

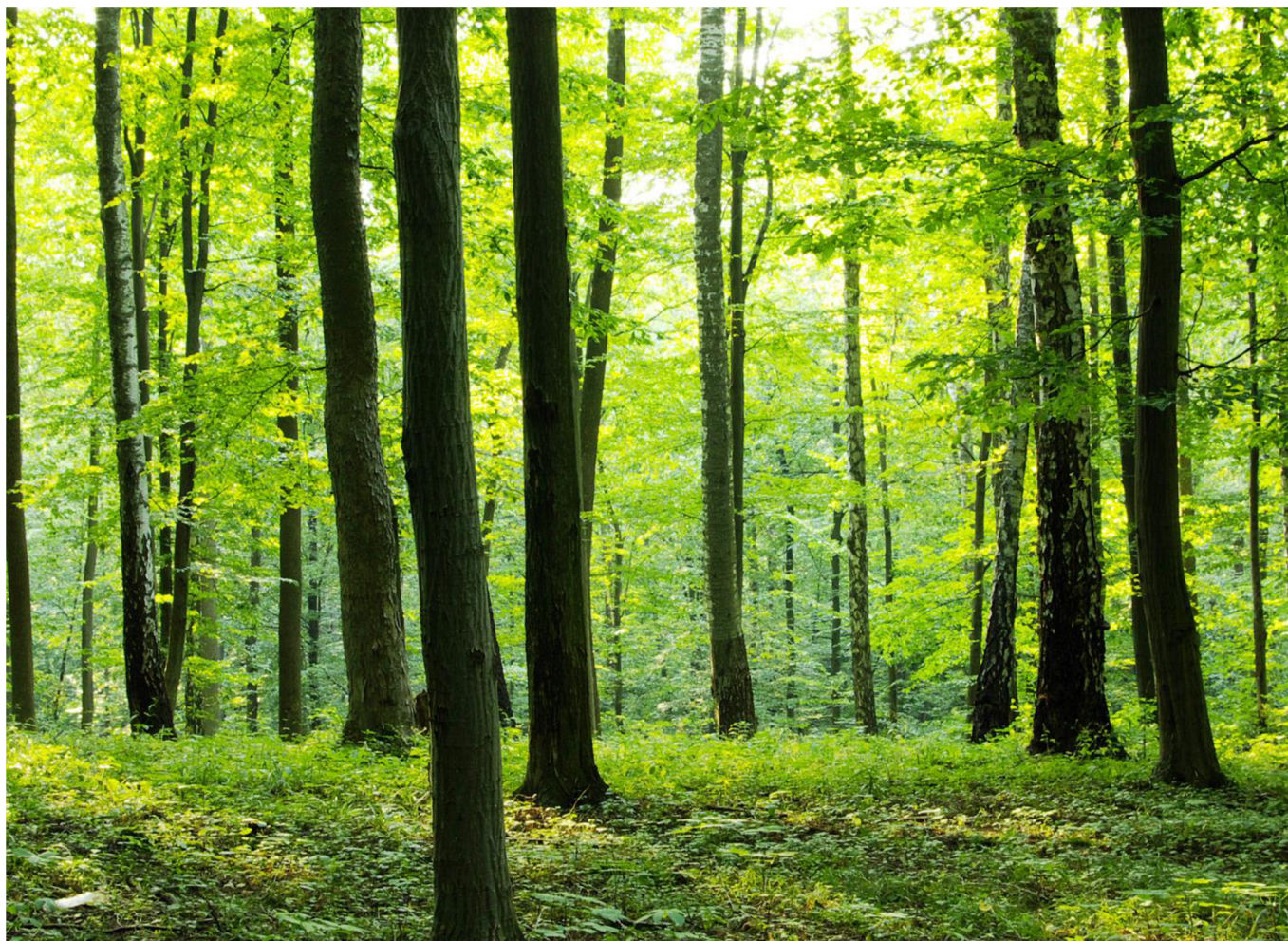
**CLEARSTONE
ENERGY**

DARTFORD ENERGY HUB

ARBORICULTURAL IMPACT ASSESSMENT

Prepared by Clearstone Energy & RSK Biocensus
| December 2024 | Document Reference: R012





Clearstone Energy

Dartford Energy Hub

Stage 1, 2 Arboricultural Impact Assessment Report

2484851

RSK GENERAL NOTES

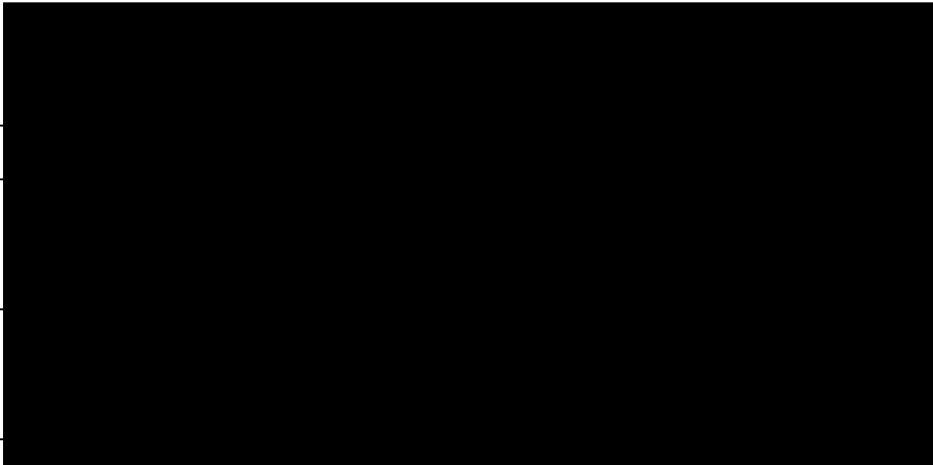
Document ref.: 2484851 D01 (1)

Title: Dartford Energy Hub

Client: Clearstone Energy

Date: 17 December 2024

Status: Rev 1

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1 INTRODUCTION

1.1 General

This report describes the results of a survey of trees across two fields either side of Station Road in Gravesend, Kent.

The survey was carried out by Dan MacIntyre, on behalf of RSK Biocensus, in September 2023 and this report was produced in November 2024.

1.2 Purpose of the Report

The survey was carried out in connection with the proposed development, in accordance with criteria outlined in the British Standard BS5837:2012¹. The aim was to:

- identify the quality and value of the trees;
- categorise them in respect of their suitability for retention;
- summarise the impacts of the development on the arboricultural features present; and,
- provide measures to protect retained trees.

This report is principally concerned with trees in relation to the proposed development. Although obvious structural defects and the condition of trees have been noted, this survey was not undertaken with health and safety in mind, and a detailed hazard assessment was not carried out.

The results and recommendations in this report are valid for a maximum of two years.

1.3 Site Context

1.3.1 General

The survey covered two agricultural fields adjacent to the B262, Station Road and west of Millbrook Garden Centre. The A2 trunk road lies to the north east and a rail line lies to the south.

1.3.2 Soil

The underlying soil types will affect structural aspects of building designs and foundation depths, and this will need to be considered in relation to existing, proposed and removed trees. To avoid conflicts between trees and built structures, engineering advice will be required, and foundations will need to be designed with due regard for trees and the shrinkable soils.

British Geological Society data indicates that the survey area may be sited on Thanet formation (sand) with a band of Lewes Nodular, Seaford and Newhaven chalk formation

¹ British Standards Institute (2012) *BS5837:2012 Trees in Relation to Design, Demolition and Construction-Recommendations*. British Standards Publications Ltd.

present through the middle of the survey area². This is only a best estimate as no soil samples were taken or lab analysis carried out for the purpose of this report.

If shrinkable clays are present, foundation design will need to take into account mature tree heights of existing and proposed trees.

1.3.3 Protected Species

The Wildlife and Countryside Act 1981 (as amended), The Conservation of Habitats and Species Regulations 2017 (as amended) and the Countryside and Rights of Way Act 2000 provide statutory protection to species of flora and fauna including birds, bats and other species that are associated with trees.

A licence will be required where there will be impacts on protected species that could result in an offence under the above legislation. Although features suitable for roosting bats or nesting birds may have been noted, this report is not intended to assess the suitability of trees for protected species.

If the presence of a legally protected species is suspected while undertaking any tree work, then the task should be halted immediately, and appropriate advice should be obtained from the project ecologist.

1.4 Statutory Designations

Trees can be afforded statutory protection in a number of ways, including;

- a tree preservation order (TPO);
- planning conditions;
- felling licences; and
- location within a designated conservation area (CA).

A felling licence is required from the Forestry Commission where greater numbers of trees are to be removed, which result in over five cubic metres of timber being felled per calendar quarter. The Forestry Commission will consult with the local authority over the application and approval of a felling licence but the applicant should ensure that any other consents that may be required are dealt with appropriately.

Countryside hedgerows are also afforded protection under The Hedgerow Regulations 1997. Consent is required from the local authority for the removal of hedgerows over 20 metres in length unless they meet specific exemptions set out within the instrument. In some cases the local authority may deem the hedgerow to be important and prohibit its removal.

Protected trees can only be removed or pruned if permission is granted, either as part of a planning permission or in response to a separate application to the local authority (or the Forestry Commission in the case of felling licences).

² <http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>

The existence of a TPO or CA does not automatically mean that a tree deserves to be a material constraint in a planning context. A formally protected tree can be in poor physiological or structural condition, making it unsuitable for retention. In that case it is inappropriate that it should influence the future use of a site.

A TPO can be applied at any time, so it is important to check for the latest information. Where a statutory designation applies, if any tree works or removals are required prior to planning consent, the local authority should be contacted in advance.

The Dartford Borough Council website³ has a web-based facility that allows searching of TPO's and CA's and this shows that the survey area is not within a CA and that no trees are protected by TPO.

1.5 Root Protection Area (RPA)

To ensure that a tree is not harmed by development activities, a theoretical RPA is calculated. The British Standard (BS5837) defines the RPA as *'the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability'*. It is initially plotted as a simple circle on the Tree Constraints Plan (TCP) with roots assumed to have colonised the ground around the tree radially.

Where veteran or ancient trees are present there will be a need to provide an additional buffer around RPA's, as these features will be less able to respond to disturbance and changes in their local environment.

In some instances, root growth may have been impeded by inhospitable ground conditions and so a simple circular RPA may not be relevant to its protection. This may apply near roads, building foundations, retaining walls or water courses and, providing there is suitable rationale, the root protection area can be adjusted to reflect this. A similar overall area should be allocated to the tree so that it can continue to thrive.

Once a design layout has been completed and tree removals agreed, the retained trees should be subject to a fenced zone encompassing the root protection area or tree crown (whichever is larger) for the duration of works. No construction, level changes, installation of services, storage of spoil or materials, discharge of chemicals or any other activity which may affect tree health negatively should take place within this area.

1.6 Supplied Documents

This report was prepared using data collected on site and the following reports and plans:

- Topographical survey
- Proposed Layout

³ <https://dbc.maps.arcgis.com/apps/webappviewer/index.html?id=3a1e244bdb144b218d1a004fd041c7c1>

2 METHOD

2.1 General

All inspected trees and tree groups were categorised using the British Standard BS5837:2012 and the attached TCP; (Appendix 2) shows tree positions, numbers and retention categories. A schedule of the trees is included in Appendix 1, which includes species, physiological and structural condition, age, recommendations and retention values.

The survey followed the method described in Appendix 4 in accordance with guidance in BS5837:2012. The life expectancy and condition of each tree or tree group informs its suitability for retention.

2.2 Tree Categorisation

Trees were categorised in terms of their useful life expectancy and condition as summarised below. Full details of categorisation criteria are given in Appendix 5. Each category has three sub-categories relating to arboricultural (1), landscape (2) and cultural and conservation (3) qualities. Trees that have been categorised as A, B or C should be considered in the planning process, whereas trees categorised as U are not a consideration in the planning process.

Table 1: Tree categorisation table

BS5837:2012 Categories	Definitions	Retention implications to a site
Category A (marked light green on the TCP)	Trees of high quality and value able to make a substantial contribution to the site.	Every effort should be made to retain trees, and amendments to a proposed scheme should be identified in preference to tree removal and to avoid their RPA entirely.
Category B (marked mid-blue on the TCP)	Trees of moderate quality and value able to make a significant contribution to the site.	Where possible, amendments to a proposed scheme should be considered in preference to tree removal.
Category C (marked in grey on the TCP)	Trees of low quality and value in an adequate condition until new planting can be established; trees with impairments downgrading them from A or B category; OR young trees with a stem diameter of less than 150 mm.	The retention of trees may be advantageous in the short term, but they should not be seen as a constraint to development.
Category U (marked in dark red on the TCP)	Trees that have limited condition that will fail or die within 10 years and/or should be removed for reasons of arboricultural best practice	Not necessarily a material consideration in the planning process but may have other benefits.

2.3 Distinction Between Individual Trees and Tree Groups

Trees have been recorded as individuals or as groups. BS5837:2012 sets out the description of a group as follows: *“The term “group” is intended to identify trees that form cohesive arboricultural features either **aerodynamically** (e.g. trees that provide companion shelter), **visually** (e.g. avenues or screens) or **culturally** including for biodiversity (e.g. parkland or wood pasture), in respect to each of the tree subcategories.”*

Where a tree in a group has characteristics that distinguish it from the rest of the group, it is generally recorded as an individual. Such trees may, among other characteristics, include veteran trees, trees with significant defects, and specimen trees that stand out within the feature.

2.4 Constraints and Limitations

The trees were viewed from ground-level and from within the site boundary only. The trees were inspected using the Visual Tree Assessment method (Mattheck & Breloer 2015⁴) and guidance given in *Principles of Tree Hazard Assessment* (Lonsdale 2007⁵). Detailed inspections such as decay detection, soil assessment or aerial inspections have not been carried out. Inspection was restricted in some instances as trees were within third-party gardens or behind fencing with restricted access.

Trees are living organisms and their health and condition is not static. Findings and recommendations in this report are therefore only valid for two years. The health and condition of the trees may also change with other factors such as extreme weather or development work.

The presence of shrinkable soils, and their relationship between tree root activity and volumetric changes in soils that may cause structural damage to buildings, is beyond the scope of this report and has not been investigated.

The proposed layout was overlaid from plans provided by the client.

³ Mattheck, C. Breloer, H. (2015) *The Body Language of Trees, Encyclopedia of Visual Tree Assessment*. Karlsruhe Institute of Technology.

⁴ Lonsdale, D. (2007) *Principles of Tree Hazard Assessment and Management*. The Stationary Office

3 RESULTS

3.1 Summary

A total of 37 individual trees, 21 groups of trees, 2 hedgerows and 3 groups of scrub/shrubs were recorded across the two survey areas. Details on the individual trees and tree groups can be found in Appendix 1, Tree Survey Data and charts 1, 2 and 3, below, show the distribution of BS5837 categories recorded.

Chart 1: Individual Trees, BS 5837 categorisation

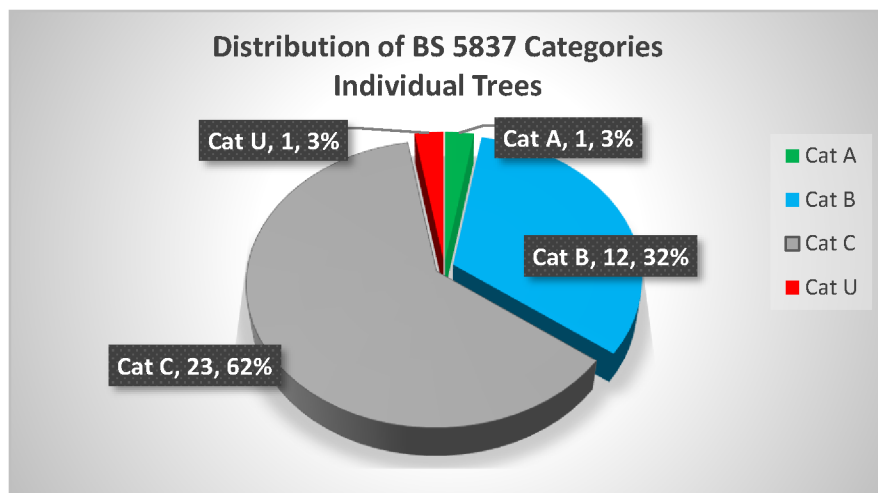


Chart 2: Groups of Trees, BS 5837 categorisation

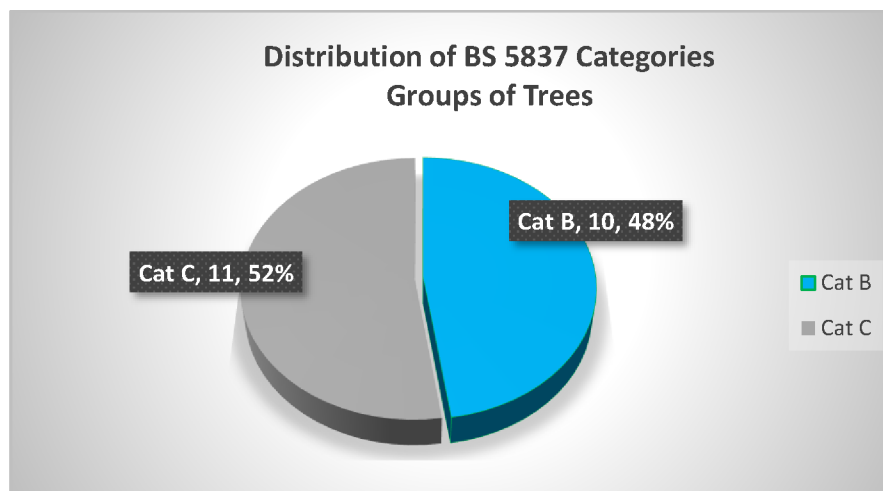


Chart 3 – Distribution of BS 5837 categorisation by Tree Reference

Individual Trees				
BS 5837 Category	Cat A	Cat B	Cat C	Cat U
Qty	1	12	23	1
ID	T24,	T1, T2, T3, T4, T5, T6, T7, T8, T9,	T10, T12, T13, T14, T15, T16, T17,	T11,
Groups of Trees				
BS 5837 Category	Cat A	Cat B	Cat C	Cat U
Qty	0	10	11	0
ID	NA	G1, G2, G6, G8, G13, G14, G17, G18, G19, G20,	G3, G4, G5, G7, G9, G10, G11, G12, G15, G16, G21,	NA

3.2 General Observations

The site is agricultural with a Station Road bisecting the two field parcels, which is set at a lower level than the adjacent fields. On the whole the planting is naturalistic with some well-defined wooded areas bordering the site.

Most of the trees recorded within the site footprint were relatively young, with the boundary planting being more defined and established and categorised as a semi-mature age class.

The predominant species encountered were field maple (*Acer campestre*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), English oak (*Quercus robur*), and Lombardy poplar (*Populus nigra 'Italica'*).

Tree T24 is a well formed in good condition walnut (*Juglans regia*) that grows in the southern portion of the southernmost survey parcel at the lower end of a well defined slope, and this has potential to become a prominent feature in the landscape

There are numerous other trees recorded, and most of these are components within group features, species present include common ash (*Fraxinus excelsior*), wild Cherry (*Prunus avium*), elder (*Sambucus nigra*), elm (*Ulmus sp.*), hazel (*Corylus avellana*), and whitebeam (*Sorbus aria*).

4 PROPOSALS AND IMPACTS

4.1 Development Summary

A battery energy storage scheme is proposed to be constructed on two field parcels, with a cable connection routed through the wooded belt to north and under the A2, to join the existing Northfleet East Grid Sub-station.

4.2 Tree Removals

The proposed works will require removal of one individual tree, parts of two groups of trees and a small area of low scrub and self-seeded hawthorn. The removal of these arboriculture features are all to enable access onto the sites.

Tree T6 is a category B Lombardy poplar growing on the north side of Station Road. It is an early mature specimen of a typical upright form growing through group G5 and the removal of a c.20m section of this group is also required to enable access.

A c.10m section will need to be removed from the east end of group G8, which predominantly comprises oak planted at very narrow spacing and occasional cherry.

Lastly, an area of low scrub, recorded as SG2, with occasional self-seeded hawthorn and blackthorn will need to be removed from the north side of the southern parcel.

Trees to be removed are highlighted on the Tree Removal and Protection Plan, at Appendix 3, with red circles and red text.

4.3 Retained Trees

4.3.1 General

The remaining trees can be retained and protected with no significant impacts envisaged.

4.3.2 Anticipated RPA Incursions

On the whole the site layout avoids the RPA's of retained trees, with the exception of a very small areas where proposed boundary fencing slightly impinges upon RPA of T24 by around 1.5m, in the south east corner of the site. The tree could be offered protection fencing to the full extent of its RPA for the duration of construction, and the installation of the fencing could be carried out by hand once all construction is complete and so impacts are felt to be minimal.

The cable route would intrude on tree RPA's where it passes through the wooded area to the north of the site. However, it is proposed that cables will be installed using trenchless techniques such as directional drilling with the launch and receptor pits located beyond tree RPA's.

4.3.3 Pruning

No pruning is required to enable the proposed works.

4.4 Impact Assessment Conclusion

Only a relatively small number of trees will need to be removed to enable access onto the sites, but given the rural nature of the surroundings, and the good number of trees present, these losses will not cause a significant detriment to the surroundings.

Notwithstanding the above, it is recommended that replacement planting be provided along with a robust programme of after-care and maintenance - to ensure their successful establishment. The recommendations provided in the British Standard, BS 8545⁶ should therefore be followed. This includes ensuring that soils are not compacted prior to planting and that adequate below ground space is provided with suitable volume requirements to support mature root growth and withstand compaction.

Impacts are limited to a very slight incursion into the RPA of tree T24 as a result of the proposed boundary fencing alignment. It is felt feasible that the boundary fencing could be installed post construction, and that the tree be protected to the full extent of its RPA for the duration of all works other than the installation of the fence, which could be installed by hand and so impacts are felt negligible.

Retained trees can be protected with a robust alignment of heras fencing around the boundary, and this is shown as a purple alignment on the Tree Removal and Protection Plan at appendix 3 and a specification for fencing is provided at appendix 5.

⁶ British Standards Institute (2014) *BS 8545:2014 Trees: from nursery to independence in the landscape – Recommendations*. British Standards Publications Ltd.

5 PROTECTION OF RETAINED TREES

5.1 Tree Protection Fencing

Tree protection fencing is shown as a purple alignment on the plan at Appendix 3 and must be installed after tree works are completed but before any site mobilisation works such as installation of site offices, demolition or any ground works.

The tree protection fencing should comprise c.2 m high heras panels being fixed to a driven scaffold framework with supports on the rear facing side. Signs should then be fixed to every third panel informing operatives of the need to respect and not move fencing and this must be relayed in any site inductions. A fence specification and example of signage is shown at Appendix 5.

This fenced area then forms a NO CONSTRUCTION ZONE for the duration of works on site. On no account should fencing be moved, or any other access gained into the fenced area for construction related activities unless it is written within this document.

6 ARBORICULTURAL METHOD STATEMENT

The timing of operations is essential if trees are to be effectively protected. Site operations are planned in the following order to help ensure this:

Pre-Construction Phase

- 1) Carry out removal of trees and boundary hedges, groups to enable access as shown with red text and hatch on the plan at appendix 3.
- 2) Install tree protection fencing as shown with a purple alignment on the Tree Removal and Protection Plan at Appendix 3, and a fence specification is shown at Appendix 4.
- 3) This area then forms a construction exclusion zone.
- 4) **On no account should any demolition, construction, or site mobilisation works commence until the tree protection fencing is in place and site operatives have been briefed about tree protection measures as part of an induction.**

Pre-Construction Phase - Inductions

- 5) The induction must include the simple instruction that tree protection fencing/site hoarding must not be moved and trees must not be damaged either directly or indirectly by attaching anything to any part of its structure. Additionally, the following points should be firmly communicated during the induction:
 - Any inadvertent damage to trees or their protective elements must be reported to site foreman and corrected immediately, to ensure that it remains effective in protecting the area around trees. If there is any doubt an appointed arboriculturist should be contacted to gain clarification on how to proceed.
 - No materials, fuel, large volumes of water or chemicals to be discharged or mixed where they are likely to flow toward trees in the event of spillage.
 - Wheel wash stations should be self-contained units where they are sited near retained trees or resultant water must be directed well away from areas where they may flow toward tree root areas.
 - Any concrete mixing stations must have protective bunds constructed around them to ensure containment of resulting debris or contaminants.
 - Any spillages of potential contaminants near trees must be reported immediately to the site manager or arboricultural consultant and action taken to either flush the soil with large volumes of water or create a bund to avoid contaminants flowing toward tree protection areas.

Construction Phase, Maintain fencing in positions and fit for purpose.

- 6) The site hoarding will need to remain in place and in an upright form for the duration of all construction. It is the principal contractor's responsibility to ensure this occurs, and only once all construction is complete should the fencing be removed.

Construction Phase, Cable Installation near trees

- 7) Installation of cables must follow a trenchless technique where they are within 15m of trees and to a minimum depth of 1.5m.
- 8) Adequate planning will be required so that launch and receptor pits can be situated well away from trees (15m buffer recommended).
- 9) Associated plant machinery and vehicle access will need to be sited on suitable ground protection track mats where they are required within 15m of retained trees.

Post Main Construction Phase, Remove Tree Protection Fence, Install Boundary Fence near T24.

- 10) The scale of works are such that no additional specific tree protection measures are felt necessary to install the site boundary fence, but adequate care and attention should be taken to avoid damage to the tree.
- 11) Care must be taken to avoid spillages of any concrete/post-crete, and these items must be mixed and an impermeable layer such as ply board and tarpaulin.
- 12) Post holes should be dug by hand, and any roots encountered should be carefully exposed using trowels, digging bars or small picks.
- 13) If any roots over 25 mm diameter are encountered, care should be taken to avoid damage to their bark, and the post hole should be shifted slightly to avoid the roots. On no account should roots over 30mm diameter (roughly thumb thickness) be severed.
- 14) Roots under 25mm diameter can be pruned to the edge of the post hole and pruning should be carried out with clean and sharp bypass secateurs or loppers. This should leave a clean cut and straight surface.
- 15) Once the sufficient depth has been reached, the post holes should be sleeved with an impermeable layer, such as geo-membrane or a similar impermeable layer such as damp proof course plastic, to prevent contamination from the concrete or postcrete to the surrounding soil.

7 APPENDICES

APPENDIX 1: TREE SURVEY DATA

Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
T1	English Oak (Quercus robur)	350	8	4	5	4	4	3	EM	Inaccessible due to dense undergrowth. Visual assessment and dimensions estimated.	20-40	B1	4.2
T2	Lombardy poplar (Populus nigra 'Italica')	250	9	2	2	2	2	3	SM	No significant defects noted. Ivy/vegetation restricts full assessment. Outside boundary fence on roadside raised verge.	20-40	B1,2	3.0
T3	Lombardy poplar (Populus nigra 'Italica')	250	9	2	2	2	2	3	SM	No significant defects noted. Ivy/vegetation restricts full assessment. Outside boundary fence on roadside raised verge.	20-40	B1,2	3.0
T4	Lombardy poplar (Populus nigra 'Italica')	250	9	2	2	2	2	3	SM	No significant defects noted.	20-40	B1,2	3.0
T5	Lombardy poplar (Populus nigra 'Italica')	250	9	2	2	2	2	3	SM	No significant defects noted.	20-40	B1,2	3.0
T6	Lombardy poplar (Populus nigra 'Italica')	500	18	3	3	3	3	3	EM	No significant defects noted.	20-40	B1,2	6.0
T7	Lombardy poplar (Populus nigra 'Italica')	490	18	3	3	3	3	3	EM	No significant defects noted.	20-40	B1,2	5.9
T8	Lombardy poplar (Populus nigra 'Italica')	200	18	3	3	3	3	3	EM	No significant defects noted.	20-40	B1,2	2.4
T9	Lombardy poplar (Populus nigra 'Italica')	450	18	3	3	3	3	3	EM	No significant defects noted.	20-40	B1,2	5.4

Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
T10	Blackthorn (Prunus spinosa)	120	5	3	3	2	2	1	Y	No significant defects noted. Small feature.	40+	C1	1.4
T11	Ash (Fraxinus excelsior)	50	4	1	1	1	1	1	Y	Isolated self set tree. Internal crack within stem. Very limited potential.	<10	U	0.6
T12	Chokeberry (prunus virginia)	150	6	3	3	3	3	2	Y	Ornamental features for garden centre entrance.	10-20	C1	1.8
T13	Chokeberry (prunus virginia)	150	6	3	3	3	3	2	Y	Ornamental features for garden centre entrance.	10-20	C1	1.8
T14	Chokeberry (prunus virginia)	150	6	3	3	3	3	2	Y	Ornamental features for garden centre entrance.	10-20	C1	1.8
T15	Chokeberry (prunus virginia)	150	6	3	3	3	3	2	Y	Ornamental features for garden centre entrance.	10-20	C1	1.8
T16	Wild Cherry (Prunus avium)	320	5	4	3	4	3	2	SM	Outside boundary fence on roadside raised verge. Twin stemmed just above ground level. Failed central stem leading to a squat crown.	10-20	C1	3.8
T17	Hawthorn (Crataegus monogyna)	340	4	2	2	3	3	0	EM	No significant defects noted. Twin stemmed from ground level. Mound of soil and debris within rooting area.	10-20	C1	4.1
T18	Hawthorn (Crataegus monogyna)	150	3	2	2	2	2	0	SM	No significant defects noted. Twin stemmed just above ground level.	40+	C1	1.8
T19	Field Maple (Acer campestre)	100	4	1	1	1	1	0.5	Y	No significant defects noted	40+	C1	1.2
T20	Field Maple (Acer campestre)	100	4	1	1	1	1	0.5	Y	No significant defects noted	40+	C1	1.2

Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
T21	Field Maple (Acer campestre)	100	4	1	1	1	1	0.5	Y	No significant defects noted	40+	C1	1.2
T22	Field Maple (Acer campestre)	100	4	1	1	1	1	0.5	Y	No significant defects noted	40+	C1	1.2
T23	Hawthorn (Crataegus monogyna)	90	3	1	1	1	1	0	Y	No significant defects noted	20-40	C1	1.1
T24	Common walnut (Juglans regia)	970	13	8	8	8	8	0	M	Dominant tree set within grass field. Multiple stems just above ground level , some bulge and included bark at fork junctions. Unmaintained tree which has led to some low heavy end weighted branches. Overall generally in a good condition and significant internal landscape feature.	20-40	A1	11.6
T25	Hawthorn (Crataegus monogyna)	150	3	1	1	1	1	0	Y	No significant defects noted	40+	C1	1.8
T26	Hawthorn (Crataegus monogyna)	150	3	1	1	1	1	0	Y	No significant defects noted	40+	C1	1.8
T27	Hawthorn (Crataegus monogyna)	150	3	1	1	1	1	0	Y	No significant defects noted	40+	C1	1.8
T28	Hawthorn (Crataegus monogyna)	150	3	1	1	1	1	0	Y	No significant defects noted	40+	C1	1.8
T29	Wild Cherry (Prunus avium)	50	4	1	1	1	1	0.5	Y	No significant defects noted	20-40	C1	0.6

Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
T30	English Oak (Quercus robur)	700	12	4	6	6	7	3	M	Boundary roadside tree situated on top of a steep verge. Multi stemmed old coppiced stump. Ivy clad. Previously crown lifted leaving stubs. Overhanging road. Generally in good health.	20-40	B1,2	8.4
T31	English Oak (Quercus robur)	550	7	4	7	7	2	3	SM	Severe asymmetry due to being within the lower crown of adjacent dominant tree.	20-40	C1,2	6.6
T32	English Oak (Quercus robur)	630	7	3	4	2	4	0	SM	Situated on top of steep verge adjacent to road. Multi stemmed from ground level with poor crown structure.	20-40	C1	7.6
T33	English Oak (Quercus robur)	820	10	7	7	5	4	2	M	Situated on top of steep verge adjacent to road. Twin stemmed just above ground level, with minimal included bark. Ivy clad stem. Some low overhanging branches within survey area.	20-40	B1	9.8
T34	English Oak (Quercus robur)	680	10	6	7	6	6	3	EM	Situated on top of steep verge adjacent to road. Ivy/vegetation restricts full assessment. Twin stemmed above ground level with good u-shaped union. Previously crown lifted.	20-40	B1	8.2
T35	Field Maple (Acer campestre)	150	4	2	2	2	2	0	EM	Stump with regrowth.	10-20	C1	1.8
T36	English Oak (Quercus robur)	250	3	1	1	1	1	0	EM	Stump with regrowth.	10-20	C1	3.0
T37	English Oak (Quercus robur)	250	3	1	1	1	1	0	EM	Stump with regrowth.	10-20	C1	3.0

Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
G1	Field Maple (<i>Acer campestre</i>), Hawthorn (<i>Crataegus monogyna</i>), Horse chestnut (<i>Aesculus hippocastanum</i>)	150	6	2				3	SM	Situated between two fences. Lower growth has been maintained as hedgerow. Small to medium size trees with hedge understorey. Compacted gravel track to west. Good screen from adjacent garden centre.	20-40	B2	1.8
G2	Ash (<i>Fraxinus excelsior</i>), Sycamore (<i>Acer pseudoplatanus</i>), Hawthorn (<i>Crataegus monogyna</i>)	250	13	5				2	EM	Boundary group situated outside for fence line. Trees on an inclining soil bank. Dominant trees are the ash and sycamore. Dense understory of hawthorn and bramble preventing access and stem diameter estimated.	40+	B2	3.0
G3	Hawthorn (<i>Crataegus monogyna</i>), Ash (<i>Fraxinus excelsior</i>), Holm Oak (<i>Quercus ilex</i>)	200	6	3				0	SM	Boundary group situated outside of fence line. Predominantly ivy clad hawthorn with sporadic self set small trees. Beneficial screen and habitat.	40+	C2	2.4
G4	Plum (<i>Prunus</i> spp)	150	4	2				0	EM	Small fruit trees, unmaintained. Suffering from leaf pests.	10-20	C2	1.8
G5	Field Maple (<i>Acer campestre</i>), Hawthorn (<i>Crataegus monogyna</i>)	200	5	3				0	SM	Situated outside boundary fence adjacent to road on raised verge. Assumed historically to be a hedge that is now progressing into small trees on the east side of the group.	10-20	C2	2.4

Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
G6	Lombardy poplar (Populus nigra 'Italica')	300	13	2				3	EM	No indicators of decay, disease or dysfunction noted. 4 trees situated outside boundary fence adjacent to road on raised verge.	20-40	B2	3.6
G7	Hawthorn (Crataegus monogyna), Blackthorn (Prunus spinosa), Elm species (Ulmus spp), Hazel (Corylus avellana)	220	4	3				0	SM	Situated outside boundary fence adjacent to road on raised verge. Unmaintained hedge now maturing into small tree group. Minor low growth overhang into survey area.	40+	C2	2.6
G8	English Oak (Quercus robur), Wild Cherry (Prunus avium)	350	11	4				2	EM	Situated outside boundary fence adjacent to road on raised verge. Overhanging survey area by approx. 6 m with some low branches in places. Medium sized cherry trees with twin stems and included bark. Oak trees closely spaced with minimal lateral growth.	40+	B2	4.2
G9	Hawthorn (Crataegus monogyna), Elder (Sambucus nigra), Elm species (Ulmus spp)	150	4	2				0	SM	Situated outside boundary fence adjacent to road on raised verge. Some small elm trees in decline due to Dutch elm disease. Larger maturing oaks to the east.	20-40	C2	1.8

Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
G10	Ash (<i>Fraxinus excelsior</i>), Field Maple (<i>Acer campestre</i>), Hawthorn (<i>Crataegus monogyna</i>)	200	5	3				0	EM	Scrubby group with ash trees. Clematis climber throughout and dense lower vegetation restricting access. Stem diameter estimated. Ash have some minor die back (possible ADB), and larger tree to east of group has stunted growth and suffering physiological stress.	20-40	C2	2.4
G11	Field Maple (<i>Acer campestre</i>), Hawthorn (<i>Crataegus monogyna</i>)	250	6	3				0	SM	Adjacent to roadside, in accessible due to dense vegetation. Insignificant arb merits.	10-20	C2	3.0
G12	Hawthorn (<i>Crataegus monogyna</i>), <i>Prunus</i> spp	150	4	2				0	Y	Adjacent to roadside, in accessible due to dense vegetation. Small insignificant scrubby group.	10-20	C2	1.8
G13	Field Maple (<i>Acer campestre</i>), <i>Prunus</i> spp	250	8	4				0	SM	Boundary roadside group. Concrete gated access to south. Cherry's are multi stemmed from ground level. Overhanging low branches within survey area , approx. 4m.	20-40	B2	3.0
G14	Swedish whitebeam (<i>Sorbus intermedia</i>), Field Maple (<i>Acer campestre</i>)	400	10	4				0	EM	Boundary roadside group. No indicators of decay, disease or dysfunction noted. Visually dominant from roadside.	40+	B2	4.8

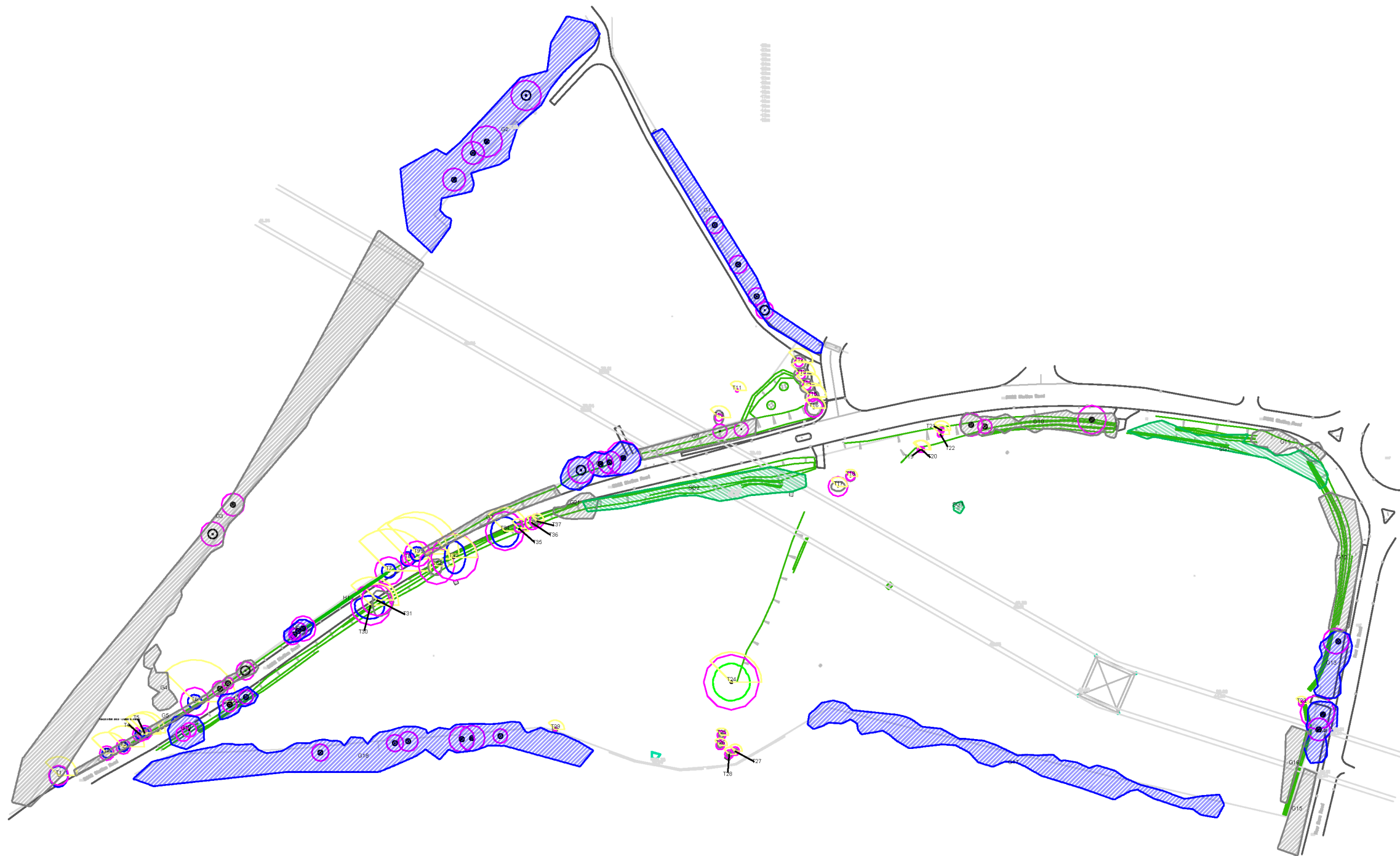
Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
G15	Hazel (<i>Corylus avellana</i>), Field Maple (<i>Acer campestre</i>), <i>Prunus</i> spp	100	4	1				0	SM	Shelter belt planting set back 2m beyond boundary fence and lateral lower growth well maintained.	40+	C2	1.2
G16	Hawthorn (<i>Crataegus monogyna</i>), Field Maple (<i>Acer campestre</i>)	100	2	1				0	New	Sporadically planted area of small trees within survey area.	40+	C2	1.2
G17	<i>Prunus</i> spp , Ash (<i>Fraxinus excelsior</i>), Field Maple (<i>Acer campestre</i>), Goat Willow (<i>Salix caprea</i>), Hornbeam (<i>Carpinus betulus</i>)	200	6	3				0	SM	Situated beyond chain fence on Network Rail (NR) land. Closely planted together forming a dense tree group along boundary. Inaccessible and estimated measurements.	40+	B2	2.4
G18	<i>Prunus</i> spp , Ash (<i>Fraxinus excelsior</i>), Field Maple (<i>Acer campestre</i>)Goat Willow (<i>Salix caprea</i>), Hornbeam (<i>Carpinus betulus</i>)	200	6	3				0	SM	Situated beyond chain fence on NR land. Closely planted together forming a dense tree group along boundary. In accessible and estimated measurements.	40+	B2	2.4
G19	Field Maple (<i>Acer campestre</i>)	250	8	3				0	EM	Remnants of old coppiced boundary hedge now with maturing regrowth. Many internal upright growth stems.	40+	B2	3.0

Tree Survey Data Table

Ref. No.	Species	DBH (mm)	Height (m)	Spread (m)				Canopy Height (m)	Life Stage	General Observations	Est. Remaining Years	BS 5837 Cat	Root Protection Radius (m)
				N	S	E	W						
G20	Field Maple (<i>Acer campestre</i>), English Oak (<i>Quercus robur</i>)	250	8	3				0	EM	Remnants of old coppiced boundary hedge now with maturing regrowth. Many internal upright growth stems.	40+	B2	3.0
G21	Field Maple (<i>Acer campestre</i>)	100	5	2				0	EM	Stumps with regrowth and now maturing into slender upright stems.	10-20	C2	1.2
H1	Blackthorn (<i>Prunus spinosa</i>)	50	4	2				0	SM	Boundary hedge on roadside verge. Unmaintained.	NA	NA	0.6
H1	Blackthorn (<i>Prunus spinosa</i>)	50	4	2				0	SM	Boundary hedge on roadside verge. Unmaintained.	NA	NA	0.6
SG1	Bramble (<i>Rubus fruticosus</i>), Hawthorn (<i>Crataegus monogyna</i>)	50	2	1				0	Y	Low level scrub with intermittent hawthorn.	NA	NA	0.6
SG2	Hawthorn (<i>Crataegus monogyna</i>), Blackthorn (<i>Prunus spinosa</i>)	50	3	1				0	Y	Scrub group with rudimentary weeds with the occasional self set thorn.	NA	NA	0.6
SG3	Elder (<i>Sambucus nigra</i>)	50	4	2				0	Y	Elder growing on utility box.	NA	NA	0.6

APPENDIX 2: TREE CONSTRAINTS PLAN



Key

Individual Trees

Tree ref. number

Approximate shade arc

Existing crown spread with BS Category Colour.

Root Protection Area. (Shown orange for veteran tree calculation)

Tree trunk

T#

Groups of Trees

Canopy extent of tree group with hatch and outline denoting Category Colour.

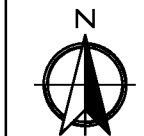
Root protection area of groups are to canopy extent unless otherwise denoted with purple outline. Orange outline indicates Ancient Semi Natural Woodland buffer of 10m from canopy edge.

Tree group ref. number

G#

Shrubs

Hedge



Tree positions shown based on supplied topographical land survey.

BS 5837 Category Colours

Higher quality trees. Concerted efforts should be made to integrate these trees into design layouts and avoid their root protection areas entirely.

Lower quality trees or smaller trees. Retention of these trees may be desirable in terms of future succession and providing ecological and environmental benefits.

BS5837 Category A

BS5837 Category B

BS5837 Category C

BS5837 Category U



Client

CLEARSTONE_ENERGY

Project Title

NORTHFLEET_SOLAR
KENT

Drawing Title

TREE_CONSTRAINTS_PLAN
(EXISTING_LAYOUT)

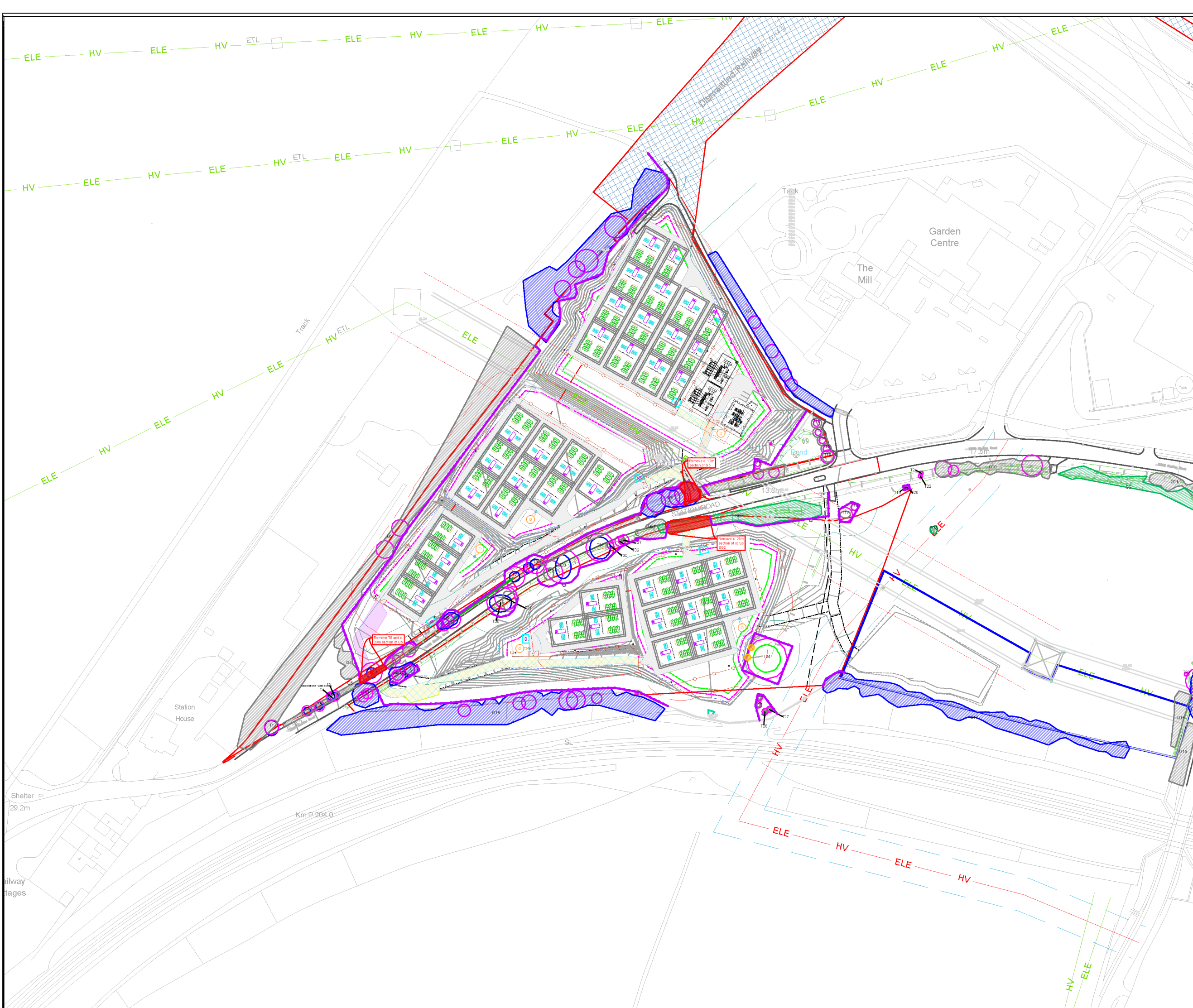
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Scale	Orig Size	Dimensions
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Project No	Drawing File
2484851	FINAL

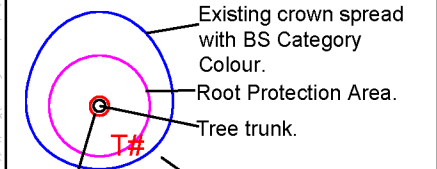
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APPENDIX 3: TREE REMOVAL AND PROTECTION PLAN



Key

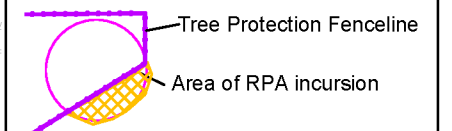
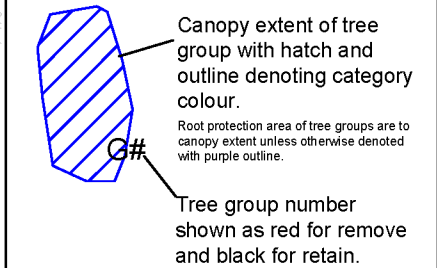
Individual Trees



Tree removal symbol
(Red = Remove)

Tree number, shown as red for remove tree or black as retained tree.

Groups of Trees



BS 5837 Category Colours

Higher quality trees. Concerted efforts should be made to integrate these trees into design layouts and avoid their root protection areas entirely.

BS5837 Category A

BS5837 Category B

Lower quality trees or smaller trees. Retention of these trees may be desirable in terms of future succession and providing ecological and environmental benefits.

BS5837 Category C

BS5837 Category U



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Client **CLEARSTONE_ENERGY**

Project Title

NORTHFLEET_SOLAR
KENT

Drawing Title

**TREE_REMOVAL_AND
PROTECTION_PLAN
(PROPOSED_LAYOUT)**

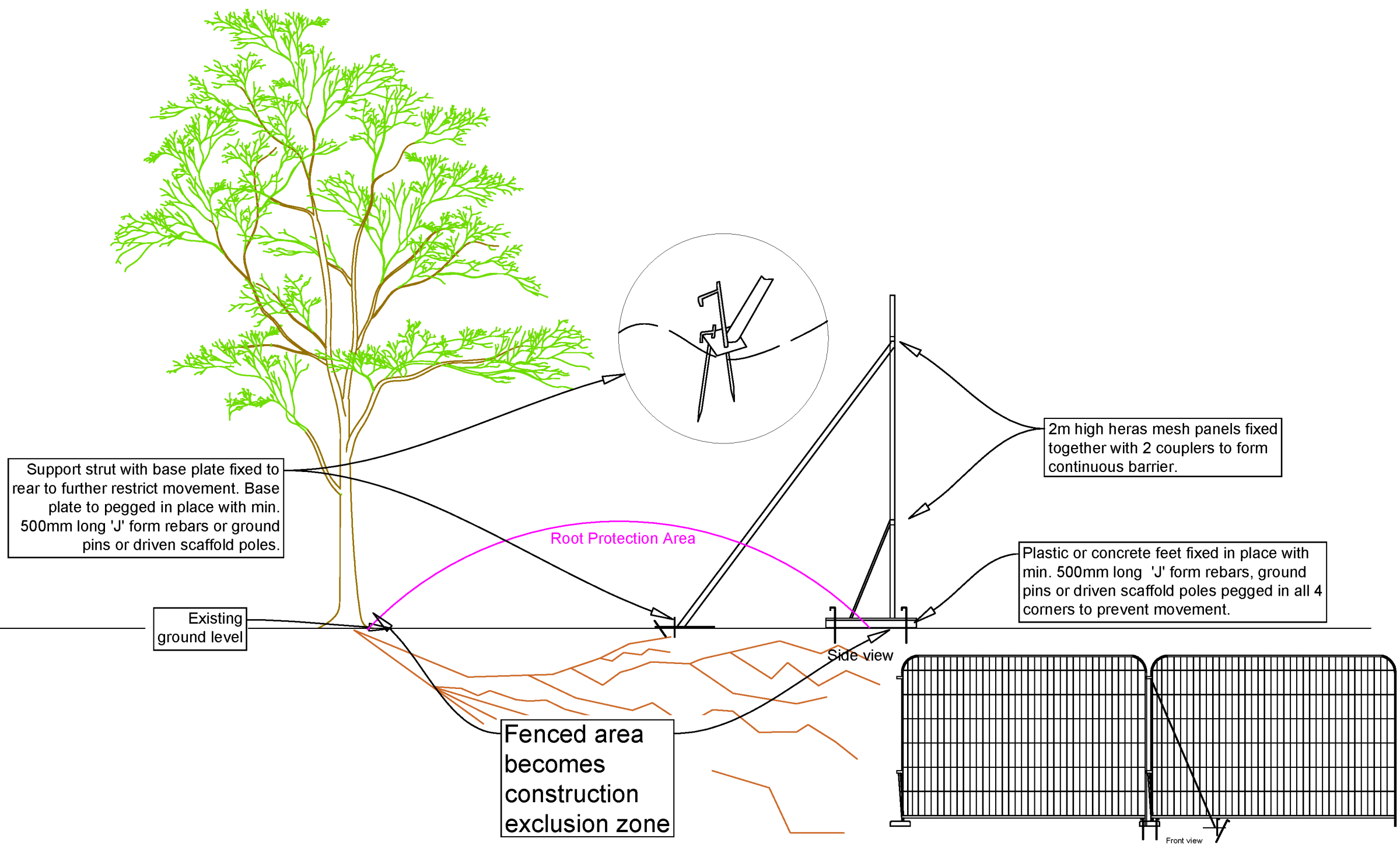
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DM	02.12.24	JB	03.12.24	JB	03.12.24

Scale 1:2000	Orig Size A3	Dimensions METRES
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Project No. 2484851	Drawing File - FINAL
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Drawing No.	Rev.
2	0

APPENDIX 4: TREE PROTECTION FENCE SPECIFICATION AND SIGNS





**THIS TREE PROTECTION FENCING
MUST NOT BE MOVED UNLESS
WRITTEN IN APPROVED
PLANNING DOCUMENTS.**

These trees are protected under planning consent.

Do not move this fencing.

Do not lean anything against it.

Do not damage it. Inform site manager if any damage occurs.

Do not allow liquids/chemicals/cement of any kind to flow
toward it.

Do not pile spoil close to it.

Do not move this fencing.

APPENDIX 5: TREE SURVEY KEY

Reference

Each tree or group has been assigned a sequential number.

T - Tree

G - Group

H - Hedge

Species

Represents the genus, species and if appropriate cultivar of the tree with common name given.

Measurements

- DBH - Stem diameter in millimetres measured at 1.5 m above ground level with callipers or estimated where there was no access. Where the stem is divided below 1.5 m, measurement is taken as directed by BS5837 Annex C.
- Height – Tree height measure in metres to the nearest half metre,
- Lower crown height – Lower crown height above ground in metres of the first lowest significant branch.

Age Classification

The following classification is employed:

- Y - Young: saplings and young trees under 10 years of age
- SM – Semi Mature: trees older than 10 years but less than one third of the life expectancy of their species, normally making substantial extension growth.
- EM – Early Mature: trees between one-third and two-thirds of the life expectancy of their species. More or less full height and large girth, increasing only slowly.
- M – Mature: trees beyond two-thirds of the life expectancy of their species. No significant extension growth.
- OM – Over Mature - a tree having reached its maximum life span and is declining in health and size due to old age.
- V – Veteran: trees that shows features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species.

General Observations

Observations made by the assessor relating to the category classification and arboricultural merits or concerns.

Estimated Remaining Contribution in Years

The estimated remaining contribution in years is an estimate based on currently known factors of the possible remaining life of the tree as an asset. Clearly, it is impossible to predict changes in condition which may occur in the future and this reflects what is

considered reasonable under existing circumstances; the classification that has been used is in accordance with the BS5837.

The estimated remaining contribution in years will be dependent on the interaction of the typical longevity of the species, its current age and condition with prevailing environmental factors. The estimated remaining contribution in years also dependent on future tree management that can extend useful life in some instances.

Tree Categorisation Using BS 5837 Methodology

The trees surveyed were categorised using the method explained in BS5837. This method categorises individual trees, groups and woodlands in a systematic way. Groups are identified as those trees forming a single arboricultural feature with trees that provide companion shelter, are avenues or screens or cultural. Initially the surveyor will determine if the tree should be regarded as a U category tree. U category trees are those that are of low value that have little future due to physiological and structural condition.

Other trees are graded A, B or C. The initial category should reflect the tree's value in making an important contribution to the amenity of the site over a period of time. The higher the tree category, the longer the perceived time period.

A subcategory is included 1, 2 or 3. This subcategory reflects the type of value the surveyor feels the tree presents in regard to its value to 1 – arboricultural, 2 – landscape, 3 – cultural or conservation context.

The cascade chart used is included as Appendix 6 of this report.

APPENDIX 6: BS5837:2012 CASCADE CHART

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2



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