Killymallaght BESS, Trench Road, County Derry, Northern Ireland.

British Standards 5837:2012 Tree Survey: Arboricultural Impact Assessment, Method Statement and Tree Protection Plan

Client:

Renewable Energy Systems Ltd.

Report Reference:

RSE_7792_R1_V2_ARB

Issue Date:

June 2024

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Project Details

Client:	Renewable Energy Systems Limited
Project:	Killymallaght BESS, Trench Road, County Derry, Northern Ireland.
Reference	RSE_7792_R1_V2 _ARB
Report Title	BS 5837:2012 Tree Survey, Arboricultural Impact Assessment (AIA), Arboricultural Method Statement (AMS) & Tree Protection Plan (TPP)

DISCLOSURE:

Document Control

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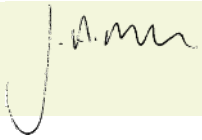
Technical Reviewed:	**Jake Mellor** BA (Hons) FdSc, MAborA	Principal Arboriculturist		22/02/2024
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1 EXECUTIVE SUMMARY

i RammSanderson Ecology Ltd was instructed by Renewable Energy Systems Ltd to carry out an assessment of trees at Killymallaght BESS, Trench Road, County Derry, Northern Ireland which follows the guidance of British Standards 5837:2012 'Trees in relation to design, demolition and construction – Recommendations', and to provide a report on the arboricultural implications to the proposed development of the site.

ii The current development proposals are for an energy storage facility.

iii A current topographical survey of the site in AutoCAD format has been provided and this formed the basis for the Tree Constraints Plan.

iv Following consultation with the project clients regarding the arboricultural constraints, a site layout plan has been produced which is considered represent the most appropriate integration between the new buildings and existing trees. A provided AutoCAD copy of this proposed site plan (Drawing Reference: 05195-RES-LAY-DR-PT-001_5 May 24) has been considered during the Arboricultural Impact Assessment and used to produce Tree Protection Plan.

v The content and scope of this report is listed below:

- BS 5837:2012 Tree Survey and Categorisation
- Arboricultural Impact Assessment
- Arboricultural Method Statement
- Tree Protection Plan

1.1 Findings and Recommendations

i The survey assessed 12 individual trees and 4 hedgerows. All of which were deemed low quality (Category C) and were limited to the site boundaries and dividing hedgerow.

ii There are currently no tree preservation orders (TPO) at this location and the site is not situated within a conservation area. Therefore, none of the trees detailed within this report were subject to statutory protection at the time of the survey.

iii The proposed development will not require the removal of any individual trees or hedgerows.

iv There will no change in terms of arboricultural or amenity value to the site as a result of the proposals. However, the site does present itself with a good opportunity for additional planting which should be implemented through an effective landscape design, with the aim of increasing tree cover and amenity value.

v It is recommended that temporary protective fencing is erected in order to create a construction exclusion zone which adequately protects the retained trees from damage during the construction works. This fencing should be erected at the outset of the development before any activities are carried out or materials/ plant is brought onto the site. For full details see the Tree Protection Plan (Appendix D).

vi Any tree works detailed in the Tree Survey Schedule at Appendix A have been identified solely in the context of the sites current use and would be considered good arboricultural management irrespective of any development proposals. It should not be inferred that any such recommended tree works are necessary to implement the proposed development.

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2 INTRODUCTION AND BACKGROUND

2.1 Purpose and Scope of this Report

i This report has been prepared following the guidance within BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' Its purpose is to assess the likely arboricultural implications to the development proposals for the site and to be submitted in support of a planning application to the Local Planning Authority seeking consent for these proposals. It also provides arboricultural guidance on how the proposed development can be achieved while minimising any potential detrimental impacts to retained trees.

ii In preparing this report, consideration has been given to the proposed layout, the condition of the trees, and the final use of the site with a focus on providing a harmonious, balanced environment between the trees, buildings, and the end users of the site.

iii Whilst not definitive, the findings and any associated recommendations detailed within this report are considered reasonable, practicable, sustainable, and in the interests of promoting good arboricultural management.

iv Recommendations included within this report are the professional opinion of an experienced Arboriculturist and are the view of RammSanderson Ecology Ltd. This is based on a review of the information provided by the Client, the brief, and a survey of the site. This report pertains to these results only.

v This report and the survey(s) on which it depends have been carried out by a competent Arboriculturist.

2.2 Regulatory and Policy Framework

i Planning Act (Northern Ireland) Regulations 2011 enable a local planning authority to make a Tree Preservation Order (TPO) to protect specific trees, groups of trees, or woodlands in the interests of amenity. A TPO prohibits the cutting down, toppling, lopping, uprooting, wilful damage, and wilful destruction of protected trees without the local planning authority's written consent.

ii Part 4, Chapter 3 of the Planning Act (Northern Ireland) Regulations 2011 makes provisions to protect trees which are within a conservation area, but not the subject of a TPO. These provisions require anyone intending to carry out works to a tree within a conservation area to give the local planning authority 6 weeks' notice before carrying out certain works unless an exemption applies.

iii The Forestry Act (Northern Ireland (2010) requires that a Felling Licence, issued by the Forestry Commission, is obtained before felling trees, unless an exemption applies; such exemptions include felling small quantities of trees (less than $5m^3$ of timber in any calendar quarter) or felling in specific areas (e.g. gardens).

2.3 Site Location and Context

i Site address: Killymallaght, Trench Road, Londonderry, County Derry, Northern Ireland. BT47 2QS

ii Central grid reference: NV 58057 73625

iii The site comprises of 2 grassland field compartments bordered by hedgerows and divided by an internal hedgerow. Running to along the south of site is Trench Road, with other arable fields and pastures surrounding the site on all other sides of the site. The southwestern boundary is comprised of planted hedgerow with saplings of mixed species to the height of 50cm.

Figure 1: Site Location Plan

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3 SURVEY METHODOLOGY

3.1 Survey Methods

i The site was visited on Thursday the 18th January 2024 to carry out an assessment in accordance with BS 5837:2012 – Trees in relation to Design, Demolition and Construction - Recommendations.

ii The weather at the time was overcast, with slight wind and minor easing snow flurries, however it was considered to be adequate for conducting the survey during which, the following information was collected:

- Sequential reference number (recorded on the tree survey plan), including reference to type (tree, group, woodland, or hedgerow).
- Species, listed by common name (a key to scientific names is provided at Appendix B).
- Height.
- Stem diameter measured @ 1.5m height (for trees with more than one stem, the combined stem diameter is recorded as per BS5837:2012 Section 4.6).
- Branch spread (measured at the four cardinal points).
- Existing height above ground level of first significant branch.
- Life stage:

  Y – Young,
  SM – Semi Mature,
  EM – Early Mature,
  M – Mature,
  OM – Over Mature.

- General observations, particularly of structural and/or physiological condition, and/or preliminary management recommendations as appropriate.
- Estimated remaining contribution (future life expectancy) in years (<10, 10+. 20+, 40+);
- Tree quality assessment category grading as per Section 4.5 and Table 1 of BS5837:2012. 'U' or 'A' to 'C' grading with the subcategory 1, 2 or 3 reflecting arboricultural, landscape or cultural values, respectively.

Notes: Only individual trees with a stem diameter of 75mm or greater are included in the survey. It is not always practical or necessary to record individual details for every tree within a group or woodland. Only basic details (height and species) for domestic hedgerows and significant shrubs were recorded. More substantial hedgerows (including evergreen screens) are generally recorded in a similar manner to groups of trees.

iii The measurement conventions used were as follows:

- Height, crown spread, and crown clearance was recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- Stem diameter was recorded in millimetres, rounded to the nearest 10mm.
- Any estimated dimensions (for offsite or otherwise inaccessible trees where accurate measurements cannot be taken) were clearly identified as such in the tree schedule (Appendix A).

iv The survey includes all trees plotted on the provided topographical survey. Should any relevant trees on or adjacent to the site have been missed on the topographical survey, these have been included where appropriate. However, the positions indicated on any plans included within this report for all trees not included on the provided topographical survey have been approximated for the purposes of identification only, and if accurate locations are required these should be confirmed on site.

4 LIMITATIONS

4.1 Survey

i Each of the surveyed trees has been plotted and recorded as an individual tree or a tree group in accordance with the criteria detailed in section 4.4.2.5 of BS 5837:2012.

ii The information contained within this report is based on the author's knowledge and experience in respect of tree related issues. Whilst the appropriate level of skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete, or not fully representative information.

iii Any survey work undertaken will have been subject to natural limitations, including seasonal and phenological aspects.

iv Trees were assessed from ground level using the Visual Tree Assessment (VTA) method. The trees included in the survey were not climbed, no samples were removed, and no detailed internal investigation of decay was made.

v Where other vegetation (e.g. ivy or dense ground cover) prevented full access to any tree, this is noted in the tree survey schedule (Appendix A). Dense ivy cover can prevent full access to a tree and so obscure the presence of cavities or other defects. Any such situations are noted in the tree survey schedule with, where appropriate, recommendations for the ivy to be removed and a re-inspection carried out. No ivy was removed from any tree during the survey.

vi No liability can be accepted by RammSanderson Ecology Ltd. in respect of the trees unless the recommendations of this report are carried out under their supervision and within their recommended timescales. Acceptance of this report represents an agreement with the guiding principles and the terms listed.

vii The findings and recommendations contained within this report are, assuming its recommendations are observed, valid for a period of twelve months from the date of survey. Trees are living organisms and their condition can change significantly over a relatively short period of time – good practice dictates they are inspected on a regular basis for reasons of safety.

viii Any hedgerows within the survey area were assessed solely for their general arboricultural condition and value. Further detailed assessment, following the Hedgerow Regulations 1997, is outside the scope of this report and no attempt has been made during this assessment to classify any hedgerow under the criteria within those Regulations.

ix Tree rooting characteristics and soils are both enormously variable as are their interactions. This makes any attempts to quantify tree related subsidence risk assessment impossible. No attempt has been made to assess subsidence risk potential nor should any be construed.

x The report relates only to the trees included within the Tree Schedule (Appendix A).

5 RESULTS

5.1 Surveyors

i The survey was carried out by:

- Liam Bancroft BSc (Hons) is an assistant arboriculturist gaining experience within the field. He has previously worked as a forestry operations supervisor in New Zealand.

ii The survey was completed during suitable conditions as detailed in the table below.

Table 1: Summary of conditions during survey

Abiotic Factor	Survey 1
Survey type	BS 5837:2012 Tree Survey
Date completed	18/01/2024
Temperature	2 °C
Wind speed (Beaufort Scale)	4
Cloud cover	70%
Precipitation	2

5.2 Statutory Tree Protection

i Derry City and Strabane District Council confirmed, by email on the 9th of January 2024 that the site is not within a conservation area and that none of the trees detailed within this report are covered by a tree preservation order (TPO).

ii The trees on the site are therefore not currently subject to any statutory protection and there are no restrictions on tree works being carried out at this location. However, it is recommended that immediately prior to carrying out any future tree works, further confirmation is obtained from Derry City and Strabane District Council that the trees remain unprotected.

5.3 Tree Survey

i The survey assessed 12 individual trees and 4 hedgerows of trees, the quality and value of which are summarised in the table below whilst full results of the tree survey are provided in the Tree Schedule (Appendix A).

ii All of the trees and hedgerows were deemed to be of low quality (Category C) and were limited to the red line site boundary edges and the internal dividing hedgerow.

iii The southwestern boundary is comprised of planted saplings of mixed species to the height of 50cm to form a future hedgerow.

iv The northeastern boundary is comprised of a heavily managed dense gorse hedgerow.

v The main arboricultural features from the survey relate to a mature low quality (Category C) Ash tree situated within the internal hedgerow, and the largest tree surveyed was an English oak situated south of the red line boundary in an adjacent field, albeit situated on the existing topographical plan. The hedgerows surrounding the site had good habitat value.

Table 2: Survey Results

BS5837:2012 Tree Quality Assessment Category		Trees	Hedgerows	Total
A	**Trees of high quality** which are healthy and attractive with high visibility and no significant defects, and which can make a substantial contribution for a minimum of 40 years	0	0	**0**
B	**Trees of moderate quality** which are healthy and attractive but with some remediable defects such that they are in a condition to be able to make a significant contribution for a minimum of 20 years	0	0	**0**
C	**Trees of low quality** which are unremarkable, of limited merit and that are easily replaced, small-growing, young species which have a relatively low potential amenity value, and low landscape benefits. These trees typically include self-seeded trees of limited life span, small (below 150mm stem diameter) and young trees and trees of poor form and limited amenity value.	12	4	**16**
U	Trees which are 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 and/or are considered to be unsuitable for retention in the proximity of new dwellings or areas of public open space.	0	0	**0**
	Total	**12**	**4**	**16**

6 ARBORICULTURAL IMPACT ASSESSMENT

6.1 Introduction

i The arboricultural constraints, both above and below ground, identified during the tree survey (Section 5) and illustrated on the Tree Constraints Plan (Appendix A), have been used, through consultation with the project Client, to inform the proposed site layout design.

ii The following arboricultural impact assessment evaluates the direct and indirect effects of the proposed design, with recommendations for appropriate mitigation where necessary. It takes account of the effects of any tree loss required to implement the design and any proposed construction activities which may have the potential to damage retained trees.

6.2 Trees Suitable for Retention

i Where possible, it is generally considered desirable for any Category 'A' and Category 'B' trees to be retained and appropriately integrated within the layout for new developments. Category 'U' trees are unsuitable for retention other than for the very short-term or exceptionally for their conservation value and therefore should not be considered to be a constraint to development.

ii In assessing the probable impact of the proposed development on the trees and vice versa, and therefore identifying which trees are suitable for retention and integration within the context of the proposed layout, the following factors have all been considered:

- Root Protection Areas for Retained Trees
- Shading
- Direct Damage
- Construction Activity
- Demolition/Ground Works
- Future Pressure for Tree Removal and Pruning
- Seasonal Nuisance
- Infrastructure
- Future Management

6.3 Root Protection Areas (RPAs)

i Recommended Root Protection Areas (RPA) for all individual trees on or immediately adjacent to the survey area are detailed within the Tree Schedule (Appendix A) and illustrated on the Tree Constraints Plan (Appendix C).

ii These RPAs have been calculated following the recommendations within BS5837:2012 Section 4.6 and are represented on the Tree Constraints Plan as a circle centred on the base of the tree's stem. Should any deviation from this circular RPA be considered appropriate, for example where previous site conditions (the presence of roads, structures, and underground apparatus), topography, or soil type/structure will have influenced root growth, any modifications to the RPA will be clearly explained and reflect a soundly based arboricultural assessment of the likely root distribution for the individual tree. Any such modified RPA will be of an overall area which is equivalent to the BS5837:2012 recommendation.

iii Recommendations for RPAs for any groups of trees, woodlands, or hedgerows, where the positions of individual trees are not included on the provided topographical survey, also reflect a soundly based arboricultural assessment of the likely collective root distribution of the constituent trees.

6.4 Recommendations for Tree Removals

i The survey identified no trees which were unsuitable for retention due to their condition.

ii In addition, no trees or hedgerows have been identified as requiring removal solely to accommodate the proposed new site layout.

iii All Arboricultural work should be carried out by qualified and competent Arborists working to BS 3998:2010 'Tree Work – Recommendations'.

6.5 Tree Loss Evaluation

i There will be no losses in terms of arboricultural or amenity value to the site. That being said, additional planting of appropriate site specific species should be considered to improve the limited arboricultural value of the site through the landscaping scheme, with the aim of increasing amount of tree cover whilst improving the long term arboricultural value of the site.

6.6 Recommendations for Tree Pruning

i Any recommendations within the Tree Survey Schedule (Appendix A) details pruning works **solely** in the context of the current use of the site that are recommended in the interest of good arboricultural management of the trees irrespective of any changes in use of the site. These recommendations should not be considered as necessary to implement or facilitate the proposed development.

ii All Arboricultural work should be carried out by qualified and competent Arborists working to BS 3998:2010 'Tree Work – Recommendations'.

6.7 Tree Protection Plan

i The Tree Protection Plan (Appendix D), when read in conjunction with this report, details the required tree protection and mitigation measures for all trees proposed to be retained and integrated within the proposed layout.

ii The Tree Protection Plan is superimposed on the proposed layout and includes details of;

- Trees selected for retention and trees proposed for removal.
- The precise location and specification of protective barriers to form a construction exclusion zone around the retained trees.
- The extent and type of any temporary ground protection, and/or any additional physical measures, that are recommended in association with any temporary access or other activities which are permitted within the construction exclusion zone.
- The position, extent and general construction specification of any new permanent new hard surfacing within the RPA.

6.8 Shading

i Although there are circumstances where shade from trees could be considered beneficial, excessive shading of buildings by trees can be a problem, particularly where it affects rooms which require natural light. Similarly, it is often considered that open spaces such as gardens and sitting areas benefit from direct sunlight, for at least part of the day, and therefore that excessive shading of these areas by trees is undesirable.

ii In this instance, no further investigation, illustration or mitigation is considered necessary due to the generally favourable layout orientation and the nature of the proposal (i.e. non-residential) which means that the development is not considered likely to be subjected to an unreasonable level of shading from trees.

iii Shading can be represented using drawn segments, with radii equivalent of the current tree height, taken from the centres of those surveyed tree stems that are considered to be relevant, drawn from due north-west

to due east. These segments represent a basic illustration of the shade pattern through the main part of the day and based on advisory comments detailed in section 5.22, Note 1 of BS 5837:2012.

6.9 Direct Damage

i All new developments should consider the likelihood of direct damage occurring to any new structures, hard surfacing or associated utilities from incremental tree stem/root growth or mechanical damage resulting from encroachment of branches.

ii The proposed layout locates all new structures and services outside of the recommended RPAs.

iii For any proposed new planting, Table 3 below, taken from Annex A of BS 5837:2012, provides recommendations that are advised as minimum distances from structures and services for new tree plantings.

Table 3: Minimum distance between young trees or new planting and structure to avoid direct damage to a structure from future tree growth

Type of structure	Minimum distance between young trees or new planting and structure, in metres (m)		
	Stem dia. ≤300mm[A)]	Stem dia. 300mm to 600mm[A)]	Stem dia. ≥600mm[A]
Building and heavily loaded structures	---	0.5	1.2
Lightly loaded structures such as garages, porches etc.	---	0.7	1.5
Services			
≤1m deep	0.5	1.5	3.0
≥1m deep	---	1.0	2.0
Masonry boundary walls	---	1.0	2.0
In-situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

A) Diameter of stem at 1.5m above ground level at maturity.

6.10 Temporary Ground Protection

i The proposed site layout does not include any conflict between the necessary construction working space and retained trees. Therefore, it is not considered that any temporary ground protection will be required to implement the development.

ii British Standard 5837:2012 advises that temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction to underlying soil and further provides the following note:

The ground protection might comprise one of the following:

a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a

compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

iii Final on-site measurements should be taken to ascertain the extent of any tree protection measures and provide an indication of whether incursions, which have not been anticipated, into the RPAs of retained trees might prove necessary.

6.11 Excavation/Ground Works

i The installation of any protective mitigation measures, if necessary, prior to the commencement of any works on site, will allow excavations and ground works to take place whilst minimising any anticipated adverse effect and/or impact on the retained trees.

ii All plant and vehicles engaged in ground works should either operate outside the RPAs, or run on appropriate ground protection, if necessary, in the proximity of retained trees.

iii Where trees stand adjacent to hard surfaces and/or buildings to be removed, excavation should be undertaken inwards, from within the footprint of the existing hard surfacing, or outside of the RPAs.

6.12 Construction Within the Root Protection Area

i The use of traditional strip foundations can result in extensive root loss and should be avoided. However, BS5837:2012 recommends that the insertion of specially engineered structures within RPAs may be justified if it enables the retention of a good quality tree (usually category A or B) that would otherwise be lost.

ii The foundation design should minimise any adverse impact on the trees and should take into consideration all relevant site-specific constraints. In order to arrive at a suitable solution, the combined advice of the project arboriculturist and an engineer will be required.

iii BS5837:2012 recommends that root damage can be minimised by using piles, located optimally to avoid any structural roots, by means of hand tools or compressed air soil displacement, to a minimum depth of 600mm, or beams laid at or above ground level to avoid tree roots.

iv Where piling is to be installed near to trees, the smallest practical pile diameter should be used to reduce the possibility of striking major tree roots. Temporary ground protection, appropriate to the size of the piling rig in use, should be used as detailed above in section 6.6.

v It may be appropriate for slabs for minor structures (e.g. a shed base) to be formed within the RPA. It should however be placed on the existing ground level with no new excavation and should not exceed an area greater that 20% of the unsurfaced ground within the RPA.

vi The proposed layout does not include any construction within the RPA and so there is no requirement for any specially engineered structures in this instance.

6.13 Hard Surfacing Within the Root Protection Area

i It is not anticipated that the installation of any specially engineered hard surfaces to protect the roots of retained trees will be necessary in this instance. However, general guidance on such surfacing is provided below should a subsequent need arise.

ii BS5837:2012 recommends that three-dimensional cellular confinement systems, incorporating geotextile or impermeable barriers as necessary, may be appropriate sub-base options for new hard surfacing with the RPA.

iii A 'no-dig' design should be used which does not require excavation into the soil other that the removal, using hand tools, of any turf layer or other surface vegetation. The structure of the hard surface should be designed to avoid localised compaction and in all cases, the advice of a structural engineer should be sought to ensure that the design is suitable for the anticipated vehicle loads it will be subjected to.

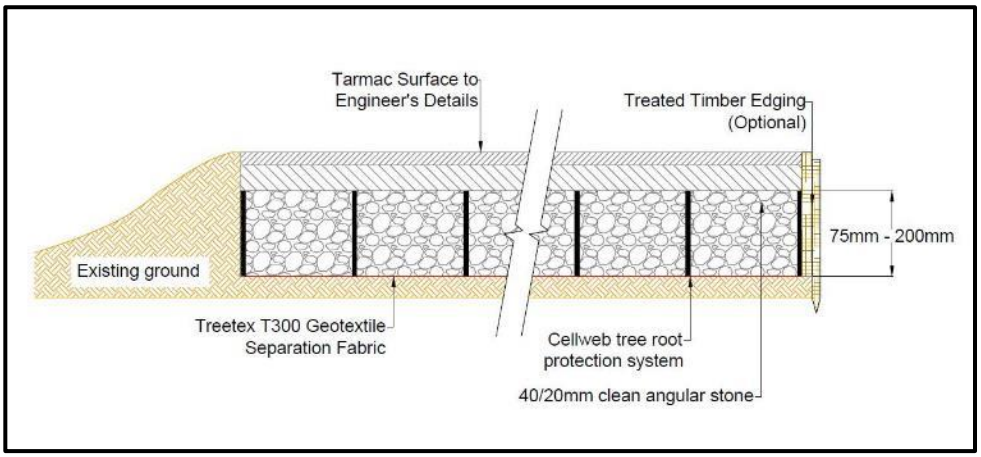
iv An assessment should be made to establish whether the existing site topography lends itself to the installation of a three-dimensional cellular confinement system. Final on-site measurements should be taken to ascertain the extent of any incursions into the RPA and provide subsequent guidance on the extent of any 'no-dig' installation.

v The new hard surfacing should be resistant to deformation by tree roots and should be set back from the tree's stem and above ground buttresses by a minimum distance of 500mm to allow for growth and movement. Where no-dig installations are proposed to be located particularly close to the main stems of retained trees then it is recommended that consideration is given to realigning the hard surfacing in order to reduce the total area (m^2) of RPAs affected in order to reduce the likelihood for future pruning pressure and minimise the potential for any detrimental impact on the retained trees.

vi It is recommended that the total area for all new permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

vii Indicative cross-sectional drawings of a suitable three-dimensional cellular confinement system (CellWeb™) are shown below (Figure 2).

Figure 2: Cross section illustrating a permeable tarmac surface finish



6.14 Construction Activity

i The installation of any recommended protective or mitigation measures prior to the commencement of any works on site will allow the development to take place whilst minimising any anticipated adverse effect and/or impact on the retained trees.

ii All plant and vehicles engaged in construction works should either operate outside the RPA, and/or run-on appropriate ground protection.

6.15 Future Pressure for Tree Pruning/Removal

i Whilst the presence of retained trees can often enhance the immediate environment upon completion, any proposed layout should provide sufficient space that will allow for future tree growth and to provide a subsequently reduced need for future, frequent remedial pruning.

6.16 Seasonal Nuisance

i Foliage, fruit, and cone fall can be considered by some to be a nuisance and requests to Local Planning Authorities to carry out pruning works to negate these issues are often refused due in part to their brief, seasonal nature of the problem.

ii Providing a suitable juxtaposition when considering new layouts will help in minimising issues experienced by people living in proximity to trees.

iii A certain level of leaf fall in the autumn will be inevitable due to the generally deciduous nature of the existing trees on the site. This it is however not considered to be unreasonable in the context of the site's use.

6.17 Infrastructure

i Infrastructure requirements have been considered and there no evidence to suggest that retained trees will have an impact on lighting, signage, CCTV sightlines or visibility splays.

ii Where the installation of any underground apparatus and drainage is considered necessary then particular care should be taken in its routeing and methods of installation and wherever possible be routed outside RPAs.

iii Where routeing services outside RPAs is not possible then detailed plans showing the proposed routeing should be drawn up in conjunction with the project Arboriculturist. Trenchless insertion methods are considered appropriate for this purpose and British Standards 5837:2012 details solutions for differing utility apparatus requirements (see table 4 below).

iv British Standards 5837:2012, Section 7.7.2 suggests that in the event roots can be retained and appropriately protected during exposure, then excavation using hand-held tools might be acceptable for shallow service runs. The National Joint Utilities Group's publication 'NJUG Volume 4' contains further guidelines on the installation of new underground services in proximity to trees.

Table 4: Trenchless solutions for differing utility apparatus installation requirements

Method	Accuracy	Bore dia. A)	Max sub. B) length	Applications	Not suitable for
Micro tunnelling	≤20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/roadway undercrossing	Low-cost projects due to relative expense
Surface-launched directional drilling	≈100	25 to 1,200	150	Pressure pipes, cables including fibre optic	Gravity-fall pipes, e.g. drains and sewers C)
Pipe ramming	≈150	150 to 2,000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling D)	≈50 E)	30 to 180 F)	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5m

A) Dependent on strata encountered.

B) Maximum subterranean length.

C) Pit-launched directional drilling can be used for gravity fall pipes up to 20m subterranean length.

D) Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.

E) Substantial inverse relationship between accuracy and distance.

F) Figures given relate to single pass up to 300mm bore achievable with multiple passes.

6.18 Landscaping

i BS 5837:2012 advises that any new tree planting and associated landscaping proposals should consider the ultimate height and spread, form, habit and colour, density of foliage, and maintenance implications, in relation to both the built form of the new development, and the retained landscape features.

ii Consideration should also be given to the advice detailed in section 6.4 in respect of distances of newly planted trees in relation to new structures.

iii For all new tree planting, the guidance within BS 8545:2014 'Trees: from nursery to independence in the landscape – Recommendations' should be followed.

iv No details of any proposed landscaping have been provided.

v Appropriate compensation for removed trees should be put in place through the landscaping design plan. It is recommended that trees should be planted at minimum 1:1 ratio and located within an area of the site to enable the trees to reach maturity. Planted trees be of a standard size (8-10cm girth at 1.5 metres) and be of a suitable species in keeping with the species present on site. However, ultimately the relevant Local Planning Authority will have their own specifications with regards to compensatory planting.

6.19 Issues to be addressed by an Arboricultural Method Statement

i The Arboricultural Method Statement (Section 7) details the general methodology for the implementation of those aspects of the proposed development that have the potential to result in damage to the retained trees.

7 ARBORICULTURAL METHOD STATEMENT

7.1 Summary of Mitigation

i The table below summaries the mitigation methods required for the site, specific to any trees where their RPA may be subject to impact by the proposed development.

ii Each specific requirement is detailed further in the subsequent sections of this report.

Table 5: Summary of Mitigation Requirements

Tree No.	Species	Works effecting	Mitigation Required
Throughout the site		Retained trees in general proximity to the proposed construction works	Create a construction exclusion zone, by erecting and maintaining temporary tree protection fencing for the duration of the construction works. The tree protection fencing should be installed as detailed on the Tree Protection Plan (Appendix D).

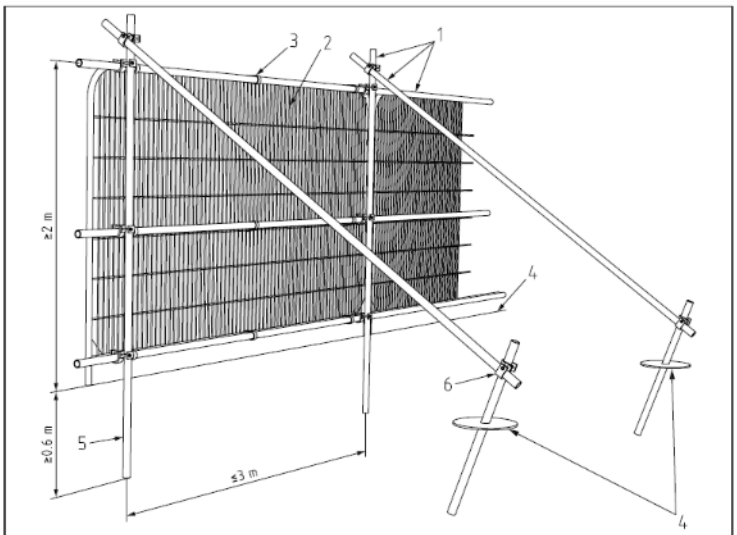
7.2 Erection of Protective Fencing

i It is recommended that temporary protective fencing should be erected in order to create a construction exclusion zone which adequately protects the retained trees from damage during the construction works. This fencing should be erected at the outset of the development works before any activities (including demolition and ground works) are carried out and materials/ plant are brought onto site.

ii The recommended position for protective fencing is detailed on the Tree Protection Plan (Appendix D).

iii The fencing should consist of a vertical and horizontal scaffold framework which is well braced to resist impacts as seen below in Figure 3.

Figure 3: Default specification for protective barrier © British Standards Institute

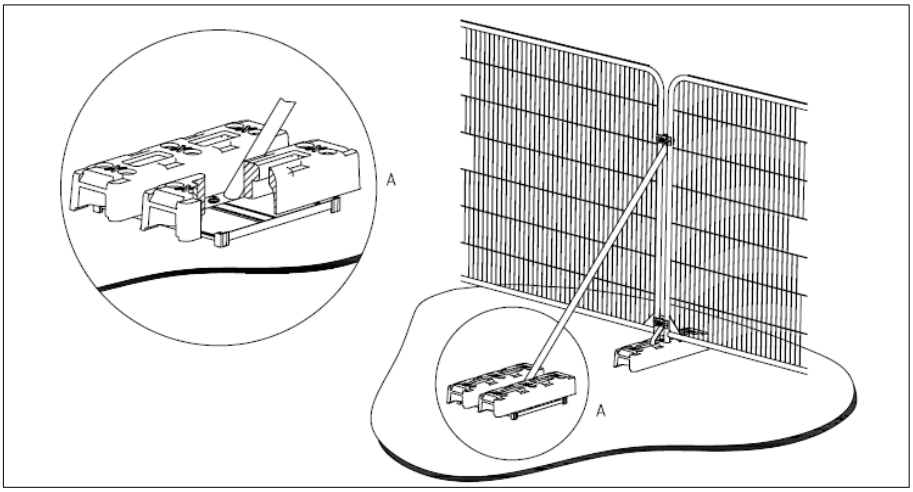


iv All-weather warning notices should be attached to the fencing to clearly identify the area as a tree protection exclusion zone into which access is not permitted

v Once erected, the protected area should be regarded as sacrosanct and the fencing should not be removed or altered unless recommended by the project Arboriculturist and, where necessary, approval from the local planning authority.

vi Where the site circumstances and associated risk of damaging incursion into the RPAs do not necessitate the default level of protection, an alternative specification may be considered to be appropriate. For example, 2m tall welded mesh panels on rubber or concrete feet as illustrated below in Figure 4.

Figure 4:Alternative Specification for Protective Fencing © British Standards Institute



vii In this instance, it is considered that the associated risks to trees from the proposed development do not necessitate the default specification and therefore that use of the alternative specification will be appropriate.

7.3 Additional General Precautions Outside of the Exclusion Zone

i Fires on site should be avoided wherever possible. Where they are unavoidable, they should be kept well away from the exclusion zone, and only lit in positions where heat will not affect foliage or branches. The potential size of a fire and wind direction should be taken into account, and it should be attended at all times until safe to leave.

ii Any materials, fuel, or chemicals whose accidental spillage would cause damage to a tree should be stored and handled well away from the exclusion zone.

7.4 Site Monitoring

i Following consideration of the likely arboricultural impacts to the development, together with the recommended mitigation options, it is not considered that on-site arboricultural monitoring will necessary during the construction works.

7.5 Ground Works, Demolition & Construction Works

i Installation of all recommended protective mitigation measures prior to the commencement of any works, combined with use of temporary ground protection and/or the retention of existing hard surfacing within the

RPAs, will allow the ground works to take place whilst minimising any adverse effect or impact on the retained trees.

ii All plant and vehicles engaged in ground works should either operate outside the RPA or run-on temporary ground protection or existing hard standing, where appropriate.

iii During ground works and demolition, the utmost caution should be used to not sever any roots, especially those measuring ≥25mm in diameter. Any roots uncovered roots should be wrapped/covered to prevent them from desiccation and rapid temperature changes (any wrapping should be removed prior to backfilling).

iv In the case where plant or wide/tall loads are being used, it must be ensured that all parts of the equipment remain outside of the RPAs, in order that they can operate without coming into contact with any of the on-site or adjacent trees. All works must have appropriate supervision by a banksman, to ensure that adequate clearance from trees is maintained at all times.

v Access facilitation pruning should not be necessary on site but if it does become necessary to maintain a safe clearance. All work must be approved by the project Arboriculturist and carried out by a qualified and competent Arborist working to BS 3998:2010.

vi If damage occurs to part of a tree during the works, the project Arboriculturist must be contacted without delay.

7.6 Soil Compaction and Remediation Measures

i Soil that has been compacted will not provide suitable conditions for the survival and growth of vegetation, whether existing or new, and is a common cause of post-construction tree loss on development sites.

ii Compacted soil will adversely affect drainage, gas exchange, nutrient uptake, and organic content, and will seriously impede or restrict root growth.

iii Soil compaction should be avoided around existing vegetation, including trees, and in areas where new planting or seeding is proposed.

iv Where soil compaction has occurred near to existing trees, remedial works might include sub-soil aeration using compressed air, and the addition of other materials, preferably of a bulky, organic nature (but excluding peat), to improve structure.

v Heavy mechanical cultivation such as ploughing or rotavating should not occur within the RPA.

vi Any cultivation operations should be undertaken carefully by hand to minimize damage to the tree, particularly the roots.

vii Decompaction measures include forking, spiking, soil augering and tilthed radial trenching. Care should be taken during such operations to minimize the risk of further damage of tree roots.

7.7 Contractors Storage, Parking & Access

i Provision should be made for welfare facilities, the site office, contractor parking, storage for materials, plant and spoil, and space for mixing, all outside of the RPAs of retained trees.

ii In this instance, it is considered that there is sufficient space for provision of the above, without placing significant constraints on the working space available for the construction and its associated activities.

7.8 Completion

i At the completion of the construction works, before removal of any of the tree protection measure at the completion of the project, it is recommended that the advice of the project Arboriculturist is sought regarding whether a re-survey of the retained trees is necessary for signs or symptoms of damage and/or stress that the construction may have caused.

ii The protective fencing and ground protection measures should remain in position until its use is considered unnecessary and any risk of damage to the retained trees and/or their respective RPAs e.g. soil compaction from vehicular plant or machinery, has completely passed.

7.9 Tree Planting & After Care

i When planning or implementing any new tree planting scheme, it is recommended that the guidance within BS 8545:2014 'Trees: from nursery to independence in the landscape – Recommendations' is followed.

ii The following points summarise good after care for newly planted trees with an additional consideration to any necessary formative, corrective and maintenance pruning:

iii Water the trees immediately after planting and weekly throughout the first growing season by allowing 10 – 20 litres of water for each tree. This is especially important during prolonged periods of dry weather in which case the frequency of watering may need to be increased.

iv Do not allow weeds or grass to grow within a 500mm radius of the stem.

v Maintain an organic mulch (e.g. composted woodchip or bark) to a minimum depth of 75mm for a radius of 500mm around the base of new trees.

vi At the end of each growing season, check that tree-ties are not damaging the tree stems and loosen if necessary.

vii Ensure that the tree stakes remain firm while the new planting becomes established and only remove when the tree can support itself, usually after a period of 2 -3 years.

viii Carry out formative pruning to the young trees by removing dead, weak, and crossing branches, epicormic growth, and suckers arising from the roots.

7.10 Contacts

i RammSanderson Ltd. 0115 930 2493, info@rammsanderson.com

Appendix A: Tree Schedule

Tree No	Species	Age	Height (m)	Dia (mm)	Crown Spread (m)				Life Exp	Cat	Cond	General Observations	Preliminary Management Recommendations	RPA (m^2)	RPA Radius (m)
					N	E	S	W							
T1	Hawthorn	EM	3	134	1	1	1	2	10+	C1	Poor	Not plotted on topographical plan. Located offsite sandwiched between parallel fence lines. Estimated location. Ivy present from base of stem to top of canopy. Multi stemmed from 0.5 metres. Low vitality throughout. Evidence of minor damage caused by flail. Minor snapped branching throughout.	No works recommended at present.	8	1.6
T2	Silver Birch	SM	4	60	1	1	1	1	10+	C1	Fair	Not plotted on topographical plan. Estimated location. Located offsite, sandwiched between parallel running fence lines. Boundary tree. Twisted stem for first 1 metre then self corrects. Good vitality.	No works recommended at present.	2	0.7
T3	Hawthorn	EM	3	139	1	1	1	1	10+	C1	Poor	Not plotted on topographical plan. Estimated location. Located offsite, sandwiched between parallel running fence lines. Boundary tree. Twisted smaller stem is still attached to main stem, albeit snapped and decaying. Wire fence is tied around tree at 1 metre and cutting into bark. Previous minor pruning points evident. Ivy present from base of stem to top of canopy. Overall low vitality.	Remove if in proximity to developments. Otherwise, leave for habitat as no targets present.	9	1.7
T4	Hawthorn	EM	3	167	1	1	1	1	10+	C1	Poor	Not plotted on topographical plan. Estimated location. Located offsite sandwiched	No works recommended at present.	13	2

Tree No	Species	Age	Height (m)	Dia (mm)	Crown Spread (m)				Life Exp	Cat	Cond	General Observations	Preliminary Management Recommendations	RPA (m^2)	RPA Radius (m)
					N	E	S	W							
												between parallel running fence line. Boundary tree. Minor previous pruning points evident on south side of tree. Low vitality. Frequent snapped and broken decaying stubs on main stem.			
T5	Common Lime	Y	3	81	1	1	1	1	10+	C1	Fair	Not plotted on topographical plan. Estimated location. Located between parallel running boundary fence lines. Multi stemmed for 0.5 metres. One minor snapped stem. Otherwise, good vitality.	No works recommended at present.	3	1
T6	Silver Birch	SM	4	90	1	1	1	1	10+	C1	Fair	Not plotted on topographical plan. Estimated location. Located between parallel running boundary fence lines. Good structure and vitality.	No works recommended at present.	4	1.1
T7	Silver Birch	SM	4	60	1	1	1	1	10+	C1	Fair	Not plotted on topographical plan. Estimated location. Located offsite, sandwiched between parallel running fence lines. Boundary tree. Twisted stem for first 1 metre then self corrects. Good vitality.	No works recommended at present.	2	0.7
T8	Silver Birch	SM	4	156	2	2	2	2	10+	C1	Fair	Not plotted on topographical plan. Estimated location. Located offsite, sandwiched between parallel running fence lines. Boundary tree. Multi stemmed fused at base. Good vitality. Minor pruning points on southern aspect at 1.5 metres.	No works recommended at present.	11	1.9

Tree No	Species	Age	Height (m)	Dia (mm)	Crown Spread (m)				Life Exp	Cat	Cond	General Observations	Preliminary Management Recommendations	RPA (m^2)	RPA Radius (m)
					N	E	S	W							
T9	Hawthorn	M	5	314	2	1	2	2	10+	C1	Poor	Boundary tree. Located just inside red line boundary. Rocks piled up at base of tree. Large pruning cuts at base on northern side of main stem to facilitate the installation of the boundary fence line. Minor pruning cuts throughout lower half of main stem. All lower branches have been removed to 2.5 metres, with frequent remaining broken stubs on all aspects of main stem. Canopy looks to be fair vitality.	No works recommended at present.	45	3.8
T10	Hawthorn	M	4	235	2	2	2	2	10+	C1	Fair	Not plotted on topographical plan. Estimated location. Located offsite. Estimated DBH. Limited VTA due to presence of barbed wire fences and observed from approximately 5 metres distance. Ivy present on main stems to 2 metres. Multi stemmed from base. Fenceline running along northern side against main stems, possibly attached. Minor dead branching throughout. Fair vitality of canopy. Located approximately 5 metres from southwest corner of red line boundary.	No works recommended at present.	25	2.8
T11	Ash	M	9	310	4	4	4	4	10+	C1	Fair	Located on a small, raised mound. Wire fencing included in bark at 0.5 metres on southern aspect of main stem. Minor shallow cavities from previously broken branching on northern aspect at 2 and 2.5 metres.	No works recommended at present.	43	3.7

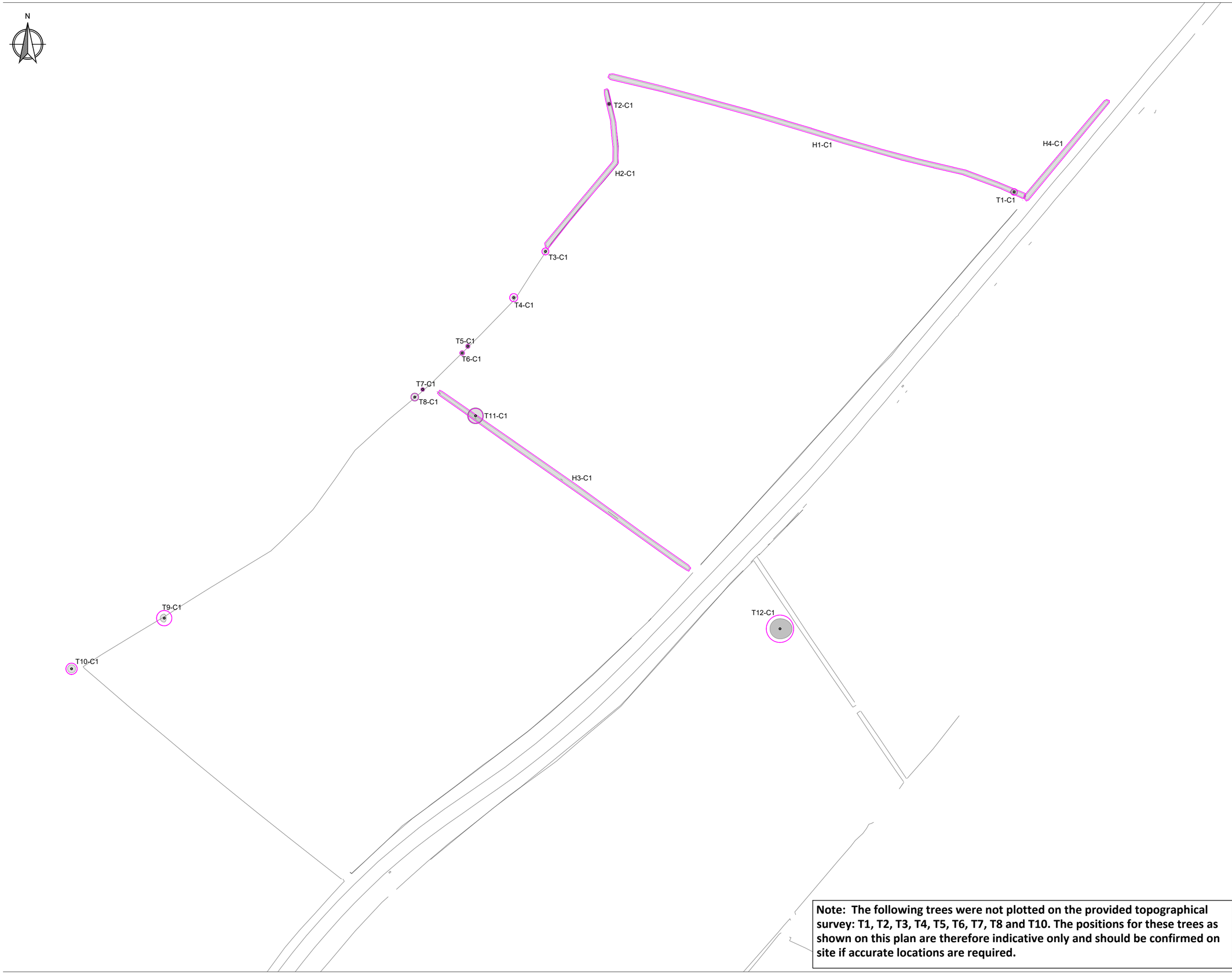
Tree No	Species	Age	Height (m)	Dia (mm)	Crown Spread (m) N	E	S	W	Life Exp	Cat	Cond	General Observations	Preliminary Management Recommendations	RPA (m^2)	RPA Radius (m)
												Snapped hanging branch >25mm within canopy on southern aspect. Minor frequent deadwood throughout canopy. Fair amount of buds present.			
T12	English Oak	M	7	566	5	6	5	5	10+	C1	Fair	Located outside of red line boundary. Tree is however on topographical plan. Multi stemmed from base. Large rocks around base of tree on southern side encapsulated by large roots. Tree is located on very steep bank on southern aspect. Large pruning points >200mm on southern and eastern aspects of main stems with associated decaying heartwood on exposed cut faces. Exposed large stabilising roots on southern/eastern aspect. Large pruning points >25mm on northern aspect of canopy at 3 metres. Small amount of minor dead wood within canopies typical of species. Fair vitality of canopy. No targets present.	Notify owner of condition. Monitor condition/stability.	145	6.8
H1	Gorse	Y	1.5 (Avg. Est.)	40 (Avg. Est.)	/	/	/	/	10+	C1	Poor	Gorse hedgerow. Flailed to 1.5 metres. Consistently dense for the whole length. Good habitat value. located between parallel running fence lines along northern boundary of site. Thicker stems at base. Appears in good health throughout.	No works recommended at present.	/	0.5

Tree Nº	Species	Age	Height (m)	Dia (mm)	Crown Spread (m)				Life Exp	Cat	Cond	General Observations	Preliminary Management Recommendations	RPA (m^2)	RPA Radius (m)
					N	E	S	W							
H2	Hawthorn, Silver Birch, Blackthorn	Y	2 (Avg. Est.)	40 (Avg. Est.)	/	/	/	/	10+	C1	Poor	Located offsite. Sandwiched between parallel running fence lines. Heavily flailed. Inconsistent/gappy. Bramble throughout. Approximately 1.5 metres wide. Minor gorse bushes located within hedgerow.	No works recommended at present.	/	0.5
H3	Hawthorn, Silver Birch, Blackthorn	Y	1.5 (Avg. Est.)	40 (Avg. Est.)	/	/	/	/	10+	C1	Poor	Heavily flailed hedgerow dividing the two field compartments. Minor gaps throughout hedgerow. Thick boles >100mm at ground level to 1 metre and then new growth. Fair structure of main stems throughout.	No works recommended at present.	/	0.5
H4	Hawthorn, Blackthorn, Gorse.	Y	2 (Avg. Est.)	40 (Avg. Est.)	/	/	/	/	10+	C1	Poor	Hedgerow located from northeast corner of site entrance. Previously heavily managed. Located behind fence line. Gorse located throughout. Flailed to 1.5 metres with new growth to 2 metres. Mesh fence encompassed within hedgerow. Mainly hawthorn-blackthorn even mix.	No works recommended at present.	/	0.5

Appendix B: Key to Species Scientific Names

Common Name	Scientific Name
Ash	*Fraxinus excelsior*
Blackthorn	*Prunus spinosa*
Common lime	*Tilia X europaea*
English oak	*Quercus robur*
Gorse	*Ulex europaeus*
Hawthorn	*Crataegus monogyna*
Silver birch	*Betula pendula*

Appendix C: Tree Constraints Plan – RSE_7792_TCP_V1



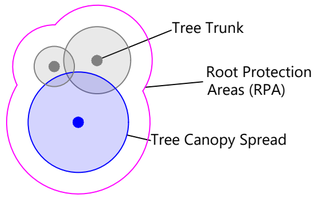
LEGEND:

TX-A — Category A - Trees of High Quality

TX-B — Category B - Trees of Moderate Quality

TX-C — Category C - Trees of Low Quality

TX-U — Category U - Trees Unsuitable for Retention



Note: The following trees were not plotted on the provided topographical survey: T1, T2, T3, T4, T5, T6, T7, T8 and T10. The positions for these trees as shown on this plan are therefore indicative only and should be confirmed on site if accurate locations are required.

RammSanderson ARBORICULTURE

Client :
Renewable Energy Systems Ltd

Project:
Killymallaght BESS, Trench road.

Drawing Title :
Tree Constraints Plan

Drg No.	Rev :
RSE_7792_TCP	V1

Drn By :	Scale :	Date :
LJB	1:1250@A2	19/01/2024

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West Midlands: Chase View Barn, Dunston Business Village, Stafford, ST18 9AB T: 01785 711 575
Yorkshire: The Former Library, 10 Leeds Road, Sheffield, S9 3TY
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Appendix D: Tree Protection Plan - RSE_7792_TPP_V2

N

T1-C1

T2-C1

T3-C1

T4-C1

T5-C1

T6-C1

T7-C1

T8-C1

T9-C1

T10-C1

T11-C1

T12-C1

H1-C1

H2-C1

H3-C1

H4-C1

Tree Protection fencing not deemed necessary along the length of H1-C1 due to the small DBH and species composition of the hedgerow.

Protection fencing to meet existing fence line.

Trees located within this field compartment deemed far enough away from developments that it negates the need for tree protection fencing.

Tree located away from developments. No protection fencing required.

LEGEND:

TX-A — Category A - Trees of High Quality

TX-B — Category B - Trees of Moderate Quality

TX-C — Category C - Trees of Low Quality

TX-U — Trees Proposed for Removal

Tree Trunk

Tree Canopy Spread

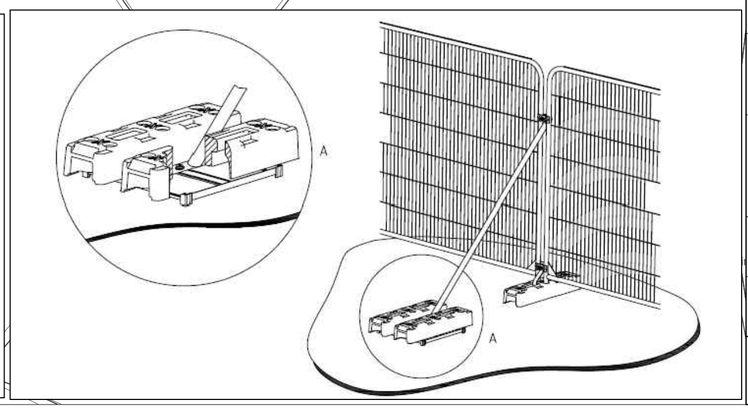
Tree Protection Fencing

Tree Protection Fencing

Tree protection fencing is to be installed at the positions shown at the commencement of works, before any ground works or soil stripping are carried out and before vehicles or materials are brought onto site.

The fencing will consist of a robust scaffold framework which is well braced to resist impacts as shown above. The areas enclosed are to be maintained as a total exclusion zone to all construction activity. All-weather warning notices will be attached to the fencing to clearly identify the area as a tree protection exclusion zone into which access is not permitted.

No working activity, storage of materials, ground level changes, excavations or vehicular access is permitted within the protected area. Once erected, the protected area are to be regarded as sacrosanct and the fencing must not be removed or altered unless recommended by the project Arboriculturist and, where necessary, approval from the local planning authority.



RammSanderson ARBORICULTURE

Client :
Renewable Energy Systems Ltd

Project:
Killymallaght BESS, Trench road.

Drawing Title :
Tree Protection Plan

Drg No.: RSE_7792_TPP
Rev : V2

Drn By : LJB
Scale : 1:1250@A2
Date : 12/06/24

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