Proposed Green Energy Park
Asland Walks
Bretherton, Lancashire

Arboricultural Impact Assessment

Bretherton Energy Partnership & GA Pet Food Partners

P.2285.25
November 2025

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Reference	Site	Client	Date
P.2285.25	Proposed Green Energy Park, Asland Walks, Bretherton, Lancashire	Bretherton Energy Partnership & GA Pet Food Partners	27 November 2025

Field work	Document author(s)	Technical review	Quality & approval
Alistair McLeod	Alistair McLeod	Kevin Pope	Richard Anderson, Quality & Office Administrator

Revision	Date	Details	Name

IMPORTANT: Any recommendations made within this report are subject to the appropriate consents being in place in advance. We cannot be held responsible for the actions of others not adhering to statutory controls.

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Executive Summary

A survey of the existing trees along a pre-determined route at Asland Walks, Bretherton, Lancashire has been carried out by a suitably qualified and competent Arboriculturist in accordance with British Standard 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*.

The purpose of the survey and of this report is to identify the impact of the proposed project on trees in accordance with the provisions of BS5837: 2012.

The project will involve the erection of a wind turbine, solar arrays, sub-stations and battery storage, with associated transmission infrastructure. Whilst the project will not directly require the removal of any trees, in the absence of suitable controls it does have the potential to have an indirect impact on a number of trees, hedges and woodlands.

Mitigation for the impact of the development can be provided in the form of the following:

- The erection of temporary protective fencing on a phased approach basis to safeguard the root systems of retained trees
- The agreement, in advance of the commencement of the project, together with the implementation during the construction phase, of an Arboricultural Method Statement
- Arboricultural site supervision via an Arboricultural Clerk of Works (ACoW) where works are proposed in proximity to trees

1. Introduction

1.1

Ascerta has been instructed to carry out a survey of the trees along a proposed transmission infrastructure route at Asland Walks, Bretherton, Lancashire and to assess the potential impact of the project as proposed on trees in accordance with British Standard 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*.

1.2

The site was visited on 6th & 7th August 2025 by Alistair McLeod, a competent and qualified arboriculturist with 38 years' experience of the UK and European arboricultural and landscape industries within the context of the planning system. During the site visit, a survey was carried out of the trees growing both on and immediately adjacent to the route of the proposed transmission infrastructure in accordance with BS5837: 2012. This report presents the results of the survey, provides an assessment of the impact of the proposals and includes recommendations for further actions, where applicable, to mitigate any potentially negative effects on tree cover within the local landscape.

2. Objectives

2.1

Our client's objective is the erection of a wind turbine, solar arrays, sub-stations and battery storage, with associated transmission infrastructure at Asland Walks, Bretherton, Lancashire.

2.2

Our objectives are as follows:

- Identify what arboricultural features exist presently along the transmission infrastructure route and to record and categorise them in a manner consistent with BS5837: 2012
- Identify which trees will need to be removed directly as a result of the project
- Identify any indirect impact from the project on trees proposed for retention
- Provide an indication of what protection measures can be implemented to ensure the physical protection of retained trees
- Provide any other recommendations to assist our clients in achieving their objectives whilst satisfying current legislation or policy guidance in relation to the woody vegetation.

3. Planning Policy and Relevant Legislation

3.1

The revised National Planning Policy Framework, updated on 12 December 2024, sets out the government's planning policies for England and how these are expected to be applied. It provides a framework within which locally prepared plans for housing and other development can be designed and produced.

3.2

The purpose of the planning system is to contribute to the achievement of sustainable development, including the provision of homes, commercial development, and supporting infrastructure in a sustainable manner. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

a) **An economic objective:** To help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity, and by identifying and coordinating the provision of infrastructure.

b) **A social objective:** To support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, safe and beautiful places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural wellbeing.

c) **An environmental objective:** To protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

These objectives should be delivered through the preparation and implementation of plans and the application of the policies in the Framework; they are not criteria against which every decision can or should be judged. The Framework promotes the retention of existing trees wherever possible, that new streets are tree-lined, and that the right trees are planted in the right places.

3.3

The site lies within the Chorley Council administrative area and is subject to the policies contained within its Local Plan, which have been considered when writing this report.

3.4

Checks have been made with the Local Planning Authority, DEFRA MAGIC Map and Ancient Tree Inventory resources. At the time of writing this report, the results of those checks are as follows:

Conservation Area	Bretherton Village
Tree Preservation Order(s)	TBC
Ancient Woodlands	N/A (Priority Habitat Inventory – Deciduous Woodland does however apply)
Ancient and/or Veteran Trees	N/A

NOTE: Our searches are mainly undertaken using Local Authority and government interactive websites, the reliability of which can sometimes be questionable. A more detailed search should therefore be carried out prior to any works to trees being commenced.

Irrespective of the above and the outcome of the planning application, in advance of the commencement of any works to trees within or adjacent the site however, those instructing and proposing to carry out such works should satisfy themselves that all appropriate consents are in place to prevent potential breach of legislation.

3.5

British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations* provides current recommendations and guidance on the relationship between trees and design, demolition and the construction processes. It sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.

3.6

Notwithstanding the aforementioned policies and legislation, consideration should also be given to any impacts from the proposed development in respect of the Hedgerow Regulations 1997 and the Forestry Act 1967 (and specifically the potential need for a felling licence), as well as existing UK and European legislation relating to wildlife and nature conservation.

4. Survey and Survey Methodology

4.1

We have been supplied with a digital copy of the Ordnance Survey base map for the site. Features of arboricultural or landscape interest have been added to the plan manually.

4.2

Our survey of the trees was carried out by a qualified and competent arboriculturist in accordance with sections 4.4 and 4.5 of BS5837: 2012 on 6th & 7th August 2025 during warm, sunny – cool misty weather conditions. Those trees surveyed have been numbered sequentially, although for the purposes of this project they have not been tagged. The trees have also been categorised in accordance with Section 4.5 and Table 1 of the Standard.

4.3

Where relevant and where the quality of shrub masses and hedges justifies recording, details have been recorded to the tree survey plan and tree data tables.

4.4

Where trees are surveyed that require immediate attention, for example to abate a nuisance, prevent a serious hazard to life or property, or are affected by a pathogen or pest that could cause widespread damage unless it is controlled, notification should be issued to the relevant person or organisation such that appropriate action can be taken.

4.5

Root Protection Areas for those trees surveyed have been calculated in accordance with the formulas within Section 4.6 and Annex C of the Standard and can be found within the tree data tables that accompany this report. The tree data tables also contain a key to abbreviations used and the rationale for determining Root Protection Areas for groups of trees and woodlands (where applicable).

5. Survey Results and Impact Assessment

5.1

Existing Tree Cover: Thirteen individual, thirty three groups of trees, five hedges and three woodlands were recorded during our survey, the details of which can be found within Appendix 1 to this report and cross-referenced with drawing P.2285.25.01 *Tree Survey*.

5.2

Direct Impact on Trees: The project as proposed will not directly require the removal of any existing trees, however it is recommended that T10 of our survey be removed on account of its condition.

5.3

Indirect Impact on Trees: In the absence of suitable controls, the project may well have an indirect impact on trees growing adjacent the proposed transmission infrastructure route. Measures are therefore required as described throughout this report in order to safeguard retained trees for the long-term benefit of the landscape.

5.4

Hedgerows: In accordance with the Hedgerow Regulations 1997, 'important' hedgerows (in the context of the Regulations) should not be removed without a Hedgerow Removal Notice issued by the relevant Local Authority, unless that removal is subject to an appropriate consent under the Town and Country Planning Act 1990. In this instance however, no hedgerows are proposed for removal to accommodate the project proposals, therefore there are no arboricultural implications associated with such work.

5.5

Potential Mitigation for Impacts: Mitigation of the direct impacts from the project can be provided in the form of the erection of protective fencing on a phased basis and the use of site-specific actions as agreed and documented within an appropriate Arboricultural or Tree Protection Method Statement (AMS).

5.6

Proposed Transmission Infrastructure Installation: A key element of the project will be the excavation of a suitable trench for the purposes of installing a high voltage electricity cable connecting the wind turbine and solar arrays with the substations and battery storage facility. This trench will follow a route as indicated on the plans submitted with the application and appended to this report. During the installation process, general guidance can be obtained from the National Joint Utilities Group (NJUG) Publication *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Volume 4* such as to minimise the impact of works on retained trees. Given the proximity in some areas of the proposed trench to retained trees, an element of on-site supervision of works by an appointed Arboricultural Clerk of Works (ACoW) will be required. These areas are denoted on the appended plans in red.

Where the proposed trench will be located in the soft space section north of Bank Bridge to the pet food factory, it is likely that roots from trees within G11 will be encountered. It is therefore recommended that excavation is carried out carefully under ACoW supervision and any exposed roots pruned clean to the edge of the trench using sharp tools. Further north, the trench will pass through G12, a mature woodland, then run along side the immature trees forming the linear woodland strip adjacent the main road. For the section through the mature element of the group, it may be necessary to hand dig or use an air spade within close proximity to trees to ensure maximum root retention. It is important that no roots greater than 25mm be severed to limit potential impacts on tree stability and future health. The ACoW should be on hand in these areas to supervise and advise on any issues that may arise.

To the east of the River Douglas, if the trench is located on the south side of the track alongside the field, the impact on roots should be minimal. The exception to this is where the track passes through W1, G18 & W2, where the trench should be located central to the track and excavated under ACoW supervision.

As the route of the trench follows Eyes Lane up to the junction with South Road, it should hug the edge of the road as close as possible and all excavations within the line marked in red supervised by the ACoW. A detailed working methodology written in to an Arboricultural Method Statement (AMS) will be required in these areas to ensure impact on trees are minimised. Where the trench passes close to hedges alone, it is not anticipated that significant damage will occur provided that the trench is kept as far away from the hedge as possible.

The proposed route of the trench along the south side of South Road will be contained within the existing highway footpath. Given the typical construction for such a footpath, including its sub-base, together with the fact that private gardens where trees grow are set at a lower level than the footpath itself (by up to 500mm) and the presence of open garden areas to the south, it is not anticipated that there will be a significant rooting presence beneath the footpath itself. Nevertheless, the ACoW should be retained on hand to oversee excavations and advise on root protection methodologies, including where necessary root pruning, to minimise the impact on retained trees and hedges.

There is a single tree, a Lombardy Poplar numbered T10, that is growing at the entrance to 175 South Road that is of concern. This tree has extensive basal damage and internal cavities with decay that suggest that failure is a possibility. The root structure of this species is particularly dominant therefore we would anticipate some rooting beneath the footpath to depth. Given the current condition of the tree we would recommend it's removal to prevent a future liability should the tree fail. If the stump is ground out following felling, a suitable replacement tree can be planted in its place. The tree is under private ownership therefore the consent of the owner will be required in advance.

As the trench heads north from South Road to the sub-station area off North Road, the first section past G33 & H5 will require ACoW supervision to prune any exposed roots. Further north however, provided that the trench is kept a suitable distance away from the hedge, there should be no impacts of any significance.

5.7

Working Space During the Implementation Phase: Considering the route of the proposed trench, working space in some areas may be at a premium. It is therefore important that a working methodology is agreed in advance between the site contractor and ACoW, which should be written in to an AMS to be adopted as a site control document.

5.8

Access Facilitation Pruning: There may be a limited number of areas across the working area where an element of access facilitation pruning may be required, for example to provide suitable ground clearance for machinery. Providing that these works are controlled and carried out to a minimum of the standards as contained within BS3998: 2010 *Tree work – Recommendations*, then the visual impact of the work will be minimal and will not detract from the overall landscape value of the site.

5.9

Requirement for an Arboricultural Method Statement (AMS): As stated above, it is recommended to agree and implement an Arboricultural Method Statement to ensure that retained trees are adequately protected from the outset and that no unnecessary harm occurs during the project implementation phase. Section 6 of this report contains further details of the aspects of the project that should be controlled, which can in turn be subject to a suitably worded planning condition if necessary.

6. Tree Protection Measures

6.1

Given the extent of the project, it is likely that a phased approach to installation and tree protection measures will be necessary in this instance. It would be impractical, and indeed unnecessary in some areas to install BS5837 compliant tree protection fencing along the entire length of the transmission infrastructure route. We would therefore advocate a reduced scope of tree protection fencing comprising of hi-vis safety barriers, supplemented with direct ACoW supervision commencing with a toolbox talk to site personnel. In advance of this however, it would be beneficial to mark the route of the proposed trenching on the ground to set out the least impactful location of excavations in relation to trees. Site compound areas and welfare facilities can be agreed in advance such that there is no impact on trees / vegetation.

The above can be documented within the appropriate contractor method statement and AMS, with a photographic record maintained on file on a before & after basis. Overall however, provided that tree protection & procedural measures are agreed in advance, the impact on trees throughout the working area of the project can be minimised.

7. Summary of Impacts and Potential Mitigation Factors

7.1

Table 1 below summarises the impacts of the project as proposed on tree cover within and immediately adjacent to the working area. Comments are also provided on potential mitigation, compensation or special measures required to minimise the impact of the works and to safeguard trees proposed for retention.

Table 1: Summary of the impacts of the development on trees within/adjacent to the site

Issue	Affecting	Mitigation / Compensation / Special Procedures
Trees/hedges to be removed	None relating directly to the project, although T10 should be removed on account of its condition.	Mitigation can be provided through a phased approach to tree protection, with appropriate ACoW supervision.
Indirect physical impact on retained trees	All trees & hedges adjacent the proposed transmission infrastructure installation route.	Tree protection fencing should be erected in phases to an agreed specification in advance of the commencement of works. ACoW supervision & root pruning where required and as documented within an AMS.
Working Space	All trees & hedges adjacent the proposed transmission infrastructure installation route.	Working methodology to be agreed in advance.
Access Facilitation Pruning	Dependent upon machine type & size, as well as proximity to adjacent trees.	All pruning works should be carried out to a minimum of the standards contained within BS3998: 2010 *Tree work – Recommendations.*
Protective fencing	To be erected to an agreed specification in advance of the commencement of the phased works and retained in-situ throughout the course of the excavation works.	

7.2

On the basis of the above and the contents of this report, it is considered appropriate that an Arboricultural Method Statement be prepared to demonstrate how trees proposed for retention can be suitably safeguarded. The Arboricultural Method Statement can be secured by way of an appropriately worded planning condition attached to the consent for the works and should be adopted as a control document by site personnel.

8. Conclusions and Recommendations

8.1

The direct and indirect impacts on tree cover as a result of the project proposals are outlined within this report and mitigation proposed accordingly that seeks where possible to satisfy local and national planning guidance and policy. Arrangements for the safeguarding and physical protection of retained trees should be agreed and implemented in a manner consistent with current best arboricultural management practices to minimise any potentially negative effects on long term tree cover.

8.2

We recommend that tree protection measures are implemented in accordance an Arboricultural Method Statement to be prepared and implemented to safeguard those trees proposed for retention.

9. References

Ministry of Housing, Communities & Local Government (December 2024) *National Planning Policy Framework*.

British Standard 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*.

National Joint Utilities Group Publication *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Volume 4.*

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Appendix 1

Site:	**Asland Walks, Tarleton & Bretherton**	Surveyor:	**A McLeod**
Client:	**Bretherton Energy Partnership & GA Pet Food**	Survey Date:	**6th & 7th August 2025**
Brief:	**Tree Survey to BS5837:2012**	Survey Conditions:	**Warm, sunny – cool misty**

ASCERTA LANDSCAPE | TREES | ECOLOGY

T. No	Species	Ht (m)	Stem DBH (mm)	RPA Radius (m)	Branch Spread				Ht Crown Clearance (m)	Age Class	P Condition	Structural Condition & General Comments	Preliminary Recommendations (not to be actioned without a valid planning consent)	Est. (yrs)	Cat Grade
					N	S	E	W							
G1	Ash, Cedar, Elder, Cypress, Apple, Hawthorn, Birch, Willow, Pine	16	Max 790	9.48	8	8	8	8	0.5	M/FM	F	Linear boundary group. Off site, forming the boundary to the adjacent residential property. Boundary Privet hedge in areas. Overgrown in parts with Clematis.	No work required at this stage.	30+	**B2**
G2	Damson, Beech, Oak, Laurel, Weeping Birch, Sumac, Cypress, Hawthorn, Elder, Goat Willow, Cherry, Whitebeam, Willow	Max 17	Max 350	4.20	4	4	4	4	0	EM/OM	F	Off site, linear group forming the boundary to the adjacent residential property. Large over-mature Willow at western end of group with dieback in canopy and several structural failures / deadwood.	No work required at this stage.	30+	**B2**
H1	Hawthorn	2	50	0.60	1	1	1	1	0	M	F	Growing adjacent ditch. Intermittent in parts.	No work required at this stage.	30+	**B2**
G3	Hawthorn, Elder, Willow	8	230	2.76	6	6	6	6	0	M	F	Karge Hawthorn with Elder & part-collapsed Willow.	No work required at this stage.	30+	**B2**
G4	Crack Willow, Hybrid Poplar, Goat Willow, Hawthorn	25	Max 750	9.00	8	8	8	8	0	M	F	Large Poplars with understorey of mixed trees.	No work required at this stage.	30+	**B2**
G5	Hawthorn, Elder, Ash, Crack Willow	Max 6	Max 200	2.40	4	4	4	4	0	M	F	Overgrown boundary hedge. Dead tree at northern end of group.	Reduce dead tree to 4m stump to limit hazard potential but retain as habitat feature.	30+	**B2**
T1	Alder	8	520+380	7.33	4	4.5	4	3.5	0.5	M	F	Off site, adjacent ditch.	No work required at this stage.	20+	**B2**
G6	Ash, Alder	16	490+470	8.15	9	5	6	6	0.5	M	F	Off site across ditch. Ash pruned in the past. Overhangs into the site.	No work required at this stage.	30+	**B2**
G7	Sycamore, Elder, Alder	7	Max 350	4.20	5	5	4	3	0.5	EM/M	F	Off site across ditch.	No work required at this stage.	30+	**B2**

NOTE: The Category Grade applied to trees surveyed is consistent with the recommendations within Table 1 of BS5837: 2012, however this does not necessarily correlate with the visual importance of a tree within the wider landscape, nor does it dictate which trees should be retained at the cost of quality development. Where trees are to be lost to accommodate a development, recommendations will be made such as to provide suitable mitigation and compensation, and to integrate the development into the wider landscape.

Key to Abbreviations & Headings

T. No.: Tree number (T = Tree, G – Group, W = Woodland, H = Hedge, Cpt. = Compartment)
Stem DBH (Diameter at Breast Height): Measured at 1.5m above ground level*
Ht Crown Clearance: Canopy ground clearance
Structural Condition: Description of any observed defects
Cat. Grade: Tree quality assessment in accordance with BS5837: 2012

Species: Common name used
Root Protection Area Radius: Root Protection Area as per BS5837: 2012
Age Class: Y = Young, EM =Early Mature, M = Mature, OM = Over mature, D = Dead
Preliminary Recommendations: Made in respect of known / intended use of the site
* For groups of trees, the stem diameter of the largest tree in the group is generally used
# Denotes estimated DBH where access was not possible

Ht: Approximate height of tree from ground level in metres
Branch Spread: Extent of canopy spread in metres to each of the four cardinal points
P (Physiological) Condition: G = Good, F = Fair, P = Poor, D = Dead
Est. (yrs): Estimated remaining contribution in years

Site:	**Asland Walks, Tarleton & Bretherton**	Surveyor:	**A McLeod**
Client:	**Bretherton Energy Partnership & GA Pet Food**	Survey Date:	**6th & 7th August 2025**
Brief:	**Tree Survey to BS5837:2012**	Survey Conditions:	**Warm, sunny – cool misty**

ASCERTA LANDSCAPE | TREES | ECOLOGY

T. No	Species	Ht (m)	Stem DBH (mm)	RPA Radius (m)	Branch Spread N	S	E	W	Ht Crown Clearance (m)	Age Class	P Condition	Structural Condition & General Comments	Preliminary Recommendations (not to be actioned without a valid planning consent)	Est. (yrs)	Cat Grade
G8	Alder	Max 10	Max 530	6.36	5	5	5	5	0.3	M/OM	F/P	Off site across ditch. Some trees dead / dying.	No work required at this stage.	20	**C2**
G9	Alder, Crack Willow, Hawthorn, Cherry	11	Max 280	3.36	4	4	4	4	0	EM	F	Off site.	No work required at this stage.	30+	**B2**
T2	Crack Willow	10	6 x ave 400	11.76	14	13	8	8	0	M	F	Adjacent river. Very large spreading tree. Multi stem.	No work required at this stage.	20	**C1**
T3	Crack Willow	9	620	7.44	6	8	5	7	1	M	F	Adjacent river. Large spread.	No work required at this stage.	20	**C1**
G10	Ash, Sycamore	16	680	8.16	6	8	5	5	1	M	F/P	Ash dieback in most trees. On river bank.	No work required at this stage.	20	**C2**
G11	Sycamore, Ash, Beech	Max 25	Max 600	7.20	8	8	8	8	0.5	EM/M	F	Linear woodland group alongside river. Mixed shrub understorey.	No work required however care will be required during any service installation.	40+	**B2**
H2	Hawthorn with Elder & Sycamore	2-3	75	0.90	1	1	1	1	0	EMM	G	Strong boundary feature.	No work required at this stage.	40+	**A1**
G12	Sycamore, Beech, Ash, Field Maple, Elder, Scots Pine, Hazel, Oak, Rowan	19	810	9.72	7	7	7	7	1	M	F	Ash dieback in Ash element. Mature Beech trees at southern end of group. Younger trees forming screen to adjacent factory.	No work required at this stage, however care will be required during any service installation. Hand-digging & root retention will be required.	30+	**B2**
G13	Crack Willow,, Sycamore, Hawthorn, Elder, Ash, Alder	Max 18	Max 650	7.80	9	9	9	9	0	Y-OM	F	Some over-mature trees adjacent the canal.	No work required at this stage.	30+	**B2**
G14	Crack Willow	7	8x220	7.47	5	5	5	5	0	M	F/P	Low quality linear group.	No work required at this stage.	20	**C2**
G15	Oak, Hawthorn, Lime, Beech, Sycamore, Blackthorn, Ash, Goat Willow	Max 17	Max 1100	13.20	8	8	8	8	0	M/OM	F/P	Mostly on north side of a ditch but some trees on the south side adjacent the track. Some Sycamores showing signs of advanced decay with tops lost. Ash element largely in decline.	Ensure that proposed service trench is kept within the track.	30+	**B2**

NOTE: The Category Grade applied to trees surveyed is consistent with the recommendations within Table 1 of BS5837: 2012, however this does not necessarily correlate with the visual importance of a tree within the wider landscape, nor does it dictate which trees should be retained at the cost of quality development. Where trees are to be lost to accommodate a development, recommendations will be made such as to provide suitable mitigation and compensation, and to integrate the development into the wider landscape.

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G16	Crack Willow, Sycamore	14	670	8.04	5	5	5	5	0	EM/M	F	Scrub group with single Sycamore. Japanese knotweed stand adjacent.	Treat the Japanese knotweed to eradicate it.	30	**B2**
W1	Oak, Sycamore, Hornbeam, Beech, Hawthorn, Pine, Ash	20	700	8.40	8	8	8	8	1	EM/M	F/P	Ash element declining. Fallen trees throughout. Typical for age & condition.	Ensure that proposed service trench is kept within the track.	30+	**B2**
G17	Oak, Blackthorn, Sycamore, Hawthorn, Ash	Max 12	Max 450	5.40	6	6	6	6	0	EM	F	Growing north of the ditch.	No work required at this stage.	30+	**B2**
G18	Oak, Sycamore, Crack Willow, Hawthorn	17	Max 590	7.08	6	6	6	6	0	M	F	Pond within the group. Typical form & condition for age & species.	No work required at this stage.	30+	**B2**
W2	Sycamore, Oak, Beech, Hawthorn, Horse Chestnut, Ash, Elm, Cherry, Blackthorn	20	Max 740	8.88	6	6	6	6	1	M	F	Typical form & condition for species & age class. Mature trees located 5m from road edge. Roadside element with Hawthorn hedge part way along the roadside. Limited verge in places. Fungal fruiting body noted in one Ash tree.	Centre the proposed service trench on middle of track into the field. Consider some management for highway safety.	40	**B2**
W3	Beech, Ash, Sycamore, Willow, Hawthorn, Whitebeam, Elm	Max 19	Max 770	9.24	8	8	8	8	0	M	F	Roadside woodland. Hawthorn hedge element. Ash dieback throughout. Cavities in some trees at northern end of group.	No work required at this stage, however consider some management for highway safety. Trench will need to be installed as close to the road edge as possible to limit the impact on root systems. Care will be required during the installation process.	40	**B2**
G19	Purple Norway Maple, Cherry	7	390	4.68	5	5	5	5	2	EM/M	F	Off site. Sparse foliage on the Cherry.	No work required at this stage.	30	**B2**
T4	Oak	22	800	9.60	4	7	6	6	3	M	F	Slight canopy bias to south.	No work required at this stage.	30+	**B2**

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Species: Common name used
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Est. (yrs): Estimated remaining contribution in years

Site:	**Asland Walks, Tarleton & Bretherton**	Surveyor:	**A McLeod**
Client:	**Bretherton Energy Partnership & GA Pet Food**	Survey Date:	**6th & 7th August 2025**
Brief:	**Tree Survey to BS5837:2012**	Survey Conditions:	**Warm, sunny – cool misty**

T. No	Species	Ht (m)	Stem DBH (mm)	RPA Radius (m)	Branch Spread N	S	E	W	Ht Crown Clearance (m)	Age Class	P Condition	Structural Condition & General Comments	Preliminary Recommendations (not to be actioned without a valid planning consent)	Est. (yrs)	Cat Grade
T5	Sycamore	19	390+250	5.56	3	4.5	2	4	3.5	EM	F	Twin stem. 2.5m to road edge. Ivy on stem.	No work required at this stage.	30	**B2**
T6	Horse Chestnut	19	730	8.76	10	6	6	5	2.5	M	F	Basal growth. Ivy on stem. Leans to north.	No work required at this stage.	30	**B2**
G20	Ash	15	Max 790	9.48	8	6	4	5	3.5	M	F/P	Past pruning & branch failure. Large pruning wounds. Deadwood throughout. In decline.	No work required at this stage.	20	**C2**
G21	Ash	13	350	4.20	5	5	5	5	3.5	EM	F	Growing in hedge. Eastern tree topped in past.	No work required at this stage.	30+	**B2**
H3	Hawthorn	2	50	0.60	0.5	0.5	0.5	0.5	0	EM	G	Strong boundary feature. Cypress hedge behind northern section. Growing both sides of the road.	No work required at this stage.	40+	**A2**
G21	Norway Maple, Field Maple, Ash, Rowan, Cedar, Spruce, Holly, Bird Cherry, Cherry, Lombardy Poplar	Max 17	Max 300	3.60	6	6	6	6	0	EM	F	Ash in decline. Dense group. Dead Poplars. Off site.	No work required at this stage.	30	**B2**
G22	Ash	15	510	6.12	6	6	6	6	2.5	M	P	Ivy throughout. Ash dieback. In decline.	No work required at this stage. Care will be required during trench excavations with exposed roots retained intact.	20	**C2**
G23	Cherry	11	Max 390	4.68	5	5	5	5	2	M	F	Tagged. Buttress / surface roots.	No work required at this stage.	30	**B2**
H4	Hawthorn, Laurel, Privet	2.1	80	0.96	0.5	0.5	0.5	0.5	0	M	F	Boundary hedge.	No work required at this stage.	30	**B2**
G24	Birch	17	Max 420	5.04	5	5	4	4	2.1	M	F	Growing in graveyard. Approx. 250mm below level of pavement. Pruned in the past.	No work required at this stage.	30+	**B2**
T7	Ash	10	400	4.80	6	5	5	5	3	EM	F	Dense Ivy. Minor twig dieback.	No work required at this stage.	30	**B2**

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ASCERTA LANDSCAPE | TREES | ECOLOGY

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					N	S	E	W							
G25	Sycamore	16	Max 360	4.32	5	5	5	5	0.5	EM	F	Various heights throughout the group. Roadside hedge of Hawthorn.	No work required at this stage.	30+	**B2**
G26	Sycamore, Oak	17	740	8.88	6	6	6	6	3	M	F	Dimensions taken from tree closest to road.	No work required at this stage.	30+	**B2**
T8	Horse Chestnut	15	820	9.84	6	7	8	7	3	M	F	Low branch growing over the highway. Cypress hedge adjacent road.	No work required at this stage.	20	**B2**
G27	Aspen, Sycamore, Chestnut	Max 19	Max 450	5.40	9	9	9	9	1.3	EM/M	F	Within adjacent garden, set 3.5m back from back of footpath. Typical for species with some minor defects throughout. 1.6m Laurel & Holly hedge on roadside boundary.	No work required at this stage.	30+	**B2**
T9	Norway Maple	7	250	3.00	4	4	5	3	1.4	EM	F	Within adjacent garden. Typical for species. 400mm below level of footpath.	No work required at this stage.	30+	**B2**
G28	Birch	Max 14	Max 370x2	6.28	6.5	6.5	6.5	6.5	1.6	M	F	Typical form & condition for species. Set 3m from back of footpath. 400mm below footpath level.	No work required at this stage.	20+	**B2**
G29	Wild Cherry, Purple Plum, Birch	Max 14	Max 330	3.96	5	5	5	5	0.5	M	F	Typical form & condition for species & age class.	No work required at this stage.	30	**B2**
G30	Wild Cherry, Goat Willow, Norway Maple	Max 10	Max 310	3.72	5	5	5	5	0.5	EM/M	F	Set 2m from back of footpath behind a low brick wall.	No work required at this stage.	30	**B2**
T10	Lombardy Poplar	14	950	11.4	1	1	1	1	2.5	M	P	Typical form for species. Topped previously around 6m above ground level. Significant basal cavities, internal decay & basal wounding.	Remove if possible to prevent a highway hazard.	10	**C1**

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ASCERTA LANDSCAPE | TREES | ECOLOGY

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T11	Wild Cherry	5	450	5.40	4	5	7	3	1.1	M	F	Set 1m from back of footpath. Typical form for species & age class.	No work required at this stage.	20	**B2**
T12	Apple	6	330	3.96	3	2	3	3	1.5	M	F	Dense Ivy on stem & through scaffolds.	No work required at this stage.	30	**C2**
T13	Pear	5	250	3.00	2	2.5	2.5	2.5	1	M	F	Dense Ivy on stem & scaffolds.	No work required at this stage.	20	**C2**
G31	Lawson Cypress, Norway Maple, Sycamore, Beech	16	Max 370	4.44	6	6	6	6	0.3	EM	F	Growing close to back of footpath.	No work required at this stage.	30+	**B2**
G32	Birch, Norway Maple	15	350+470	7.03	6	6	6	6	0.5	EM/M	F	Set 2m from back of footpath. Typical form & condition for species & age class.	No work required at this stage.	30_	**B2**
G33	Alder, Birch, Oak	Max 14	Max 300	3.60	5	5	5	5	0.3	EM	F/G	Linear group with emerging understorey. Typical form & condition for age class & species.	No work required at this stage.	40	**A2**
H5	Hawthorn with occasional Oak, Goat Willow & Sycamore	2.2-5	120	1.44	1	1	1	1	0	M	G	Strong boundary feature. Occasional Oak standard & emerging scrub. Growing underneath electricity wires.	No work required at this stage.	40	**A2**

NOTE: Trees have been surveyed to take account of the proposed works relating to the impacts of laying a cable connection along the prescribed routes. Individual landowners are responsible for the condition of trees under their ownership and therefore should conduct their own surveys on tree condition for health & safety purposes.

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Appendix 2

Drain
CC
Asland or Douglas
Old Course of River
2xMax 5m Elder
Rufford Branch
4m Elder
Leeds and Liverpool Canal
CP & ED Bdy
CC
Pond
Track
CC
T2
River Douglas
Path (um)
Saltmarsh
HTEW
Sluice
G9
Sluice
Drain
Drain
G8
Track
Saltmarsh
Drain
Ash
G6
T1
Red Bridge Farm
G7
Drain
Drain
Path (um)
Drain
Posts
EYES LANE
Red Bridge
4.5m
Track
CP & ED Bdy
Ash
G1
Strand Bridge
Drain
7.3m
Def
Borrowford House
G2
Well
Sollom Lock
Lock House
Large Willow
Def
Ditch
Dead tree
G5
Drain
SOLLOM LANE
COCK
H1
4.9m
MP
G3
G4

CLIENT:
Bretherton Energy Partnership & GA Pet Food

PROJECT:
Asland Walks, Tarleton & Bretherton

DRAWING TITLE:
Tree Survey - Sheet 1 of 6

SCALE:	DRAWN BY:	DRAWING No:	REV:
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t: 0845 463 4404
e: info@landscapetreesecology.com
www.landscapetreesecology.com

Key

- Existing tree / group retained
- Existing hedgerow retained
- Proposed line of cable route where excavation will have no, or limited impact on retained trees / vegetation
- Proposed line of cable route where excavation will potentially have an adverse impact on retained trees / vegetation and where precautionary measures will be required

Rev	Date	Details
A	27/11/25	Minor updates

ALL COORDINATES RELATED TO LOCAL GRID LOCATED TO OS NG BY BEST FIT TO DETAIL, EXTRACTED FROM OS DIGITAL DATA.

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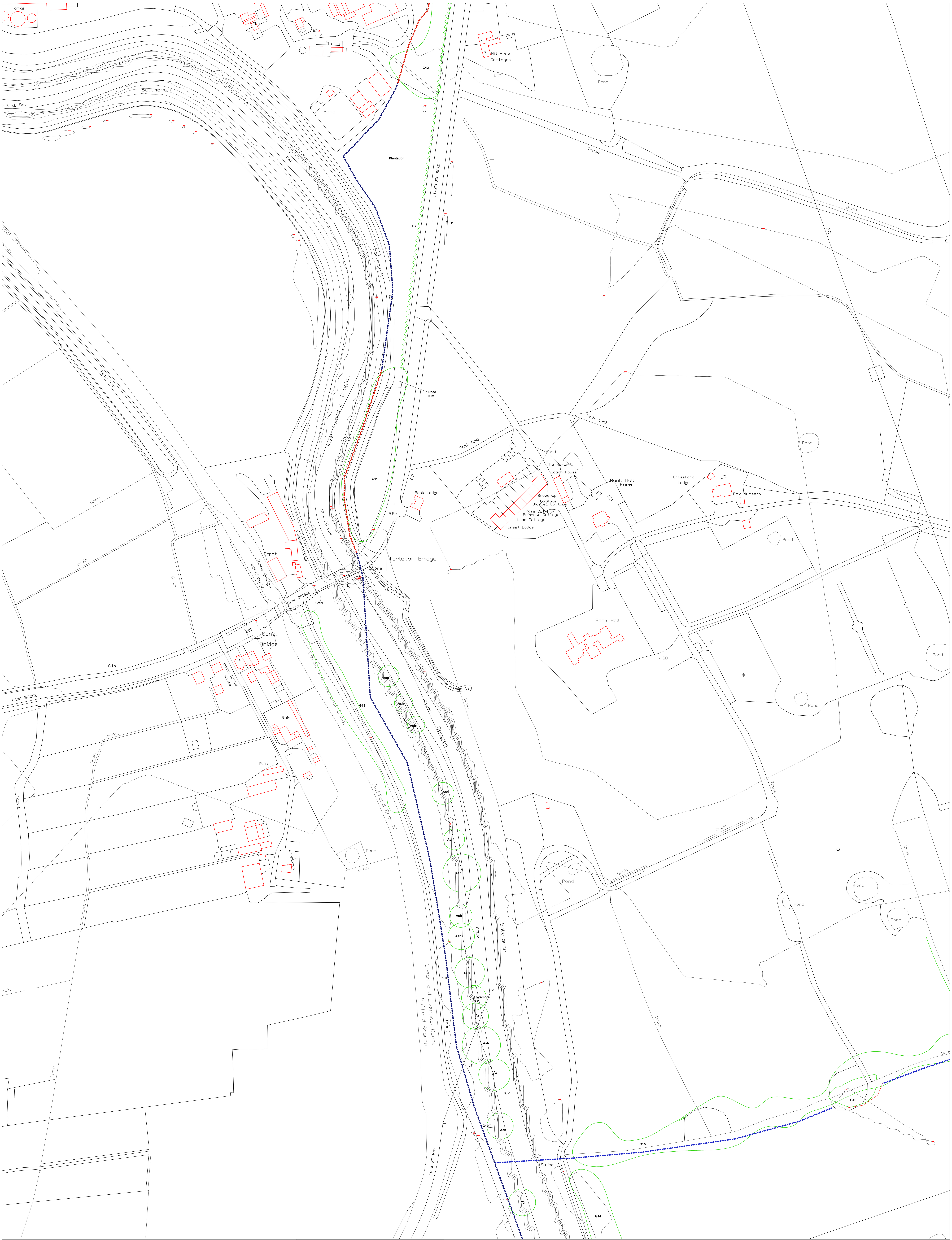

CLIENT:
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DRAWING TITLE:
Tree Survey - Sheet 2 of 6

SCALE:	DRAWN BY:	DRAWING No:	REV:
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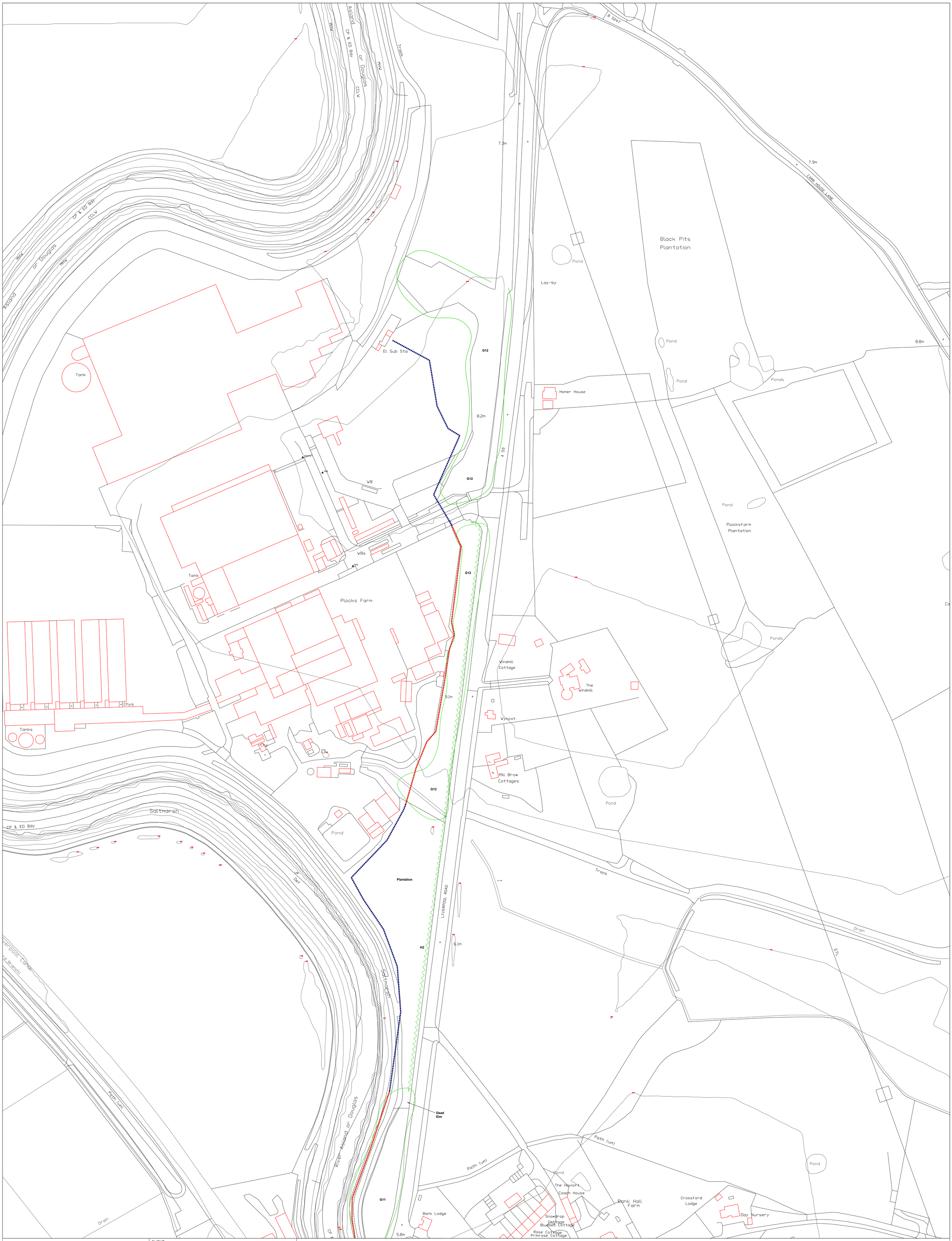

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Tree Survey - Sheet 3 of 6

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Path (um)
Path (um)
Pond
The Hayloft
Coach House
Bank Hall Farm
Snowdrop Cottage
Bluebell Cottage
Rose Cottage
Primrose Cottage
Lilac Cottage
Forest Lodge
Crossford Lodge
Day Nursery
Pond
Keepers Cottage
ETL
Pond
Bank Hall
SD
Pond
Pond
Drain
Track
Drain
Drain
Pond
Pond
Drain
Pond
Pond
Pond
Pond
Drain
Pond
Pond
Pond
Ponds
8m Cypresses
Drain
Saltmarsh
CCLW
Ash
Sycamore x 2
Ash
Ash
Ash
MLW
Def
G10
Ash
T3
G14
T2
G15
Sluice
Drain
Drain
G16
W1
W1
G17
Pond
G18
Post
5.2m
W2
W3
W2
Drain
Glynwood House
Track
EYES LANE
Track
Pond
Drain
Drain
Drain
Drain
Pond
4.5m
ETL
Drain

CLIENT:
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PROJECT:
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DRAWING TITLE:
Tree Survey - Sheet 4 of 6

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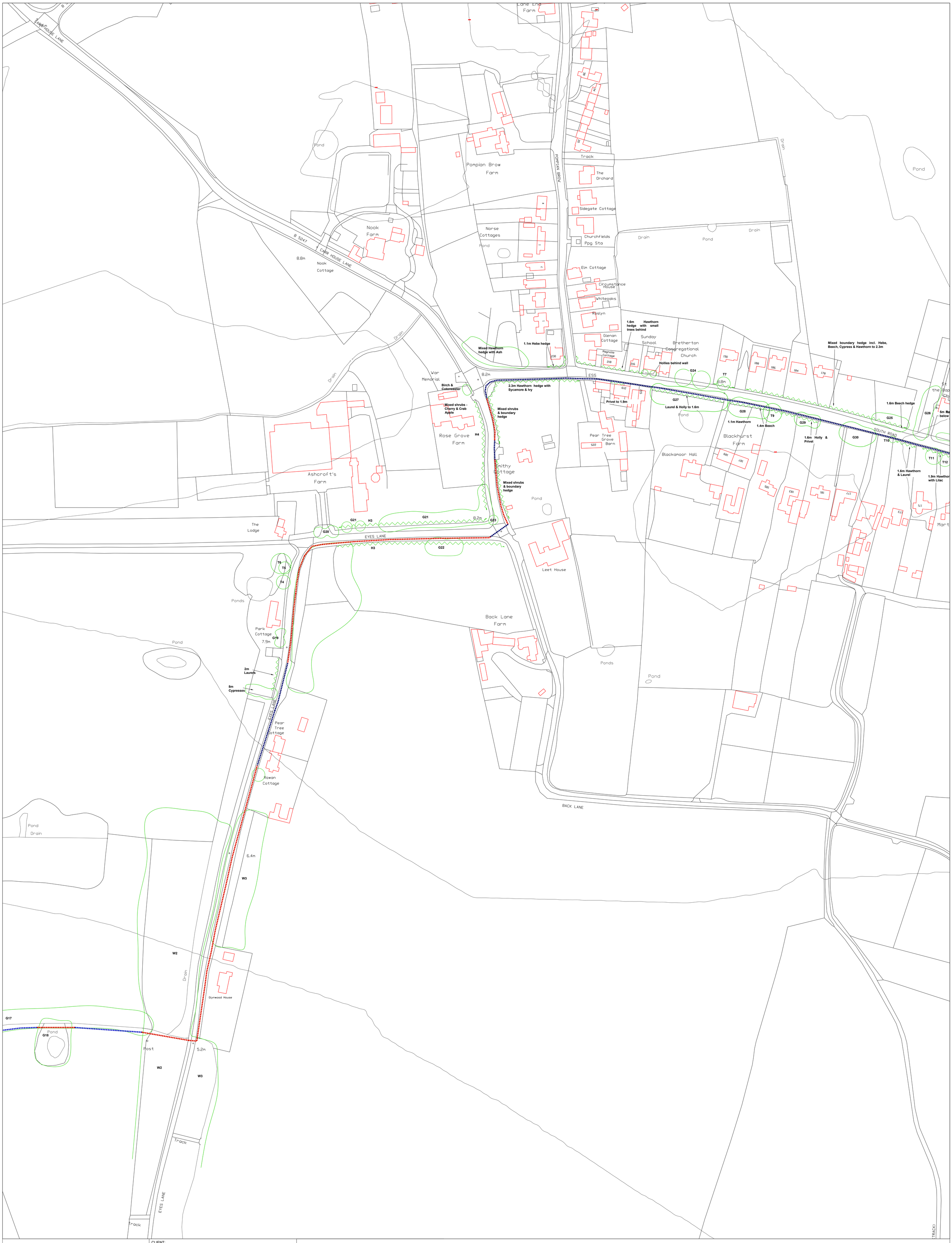

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Tree Survey - Sheet 5 of 6

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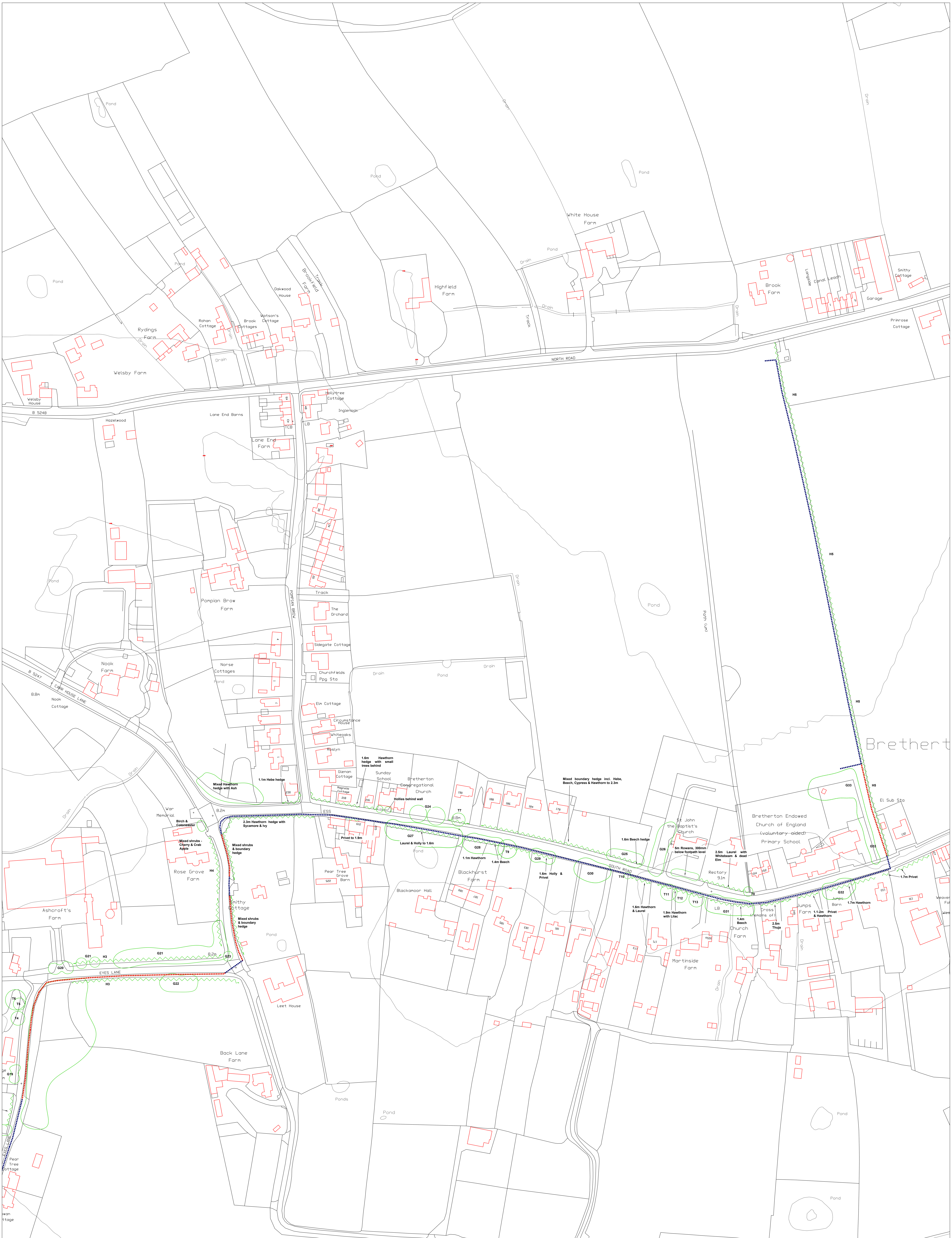

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Tree Survey - Sheet 6 of 6

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Appendix 3

The National Joint Utilities Group

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

Volume 4

NJUG GUIDELINES FOR THE PLANNING, INSTALLATION AND MAINTENANCE OF UTILITY APPARATUS IN PROXIMITY TO TREES

PLEASE ENSURE THAT YOU READ THE LEGAL NOTICE AND DISCLAIMER WHICH APPEARS IN APPENDIX B OF THIS PUBLICATION

Issue 2: 16th November 2007

NJUG has a vision for street works, this vision is simply:

- Safety is the number one priority
- Damage to underground assets is avoided
- Utilities work together and in partnership with local authorities to minimise disruption
- Utilities deliver consistent high quality
- Utilities maximise the use of sustainable methods and materials
- Street Works in the U.K. are regarded as world class

This document forms part of that vision.

Mark Ostheimer
Director, Safety and Policy

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

The following volumes constitute the NJUG Publications. They are living documents and may be amended from time to time. There is no attempt to describe any specific industry process as each utility has its own specifications and procedures. Not all the publications will necessarily be available at one time as individual volumes will be published when available.

NJUG PUBLICATIONS	
Current	*Previous*
VOLUME 1	
NJUG Guidelines on the Positioning and Colour Coding of Underground Utilities' Apparatus	NJUG 4 & 7
VOLUME 2	
NJUG Guidelines on the Positioning of Underground Utilities Apparatus for New Development Sites	NJUG 2, 5 & 6
VOLUME 3	
NJUG Guidelines on the Management of Third Party Cable Ducting	New
VOLUME 4	
NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees	NJUG 10
VOLUME 5	
NJUG Guidelines on Environmental Good Practice	New
VOLUME 6	
Legislation & Bibliography	NJUG 1

The following NJUG publications have not been reviewed and have been completely withdrawn:

NJUG 3 – Cable Locating Devices
NJUG 8 – Performance Guide for the Assessment of Metallic Pipe and Cable Locators
NJUG 9 – Recommendations for the Exchange of Records of Apparatus between Utilities
NJUG 11 – Proposed Data Exchange Format for Utility Map Data
NJUG 12 – NJUG Specification for the Digitisation of Large Scale OS Maps
NJUG 13 – Quality Control Procedure for Large Scale OS Maps Digitised to OS 1988
NJUG 15 – NJUG/Ordnance Survey Service Level Agreement (Technical) for Digital Map Products and Services

CONTENTS

In this document the word 'apparatus' is used to describe both the distribution mains and also the lateral apparatus to properties. The words 'plant' or 'services' are also used to collectively describe this and other equipment.

This volume supersedes NJUG 10 'Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees' and has been drafted by NJUG members and arboriculturists.

Background

The statutory right of undertakers (utilities) to carry out works within the public highway in order to provide and maintain their apparatus dates from the mid - 19th century. There are no statutory obligations governing the position or depth at which apparatus should be laid within the highway. The following guidelines should therefore be adhered to wherever practicable.

The New Roads and Street Works Act 1991, as amended by the Transport Act 2000, the Traffic Management Act 2004, the Transport (Scotland) Act 2005 together with the Street Works (Northern Ireland) Order 1995, sets down the legislative requirements to be adopted during the installation, repair and maintenance of apparatus in roads and streets (**see Volume 6 – 'Legislation and Bibliography'**).

Scope

(i) Trees (including shrubs and hedges) play an essential role in the environment and visual amenity of both rural and urban landscapes. They may take decades to grow, but can be destroyed in minutes. Wherever they are growing, whether in public footpaths, private gardens, rural verges or elsewhere, they require space for the adequate development of their root systems and to allow the branches to develop an attractive and natural shape.

(ii) Modern society expects a multiplicity of apparatus (electricity, gas, water, sewage, telecommunications and cable television) each of which requires an extensive distribution network, both above and below ground. These networks also need space, and they are frequently under tight constraints regarding their alignment.

(iii) The space available for both trees and apparatus is often very restricted, and they are frequently forced to share the available space, both above and below ground. Where they are in close proximity, there is the potential for either the tree or the apparatus to be subject to damage. To successfully co-exist precautions should be taken to minimise the risk of damage to both trees and apparatus based upon technical guidance obtained from this document and where appropriate further advice from local authority arboriculturists.

(iv) Legislative mechanisms for ensuring that existing trees (including shrubs and hedges) are safeguarded already exist (see sub-section 7 – 'Legislation'). References to legislation relate to the whole of the United Kingdom (UK) but variations between countries may occur. They seek to provide constructive advice on how to minimise damage to trees by undertakers (utilities) and to utility apparatus by trees and will be helpful to utility companies, contractors, arboriculturists, highway engineers, developers and planners. The guidelines have been prepared in collaboration between representatives of the utilities, the arboricultural and urban forestry professions and the Department for Communities and Local Government. As with all guidelines, their interpretation and application should be complimented at all times by common sense. However, expert guidance on specific instances should be sought from the appropriate utility, local authority or arboriculturist. The emphasis throughout this document is on the need for local liaison and communication.

(v) Certain trees are subject to Tree Preservation Orders (TPOs). Trees protected by a TPO must not be willfully damaged or destroyed and cannot be cut down, uprooted, topped or lopped without the local planning authority consent.

(vi) These guidelines are applicable to all apparatus (underground and overhead) and to trees in any location (public or private, rural or urban). They should be considered when new apparatus is planned to be constructed adjacent to existing trees, when new trees are to be planted adjacent to existing apparatus and where apparatus is to be maintained or repaired and trees are to be managed (e.g. pruning, removal or replacement).

(vii) Site surveys should be undertaken appropriate to the scale of the planned works. These surveys will identify the presence of trees which could impact on works. Advice should then be sought from a local authority tree officer. However, on major projects, a consultant arboriculturist may be employed to liase with the local authority tree officer. Site surveys should be carried out according to the recommendations within BS 5837 (see sub-section 8 – 'Other Useful Publications').

(viii) The principles set out in these guidelines also have relevance in respect of work carried out to highways near trees (e.g. kerbing, footway reinstatement).

1. HOW TREES ARE DAMAGED

Trees are complex living organisms, which are susceptible to damage from a wide range of physical agents or activities. Trees do not heal, damage caused to a tree will remain for the rest of its life. Even minor damage may set up circumstances leading to serious long term decay.

Contrary to popular belief, the root system of a tree is not a mirror image of the branches, nor is there usually a 'tap root'. The majority of the root system of any tree is in the surface 600mm of soil, extending radially in any direction for distances frequently in excess of the tree's height. Excavation or other works within this area are liable to damage the roots.

1.1 The Root System

The base of a trunk typically flares out in buttresses extending into the main lateral structural roots. These rapidly subdivide into the mass of smaller roots which serve to anchor the tree into the soil and transport water and nutrients. Even at a short distance (3m) from a large mature tree, most roots will be less than 10mm in diameter, but these may extend to well beyond the branch spread of the tree. A mass of fine roots, less than 1 mm in diameter, develop off all parts of this root system. These fine roots also absorb the water and nutrients, which are essential for the growth of the tree.

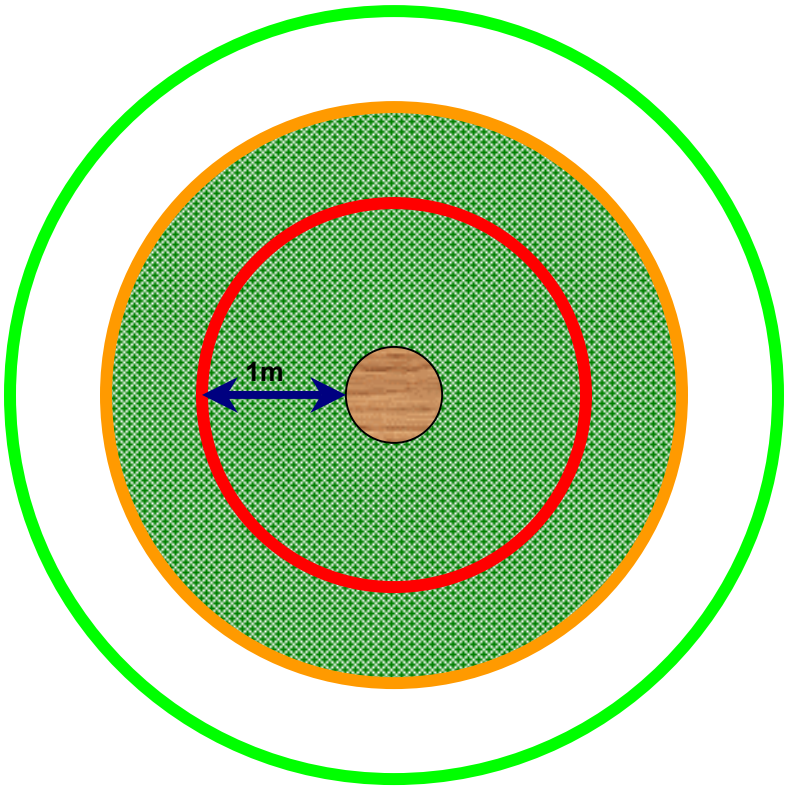
The main structural roots (close to the trunk) develop as the tree grows in response to the need for physical stability. Beyond these major roots growth is influenced by the availability of water, air and nutrients in the soil. Disturbance of soil provides ideal conditions for root growth. Apparatus is often cooler than the surrounding soil encouraging moisture within the soil to condense on its surface stimulating root growth close to the apparatus. For all these reasons root growth is often most prolific within the backfilled trench and in the soil around the apparatus.

There are certain areas around trees, illustrated in Figure 1 – 'Tree Protection Zone', where excavation either must not be undertaken or only undertaken under strict conditions in order to avoid or minimise any damage to a tree's root system.

For the purposes of this guideline document they are called zones;

- the Prohibited Zone (1m from the trunk)
- the Precautionary Zone (4 x the tree circumference)
- the Permitted Zone (outside of the Precautionary Zone)

FIGURE 1 – Tree Protection Zone



Key

Trunk of tree

Canopy or branch spread

PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with the local authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.

PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with the local authority Tree Officer if in any doubt.

PERMITTED ZONE – outside of the precautionary zone. Excavation works may be undertaken within this zone, however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

1.2 Below Ground

1.2.1 **Root systems can be damaged by;**

- the severance of a root, for example by trenching will destroy all parts of the root beyond that point. Even roots less than 10mm in diameter may be serving the fine roots over a wide area. The larger the root severed, the greater the impact on the tree.

Typical root damage caused by excavation works

- damage to the bark on the root. The bark protects the root from decay and is also essential for further root growth. It is loosely attached and easily damaged. If damage to the bark extends around the whole circumference the root beyond that point will be killed.

- damage to surface roots. Care must be taken when using mechanical plant. Materials and vehicles must never be stored within the Prohibited Zone and ideally should not be stored within the Precautionary Zone.

- compaction of the soil. Incidental compaction may occur from storage of materials and / or the passing of heavy equipment over the roots. This can restrict or even prevent gaseous diffusion through the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.

Poor site management within the Precautionary Zone

- alterations in soil level. Lowering the level will strip out the mass of roots near the surface. Raising levels will have the same effect as soil compaction.

- the application of herbicide - frequently used to clear weed growth on operational land (e.g. substations). The wide-ranging root system of a tree may extend into the operational land and absorb herbicides, which have been applied to the ground. Herbicide absorbed in one part of the root system can kill the whole tree.

NOTE: The selection and application of herbicides must be undertaken by a competent person in accordance with Control of Substances Hazardous to Health (COSHH) regulations.

- spillage of oils or other materials (e.g. diesel oil, cement, resins). Spillage can permeate into the soil and damage root systems (see sub-section 4.3 – 'Chemical Damage to Trees').

1.2.2 **If roots are damaged;**

- close to the trunk. The anchorage and stability of the tree may be adversely affected rendering the tree immediately hazardous.

- anywhere along their length. The distal portion including the fine roots they serve, will be destroyed. Damage to fine roots by severance of a main root, or by compaction or alteration of ground levels, will prevent fine roots from absorbing the water and nutrients which are essential for the well-being, growth and anchorage of the tree.

- by successive excavations. Multi-utility excavations close to a tree can cumulatively damage a root system.

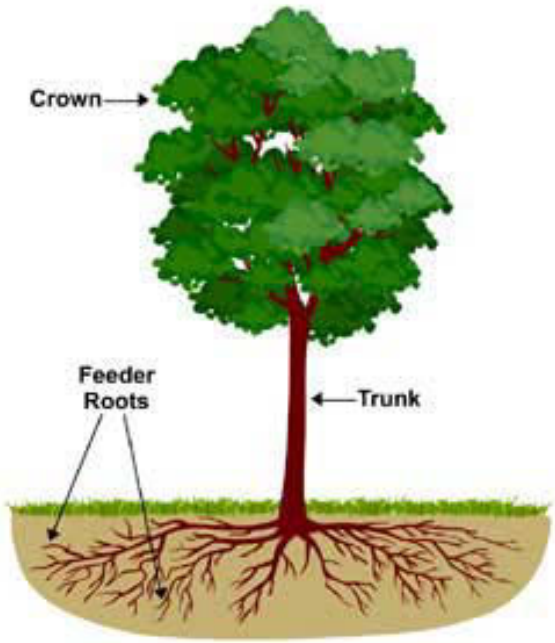


Figure 2 - Typical Tree Structure

1.2.3 **Symptoms**

Trees with damage may not show any immediate symptoms. Such symptoms may range from minor branch dieback to deterioration and ultimate death and collapse of the tree dependent on the severity of damage and the ability of the roots to regenerate.

If a root of 25mm diameter or over is severed, as a precautionary measure, a local authority tree officer / arboricultural officer should be contacted immediately.

1.3 Above Ground

Trees have a single or multi-stemmed trunk supporting a framework of branches and twigs. These structures are protected by a layer of bark, the purpose of which is to protect the functional tissues immediately beneath.

Trees can be damaged by:

- Direct impact by plant or machinery
- Fire and scorching.
- Poor pruning
- Abrasion by overhead apparatus
- Chemicals and fuel oils
- Storage of materials within the Prohibited and Precautionary Zones

1.3.1 **Abrasion**

The tree may be damaged by abrasion with overhead apparatus. Initially this only removes the outer bark. If the abrasion continues it can expose the underlying wood which may increase the risk of fire or eventual collapse of the branch or the tree.

If trees are growing in proximity to overhead apparatus it should be possible to prevent the development of problems by timely pruning and tree management. This requires knowledge of the growth pattern of the many different species of tree, consideration of the effects of the pruning on the appearance of the tree and application of the correct pruning techniques. All pruning should be in accordance with BS 3998 (see sub-section 8 – 'Other Useful Publications'). All operatives should be authorised and competent.

For all works other than emergency or urgent works, notification and consultation with all interested parties is necessary before work commences (see section 5 – 'How to Avoid Damage to Apparatus by Trees').

1.3.2 **Permissions / Notifications**
Any work to trees adjacent to an area of operations that extends beyond what is absolutely necessary for operational requirements may require either written permission from the local planning authority (in respect to tree preservation orders) or six weeks' notification to the local planning authority (in respect to trees in conservation areas)(see also section 6 – 'Sites with Designated Status').

2. HOW APPARATUS IS DAMAGED

The positioning and type of underground apparatus are detailed in NJUG publication **Volume 1 – 'NJUG Guidelines on the Positioning and Colour Coding of Underground Utilities' Apparatus'.**

Construction methods and utility service materials are subject to change and any cluster of utility services is likely to consist of a variety of historic and modern materials constructed to various specifications. In general utility apparatus includes the following:

Pipes
Cables
Ducts
Chambers
Poles/Towers/Masts/Satellite dishes
Above ground installations

2.1 Below Ground

Underground apparatus (especially those less than 600mm deep) may be affected by tree roots. The risk will depend on the ability of the apparatus, in particular any joints, to resist or tolerate distortion.

2.1.1 **Direct damage**
Direct damage is caused by the annual increase in root thickness resulting in eventual contact with apparatus. However, it is usually either the root or the adjacent soil that will distort rather than the apparatus itself. The potential for damage depends on how much the root thickens and is greatest in the main structural roots within 3 metres of the tree. Roots may grow around an apparatus to form a sheath but this will rarely exert sufficient pressure to cause any damage. Surface wrappings inadequately attached to an apparatus, if non-toxic, may be colonised by roots and eventually lifted off.

2.1.2 **Indirect damage**

Indirect damage is restricted to shrinkable soils, mainly clays but also peat and some silts. Such soils shrink as they dry with the potential to distort any apparatus supported by the soil. Vegetation growing within the same area of soil may increase the drying effect.

The degree of the shrinkability of the soil will affect the amount of movement caused by drying and thus the potential for damage to occur. In situations where apparatus passes from a shrinkable soil into a rigid structure there is the possibility of extreme distortion taking place. Regular seasonal movement can also cause damage even in the absence of roots, particularly with short segmented pipes (see sub-section 3.1.4 – 'Shrinkable Soils').

2.1.3 **Root incursion**

Intact apparatus will not generally be penetrated by roots. However roots can exploit existing defects such as;

- defective pipe joints
- cracks in foul or surface water drains
- inadequate or degraded pointing of inspection chambers.

Where internal conditions are moist and aerated and therefore most conducive to root growth, root proliferation may occur and ultimately block the apparatus. If root thickening occurs where it passes into apparatus, root related enlargement of a defect may occur. This is unlikely at distances 3 metres or more from the trunk.

2.1.4 **Trees and Wind Movement**.

The potential for damage to apparatus close to a tree may increase due to movement of the lower trunk and a structural root as the tree sways in strong winds. Such movement may result in direct pressure being applied to the apparatus. Furthermore, if a tree is uprooted, any apparatus passing across or through the disturbed root plate may also be displaced. Such events are unlikely and are restricted to situations where apparatus is in close proximity to the trunk of the tree, but the potential may be increased if other structural roots are severed. Encasing apparatus in lean mix or course concrete can exacerbate this problem as fine roots may penetrate the material providing a greater 'hold' on the apparatus unless an appropriate root barrier material is used to separate the apparatus from the root system.

2.1.5 Mechanical Removal of Trees and Stumps

The mechanical removal of tree stumps by grinding or grubbing may disturb or damage apparatus passing across or through the root plate of the tree. Using a mechanical digger to uproot a tree scheduled for removal is very likely to damage apparatus within and also close to the Prohibited or Precautionary Zones as the roots will apply pressure to the apparatus as they are uprooted.

2.2 Above Ground

If overhead apparatus come into contact with trees they may be damaged as a result of:

- Abrasion when the tree and / or apparatus move in the wind bringing them into contact. The resultant abrasion can damage wires affecting their efficiency, strength and causing interference or loss of supply.

- The collapse of a branch or a whole tree which could bring down overhead lines.

3. PLANNING OF WORKS

The inherently variable nature of trees, and also the generally low incidence of damage to underground apparatus, makes it neither practical nor justifiable to impose absolute limits on the proximity of trees to apparatus. Therefore site specific liaison and agreement between the asset owner and other interested parties is essential.

With respect to overhead apparatus there are minimum established clearances which must be maintained. Details of these clearances can be obtained from the utility network operator.

Before new trees are planted the advice of a local authority tree officer or arboriculturist should be obtained.

3.1 Special Considerations when Planning the Installation of Underground Apparatus

3.1.1 New / Renewal of Apparatus - New Trees

In considering the location of new or renewed apparatus in conjunction with a new tree planting scheme early consultation is essential between the relevant

professional organizations e.g. local authorities, utility companies, developers and landowners

3.1.2 New / Renewal of Apparatus - Existing Trees

When planning the installation or renewal of apparatus the position of existing trees should be considered as one of the primary factors which could affect the siting, depth, method of installation and future maintenance of that apparatus.
Consultation with the relevant interested parties will identify any conflict and consideration should be given to apparatus diversion or felling and re-planting. This decision should be influenced by the value of the tree and the extent of the additional diversionary works.

3.1.3 Existing Apparatus - New Trees

Early consultation with utilities should take place before any tree work, including planting, is undertaken to ascertain the position of existing apparatus. Records of underground apparatus should be obtained from utilities and used in conjunction with on site apparatus detection techniques. The guidance contained within Health and Safety Executive guidance note HSG47 – 'Avoiding Danger from Underground Services' should be followed when excavating. In addition, when planning new tree planting, there should be liaison with the utilities, local authority and landowner so that the risks trees may pose to utility apparatus in the future are minimised.

3.1.4 Shrinkable Soils

Apparatus laid in clay or peat should be constructed to tolerate movements of the subsoil caused by root activity. Special precautions for differential movement should be incorporated where apparatus joins rigid structures founded at a different depth to the apparatus (e.g. pipe connections to chambers). See sub-section 2.1.2 'Indirect Damage'.

3.2 Precautions when Repairing Existing Apparatus

Where apparatus requires repair the location of the excavation is often defined by the location of the fault. The nature of the work usually requires open excavation. Excavation within the Prohibited and Precautionary Zones should be in accordance with sub-section 4.1 'Below Ground' except for emergency or urgent works.

Where emergency or urgent works may have caused damage to roots with a diameter in excess of 25mm, interested parties should be informed immediately. They may choose to consult a local authority tree officer or arboriculturist regarding whether remedial treatment to the tree is necessary.

If roots have grown into a drain or duct and proliferated so as to cause a blockage, the removal of the root mass from within the drain or duct will only provide temporary relief. If the root, which originally penetrated the drain, is still present it will regenerate and recreate the same problem. Roots of other plants may have a similar effect. Permanent relief can only be obtained by the proper repair of the original defect e.g. by replacement or refurbishment.

Utility apparatus may be refurbished by the use of pre-fabricated, slip lined or cured-in-place lining systems or pipes. Pre-fabricated and slip lined systems and pipes are generally resistant to root growth / intrusion, but cured-in-place linings may deform and ultimately collapse from the incursion of root growth. Following pre-survey (e.g. CCTV), it is essential that any roots are removed from the bore of the apparatus as far as practicable prior to lining, by the use of proprietary root removal systems (e.g. high-pressure water, flails, or rotating blade cutters).

3.3 Special Considerations when Planning the Installation of Above Ground Apparatus

The aerial parts of a tree are constantly growing larger and are prone to bend and flex in windy conditions. As a result parts of a tree may come close to or into contact with above ground apparatus.

3.3.1 **Electricity**

The overhead apparatus belonging to the electricity supply industry is subject to minimum clearances from adjacent trees and other structures. This is to ensure the safety of the public and protect against flashover and loss of supply. Local conditions may require an increase in the clearances specified in current electricity industry standards.

Part IV of The Electricity Supply Regulations covers the construction of power lines above ground. Schedule 4(9) of the Electricity Act 1989 enables electricity companies to require the felling or lopping of trees which obstruct or interfere with the working of their lines or constitute an unacceptable source of danger.

In addition to the above reference should be made to the Energy Networks Association (ENA) document Engineering Recommendation G55/1- Safe Tree Working in Proximity to Overhead Electric Lines (see section 8).

3.3.2 **Communications**

Communication operators run their systems under the Telecommunications Act 1984 (as amended by the Communications Act 2003) in accordance with The

Telecommunications Code (Schedule 2). Paragraph 19 of the Telecommunications Code enables operators to require the lopping of trees which overhang the street and obstruct or interfere with the working of their lines.

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

4.1 Below Ground

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

4.1.1 **Fine Roots**

Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.1.2 **Precautions**

The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – ‘Tree Protection Zone’.

4.1.3 **Realignment**

Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

a) Trenchless

Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones.
In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

b) Broken Trench - Hand-dug

This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) below. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.

c) Continuous Trench - Hand-dug

The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

4.1.5 **Backfilling**

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – 'Legislation and Bibliography'**). In England this relates to the requirements of the code of practice – 'Specification for the Reinstatement of Openings in Highways' approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.

- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.

- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

4.1.6 **Additional Precautions near Trees**

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.

- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –'Prevention of Damage to Trees Below Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 1 - Prevention of Damage to Trees Below Ground

Causes of Damage	Type of Damage	Implications to Tree	Precautions
Trenching, mechanical digging etc.	Root severance	• The tree may fall over • Death of the root beyond the point of damage • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm in diameter use a sharp tool and make a clean cut leaving as small a wound as possible.
Trenching, mechanical digging, top soil surface removal etc.	Root bark damage	• The tree may fall over • If the damage circles the root it will cause the death of the root beyond that point • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Do not use mechanical machinery to strip the top soil within the Precautionary Zone. Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm use a sharp tool and make a clean cut leaving as small a wound as possible.
Vehicle movement and plant use. Material storage within the precautionary area.	Soil compaction & water saturation	Restricts or prevents passage of gaseous diffusion through soil, the roots are asphyxiated and killed affecting the whole tree.	Prevent all vehicle movement, plant use or material storage within the Precautionary Zone.
Top-soil scouring, excavation or banking up.	Alterations in soil level causing compaction or exposure of roots.	Lowering levels strips out the mass of roots over a wide area. Raising soil levels asphyxiates roots and has the same effect as soil compaction.	Avoid altering or disturbing soil levels within the Precautionary Zone.
Use of herbicides.	Poisoning of the tree via root absorption	• Death of the whole tree • Death of individual branches Damage to leaves and shoots.	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.
Spillage of oils or other materials.	Contamination of soil	Toxic and asphyxiation effects of chemicals, oils, building materials (cement, plaster, additives etc.) on the root system can kill the tree.	Never store oils, chemicals or building materials within the Precautionary Zone or within the branch spread of a tree, which ever is the greater.
Placement or replacement of underground apparatus.	Various	Death of all or part of the tree.	Effective planning and liaison with local authority tree officer, taking into consideration the position of trees, and their future growth potential and management

4.2 Above Ground

4.2.1 **Damage by Pruning**

Trees (including shrubs and hedges) can be damaged by inappropriate or excessive pruning. Reference should be made to the Energy Networks Association (ENA) document "Engineering Technical Report 136 Vegetation Management near Electricity Equipment – Principles of Good Practice" (see section 8 – 'Other Useful Publications') or appropriate company specific documentation for guidance on pruning.

See TABLE 2 – 'Prevention of Damage to Trees Above Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 2 - Prevention of Damage to Trees Above Ground

Causes of Damage	Type of Damage	Implications for the Tree	Precautions
Impact by vehicle or plant Physical attachment of signs or hoardings to the trunk Storage of materials at base of tree Rubbing by winch or pulling cables	Bark bruising, bark removal, damage to the wood, damage to buttress roots, abrasion to trunk	Wounding with the potential for infection ultimately resulting in death of all or part of the tree. Structural failure of the tree	Surround the trunk with protective free-standing barrier. Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes.
Impact by vehicle or plant Rubbing by overhead cables	Bark damage to branches, breakage and splitting of branches, abrasion to branches	Structural failure of the branch. Wounding or loss of a branch with the potential for infection ultimately resulting in death of all or part of the branch or tree.	Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes. All pruning should be carried out in accordance with BS3998 *(prune affected branches to give appropriate clearance from cables)*
Inappropriate siting of overhead apparatus, such as CCTV, lighting fixtures and communications masts and dishes.	Inappropriate pruning, unnecessary tree removal	Severely pruning tree to acquire line of sight signal for communications dish etc.	Effective planning and liaison with local authority tree officer / arboriculturist, taking into consideration the position of trees, and their future growth potential and management.
Lack of forethought in design and location of apparatus and services entries on new developments	Complete tree removal	The tree is removed unnecessarily	Agree the location and installation of services at the design stage. Consideration should be given to the creation of dedicated service routes wherever possible.
Use of herbicides	Poisoning of the tree via absorption through bark, leaves and shoots	Death of the whole tree, death of individual branches, damage to leaves and shoots	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.

4.3 Chemical Damage to Trees

Chemical damage to trees adjacent to utility premises and operational land can be avoided if;

- the risk is identified when planning any work involving herbicides or other chemicals ensuring that only appropriate chemicals are used. Particular care should be exercised when considering the use of herbicides recommended for “non crop areas” as many of these also specify “do not use where there may be roots of desirable plants”,

- herbicides are applied only at the rate and in the manner recommended by the manufacturer,

- follow-up applications are not undertaken until weeds reappear on the operational land,

- alternative methods of weed control are considered.

5. HOW TO AVOID DAMAGE TO APPARATUS BY TREES

5.1 Consultation with Utilities

The potential for future conflict between trees and above-ground apparatus can be reduced by appropriate planning. Early consultation with utilities should therefore take place before any tree work including planting is undertaken to ascertain the position of existing apparatus. Records of underground apparatus should be obtained from utilities and used in conjunction with on site apparatus detection techniques. Specific care must be taken when removing the stumps of existing trees. In addition when planning new tree planting there should be liaison with the utilities, local authority and landowner so that the risks trees may pose in the future are minimised.

5.2 Precautions during Planting

Every possible precaution should be taken to ensure that the existing apparatus is not damaged during excavation works. Health and Safety Executive guidance note HSG47 – ‘Avoiding Danger from Underground Services’ and any specific guidance issued by the apparatus owner should be followed at all stages of the work.

5.2.1 **Below Ground**

Before any excavation work begins, trial holes should be undertaken to validate the results of any detection surveys undertaken to confirm the actual position and depth of the apparatus.

5.2.2 **Above Ground**

Consideration should be given to the presence of satellite dishes and masts on commercial properties, poles and drop wires, as future tree growth may cause operational problems.

Reference should also be made to Energy Networks Association (ENA) document 'Engineering Technical Report 136 Vegetation Management near Electricity Equipment – Principles of Good Practice' (see section 8 – 'Other Useful Publications') or appropriate company specific documentation.

NOTE: In all cases where definitive clearances are required, contact must be made with the appropriate electricity or communication company who will determine the clearance to be adopted.

See also sub-section 3.3 – 'Special Considerations when Planning the Installation of Above Ground Apparatus'.

6. SITES WITH DESIGNATED STATUS

Certain sites may be specifically designated and will require consultation and / or permission from the relevant authority prior to undertaking any works. These sites include:

- Sites of Special Scientific Interest
- English Heritage Sites
- English Nature / Natural England
- National Trust Land
- Nature Reserves
- Conservation Areas
- Scottish Natural Heritage
- Areas of Outstanding Natural Beauty
- Countryside Council for Wales
- Historic Scotland
- Northern Ireland Environment and Heritage Service
- Cadw (Welsh Historic Monuments)

6.1 Tree Preservation Orders and Trees in Conservation Areas

Section198 of the Town and Country Planning Act 1990 (the Act) gives local planning authorities powers to make trees and woodlands the subject of tree preservation orders (TPOs) in the interests of amenity. Trees protected by a TPO may not be willfully damaged or destroyed and cannot be cut down, uprooted, topped or lopped without the local planning authority's consent.

Additionally, under section 211 of the Act, anyone proposing to cut down, uproot, top, lop etc. a tree in a conservation area is required to give the local planning authority six weeks' notice before doing so. This gives the authority an opportunity of making a TPO in respect of the tree.

Certain statutory obligations imposed by Acts of Parliament may allow for the limited felling, topping or lopping of trees protected by a TPO in order to supply and maintain service. This does not preclude the requirement to consult with the owner.

See also: **Volume 5 – 'NJUG Guidelines on Environmental Good Practice'**

7. LEGISLATION

Reference should also be made to **Volume 6 – 'Legislation & Bibliography'.**

7.1 Primary Legislation

National Parks and Access to the Countryside Act 1949*
Health and Safety at Work Act 1974
Highways Act 1980**
Telecommunications Act 1984
Gas Act 1986
Electricity Act 1989
Town and Country Planning Act 1990 (Section 198 Tree Preservation Orders).
Water Industry Act 1991
The New Roads and Street Works Act 1991 (NRSWA)
The Streets Works (Northern Ireland) Order 1995
Communications Act 2003
Traffic Management Act 2004
Transport (Scotland) Act 2005
The Streets Works (Northern Ireland) (Amendment) Order 2007

* Under the National Parks and Access to the Countryside Act 1949 local authorities are given a general power to plant trees.

** Under the Highways Act 1980 highway authorities may plant trees in the highway, or license others to do so. They need to ensure that trees do not overhang or cause a danger to roads or footpaths, and are given powers to prevent this from happening.

The above list is not exhaustive.

7.2 Secondary Legislation

Each Act of parliament in 7.1 will have various associated regulations that should be referred to.

8. OTHER USEFUL PUBLICATIONS

This is not an exhaustive list of available publications and is only valid at the time of issue.

BS 3998 Recommendations for Tree Work

- Provides general recommendations for tree surgery and other tree work.

BS 5837 Trees in Relation to Construction

- Gives advice on the integration of new development amongst trees.

Codes of Practice approved under the New Roads and Street Works Act 1991

- Co-ordination of Street Works and Works for Road Purposes and Related Matters
- Specification for the Reinstatement of Openings in Highways
- Safety at Street Works and Road Works
- Measures Necessary where Apparatus is Affected by Major Works (Diversionary Works)
- Inspections

Energy Networks Association publications:

- Engineering Technical Report 136 ‘Vegetation Management Near Electricity Equipment – Principles of Good Practice’
- Engineering Recommendation G55/1 – ‘Safe Tree Working in Proximity to Overhead Electric Lines’
- ENA-TS 40-80 – ENA Technical Standard for Overhead Line Clearances
- Engineering Recommendation G70 – Vegetation Control near Overhead Lines

- ETR 132 – Improving Network Performance (under abnormal weather conditions by the use of a risk based approach to vegetation management near electric overhead lines)
- MNT/004 – UK Distribution Policy for the Inspection and Maintenance of Overhead Lines

HSE Arboriculture and Forestry Advisory Group publications

- AFAG 804 Electricity at work: Forestry and arboriculture
- AFAG 404 Electrical utility arboriculture

Manual for Streets (supercedes Design Bulletin 32 and Places, Streets and Movement)

- The Department for Transport and the Department for Communities and Local Government (DCLG), with support from the Commission for Architecture and the Built Environment (CABE), commissioned WSP , TRL , Llewellyn Davies Yeang and Phil Jones Associates to develop a Manual for Streets to give guidance to a range of practitioners on effective street design.

National House Building Council (NHBC) Standards Chapter 4.2. Building near trees

- Gives information on the design of new foundations in proximity to trees on shrinkable clay soils.

9. OTHER REFERENCES

9.1 Arboricultural

Arboricultural advice may be sought from the:

- Arboricultural Advisory and Information Service
- Arboricultural Association
- Arboriculture and Forestry Advisory Group
- International Society of Arboriculture
- Local authority Arboricultural Officer
- The Tree Advice Trust

9.2. Herbicides

Information on herbicides and their application may be obtained from the:

- British Agrochemicals Association

9.3 Utilities

Utility advice may be sought from the local utility contact or NJUG.

GLOSSARY

Apparatus	Equipment such as valves, stopcocks, chambers, cabinets, transformer chambers etc and includes any structure for the lodging of apparatus.
Arboriculturist	A professional who cultivates and manages trees, hedgerows and shrubs and provides information and advice on specific tree related issues.
Carriageway	A way constituting or comprised in a highway, being a way (other than a cycle track) over which the public have a right of way for the passage of vehicles.
Cycle track	A way constituting or comprised in a highway over which the public have a right of way on pedal cycles with or without a right of way on foot.
Desiccation	The state of extreme dryness, the drying out of roots.
Distal	Situated farthest from the centre.
Drop wires	Overhead wire from telegraph pole to customer premises.
Duct / ducting	Structure (usually cylindrical) used to convey and protect apparatus.
Fibre optic	The use of very thin glass or plastic fibres through which light can be transmitted to carry information from a source to a receiver, especially for telecommunication, television and information technology systems.
Footpath	A highway over which the public have a right of way on foot only, not being a footway.
Footway	A way comprised in a highway which also comprises a carriageway, being a way over which the public have a right of way on foot only.
GRP	Glass Reinforced Plastic
Herbicide	A chemical that destroys plants.
Main	Structure (usually cylindrical) used to convey water or gas or oil generally greater than 50mm in diameter.
NJUG	National Joint Utilities Group Limited.
Pipe	Longitudinal structure (usually cylindrical) used to convey water, gas or oil.
Root plate	Formed just below the soil surface when shallow lateral growing roots predominate over the development of a deep taproot.

Service strip	A strip of designated land alongside a carriageway or footway used to convey services.
Sub-duct	Longitudinal structure (usually cylindrical) laid inside ducts used to carry smaller diameter cables such as fibre optic.
Tiles	Impact resistant cover constructed of earthenware, concrete or polyethylene for protecting underground cables
Utility	An undertaker by statute that has a legal right to provide customer services (e.g. communications, electricity, gas, water)
Verge	A strip of land which may form part of the public highway alongside a carriageway or footway, which may contain services.

APPENDIX A

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