered Arboriculturist. James joined AWA in 2016, he has many years' experience as an Arboricultural Consultant, he previously worked in Europe's largest container tree nursery and he has experience of local authority Tree Officer work.

James Godfrey: BA (Hons), FdSc Arboriculture and Tree Management, TechArborA, PTI (Lantra), QTRA Registered

James has had extensive arboricultural experience working as an arborist within the public and private sector. While working at AWA, James completed his FdSc in Arboriculture and Tree Management, graduating with a distinction and was also awarded for achieving the highest overall mark in his year. James has used his arboricultural knowledge to inform and carry out accurate tree surveys and produce detailed reports that aim to balance appropriate tree retention with the requirements of landowners.

Joe Thomas: MSci Biology, Award L4 Arboriculture, TechArborA, PTI (Lantra), QTRA Registered

Joe achieved a first class degree in Biology with an integrated Masters (MSci) from the University of Sheffield. Additionally, he has a Level 4 Award in Arboriculture. Joe joined AWA after an Urban Forestry role with the Sheffield and Rotherham Wildlife Trust and Sheffield City Council, where he gained a variety of experience in different aspects of the arboriculture sector.

Lucy Garbutt: MSc, PGCert, BSc (Hons) Biology, PTI (Lantra), TechArborA, QTRA Registered

Lucy graduated with a masters degree in Animal Behaviour from the UK's highest rated university, St Andrews of Scotland, immediately following the completion of her BSc degree in Biology from Lancaster University. Lucy has experience in botany and plant science and moved into arboriculture after previous experience of protected species and botanical surveys with a large environmental consulting company.

Sophie Beckerman: BA (Hons), Dip Arboriculture Level 4, PTI (Lantra), TechArborA, QTRA Registered

Sophie has more than 10 years' experience as an arborist, working for a variety of private companies as well as undertaking tree management with Sheffield City Council Ranger Service and The Wildlife Trust. Her expertise in arboriculture is demonstrated in the practical NPTC qualifications gained, and her excellent knowledge is reflected in the L4 diploma in Arboriculture, which she completed while working. Her roles as a climbing arborist and team leader included estimating for jobs and project management, supervising tree contracting teams - ensuring that work is carried out safely and efficiently and that health and safety standards are adhered to, and risk assessments are carried out.

Ross Lane: FdSc Environmental Conservation, Diploma Arboriculture, MArborA, PTI (Lantra), QTRA Registered

Ross has a diverse background spanning horticulture, arboriculture, and ecology. Ross has extensive experience conducting surveys throughout the UK and has worked on projects of all sizes, including major infrastructure projects such as HS2. In his previous role as a Tree Inspector at Derbyshire County Council, projects involved managing the county wide tree stock in relation to the ash dieback response and contributing to ambitious County Council targets of planting a million trees. Possessing professional-level membership with the Arboricultural Association, coupled with a comprehensive range of qualifications from tree risk assessment to habitat management, underscores Ross' dedication in professional arboriculture.

Appendix 2: Survey Methodology and Limitations

The survey was undertaken in accordance with British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. The trees were assessed objectively and without reference to any proposed site layout. The trees were surveyed from the ground using 'Visual Tree Assessment' (VTA) methodology. VTA is appropriate and is endorsed by industry guidance. It is used by arboriculturists to evaluate the structural integrity of a tree, relying on observation of trees biomechanical and physiological features. Measurements are obtained using a diameter tape, clinometer, laser distometer and loggers tape. Where this is not practical measurements are estimated. Tree groups have been identified in instances as defined in BS 5837:2012. Shrubs and insignificant trees may have been omitted from the survey.

This report represents a BS 5837:2012 tree survey and should not be accepted as a detailed tree safety inspection report; however, tree related hazards are recorded and commented upon where observed, yet no guarantee can be given as to the absolute safety or otherwise of any individual tree. All recommended tree work must be to BS 3998:2010 - '*Tree Work: Recommendations*'.

The findings and recommendations contained within this report are valid for a period of twelve months from the date of survey. The author shall not be responsible for events which happen after this time due to factors which were not apparent at the time, and the acceptance of this report constitutes an agreement with these guidelines and terms.

Appendix 3: Explanation of Tree Descriptions

HEIGHT of the tree is measured from the stem base in metres. Where the ground has a significant slope the higher ground is selected.

CROWN HEIGHT is an indication of the average height at which the crown begins.

STEM DIAMETER is measured at 1.5 metres above (higher) ground level. Where the tree is multi-stemmed at this point; the diameter is measured close to ground level or else a combined stem diameter is calculated.

CROWN SPREAD is measured from the centre of the stem base to the tips of the branches in all four cardinal points.

AGE CLASS of the tree is described as young, semi-mature, early-mature, mature, or over-mature.

PHYSIOLOGICAL CONDITION is classed as good, fair, poor, or dead. This is an indication of the health of the tree and takes into account vigour, presence of disease and dieback.

STRUCTURAL CONDITION is classed as good, fair or poor. This is an indication of the structural integrity of the tree and takes into account significant wounds, decay and quality of branch junctions.

LIFE EXPECTANCY is classed as; less than 10 years, 10-20 years, 20-40 years, or more than 40 years. This is an indication of the number of years before removal of the tree is likely to be required.

Retention Categories

A (marked in green on Appendix 5) = retention most desirable. These trees are of very high quality and value with a good life expectancy.

B (marked in blue on Appendix 5) = retention desirable. These trees are of good quality and value with a significant life expectancy.

C (marked in grey on Appendix 5) = trees which could be retained. These trees are of low or average quality and value, and are in adequate condition to remain until new planting could be established.

U (marked in red on Appendix 5) = trees unsuitable for retention. These trees are in such a condition that any existing value would be lost within 10 years.

	Tree Species			Measurements			Crown (m)				Tree Condition							Value		Management		
Tree ID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Crown height	N	E	S	W	Roots	Stem	Crown	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
G1	Cherry, Rowan, Wild service, Willow, Oak, Alder	<i>Prunus sp.</i> , <i>Torminalis sp.</i> , <i>Salix sp.</i> , <i>Quercus sp.</i> , <i>Alnus sp.</i>	Semi-mature	15	10+	150 avg	Yes	2	See plan				Mixed species group likely planted for screening. Continues up banking to southwest beyond survey area. Northeastern crowns overhang fenced area. Some larger stems plotted approximately. Occasional heavily leaning stems. Unofficial paths causing compaction through group with exposed roots. Some co-dominant stems and tight unions with included bark. Larger trees in group picked up as individuals				Good	Fair	>40 yrs	Low	C	Partial removal required to facilitate the development: Remove a strip of trees to allow adequate space for the proposed works
T2	Cherry	<i>Prunus sp.</i>	Semi-mature	6	1	200	Yes	2	3	3	3	3	Limited access around base	Stubs. Old pruning wounds	Minor deadwood	Within dense undergrowth on roadside verge. Cut back from road and overhead wires leaving stubs and multi-stemmed form from 3m. Undergrowth prevented detailed inspection.	Good	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development
T3	Cherry	<i>Prunus sp.</i>	Early-mature	12	2	250 260	No	3	4	4	3.5	3.5	Exposed roots	Twin stemmed at 1m. Tight union. Partially included bark	Minor deadwood	Co-dominant stems with significant included bark.	Good	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development
T4	Willow	<i>Salix sp.</i>	Early-mature	15	1	390	No	3	2	7	1	1	No visual defects	Significant lean. Single stemmed	Minor deadwood	Heavily leaning to northeast likely historic root plate movement. Supported on adjacent tree. Tree tie embedded in stem.	Good	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development
T5	Willow	<i>Salix sp.</i>	Early-mature	15	1	370	No	4	2	6	1	1	No visual defects	Slight lean	Minor deadwood	Slight lean to northast	Good	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development

Tree Species				Measurements			Crown (m)				Tree Condition							Value			Management	
Tree ID	Common Name	Latin Name		Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Crown height	N	E	S	W	Roots	Stem	Crown	Comments	Physiological	Structural	Life Expectancy	Amenity	Category
T6	Cherry	Prunus sp.	Early-mature	15	1	360	No	3	7	7	3	3	No visual defects	Vertical. Stubs. Single stemmed	Minor deadwood	Co-dominant stems at 5m.	Good	Fair	>40 yrs	Low	C	No works required to facilitate the development
T7	Cherry	Prunus sp.	Early-mature	15	1	290	No	5	5	5	3	3	No visual defects	Vertical. Stubs. Single stemmed	Minor deadwood	Co-dominant stems at 5m.	Good	Fair	>40 yrs	Low	C	No works required to facilitate the development
T8	Willow	Salix caprea	Mature	10	6	200 avg	Yes	1	6	6	5	5	Exposed roots	Multiple stemmed at 0.5m. Tight union. Partially included bark	Minor deadwood. Old pruning wounds	Ovewranging adjacent fenced area. Lower crown pruned back from northeast. Multi-stemmed form with tight unions.	Good	Fair	>40 yrs	Low	C	Removal required to facilitate the development
T9	Willow	Salix sp.	Early-mature	15	2	380 260	No	5	7	10	4	4	No visual defects	Twin stemmed at 0.5m. Tight union. Partially included bark. Significant lean	Minor deadwood	Co-dominant stems split out at base with northeastern stem hung up and heavily weighted over path to northeast.	Good	Poor	20 to 40 yrs	Low	C	No works required to facilitate the development
T10	Willow	Salix sp.	Early-mature	15	1	350	No	3	5	5	3	5	No visual defects	Single stemmed. Vertical	Minor deadwood		Good	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development

	Tree Species			Measurements			Crown (m)				Tree Condition							Value		Management		
Tree ID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Crown height	N	E	S	W	Roots	Stem	Crown	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
T11	Willow	Salix sp.	Early-mature	15	1	400	No	4	4	7	4	4	No visual defects	Single stemmed. Vertical	Minor deadwood	Co-dominant stems at 4m. Fissure from base to 3m on western stem aspect.	Good	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development
T12	Cherry	Prunus sp.	Early-mature	15	1	350	No	3	4	4	3	5	Exposed roots. Damage to buttress roots. Ground level changes	Stubs	Minor deadwood	Large concrete block at base in contact with buttress roots. Manhole cover to west. Significant exposed roots and soil erosion around manhole cover. Likely recent works at base with freshly exposed soil.	Good	Good	20 to 40 yrs	Low	C	No works required to facilitate the development
G13	Oak	Quercus robur	Young	8	10+	300 avg	Yes	1	See plan				Young Oaks, many multi-stemmed from 1-2m. Dense brambles prevented detailed inspection. Crown edge plotted and individual stems picked up where possible, with some plotted approximately. Inspection only cursory. Collectively category B and many individuals category B with good long-term prospects.				Good	Good	>40 yrs	Low	B	Partial removal required to facilitate the development: Remove a strip of trees to allow adequate space for the proposed works
T14	Willow	Salix sp.	Mature	15	6	250 avg	Yes	0	8	10	3	3	Limited access around base	Multiple stemmed. Ivy covered. Tight union. Significant lean	Minor deadwood. Unbalanced	Multi stemmed with some stems failed and fallen to east and in contact with fence. Ivy and access prevented detailed inspection. Stream to northwest.	Fair	Poor	20 to 40 yrs	Low	C	No works required to facilitate the development
T15	Willow	Salix sp.	Early-mature	10	4	280 200 100 50	Yes	1	3	3	6	6	Limited access around base	Multiple stemmed at base. Ivy covered	Minor deadwood. Unbalanced	Weighted to west with kink at base of stem. Ivy and brambles prevented detailed inspection.	Fair	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development

	Tree Species			Measurements			Crown (m)				Tree Condition							Value		Management		
Tree ID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Crown height	N	E	S	W	Roots	Stem	Crown	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
T16	Oak	Quercus robur	Young	6	4	100 60 50 50	Yes	1	3	3	3	3	Limited access around base	Twin stemmed. Tight union. Partially included bark	Minor deadwood		Good	Fair	>40 yrs	Low	C	No works required to facilitate the development
T17	Oak	Quercus robur	Young	5	1	90	No	1	3	3	3	3	Limited access around base	Single stemmed. Vertical	Normal		Good	Good	>40 yrs	Low	C	No works required to facilitate the development
G18	Oak	Quercus robur	Young	5	6	100 avg			See plan				Young Oak and 1 Hawthorn in dense brambles. Crown edge plotted approximately. Inaccessible and cursory inspection only.				Good	Fair	>40 yrs	Low	C	No works required to facilitate the development
T19	Cherry	Prunus sp.	Early-mature	12	1	300	No	2	4	4	4	4	Damage to buttress roots	Single stemmed. Vertical. Stubs. Old pruning wounds	Minor deadwood		Good	Good	>40 yrs	Low	C	No works required to facilitate the development
G20	Cherry, Willow, Oak, Alder	Prunus sp., Salix sp., Quercus sp., Alnus sp.	Semi-mature	10	10+	200 avg	Yes	1	See plan				Much of group inaccessible. Stream running along northern group edge. Dense brambles prevented detailed inspection.				Fair	Fair	>40 yrs	Low	C	Partial removal required to facilitate the development: Remove a strip of trees to allow adequate space for the proposed works

Tree Species				Measurements			Crown (m)				Tree Condition							Value		Management			
Tree ID	Common Name	Latin Name		Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Crown height	N	E	S	W	Roots	Stem	Crown	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
	G21	Birch, Willow, Oak, Alder	Betula sp., Salix sp., Quercus sp., Alnus sp.	Early-mature	14	10+	200 avg	Yes	1	See plan				Predominantly semi- to early-mature Birch and young Oak. Stream running along northern group edge. Dense undergrowth prevented detailed inspection. Some leaning Birch stems on edge of group.				Good	Fair	>40 yrs	Low	C	Partial removal required to facilitate the development: Remove a strip of trees to allow adequate space for the proposed works
	G22	Birch, Willow, Oak, Alder	Betula sp., Salix sp., Quercus sp., Alnus sp.	Young	10	10+	100 avg	Yes	0.5	See plan				Young to semi-mature multi-stemmed Willow with occasional young Birch, Alder and Oak. On bank sloping to south away from substation.				Good	Good	>40 yrs	Low	C	Partial removal required to facilitate the development: Remove a strip of trees to allow adequate space for the proposed works
	G23	Willow, Elder, Oak	Salix sp., Sambucus sp., Quercus sp.	Early-mature	10	10+	250 avg	Yes	1	See plan				Group of larger Willow along stream edge and on flat ground at base of bank. Ocassional Elder, Oak and Birch. Dense undergrowth prevented detailed inspection in places.				Good	Fair	>40 yrs	Low	C	Partial removal required to facilitate the development: Remove a strip of trees to allow adequate space for the proposed works
	T24	Willow	Salix caprea	Semi-mature	14	6	250 avg	No	2	4	6	6	5	No visual defects. Damage to buttress roots	Multiple stemmed at base. Tight union. Partially included bark	Minor deadwood. Snapped /hanging branches. Stubs	Multi-stemmed with tight unions.	Fair	Fair	20 to 40 yrs	Low	C	Removal required to facilitate the development

	Tree Species			Measurements			Crown (m)					Tree Condition							Value		Management	
Tree ID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Crown height	N	E	S	W	Roots	Stem	Crown	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
T25	Oak	Quercus robur	Mature	15	1	700	Yes	2	8	9	7.5	7	Limited access around base. Waterlogged	Multiple stemmed at 3m. Stubs. Ivy covered	Minor deadwood. Torn stubs	On edge of stream with roots exposed on water edge and likely frequently waterlogged. Root system undermined by water to northwest. Heavy Ivy cover on stem, in lower crown and around base prevented detailed inspection.	Good	Fair	>40 yrs	Low	B	Pruning works required to facilitate the development: Prune back and crown raise southern crown to give 3m clearance from proposed works
T26	Sycamore	Acer pseudoplatanus	Early-mature	14	1	430	No	1	4.5	6	5	4	Exposed roots. Waterlogged. Soil erosion	Twin stemmed at 2m. Stubs	Minor deadwood	On northern edge of stream with roots exposed on water edge and likely frequently waterlogged. Root system undermined by water to northwest.	Good	Fair	>40 yrs	Low	C	No works required to facilitate the development
T27	Oak	Quercus robur	Mature	14	2	650 300	Yes	1	7	6	6.5	8	Waterlogged. Exposed roots. Soil erosion	Stubs. Ivy covered. Minor cavity	Minor deadwood. Torn stubs	On edge of stream with roots exposed on water edge and likely frequently waterlogged. Root system undermined by water to northwest. Heavy Ivy cover on stem, in lower crown and around base prevented detailed inspection. Western stem horizontal to 1.5m then with sharp dogleg.	Good	Fair	>40 yrs	Low	B	Removal required to facilitate the development
T28	Oak	Quercus robur	Mature	10	1	510	No	1	7	7	5.5	5.5	Waterlogged. Exposed roots. Soil erosion	Stubs	Minor deadwood. Torn stubs	On edge of stream with roots exposed on water edge and likely frequently waterlogged. Root system undermined by water to northwest. Ivy becoming established.	Good	Fair	>40 yrs	Low	B	Pruning works required to facilitate the development: Prune back and crown raise northern crown to give 3m clearance from proposed works

Tree Species				Measurements			Crown (m)				Tree Condition							Value		Management		
Tree ID	Common Name	Latin Name		Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Crown height	N	E	S	W	Roots	Stem	Crown	Comments	Physiological	Structural	Life Expectancy	Amenity	Category
	T29	Oak	Quercus robur	Early-mature	12	4	130 370 280 150	No	2	5	7	6	3	No visual defects	Multiple stemmed at base. Bark damage	Minor deadwood. Slightly unbalanced	Multi-stemmed Oak or bundle of Oak at top of banking. Crown weighted to south and suppressed by adjacent tree. Smaller northern stem with bark damage at base.	Good	Fair	>40 yrs	Low	C
T30	Alder	Alnus glutinosa	Mature	15	6	300 avg	Yes	1	4	6	7	7	Limited access around base. Soil erosion. Exposed roots. Waterlogged	Multiple stemmed at base. Epicormic growths. Stubs	Minor deadwood. Moderate deadwood. Insect / caterpillar attack. Minor dieback	Epicormic growth and river debris around base prevented detailed inspection. Multi-stemmed tree on edge of stream with roots exposed on water edge and likely frequently waterlogged. Alder beetle damage to foliage. Northern stem with significant dieback. Dead stubs in crown.	Fair	Fair	10 to 20 yrs	Low	C	No works required to facilitate the development
T31	Oak	Quercus robur	Mature	18	1	820	No	2	9	10	9	9	No visual defects	Ivy covered. Stubs	Minor deadwood	At top of river bank. Roots likely occasionally waterlogged. Ivy prevented detailed inspection of stem and significant branch unions	Good	Good	>40 yrs	Low	A	No works required to facilitate the development
T32	Alder	Alnus glutinosa	Mature	16	6	320 avg	Yes	2	6	6	6	6	Soil erosion. Exposed roots. Waterlogged	Multiple stemmed at base. Stubs	Minor deadwood	Multi-stemmed tree on edge of stream with roots exposed on water edge and likely frequently waterlogged. Debris and brambles prevented detailed inspection.	Good	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development

Tree Species			Measurements				Crown (m)				Tree Condition							Value		Management		
Tree ID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Crown height	N	E	S	W	Roots	Stem	Crown	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
T33	Alder	Alnus glutinosa	Early-mature	11	6	100 avg	Yes	1	4	4	5	3	Limited access around base. Waterlogged. Ground level changes. Exposed roots	Multiple stemmed at base. Decay fungi. Slight lean	Minor deadwood	Younger stems growing out of decaying stump. Fungal fruiting bodies of Ganoderma sp. on decaying stem. On edge of stream with roots exposed on water edge and likely frequently waterlogged. Main stem with slight lean to southwest.	Fair	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development
T34	Willow	Salix caprea	Early-mature	10	5	210 240 260 270 220	No	1	5	5	5	5	No visual defects	Multiple stemmed at base. Tight union. Partially included bark	Minor deadwood	Multi-stemmed with significant included bark unions at base.	Good	Fair	20 to 40 yrs	Low	C	No works required to facilitate the development





Appendix 5:
Tree Constraints Plan

Kirby Substation: Land at Cut Lane, Knowsley
Ref: AWA6835

BRITISH STANDARD 5837:2012
RETENTION CATEGORIES
Definitions of these categories can be found in Appendix 2 of the report.

SCALE: 1:1000 PAPER: A3

	CATEGORY A: HIGH VALUE RETENTION MOST DESIRABLE
	CATEGORY B: MODERATE VALUE RETENTION DESIRABLE
	CATEGORY C: LOWER VALUE COULD BE RETAINED
	CATEGORY U: UNSUITABLE FOR RETENTION
	RPA: ROOT PROTECTION AREA
	TREE STEM
	INDICATIVE ROOT PROTECTION AREA

