

BEANE SOLAR FARM

Arboricultural Impact Assessment

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Beane Solar Farm
AIA
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1 EXECUTIVE SUMMARY

Scope

- 1.1 This Arboricultural Impact Assessment (AIA) has been prepared by RPS on behalf of Renewable Energy Systems Ltd. (RES) ('the Applicant'), to accompany a full planning application submitted to East Hertfordshire District Council (EHDC) for a solar photovoltaic (PV) array, battery energy storage system (BESS), and associated infrastructure and works on land to the west of the A507, Cottered, East Hertfordshire, SG9 0QD ('the site').
- 1.2 All trees within the development site and some immediate peripheral areas were recorded, and information was gathered, to allow them to be considered using guidance contained within BS5837:2012 - *Trees in Relation to Design, Demolition and Construction – Recommendations*.
- 1.3 This assessment identifies any vegetation requiring removal, pruning and how retained trees are to be protected during the implementation of the proposals.

Findings & Recommendations

- 1.4 The principles in BS5837:2012 were used to fully assess the impacts of the proposed works on the trees and other vegetation.
- 1.5 In total: 88 individual trees, 46 tree groups, 2 woodland sections and 39 hedges were surveyed and recorded within the development site and those surveyed peripheral areas.
- 1.6 There are no Tree Preservation Orders (TPO) affecting trees recorded during the survey and the site does not fall within a Conservation Area. There are also no ancient woodlands recorded within or adjacent the site.
- 1.7 In order to accommodate visibility splays for the access point off Cromer Heath Road, it will likely be necessary to remove 13m of hedgerow from the Category C H22.
- 1.8 In order to accommodate visibility splays for the access point off the A507, it will likely be necessary to prune the Category B group G33, albeit if required it will likely not require any greater than 1m additional lateral clearance back from the A507.
- 1.9 There will be extensive planting of trees and hedgerows within the site as part of the landscape strategy for the development. This will more than compensate for the minor losses required to the Category C hedgerow H22.
- 1.10 The site security fencing proposed for the Proposed Development can provide the majority of the tree protection on the site, but it is imperative that it be installed in the location it is shown on the proposed layout **and** prior to the construction phase. This can then be supplemented by Tree Protection Fencing (TPF), as shown on the Tree Protection Plan (see Figures 710-718).

- 1.11 By following guidance set out within this report all retained trees should be protected during the works.

2 INTRODUCTION

- 2.1 The planning application seeks permission for a solar farm with a capacity of 49.9MW and associated infrastructure including inverter units and energy storage facility ('the Proposed Development').
- 2.2 The Proposed Development will provide a reliable source of clean renewable energy that will be supplied to domestic and commercial consumers via the District Network Operator (DNO) network.

Purpose of Assessment

- 2.3 The arboricultural survey was initially undertaken in November 2023 and was later revisited in June 2024. The survey was undertaken in accordance with BS5837:2012, as described within the 'Survey Methodology' attached to this report at Appendix A.
- 2.4 The purpose of the survey was to gather data on the trees present within the Site and to prepare a Tree Constraints Plan (see Figures 700-708) that could be used to assess any potential impacts of the development.
- 2.5 The 'Survey Methodology' guidance at Appendix A explains the process of interpreting the plan and how it is used during the design and assessment process.
- 2.6 This report has been prepared to support and expand upon the data presented on the Tree Constraints Plan (see Figures 700-708), in addition to summarising the quality and condition of the tree stock present in the site.
- 2.7 This report should be read in conjunction with the supplied Tree Constraints Plan (see Figures 700-708) and the Tree Protection Plan (see Figures 710-718), and all other relevant Tables and Appendices as detailed within the table of contents.
- 2.8 During the site tree survey, tree positions were plotted using the Topographical Survey provided by the Applicant. The data was then collated and presented using AutoCAD in the forms of the Tree Constraints Plan (see Figures 700-708) and Tree Protection Plan (see Figures 710-718) attached to this report.
- 2.9 The 2023 survey was undertaken by former RPS Assistant Arboriculturist Ralph Baggs. The second visit in 2024 was undertaken by RPS Associate Director (Arboriculture) Thomas Flood MICFor MArborA. This assessment has also been produced by Thomas Flood.

Limitations

- 2.10 This assessment does **NOT** constitute an in-depth 'Tree Condition Survey' and is for planning purposes only. For an in-depth assessment of tree health and hazards posed by trees, this would require a separate survey specific to that purpose.
- 2.11 The findings of this survey are not valid following adverse or unpredictable weather conditions or for any failure due to 'force majeure' or unpredictable events. Trees were not climbed or inspected

below ground level and inaccessible trees will have best estimates made about the location, physical dimensions and characteristics.

3 SITE INFORMATION

- 3.1 The site has a total area of approximately 79.5 hectares (ha) of land, is an irregular shape, and is composed of two adjacent parcels of land. The site is located within the East Hertfordshire District of Hertfordshire, England.
- 3.2 The site is situated adjacent to the hamlet Cromer, and is located within close proximity to Cottered Village, approximately 0.5km South-East. Further to this, the site lies approximately 4.5km Northeast of Stevenage Town, approximately 5km to the West of Buntingford Market Town, and approximately 8km Southeast of Letchworth Garden City.
- 3.3 The site benefits from three existing points of access, two will be moved slightly and used during construction and operation, the third will only be used during construction.
- 3.4 The topography of the site is generally flat however, the site slopes upwards to either side of the River Beane, more prominently to the Southwest.
- 3.5 The site is defined by existing field boundaries which incorporate primarily drainage ditches and to a lesser extent mature vegetation. The vast majority of the trees and hedgerows recorded are of UK native species, including, but not limited to, blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*) and common oak (*Quercus robur*). A small woodland borders the Southeast edge of the Eastern parcel of the site.

Statutory Designations

- 3.6 A check has been made via the EHC online mapping service (<https://www.eastherts.gov.uk/planning-and-building/trees> - last accessed 02.10.24) in order to ascertain whether any trees recorded during the survey are subject to Tree Preservation Order (TPO) or Conservation Area designations. It has been confirmed that there are no TPO or Conservation Areas affecting the site.
- 3.7 It was also confirmed through a desktop review of the DEFRA Magic Maps service (<https://magic.defra.gov.uk/MagicMap.aspx> - last accessed 02.10.24) that there are no designated ancient woodlands within or adjacent the site.

4 PLANNING POLICY

National Planning Policy

National Planning Policy Framework (NPPF) 2023

- 4.1 The NPPF sets out the Government's planning policies for England and how these should form the framework for locally prepared plans. The NPPF states that:

(180) 'Planning policies and decisions should contribute to and enhance the natural and local environment by...(b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.'

Local Planning Policy

- 4.2 In order for the application to accord with Council planning policy, the following policies (in relation to trees) have been considered during the process of this assessment.

East Herts District Plan (October 2018)

- 4.3 This document covers the period 2011-2033 and sets out the Council's development strategy and planning policies for the long-term development of the district. Following review, the key policies relating to trees are:

Policy DES2 Landscape Character

- 4.4 This policy sets out how 'development proposals must demonstrate how they conserve, enhance or strengthen the character and distinctive features of the district's landscape'.
- 4.5 The section of this policy which refers specifically to trees is under paragraph 17.7.12, which states:

'Trees and hedgerows form an important part of our environment and, in the delivery of sustainable development, the retention and planting of new trees and hedgerows is crucial. Trees contribute to the amenity of the landscape and townscape, add maturity to new developments, make places more attractive and help soften the built environment. They also contribute to storm-water management, provide shading and improve air quality.'

Policy NE3 Species and Habitats

- 4.6 This policy requires that development proposals '...always seek to enhance biodiversity and to create opportunities for wildlife. Proposals must demonstrate how the development improves the biodiversity value of the site and surrounding environment.'

4.7 While being ecology focussed, there is mention of trees in the following section:

III. *'Development which would result in the loss or significant damage to trees, hedgerows or ancient woodland sites will not be permitted. The Council will seek their reinforcement by additional planting of native species where appropriate. Protective buffers of complementary habitat will be expected to adjoin these features, sufficient to protect against root damage and improvement of their long term condition. A minimum buffer zone of 10m (or greater if required) is considered appropriate.'*

Summary

4.8 Much effort has gone into the design of the Proposed Development to limit the impacts on trees and hedgerows within the site and this is evidenced by the sizeable buffers provided around the perimeter, where the vast majority of trees and hedgerows are located. Given impacts have been kept to a minimum as far as trees and hedgerows are concerned, it is considered that the Proposed Development is in general compliance with the aforementioned policies, albeit it will not be feasible to provide a 10m buffer between all new tree and hedgerow planting (see Policy NE3) and the new fence line.

5 RETENTION VALUES

- 5.1 All trees inspected were categorised using BS5837:2012 and the attached Tree Constraints Plan (see Figures 700-708) shows tree positions, numbers and retention categories. Trees were recorded as individuals and as groups.
- 5.2 Trees have been surveyed as groups where they can be considered as forming a group as they form cohesive features either aerodynamically (i.e. they form a discrete group feature providing companion), culturally (i.e. they are composed of trees of a similar size, age and species subject to the same management) or visually (i.e. where the value of the trees within the group is as a whole rather than individually).
- 5.3 Where trees have been surveyed as groups the details recorded with respect to condition and retention value intend to represent an average tree within the group; however, on occasion, it must be noted that there will be exceptions within any group that do not conform to the typical character of that group.
- 5.4 The initial stage of a tree survey in accordance with BS5837:2012 looks at the trees on the site in terms of life expectancy and condition. Trees are then categorised according to their retention value.
- 5.5 **Category A** trees are those that have been assessed as being of a high quality and value; significant amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in Green on the Tree Constraints Plan.
- 5.6 **Category B** trees are those that have been assessed as being of a moderate quality and value; amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in Blue on the Tree Constraints Plan.
- 5.7 **Category C** trees are those that have been assessed as being of a low quality and value; the loss of these specimens should not be considered as a constraint to development. These trees are shown in Grey on the Tree Constraints Plan
- 5.8 **Category U** trees are those that have been assessed as being in poor condition and having no retention value; these trees should not be a material consideration in the planning process. These trees are shown in Red on the Tree Constraints Plan.
- 5.9 A total of 88 individual trees, 46 groups of trees, 2 woodlands and 39 hedgerows were surveyed during the visit.
- 5.10 The distribution of BS5837 retention categories across these differing categories of vegetation are shown in the following tables (see Tables 1 and 2 below).

Species	A	B	C	U	Total
Fraxinus excelsior (Ash)		8	14	3	25
Quercus robur (Common Oak)	10	8			18
Crataegus monogyna (Hawthorn)		6	2	2	10
Acer pseudoplatanus (Sycamore)		3	5		8
Acer campestre (Field Maple)		2	4		6
Prunus spinosa (Blackthorn)	1	3			4
Corylus avellana (Hazel)		3			3
Malus (Apple)		3			3
Prunus (Prunus species)		2			2
Ulmus spp. (Elm species)				2	2
Salix babylonica (Weeping willow)		1	1		2
Ulmus procera (English Elm)				1	1
Ilex aquifolium (Holly)		1			1
Abies procera (Noble Fir)		1			1
Salix caprea (Goat Willow)			1		1
Sambucus nigra (Elder)			1		1
Total	11	41	28	8	88

Table 1: Individual tree retention category and species distribution

Type	A	B	C	U	Total
Groups	6	27	13	0	46
Woodlands	1	1	0	0	2
Hedges	0	23	16	0	39
Grand Total	7	51	29	0	87

Table 2: Group, woodland and hedgerow tree retention category distribution

5.11 It can be seen from Table 1 that the most commonly recorded individual tree species was ash and common oak and that Category B and C trees formed the bulk of the recorded individuals but included 11 Category A items. The groups, woodlands and hedgerows were also dominated by Category B and C, but with 7 Category A items.

Physiological Condition

5.12 Trees considered to be in a good physiological condition are those with crown density and shoot extension growth levels within the expected ranges for their age and species. Generally, these trees, subject to being of a suitable structural condition, can be expected to make a lasting contribution to the site. Additionally, trees within the good condition class are likely to tolerate changes within their growing environment that occur as a result of development; as such their successful retention will be easier to achieve.

5.13 Trees considered to be in a fair physiological condition are those specimens exhibiting lower shoot extension growth and reduced crown density than would typically be expected. These specimens have a lower life expectancy than those within the good condition class and will not tolerate significant changes as a result of development as well as those in the good condition class.

- 5.14 Trees considered to be in a poor physiological condition are those exhibiting crown and shoot dieback and significantly reduced crown density. Trees of a poor physiological condition are not likely to make a lasting contribution to the site and whilst their retention in the short term may be beneficial such retention will only be achievable if the trees are fully protected throughout development as they will not tolerate changes in their growing environment.
- 5.15 There are a number of ash trees present which are displaying symptoms of having contracted *Hymenoscyphus fraxinea* (commonly referred to as Chalara or Ash Dieback). This fungal pathogen is an invasive necrotrophic ascomycete which affects the leaves of ash trees. The pathogen subsequently spreads down to the branches and trunk, causing the production of deadwood and disruption of water transport in the affected tree.
- 5.16 Some management advice for this pathogen, published by the Forest Research can be seen below:
- “There is currently no cure for ash dieback, and no clear method for stopping its spread. Therefore, the aim of management, as outlined in the National Chalara Management Plan, should be to slow the spread, minimise the impact of the disease, and preserve as many chalara-tolerant ash trees as possible. Before making any changes to existing management regimes, owners and managers should carefully consider their objectives and local circumstances. Any woodland or individual tree can bring a variety of benefits and be managed for those multiple benefits.”*

Structural Condition

- 5.17 There were great variations in the structural condition of the trees surveyed within the development site; however, tree condition is largely consistent with expectations for the age, management and species of the tree.
- 5.18 The majority of structural defects that were noted across most of the tree stock on the site, such as minor deadwood in tree crowns, were not considered significant and are unlikely to result in the premature failure of the tree.
- 5.19 The dieback and structural defects found in some of the ash trees surveyed were also consistent with the state of many ash trees nationally. This is largely the result of an epidemic of the fungal pathogen *Hymenoscyphus fraxineus*, commonly known as ‘Ash Dieback,’ see paragraphs 5.15 and 5.16 for more information.

Age Distribution

- 5.20 Trees assessed as being young (Y) in age are those considered to be less than 10 years old. These trees can generally be considered to have the potential for rapid and significant future growth. Whilst these specimens are not likely to make a substantial contribution to the landscape character of the site at present, they will, if retained, provide succession for the eventual removal of mature or over-mature trees as a result of declining physiological or structural condition.
- 5.21 Trees assessed as being semi-mature (SM) are those of more than 10 years old but having attained less than 40% of the maximum lifespan expected for the species. These trees will generally make some contribution to the current landscape character and appearance of the site and their retention

will provide a more immediate succession of mature trees. As with young trees these specimens will have the potential for rapid and significant future growth.

- 5.22 Early mature trees (EM) are those considered to have reached between 40% and 70% of their ultimate life expectancy. These trees are generally not considered to have a significant potential for future growth though they will increase in size at a slower rate than young and semi-mature trees.
- 5.23 Mature trees (M) are those considered to have reached between 70% and 100% of their species life expectancy. These trees will have little future growth potential and they have generally reached their maximum expected size for the location. These trees will generally make the highest contribution to the landscape character of the site at this time; however, a tree stock over dominated by mature trees will require careful management to ensure that a continuation of canopy cover can be achieved.
- 5.24 Over-mature trees (OM) are those considered to have existed for longer than typical of their species. They do not have the potential to increase in size and may in fact reduce in size as their crowns begin to break up. These trees will often make a significant contribution to the landscape character of the site and are likely to have ecological value. However, the retention of these trees within new development must be carefully planned as they are approaching the end of their useful life expectancy and they will often have structural defects. Where over-mature trees are to be retained in new development it is essential that access is available for their eventual removal.
- 5.25 Veteran trees (V) are those that show features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species. These trees have negligible potential to increase in size. Veteran trees are usually of a high ecological value and they will require sensitive management where they are to be retained in new development. As such it is again essential that they are located in areas where access is available to undertake management operations and where there is a reduced risk of harm occurring from failure of the trees.

6 CONSTRUCTION REQUIREMENTS

- 6.1 The planning application seeks permission for a solar farm with a capacity of 49.9MW and associated infrastructure including inverter units and energy storage facility.
- 6.2 A list of the main elements of the Proposed Development which relate to trees is set out below:
- Photovoltaic (PV) Solar Panels erected on steel/aluminium frames set out in south facing arrays;
 - Transformer/ inverter units and energy storage facility co-located within compounds placed throughout the site;
 - Electrical Substation Compound;
 - On-site cabling;
 - Internal Tracks;
 - New site accesses;
 - Associated infrastructure including CCTV and Security Fencing;
 - Temporary construction compounds (x2);
 - Associated Landscaping; and
 - Biodiversity Enhancement.
- 6.3 The site will utilise three access points, one from the A507 and two from Cromer Heath Road.
- 6.4 The visibility splays for the safe use of the entrance points have been assessed and measures provided to prevent vegetation from obstructing them.
- 6.5 The full construction process will need to be monitored during its progress and this AIA should be used as the document provided to guide the construction process.
- 6.6 Reference to this document should form part of any method statement regarding the proposed construction works. This will show an understanding of the issues and actions required to protect the trees.
- 6.7 Areas of machinery exclusion have been shown on the Tree Protection Plan (see Figures 710-718) by way of the creation of a Construction Exclusion Zone (CEZ). This will largely be comprised of the proposed **Site Security Fence** which will be added to with **Heras-style tree protection fencing**.
- 6.8 The following sections detail the below and above ground constraints concerning trees that will be encountered during the development.

7 GENERAL ARBORICULTURAL GUIDANCE

Below Ground Constraints

- 7.1 Tree roots require moisture and nutrients to grow successfully, if these are not available then they will not be able to colonise the area surrounding the main stem. The tree will form a root system and exploit any water and nutrient resources that are available to them.
- 7.2 Roots do not form in hostile environments and the tree will adapt its size and shape if any of these items are in limited supply.
- 7.3 Sealed surfaces and good urban drainage are bad for root and tree growth. The soil becomes desiccated in these situations and available moisture is greatly reduced. This along with the high levels of compaction found associated with hard surfaces restrict rooting.
- 7.4 The majority of roots are found in the upper 600mm of soft surfaces adjacent to the trees and the adoption of sensible and considerate construction techniques should be used to minimise any root damage through the development process.
- 7.5 Alterations to levels within the site are not to be permitted within the root zones of any retained trees as this will invariably result in either root severance (cutting) or suffocation (filling) and this is a common cause for the decline of trees during and post construction.
- 7.6 New hard surfaces have the potential to severely damage roots of nearby trees and should therefore be avoided.
- 7.7 If it is unfeasible to do this, it may be possible to use low impact porous surfaces (e.g. permeable stone surfacing) which remove the need to excavate. As well as removing the need to excavate, these surfaces are permeable so allow free flow of moisture and air to and from the soils.
- 7.8 Where they are likely to be adjacent to the rootable area supervision by a qualified arboriculturist should be considered. The specifications should be a combination of current best practice and relevant British Standards relating to demolition and construction adjacent to trees.
- 7.9 The layout of the solar farm should react to the natural level changes within the site and therefore avoid cutting or filling of soils to change any levels within the site and especially within the RPA of retained trees.

Above Ground Constraints

- 7.10 The above ground constraints that trees provide are largely concerned with their mass (crown and main stem) and these constraints are usually abated by pruning or removal. Pruning is used to allow access and prevent damage to the tree in a site development.
- 7.11 Tree removal is considered when the tree is in a poor condition and would fail in a reasonable time scale or the development could not be achieved with the tree in its current position and its removal

is agreed as part of the planning application. The trees assessed as part of this application will be discussed below and their above ground constraints identified.

- 7.12 There are numerous trees which will be retained as part of this development. The majority of the current layout shows that the vast majority of the development should not impact tree crowns.
- 7.13 In certain instances, there may not be suitable ground clearance to allow for easy installation of tree protection fencing / security fences or clearance of proposed access tracks and therefore there may be a need to prune in order to remedy this issue in a small number of cases.
- 7.14 Where crown pruning works are required, following approval, they would need to be carried out to the specifications contained within BS3998:2010 Tree Work – Recommendations and the guidance below. They should be carried out sensitively and maintain or improve the crowns balance and form for each individual tree.

Tree Access Pruning Specification

- 7.15 All works shall be carried out by suitably qualified and professional contractors who are clear in the understanding of the specification below and their requirements.
- 7.16 All works shall be carried out using suitable handsaws and these saws should be sharp and in a serviceable condition. The use of chainsaws shall only be used with the agreement of the supervising officer (SO).
- 7.17 All risk assessments shall be carried out by the contractor prior to works commencing and they should be fully satisfied to the conditions and any hazards within the working area. Any concerns should be reported to the SO.
- 7.18 The clearance height should be agreed and included in the schedule of works. Works beyond this dimension are not to be part of the works unless it involves additional health and safety works to the tree.
- 7.19 The works are designed to provide access to the working area during the construction period and if the access is to be required beyond this period, then a tree management programme with the provision for cyclical pruning be agreed.
- 7.20 The guidance and main document providing the recommended guidance is BS3998:2010 Tree Work - Recommendations and this should be followed if any doubt exists with the requirements of the work.
- 7.21 The aim of the pruning should be to provide a natural appearance within the crown and should not be to leave an acute side to the crown of the tree. Final pruning cuts should be considered and where possible to natural target pruning points such as branch unions where branch bark ridges can be used to guide the pruning cuts. Where these points are not available the exposed stub should be as small as possible and an assessment of each individual branch taken by the operative before making the cut.
- 7.22 All cuts should be made so that they do not provide future structural issues such as weak forks and loss of structural integrity. In this way, all branch removals will comply with the ideals of 'Natural

Target Pruning' displayed in a diagram below. If there are any concerns regarding the above, then this shall be raised prior to works commencing. Branch reductions should be used to eliminate bark rips and tears; they will not be accepted by the client.

- 7.23 All debris should be removed from site and disposed of in an environmentally sensitive way agreed with the SO.

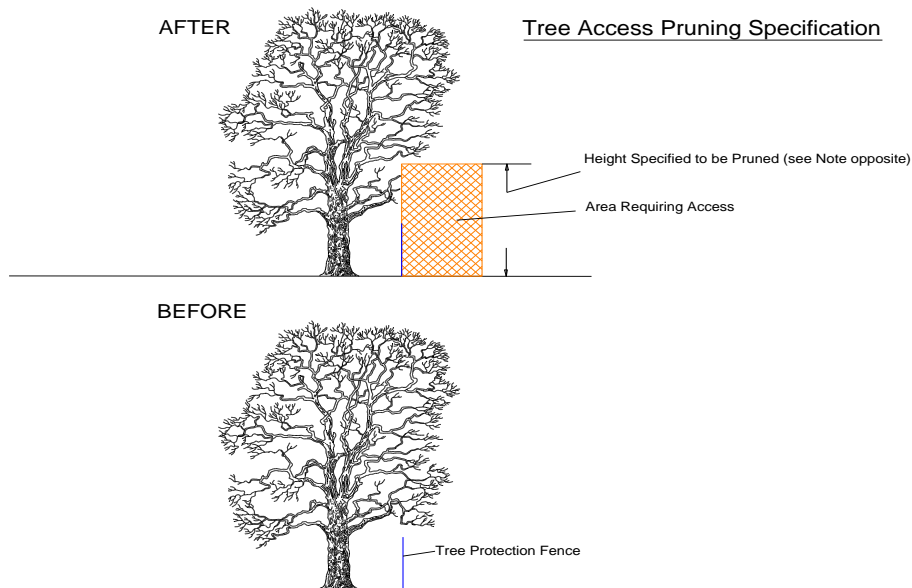


Diagram 1: Showing typical access facilitation pruning

Tree Retention / Removal

- 7.24 The prioritisation for tree retention should be based upon the guidance contained within BS5837: 2012 - Trees in Relation to Design, Demolition and Construction- Recommendations. Category A trees should be seen as the highest priority for retention and Category C the lowest. Category U trees have no retention value and in most circumstances such specimens will not be considered for retention within new development.
- 7.25 When considering the extent of tree retention on site with respect to Category C trees priority should be given to the trees that have been included within this category due to their having stem diameters of less than 150mm at 1.5m above ground level, as these specimens are relatively young trees with future potential.

Working Within or Near the RPA of Retained Trees

- 7.26 Where possible all construction shall be situated outside of retained trees designated RPA as the installation has the potential to cause soil compaction, root damage and to reduce nutrient and moisture availability to tree roots to the detriment of tree health and vitality.

- 7.27 However, where there is an overriding justification for working within the RPA of a retained tree, technical solutions might be available that prevent damage to the tree.
- 7.28 In this respect it can be noted that the use of traditional trenching methods within the RPA could result in extensive root loss and should be avoided.
- 7.29 In order to arrive at a suitable solution site specific advice should be sought from the project arboriculturist and an engineer.
- 7.30 Generally speaking, should new buildings be proposed within the RPA of an existing tree it will be necessary to take steps to minimise the potential impact to the tree to allow construction.
- 7.31 In this respect where it is intended to undertake construction operations within the RPA, precautions should be taken to maintain the condition and health of the root system and in particular to:
- Prevent physical damage to the roots during demolition or construction (such as by soil compaction or severing)
 - Make provision for water and oxygen to reach the roots
 - Allow for the future growth of the root system
 - Preserve the soil structure at a suitable bulk density for root growth and function (in particular for soils of a high fines content)

Service Installation

- 7.32 All service runs, utilities and similar infrastructure should take note of trees and allow for working methods that will minimise damage to trees by referring to documents such as NJUG Volume 4 - Guidelines for the planning, installation and maintenance of utility services in proximity to trees. (National Joint Utilities Group 2007).

New Tree Planting

- 7.33 Where tree planting is proposed, size and position should be considered, along with suitability of the species for the site. New tree planting should be measured and provide greater species diversity where possible to promote resilience and sustainability going forward. Consideration for initial maintenance through establishment should form part of the mitigation specification.
- 7.34 The new guidance provided in BS8545:2014 *Trees: from nursery to independence in the landscape* should also be considered and its recommendations followed.

8 ARBORICULTURAL IMPACT ASSESSMENT (AIA)

Introduction

- 8.1 The construction process will need to be monitored during its progress and this AIA should be used as the document provided to guide the construction process.
- 8.2 Trees have finite energy reserves, developed each year throughout the growing season, which are utilised for biological processes such as growth and defence against pests or diseases throughout the following year.
- 8.3 Any development in proximity to trees has the potential to cause harm to those trees unless control measures are identified and acted upon; as such it is essential to consider the relationship between the proposed development and the retained trees to identify what precautions are necessary, proportionate and appropriate.
- 8.4 Development has the potential to impact upon the above ground and below ground parts of trees.
- 8.5 Whilst some damage that can occur, such as physical damage to the trees stems and branches from machinery movements, is clearly visible the impact from other aspects of work common on development sites which can have a significant effect upon the continued health of trees are not always immediately evident.
- 8.6 Damage that is not immediately evident, but which can cause long term harm to retained trees includes things such as damage to the soil structure by compaction causing root damage and levels changes altering the water table and affecting moisture availability.
- 8.7 To minimise the potential for harm to occur to retained trees all works should be carried out with regard to the Tree Protection Measures detailed within this report.
- 8.8 In general, it can be seen that, by adopting appropriate methods of working, precautionary and protective measures, significant harm to retained trees can be avoided.
- 8.9 In particular the establishment of a **Construction Exclusion Zone (CEZ)** by erecting the 'Site Security Fencing', supplemented by Tree Protection Fencing (Heras-style), will minimise the potential for harm to occur to retained trees. These protective fencing areas can be seen on the Tree Protection Plan (drawings JSL5038_710-718).

Tree Removal

- 8.10 An assessment has been undertaken as to the whether removal of trees and/or any other significant vegetation may be required to facilitate the Proposed Development.
- 8.11 The Proposed Development in general is unlikely to require any significant removal of trees, albeit a short section of hedgerow on the Eastern edge of the site will need to be removed to facilitate the Northward visibility splay clearance from the proposed access point. This relates to the Category

C hedgerow section H22 which would likely require approximately 13m removed from its Southern end.

- 8.12 The above limited hedgerow removal can be seen in a solid red hatch on the Tree Protection Plan (see Figures 710-718).

Root Protection Areas (RPA)

- 8.13 Root Protection Areas (RPA) for each tree surveyed have been determined in accordance with BS5837:2012 Section 4.6 Root Protection Area.
- 8.14 Initial RPA for the trees were plotted onto the Tree Constraints Plan (see Figures 700-708) and has been used to produce all relevant tree plans in this statement. Areas where trees are located on site have been identified and the RPA information of these trees has been used in the design of the tree protection.

Main Site

- 8.15 The development has taken consideration of trees and offsets have been made to all RPAs. As mentioned previously in Section 6, there is a security fence proposed around the majority of the Proposed Development and it is recommended that this be installed as a preliminary measure prior to major works. This can perform the function of the majority of the CEZ within the main body of the site and therefore reduce the requirement for supplementary Tree Protection Fencing (TPF).
- 8.16 The Tree Protection Plan (see Figures 710-718) shows the security fencing and the required supplementary Heras style fencing locations.
- 8.17 If for any reason the security fence can't be installed prior to significant construction works, then this must be exchanged out for Heras style fencing in the positions shown for the security fencing until such a point that the security fence replaces it.
- 8.18 Due to the CEZ combined with the sizeable buffers provided between the Proposed Development and the vast majority of existing trees and hedgerows, there is not anticipated to be any impacts on the RPAs of any existing trees.
- 8.19 Two trees existing within the interior areas of the site will require supplementary TPF in order to protect them from construction activities and this relates to Category A T58 and Category B T52. The locations for TPF can be seen on the Tree Protection Plan (see drawing JSL5038_712).

Existing Canopy Spreads

- 8.20 A preliminary assessment has been carried out regarding the requirement to prune any retained trees on site. This has been done by cross referencing potential conflict between tree canopies and site works shown on the Tree Protection Plan (see Figures 710-718) with the recorded canopy heights for the trees.
- 8.21 The visibility splay for the access point off the A507 is largely clear except potentially where the Category B group G33 is growing adjacent the culvert to the North of the access. The group G33,

which comprises hawthorn and blackthorn, may therefore require pruning back from the road edge if obstructing the required splays. If required at all, it will only likely be necessary to need an additional 1m lateral crown clearance where adjacent the splay, as shown on the Tree Protection Plan (see drawing JSL5038_716).

- 8.22 As previously referred to, the site security fencing proposed around the field boundaries can act as the primary tree protection fencing around the majority of the hedgerows and trees and its installation must form one of the first phases of the development works. The security fence will be supplemented by TPF (where there is no security fencing) in order to create a CEZ as shown on the Tree Protection Plan (see Figures 710-718).
- 8.23 All pruning requirements should be checked prior to the implementation of the development to ensure that there remains suitable clearance from the erection of the site security (primary protective) fencing, the Heras-style fencing shown in the Tree Protection Plan and the proposed construction works.

Level Changes

- 8.24 Trees can be profoundly impacted by changes to ground levels within their RPA, both cutting and filling, and this is a factor that has been considered in this assessment and would be mitigated for through the retention of existing ground levels within this new proposed use of the land.
- 8.25 Therefore, it is a requirement that no earthworks be undertaken within the CEZ as indicated on the Tree Protection Plan (see Figures 710-718). It is considered that this should be feasible given the nature of the development and the positioning of the majority of trees to the boundaries of the fields. However, should this become unfeasible then it would require further assessment by the Arboricultural Consultant.

Connections

- 8.26 Given the location of the majority trees to the boundaries of the fields, there should be no cause to excavate trenches for any infrastructure within the RPA of retained trees. However, if this is deemed to be necessary for any reason then this must be assessed further for potential impacts to tree roots.
- 8.27 If it is unfeasible to avoid an RPA, this must be first assessed for impact by the Arboricultural Consultant and following this, if deemed tolerable by the tree, should allow for working methods that will minimise damage to trees. For example, reference to documents such as NJUG Volume 4 - Guidelines for the planning, installation and maintenance of drainage in proximity to trees (National Joint Utilities Group 2007).

Planning of Site Operations

- 8.28 Planning of site operations will take sufficient account of trees to ensure that no access and movement of material into and around the site impact on trees. Physical damage can result if this is not considered.

- 8.29 Consequently, any movement of plant or materials in proximity to trees will be conducted under the supervision of a banksman, to ensure that adequate clearance from trees is always maintained.
- 8.30 All materials or fluids will not be stored within or near the RPA of retained trees, particularly those whose accidental spillage would cause contamination and damage to a tree. Fluids must be handled well away from the outer edge of the RPA of trees.
- 8.31 Correct planning of access routes and storage areas prior to start on site will ensure no impacts from these activities will occur. It is considered that there should be ample space away from trees for purposes of storage.

9 PRE-DEVELOPMENT WORKS

Tree Removal

9.1 The following removals have been identified as likely being required and can be seen on the Tree Protection Plan (see drawing JSL5038_714).

- Approximately 13m from the Category C hedgerow H22

Tree Pruning

9.2 It is considered likely that Category B group G33 may require light crown pruning in order to ensure clearance of visibility splays for the proposed entrance off the A507. This is likely to require no greater than 1m additional lateral clearance.

9.3 The requirements of site-wide tree pruning works should be reassessed prior to the development being put into motion and in the event that any further tree works are required, these can follow the following guidance.

Standard of Work

9.4 Any tree works should be carried out in accordance with BS3998:2010 Tree Work - Recommendations and latest arboricultural best practice.

9.5 All tree work should be carried out by suitably qualified, competent and insured arboricultural contractors.

9.6 All green and woody waste generated by the tree works shall be removed from site and disposed of in an environmentally sustainable manner.

9.7 Burning of any green waste is not an acceptable form of waste disposal and is not permitted within the site.

Timing of Works

9.8 All tree works shall be completed prior to commencement of any construction works on the site.

9.9 All works shall be timed to have regard to the phenological cycles of protected species that are associated with trees; notably birds and bats.

9.10 Ideally tree pruning works should not be undertaken during the springtime period, when the 'sap is rising' to enable the leaves to flush (come out) and photosynthesis to begin, and during the autumn, when the tree is drawing nutrients back into itself from the leaves as they go brown. Outside these periods most trees can be pruned at any time of the year.

Tree Protection Barriers

- 9.11 As previously stated within this report, the site security fencing proposed for the solar development can provide the majority of the tree protection on the site, but it is imperative that it be installed in the location it is shown on the layout and prior to any construction / site preparation works on site.
- 9.12 The site security fencing will comprise a typical deer fence construction of 2.4m height of high tensile steel wire secured onto posts. This can be seen in Diagram 2 below:

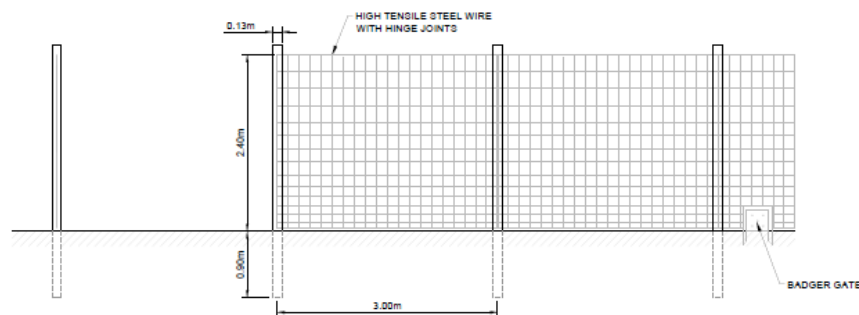


Diagram 2: Site security fence (typical deer fence design) will act as CEZ for majority of the development

- 9.13 All supplementary tree protection fencing (Heras-style) should be erected to the position shown on the Tree Protection Plan (see Figures 710-718) during the pre-development periods also.
- 9.14 To ensure successful tree protection during this process, all operatives should be briefed on the need to pay full regard to existing trees and all operations adjacent to trees should be properly supervised. This will ensure the works will not adversely affect the trees.
- 9.15 Once the protective barriers are in place they must remain in situ throughout the course of the development until the completion of all works associated with that section of the site.
- 9.16 Copies of the Tree Protection Plan (see Figures 710-718) shall be placed in the site office for reference by all site staff.
- 9.17 The protective fencing barrier is to be constructed in accordance with the specification detailed at Appendix C.
- 9.18 Signs detailing the purpose of the protective fencing shall be attached to the fencing at 10m intervals. Such signs should be weatherproof and shall be substantially in the form of the specimen provided at Appendix D. Signs must be replaced as necessary should they be removed or become illegible.
- 9.19 Following erection of the protective fencing and prior to commencement of the development it is recommended that an inspection of the site by the Arboricultural Consultant is arranged to confirm fencing has been installed in accordance with the Tree Protection Plan and any relevant conditions that may be attached to a grant of planning consent for the development.

Construction Exclusion Zone (CEZ)

- 9.20 The CEZ, as defined by the security fence or TPF lines, shall be regarded as sacrosanct, and the protective fencing shall not be moved or taken down at any time.
- 9.21 Within the CEZ there must be no mechanical digging or scraping, no alteration to existing ground levels including soil stripping, no earthworks, no handling or discharge of any chemical substance, concrete washings or of any fuels.
- 9.22 Furthermore, vehicular or pedestrian access and the storage of any materials is prohibited within the CEZ.
- 9.23 Additionally, no materials that may contaminate the soil such as concrete mixings, diesel oil and vehicle washings shall be discharged within 10m of the stem of any tree and no fires shall be lit within 10m of the maximum extent of a trees crown.

10 CONSTRUCTION WORKS

Site Compounds and Materials Stores

- 10.1 Activities related to the establishment of a temporary site compound have the potential to impact upon retained trees by various means. In particular the storage and mixing of chemicals and materials such as concrete can have a damaging effect on tree health if precautions are not taken.
- 10.2 The offices, parking of site and contractor vehicles, along with secure storage will be provided in an area away from retained trees and this area will be directly controlled by the Site Manager who will seek advice from the site Landscape Manager before allocating the area for these purposes.

Monitoring

- 10.3 Following erection of the protective fencing and prior to commencement of the construction phase, an inspection of the site by either the Council's Tree Officer or the Arboricultural Consultant should be arranged to confirm fencing has been installed in accordance with the Tree Protection Plan (see Figures 710-718).
- 10.4 It is also recommended that further monitoring visits be carried out following commencement of the works on site, ideally on at least a monthly basis to ensure ongoing functionality of the CEZ and to check on tree condition.

Reporting

- 10.5 During the construction phase of the development, the Site Manager will be responsible for liaising with the Council Tree Officer on all arboricultural issues. Should any arboricultural issues become apparent during the works the site manager should immediately contact the appointed Arboricultural Consultant or the Council's Tree Officer for advice upon how to proceed.

11 CONCLUSION

- 11.1 The principles in BS5837:2012 were used to fully assess the impacts of the proposed works on the trees and other vegetation. By following guidance set out within this report all retained trees should be protected during the works.
- 11.2 In total: 88 individual trees, 46 tree groups, 2 woodland sections and 39 hedges were surveyed and recorded within the development site.
- 11.3 There are no Tree Preservation Orders (TPO) affecting trees recorded during the survey and the site does not fall within a Conservation Area. There are also no ancient woodlands recorded within or adjacent the site.
- 11.4 In order to accommodate visibility splays for the access point off Cromer Heath Road, it will likely be necessary to remove 13m of hedgerow from the Category C H22.
- 11.5 In order to accommodate visibility splays for the access point off the A507, it will likely be necessary to prune the Category B group G33, albeit if required it will likely not require any greater than 1m additional lateral clearance back from the A507.
- 11.6 There will be extensive planting of hedgerows and trees within the site as part of the landscape strategy, which will more than compensate the minor losses required to implement the development proposals.
- 11.7 The site security fencing proposed for the Proposed Development can provide the majority of the tree protection on the site, but it is imperative that it be installed in the location it is shown on the proposed layout *and* prior to the construction phase. This can then be supplemented by Tree Protection Fencing (TPF) to address any gaps.
- 11.8 The use of security fencing and supplementary TPF as a CEZ will ensure that the retained trees located around the site are protected during the works. All protective measures can be seen on the Tree Protection Plan (see Figures 710-718).
- 11.9 Guidelines contained within BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations should be followed when dealing with trees. Working methods and specifications should be followed to limit potential damage to trees throughout the works proposed.
- 11.10 If any arboricultural issues relating from works being carried out occurs, then they should be reported to the main contractor immediately.
- 11.11 It is considered that, provided the mitigation within this report is adhered to, there should be no significant impacts on the trees to be retained.

Tables

TABLE 3: TREE SURVEY SCHEDULE

Key to Inspection Report Form

Species	Genus and variety
Height	Measured Clinometer Reading or Estimated Height in Metres
Girth (dbh @ 1.5m)	Diameter measured in cms, or estimated, where multi stemmed below 1.5m the diameter is taken as that just above the root flare
Spread (m)	Canopy height estimated in metres above ground level
Canopy height (m)	Crown Spread, radius estimated in metres
Physiological Condition	Good, Fair, Poor, Dead
Age Class	Y – Young MA – Maturing (Middle Aged) M – Mature OM - Over mature V – Veteran
Useful Life Expectancy (years)	10, 10-20, 20-40, 40+
BS Categorization	See Cascade Appendices 2

TREE SURVEY SCHEDULE

Site: Beane Solar Farm
 Project Schedule Ref: JSL5038_750
 Drawing Reference: Figures 700-708
 Survey date: 13-14 November 2023 and 3 June 2024

Surveyor: Ralph Baggs (2023) & Thomas Flood (2024)
 Status: For Planning
 Revision: -
 Notes: -



Ref. no	Species	Height (m)	Canopy Spread (m)				Crown Area	Stem dia. (mm)	Stem no. at 1.5m	Height of crown clearance (m)	FSB Height (Direction)	Age class	Condition	General Observations Management Recommendations	Estimated remaining contribution (yrs)	Tree Quality Category (BS5837)
			N	E	S	W										
T1	Acer pseudoplatanus (Sycamore)	9	5	5	5	5	79	250 300	2	0	-	EM	Fair	Multiple stems at ground level.	20+	B2
T2	Acer pseudoplatanus (Sycamore)	10	2	1	2	1	7	300	1	1	-	EM	Poor/Fair	Multi stemmed form, subject to utility pruning.	10+	C2
#T3	Salix babylonica	10	10	6	0	6	75	500	1	1	-	M	Fair	Estimated values due to access, suppressed, leaning north.	20+	B1
T4	Quercus robur (Common Oak)	10	0	5	5	5	39	900	1	4	-	M	Poor	Declining, veteran qualities.	20+	B3
T5	Quercus robur (Common Oak)	10	0	5	5	5	39	500	1	1	-	M	Good	Suppressed.	20+	B2
T6	Quercus robur (Common Oak)	17	5	7	9	7	151	1250	1	1	-	M	Good	Fine tree, veteran qualities.	40+	A1
T7	Quercus robur (Common Oak)	17	5	7	9	7	151	1050	1	1	-	M	Good	Fine tree, helical cavity up main stem.	40+	A1
T8	Salix caprea (Goat Willow)	7	3	3	3	3	28	300	1	1	-	EM	Fair	Leaning east.	10+	C2
T9	Sambucus nigra (Elder)	5	3	3	3	3	28	150	1	1	-	M	Poor	Declining, multi stemmed form.	10+	C2
T10	Prunus spinosa (Blackthorn)	4	2	2	2	2	13	75	1	1	-	M	Fair	Unremarkable tree.	20+	B2
T11	Fraxinus excelsior (Ash)	5	1	1	1	1	3	75	1	1	-	Y	Poor	Declining, deer damage.	<10	U

Note: This survey is based on a brief visual inspection from the ground.
 It is not intended as a full arboricultural inspection.

- indicates estimated/offsite tree. * - indicates off site tree. FSB - First Significant Branch.

Ref. no	Species	Height (m)	N	E	S	W	Crown Area	Stem dia. (mm)	Stem no. at 1.5m	crown clearance (m)	FSB Height (Direction)	Age class	Condition	General Observations Management Recommendations	remaining contribution (yrs)	Quality Category (BS5837)
T12	Crataegus monogyna (Hawthorn)	4	2	2	2	2	13	100	1	1	-	M	Fair		20+	B3
T13	Crataegus monogyna (Hawthorn)	4	2	2	2	2	13	100	1	1	-	M	Fair		20+	B3
T14	Crataegus monogyna (Hawthorn)	4	2	2	2	2	13	100	1	1	-	M	Fair		20+	B3
T15	Crataegus monogyna (Hawthorn)	4	1	1	1	1	3	100	1	1	-	M	Fair	Dead.	<10	U
T16	Crataegus monogyna (Hawthorn)	4	1	1	1	1	3	100	1	1	-	M	Fair	Dead.	<10	U
T17	Quercus robur (Common Oak)	12	7	7	7	7	154	700	1	2	-	M	Good	Stem divides below 1.5m.	40+	A2
T18	Quercus robur (Common Oak)	9	6	6	6	6	113	450 300	2	2	-	EM	Good		40+	A2
T19	Quercus robur (Common Oak)	8	5	5	5	5	79	400	1	4	-	EM	Good	Restricted inspection due to vegetation.	20+	B2
T20	Quercus robur (Common Oak)	8	4	4	4	4	50	250 200	2	4	-	SM	Good		20+	B2
T21	Fraxinus excelsior (Ash)	10	4	4	4	4	50	500	1	3	-	EM	Poor	Declining, cavity on stem, broken branches in crown.	10+	C3
T22	Fraxinus excelsior (Ash)	7	4	4	4	4	50	500	1	3	-	EM	Poor	Declining, cavity on stem, broken branches in crown.	10+	C3
T23	Fraxinus excelsior (Ash)	9	4	4	4	4	50	350	1	3	-	SM	Fair	Low vitality, restricted inspection due to vegetation, broken branches in crown.	20+	B3
T24	Fraxinus excelsior (Ash)	6	3	3	3	3	28	150	1	3	-	SM	Fair	Multi stemmed form.	10+	C3

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Ref. no	Species	Height (m)	N	E	S	W	Crown Area	Stem dia. (mm)	Stem no. at 1.5m	crown clearance (m)	FSB Height (Direction)	Age class	Condition	General Observations Management Recommendations	remaining contribution (yrs)	Quality Category (BS5837)
T25	Quercus robur (Common Oak)	14	8	8	8	8	201	600	1	2	-	M	Good	Fine tree.	40+	A2
T26	Prunus spinosa (Blackthorn)	4	2	2	2	2	13	150	1	1	-	M	Good		20+	B3
T27	Crataegus monogyna (Hawthorn)	5	3	3	3	3	28	200	1	1	-	M	Fair		20+	B3
T28	Quercus robur (Common Oak)	13	8	8	8	8	201	650	1	2	-	M	Good	Fine tree.	40+	A2
T29	Prunus spinosa (Blackthorn)	5	2	2	2	2	13	100	1	1	-	M	Poor		20+	B3
T30	Crataegus monogyna (Hawthorn)	4	2	2	2	2	13	100	1	1	-	M	Fair		20+	B3
T31	Acer campestre (Field Maple)	5	3	3	3	3	28	100	1	0	-	EM	Poor	Located adjacent to road.	10+	C2
T32	Fraxinus excelsior (Ash)	5	2	2	2	2	13	75	2	2	-	SM	Fair		10+	C2
T33	Acer campestre (Field Maple)	5	2	2	2	2	13	100	1	1	-	SM	Fair	Restricted inspection due to vegetation.	10+	C2
T34	Quercus robur (Common Oak)	9	5	3	3	5	50	350	1	1	-	EM	Fair		20+	B2
T35	Fraxinus excelsior (Ash)	12	6	6	6	6	113	350	1	2	-	EM	Fair	Restricted inspection due to vegetation, multi stemmed form.	20+	B2
T36	Quercus robur (Common Oak)	10	6	6	6	6	113	450 400	2	2	-	EM	Good	Restricted inspection due to vegetation.	40+	A2
T37	Quercus robur (Common Oak)	10	8	8	8	8	201	300 350	2	2	-	EM	Fair	Multi stemmed form.	20+	B2

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Ref. no	Species	Height (m)	N	E	S	W	Crown Area	Stem dia. (mm)	Stem no. at 1.5m	crown clearance (m)	FSB Height (Direction)	Age class	Condition	General Observations Management Recommendations	remaining contribution (yrs)	Quality Category (BS5837)
T38	Fraxinus excelsior (Ash)	9	5	5	5	5	79	350	1	3	-	EM	Poor/Fair	Restricted inspection due to vegetation, located adjacent to road, ivy on tree, minor deadwood in the crown.	10+	C2
T39	Fraxinus excelsior (Ash)	7	5	5	5	5	79	300	1	4	-	SM	Poor	Declining, restricted inspection due to vegetation, located adjacent to road.	<10	U
T40	Quercus robur (Common Oak)	10	7	7	7	7	154	350	1	4	-	SM	Good	Located adjacent to road.	40+	A2
*T41	Abies procera (Noble Fir)	11	4	4	4	4	50	300	1	3	-	SM	Good	Restricted inspection due to vegetation.	20+	B1
*T42	Prunus (Prunus species)	6	6	6	6	6	113	250 300	2	2	-	M	Fair	Restricted inspection due to ivy, minor deadwood in the crown.	20+	B1
#T43	Prunus (Prunus species)	5	3	3	3	3	28	200	2	1	-	EM	Fair	Estimated values due to access, located adjacent to road.	20+	B2
T44	Acer pseudoplatanus (Sycamore)	5	2	2	2	2	13	350	1	0	-	SM	Poor	Stump with epicormic regrowth.	10+	C3
T45	Ulmus procera (English Elm)	5	2	2	2	2	13	75	1	1	-	SM	Poor	Declining.	<10	U
T46	Fraxinus excelsior (Ash)	6	4	4	4	4	50	200	1	1	-	SM	Fair	Located adjacent to road.	20+	B2
T47	Acer campestre (Field Maple)	6	5	5	5	5	79	150 200	2	1	-	EM	Fair	Located adjacent to road, moderate deadwood in the crown.	20+	B2
T48	Acer campestre (Field Maple)	9	5	5	5	5	79	150 200	2	1	-	EM	Fair	Located adjacent to road, moderate deadwood in the crown.	20+	B2
T49	Corylus avellana (Hazel)	6	3	3	3	3	28	100	2	1	-	EM	Good	Located adjacent to road, coppice.	20+	B3
T50	Fraxinus excelsior (Ash)	7	4	4	4	4	50	100	1	3	-	SM	Fair	Located adjacent to road.	10+	C2

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Ref. no	Species	Height (m)	N	E	S	W	Crown Area	Stem dia. (mm)	Stem no. at 1.5m	crown clearance (m)	FSB Height (Direction)	Age class	Condition	General Observations Management Recommendations	remaining contribution (yrs)	Quality Category (BS5837)
T51	Corylus avellana (Hazel)	5	3	3	3	3	28	100	1	1	-	M	Good	Located adjacent to road.	20+	B3
T52	Ilex aquifolium (Holly)	7	3	3	3	3	28	150	1	0	-	EM	Good		20+	B3
#T53	Acer pseudoplatanus (Sycamore)	10	3	3	3	3	28	250	1	3	-	SM	Fair	Estimated values due to access, located adjacent to road.	20+	B2
#T54	Fraxinus excelsior (Ash)	7	4	4	4	4	50	150	1	3	-	SM	Poor	Low vitality, declining, located adjacent to road.	10+	C2
#T55	Salix babylonica	5	3	3	3	3	28	100	1	2	-	SM	Fair	Restricted inspection due to vegetation.	10+	C2
#T56	Fraxinus excelsior (Ash)	5	3	3	3	3	28	100	1	2	-	SM	Fair	Restricted inspection due to vegetation.	10+	C2
#T57	Malus (Apple)	5	3	3	3	3	28	150	1	3	-	EM	Fair	Restricted inspection due to vegetation.	20+	B3
#T58	Malus (Apple)	5	3	3	3	3	28	150	1	3	-	EM	Fair	Restricted inspection due to vegetation.	20+	B3
#T59	Malus (Apple)	5	3	3	3	3	28	150	1	3	-	EM	Fair	Restricted inspection due to vegetation.	20+	B3
#T60	Acer campestre (Field Maple)	6	3	3	3	3	28	150	1	2	-	SM	Fair	Restricted inspection due to vegetation.	10+	C2
#T61	Acer campestre (Field Maple)	6	3	3	3	3	28	150	1	2	-	SM	Fair	Restricted inspection due to vegetation.	10+	C2
T62	Fraxinus excelsior (Ash)	11	4	4	4	4	50	450	1	4	-	M	Fair	Located adjacent to road.	20+	B2
T63	Quercus robur (Common Oak)	10	4	4	4	4	50	500 500	2	2	-	M	Good	Multiple stems below 1.5m, minor deadwood in the crown.	40+	A1

Note: This survey is based on a brief visual inspection from the ground.
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- indicates estimated/offsite tree. * - indicates off site tree. FSB - First Significant Branch.

Ref. no	Species	Height (m)	N	E	S	W	Crown Area	Stem dia. (mm)	Stem no. at 1.5m	crown clearance (m)	FSB Height (Direction)	Age class	Condition	General Observations Management Recommendations	remaining contribution (yrs)	Quality Category (BS5837)
T64	Crataegus monogyna (Hawthorn)	5	2	2	2	2	13	100 100	2	1	-	EM	Fair	Located adjacent to road.	10+	C2
T65	Fraxinus excelsior (Ash)	6	1	3	3	4	22	300	1	2	-	EM	Poor	Dieback in crown, moderate deadwood in the crown.	10+	C2
T66	Fraxinus excelsior (Ash)	7	3	5	3	4	44	250 250 300	3	2	-	EM	Poor	Cavity on stem, dieback in crown, minor deadwood in the crown.	10+	C2
T67	Prunus spinosa (Blackthorn)	4	3	3	3	3	28	150	4	1	-	OM	Fair	Cavity on stem, minor deadwood in the crown, veteran qualities.	40+	A1
T68	Crataegus monogyna (Hawthorn)	5	3	4	3	3	33	150	4	1	-	M	Fair	Cavity on stem, minor deadwood in the crown, veteran qualities.	20+	B1
T69	Fraxinus excelsior (Ash)	10	4	4	4	1	31	250 150	2	2	-	EM	Poor	Declining, minor deadwood in the crown, symptomatic of chalara.	10+	C2
T70	Quercus robur (Common Oak)	10	5	1	4	4	38	250 200	2	2	-	EM	Good	Located adjacent to road, epicormic growth in crown.	20+	B2
T71	Corylus avellana (Hazel)	3	2	2	2	2	13	75	1	0	-	SM	Good	Located adjacent to road, coppice hazel.	20+	B2
*T72	Fraxinus excelsior (Ash)	10	4	4	4	3	44	250 250 300	3	2	-	EM	Fair	Restricted inspection due to vegetation, located adjacent to road.	20+	B2
T73	Fraxinus excelsior (Ash)	7	4	4	4	4	50	200	3	1	-	EM	Fair	Low vitality, stem divides below 1.5m.	20+	B2
T74	Fraxinus excelsior (Ash)	11	5	5	5	5	79	300 250 200 200 250	5	1	-	EM	Fair	Stem divides below 1.5m, dieback in crown.	20+	B2
T75	Fraxinus excelsior (Ash)	11	5	5	5	5	79	600	1	2	-	M	Poor	Declining, restricted inspection due to vegetation, restricted inspection due to ivy, dieback in crown, previous branch failures, large failed limb, grown on bank.	10+	C2

Note: This survey is based on a brief visual inspection from the ground.
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Ref. no	Species	Height (m)	N	E	S	W	Crown Area	Stem dia. (mm)	Stem no. at 1.5m	crown clearance (m)	FSB Height (Direction)	Age class	Condition	General Observations Management Recommendations	remaining contribution (yrs)	Quality Category (BS5837)
T76	Fraxinus excelsior (Ash)	10	6	6	6	6	113	500	1	1	-	M	Poor	Declining, fungal brackets visible on stem, dieback in crown.	<10	U
T77	Fraxinus excelsior (Ash)	5	2	2	2	2	13	75	1	0	-	Y	Fair	Self seeded.	10+	C2
T78	Fraxinus excelsior (Ash)	12	9	6	9	9	212	600	1	3	-	M	Poor	Low vitality, declining, located adjacent to road, minor deadwood in the crown, epicormic growth in crown.	10+	C1
T79	Acer pseudoplatanus (Sycamore)	10	2	2	2	2	13	250 200	2	2	-	SM	Fair	Multiple stems at ground level.	10+	C2
#T80	Fraxinus excelsior (Ash)	10	4	4	4	4	50	350	1	2	-	EM	Fair	Restricted inspection due to vegetation.	20+	B2
#T81	Quercus robur (Common Oak)	13	9	9	9	9	254	950	1	3	-	M	Good	Restricted inspection due to vegetation, located adjacent to road.	40+	A1
#T82	Quercus robur (Common Oak)	7	5	5	5	5	79	500	1	2	-	M	Good	Restricted inspection due to vegetation, located adjacent to road, suppressed.	20+	B2

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Figures

FIGURES 700-708: TREE CONSTRAINTS PLAN

FIGURES 710-718: TREE PROTECTION PLAN

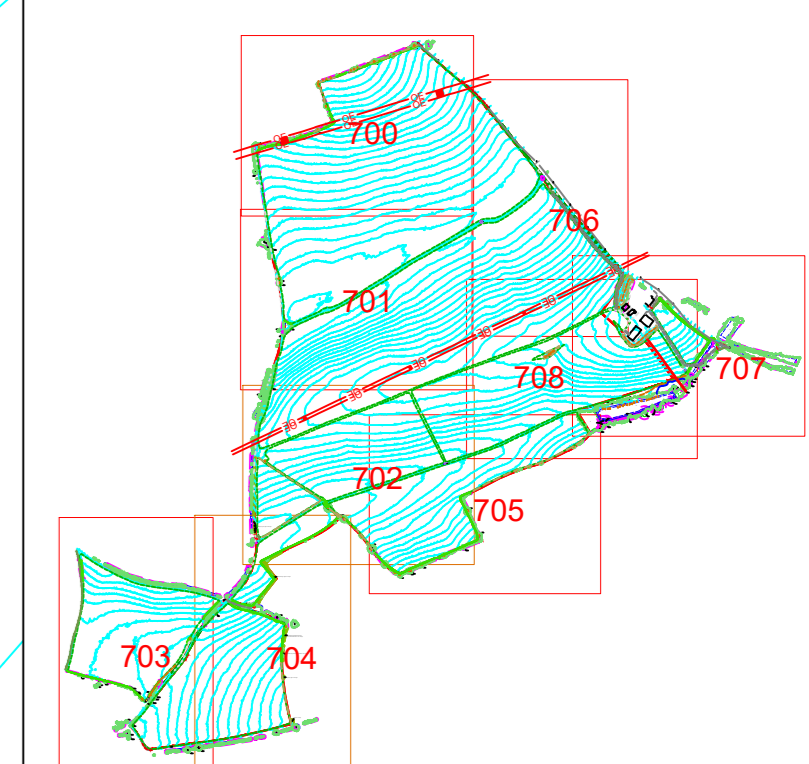
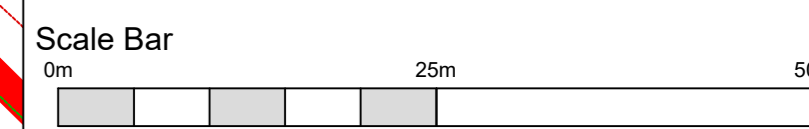
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Rev	Description	By	CB	Date
A	Added scrub to field margins where relevant to planting proposals.	TF	JB	05.06.24

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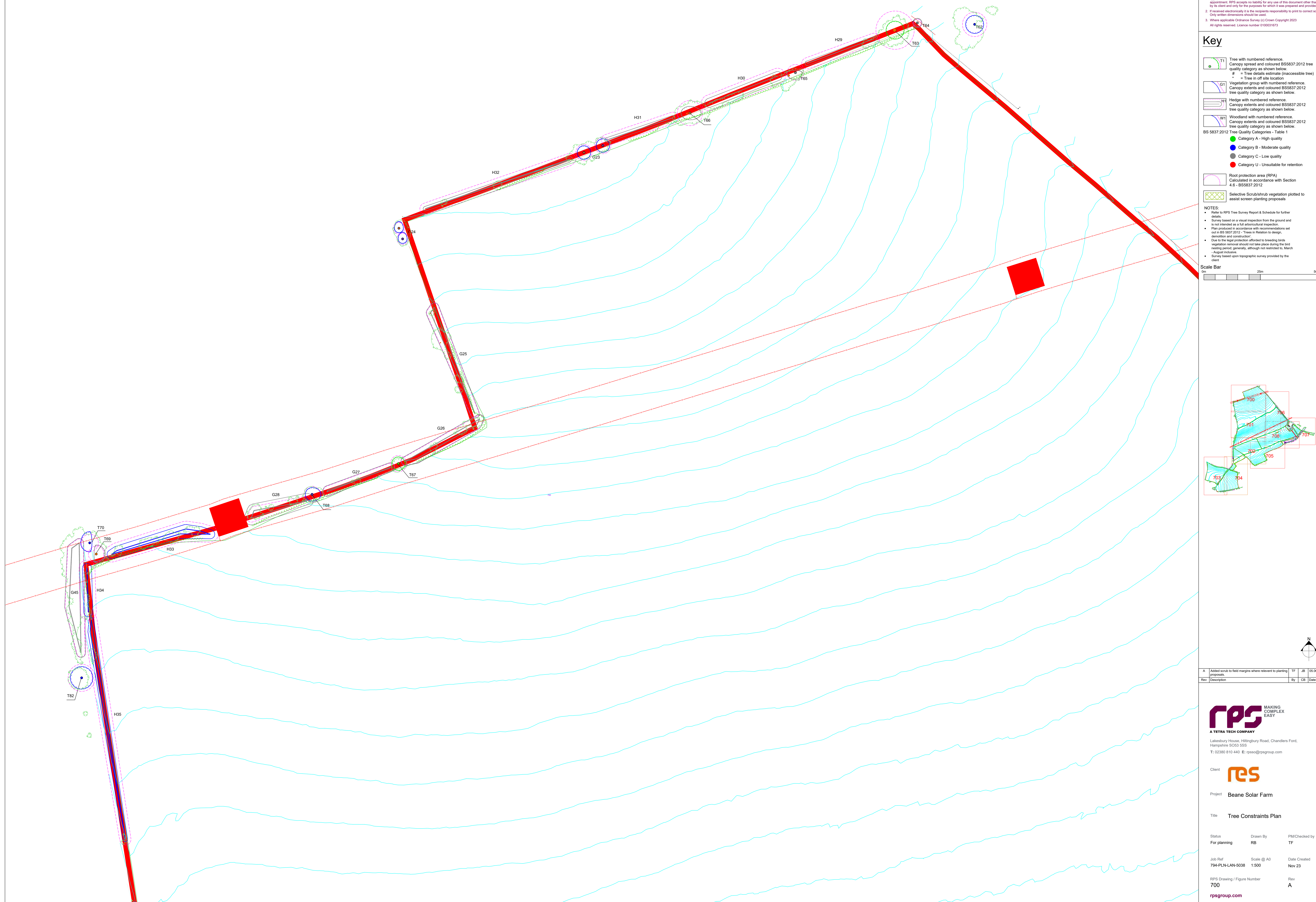
Project **Beane Solar Farm**

Title **Tree Constraints Plan**

Status **For planning** Drawn By **RB** PM/Checked by **TF**

Job Ref **794-PLN-LAN-5038** Scale @ A0 **1:500** Date Created **Nov 23**

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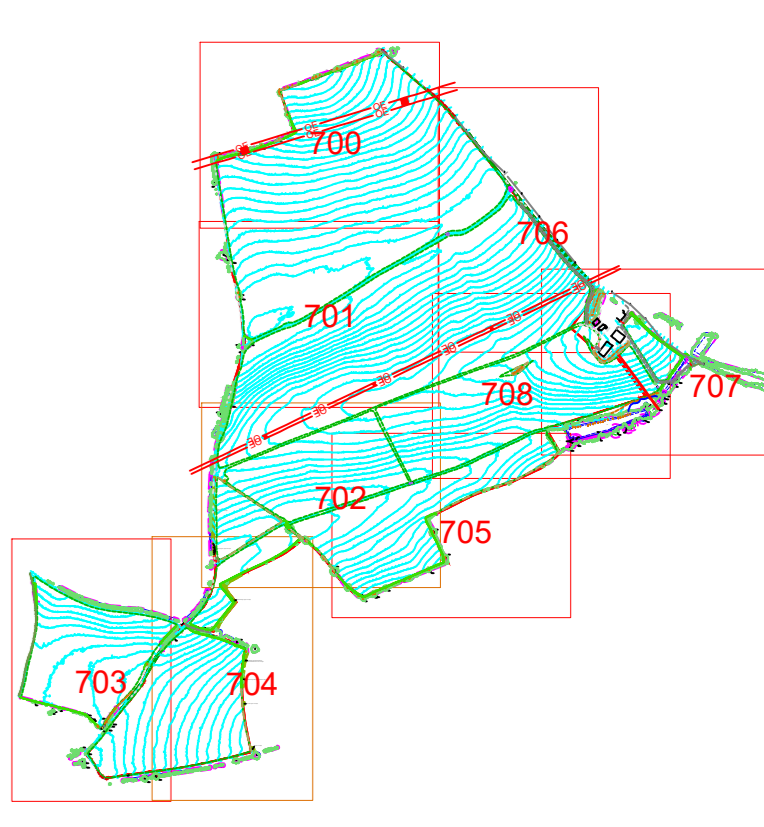
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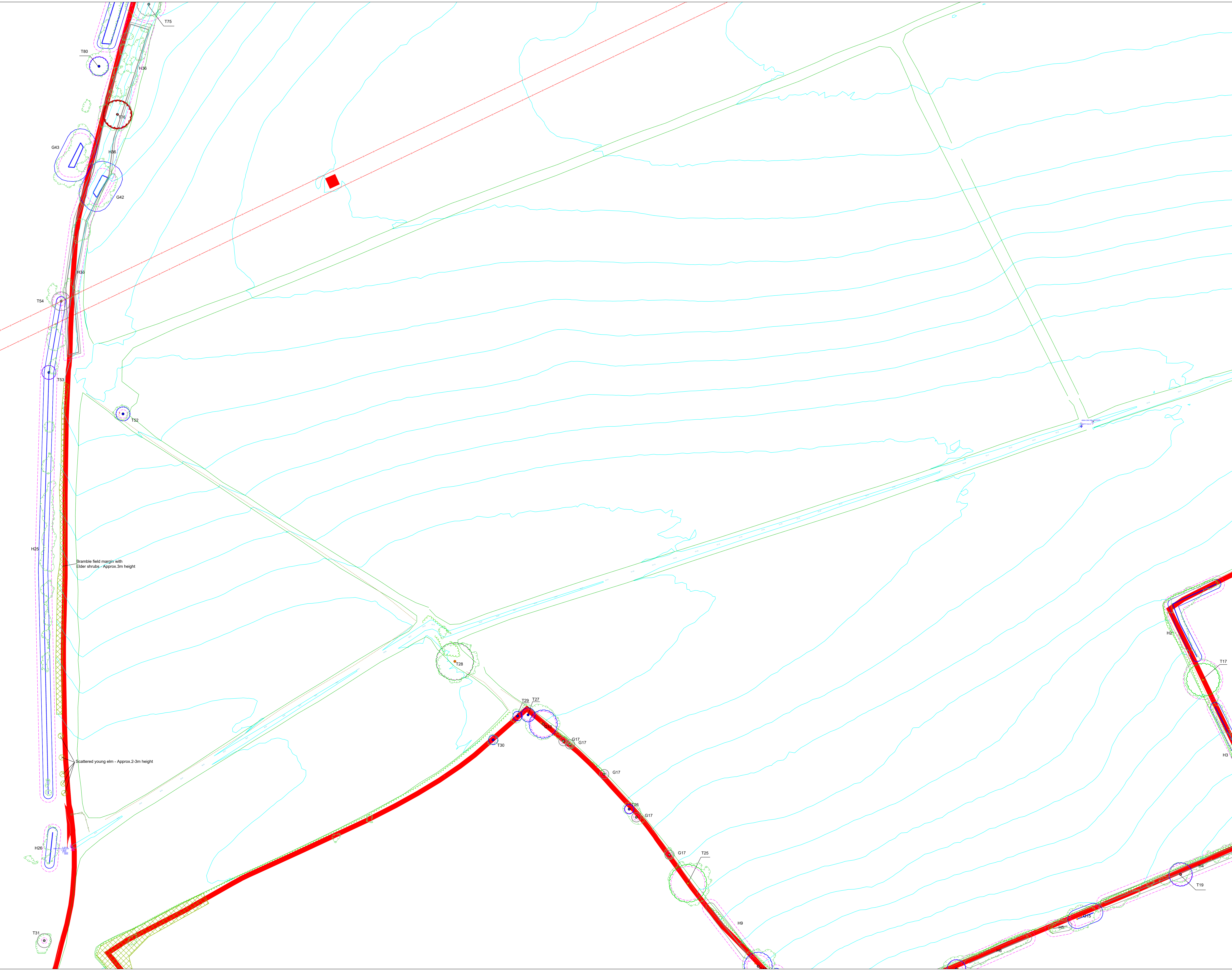
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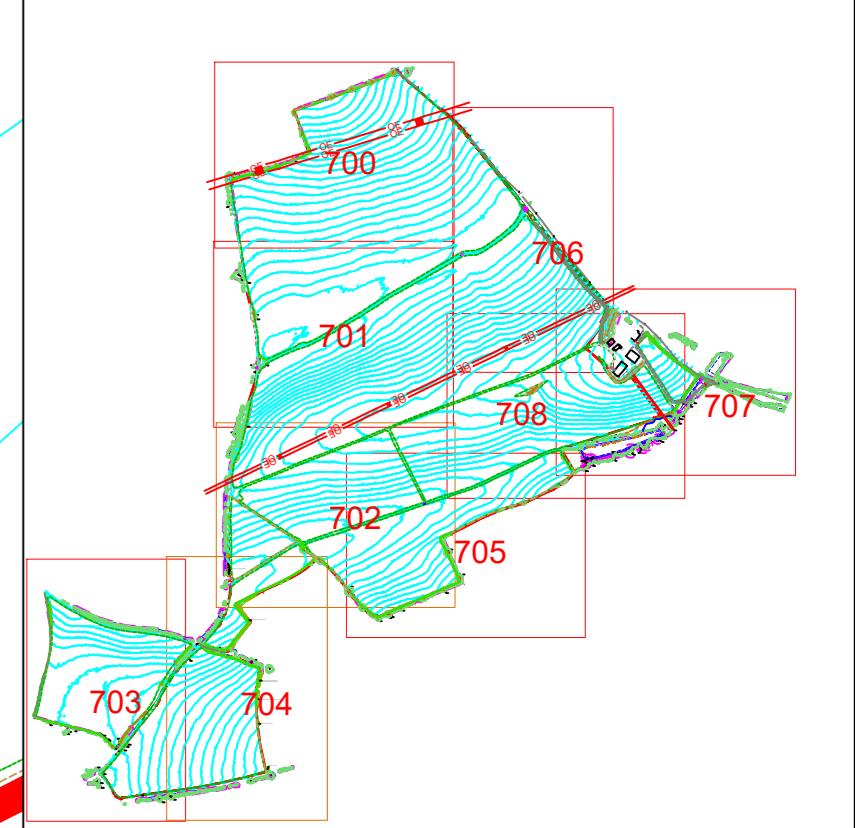
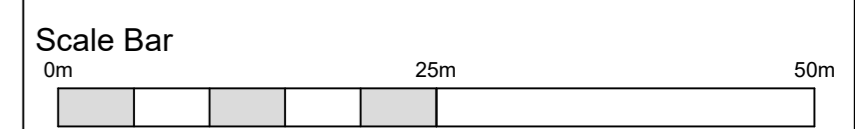
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Rev	Description	By	CB	Date
A	Added scrub to field margins where relevant to planting proposals.	TF	JR	05.08.24

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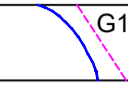

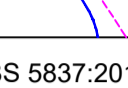




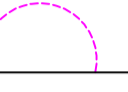
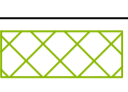
Title **Tree Constraints Plan**

Status **For planning** Drawn By **RB** PM/Checked by **TF**

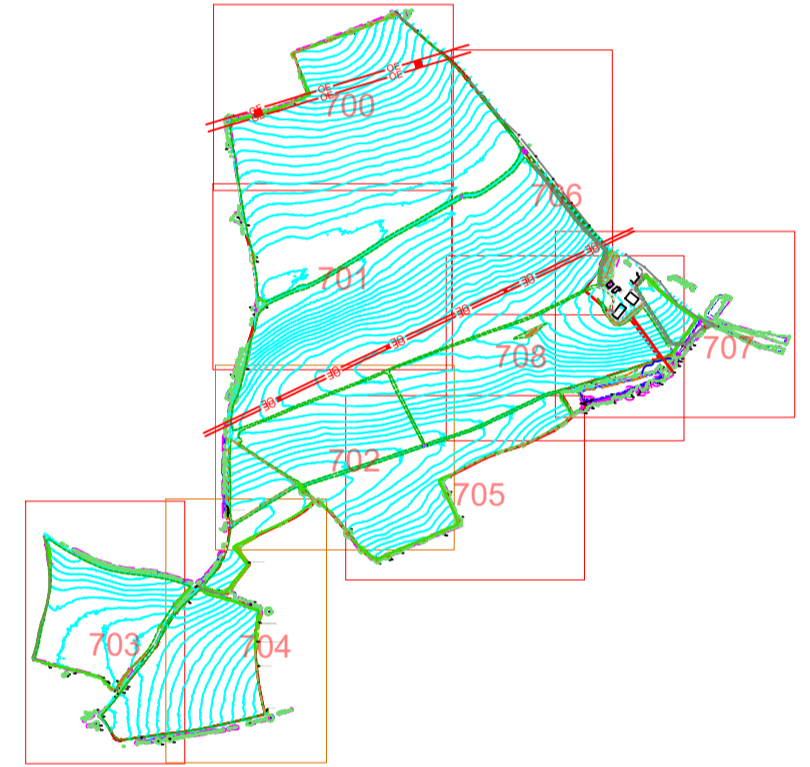
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Status **For Planning** Drawn By **RB** PM/Checked by **TF**

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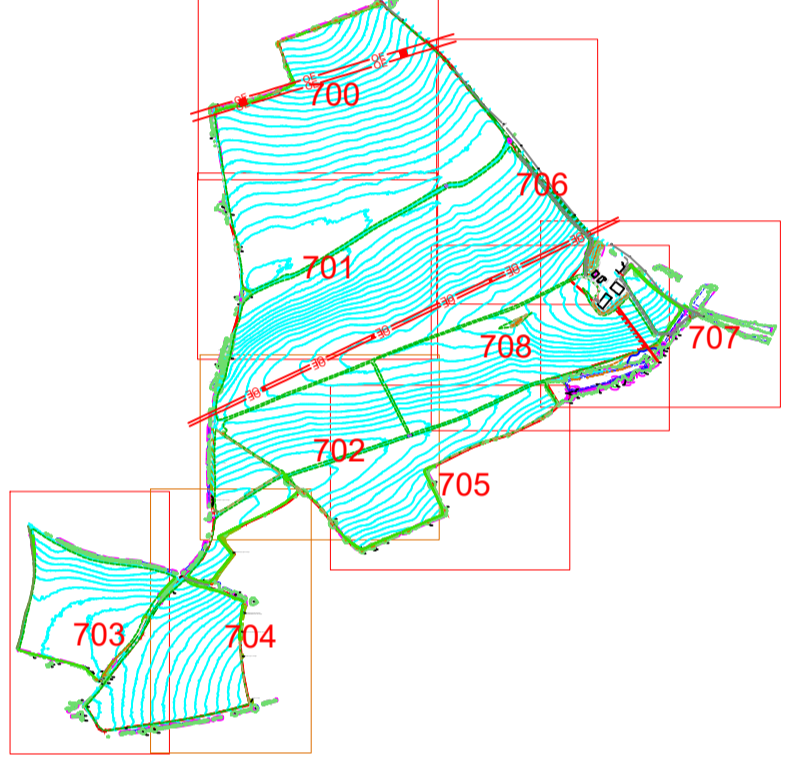
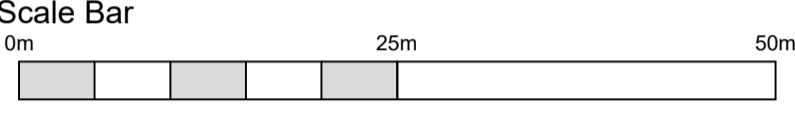
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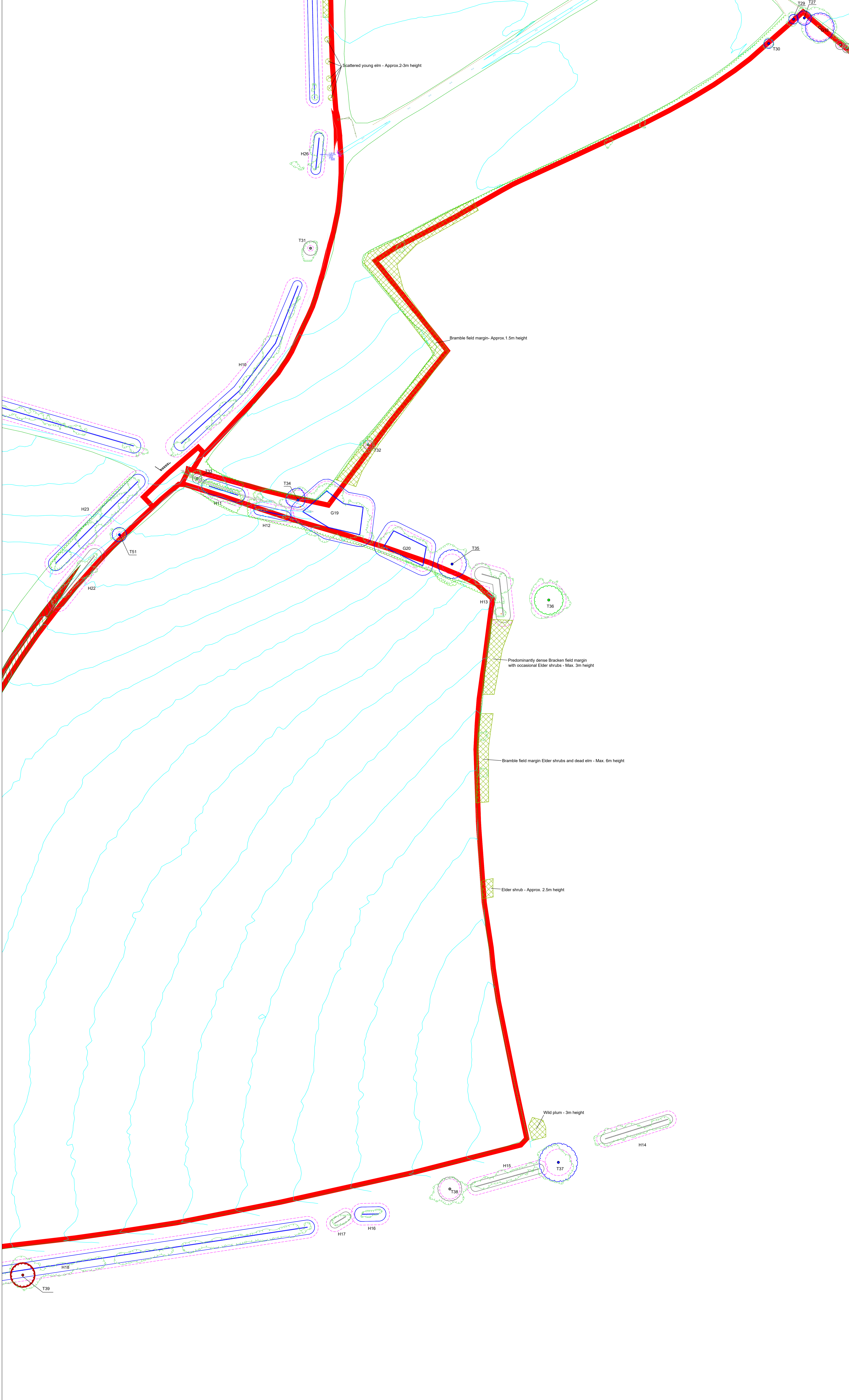
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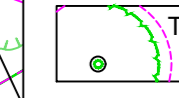


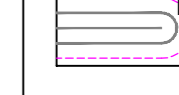
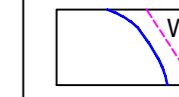
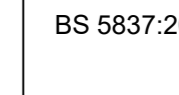


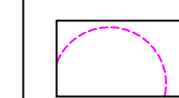

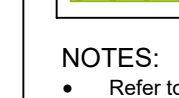
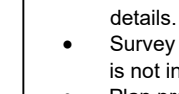
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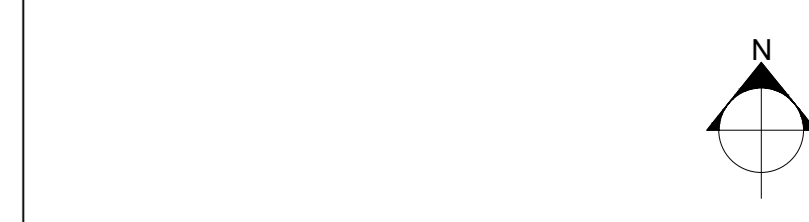
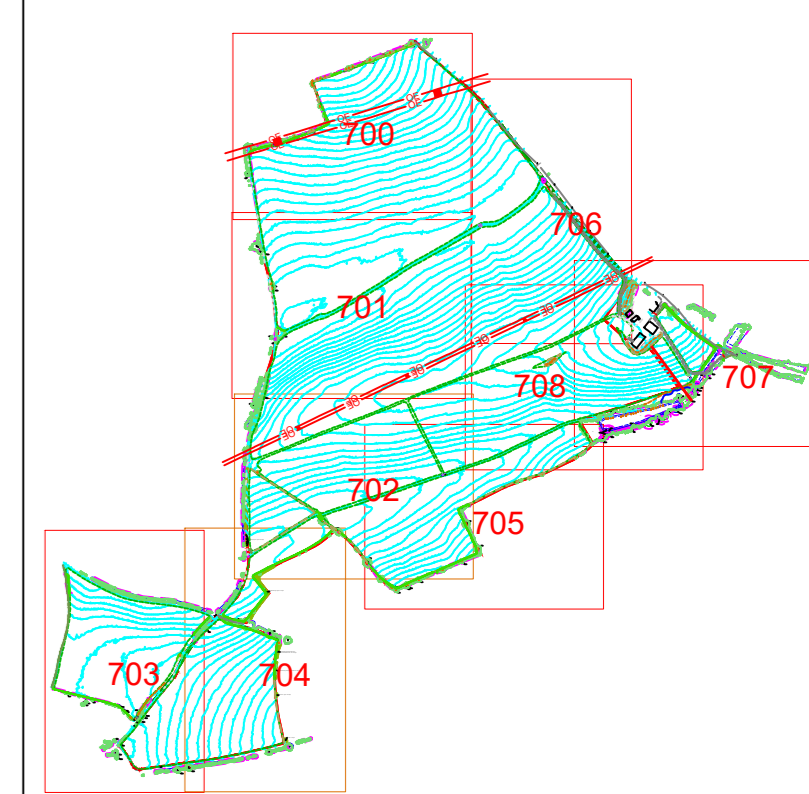
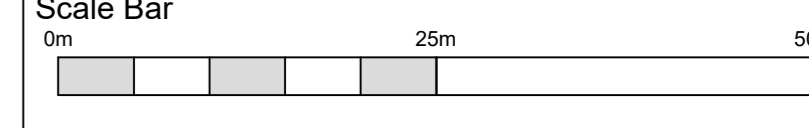
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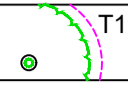

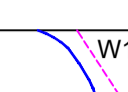





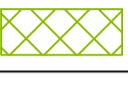
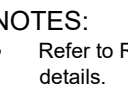
Job Ref **794-PLN-LAN-5038** Scale @ **1:500** Date Created **Nov 23**

RPS Drawing / Figure Number **705** Rev **A**
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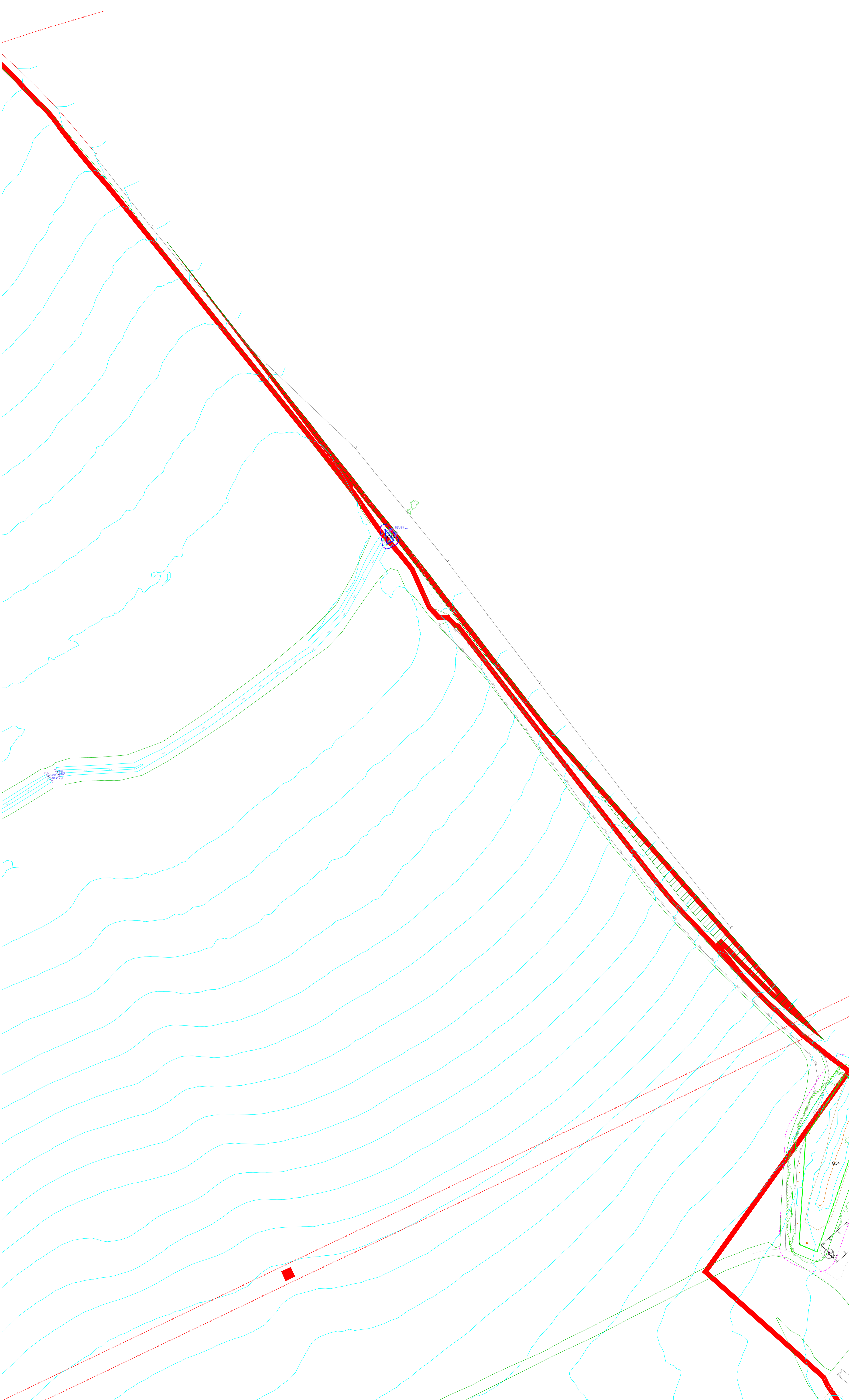
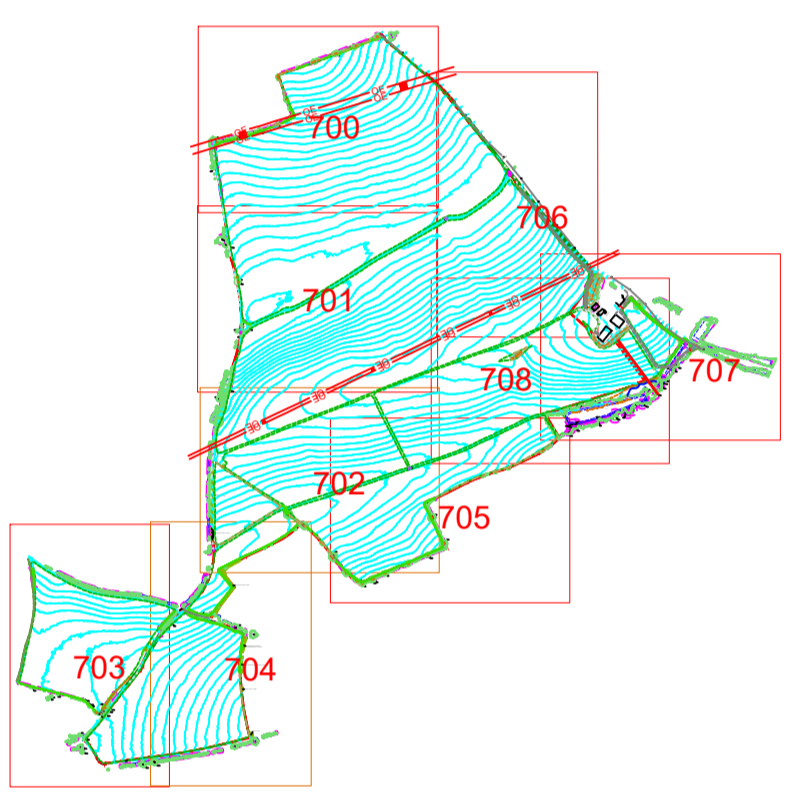
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A	Added scrub to field margins where relevant to planting proposals.	TF	JB	05.08.24
Rev	Description	By	CB	Date

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Client **res**

Project **Beane Solar Farm**

Title **Tree Constraints Plan**

Status	Drawn By	PM/Checked by
For Planning	RB	TF

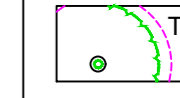
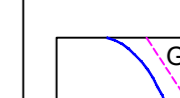

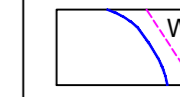
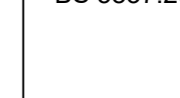

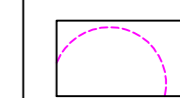
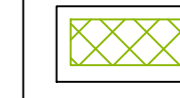


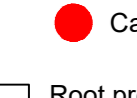
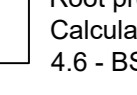
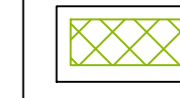
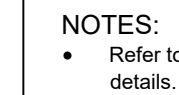
Job Ref	Scale @ A0	Date Created
794-PLN-LAN-5038	1:500	Nov 23

RPS Drawing / Figure Number	Rev
706	A

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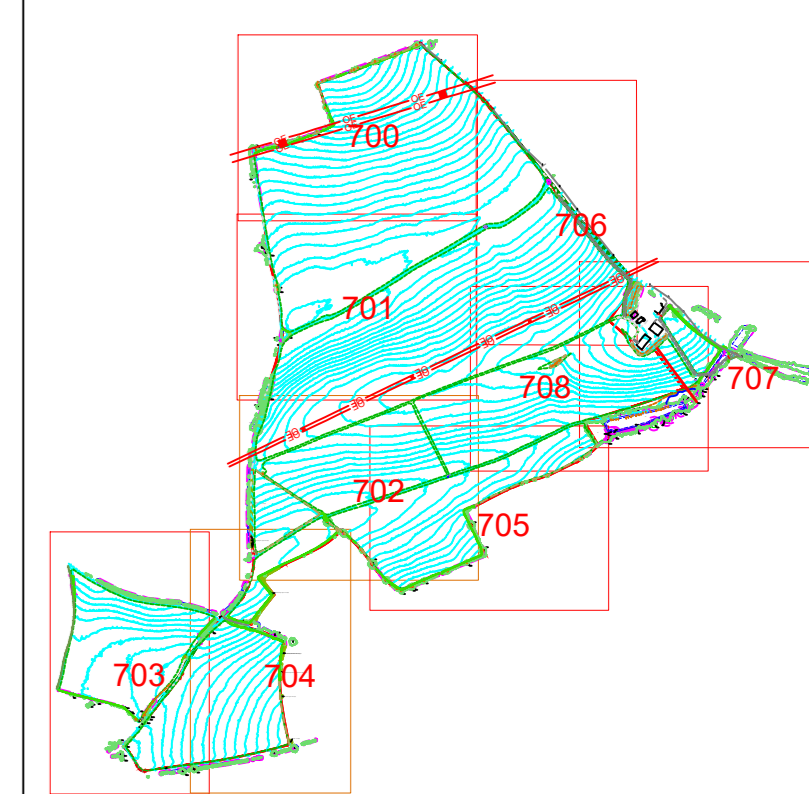
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Scale Bar
 0m 25m 50m



A	Added scrub to field margins where relevant to planting proposals.	TF	JR	05.09.24
Rev	Description	By	CB	Date

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Client **rps**

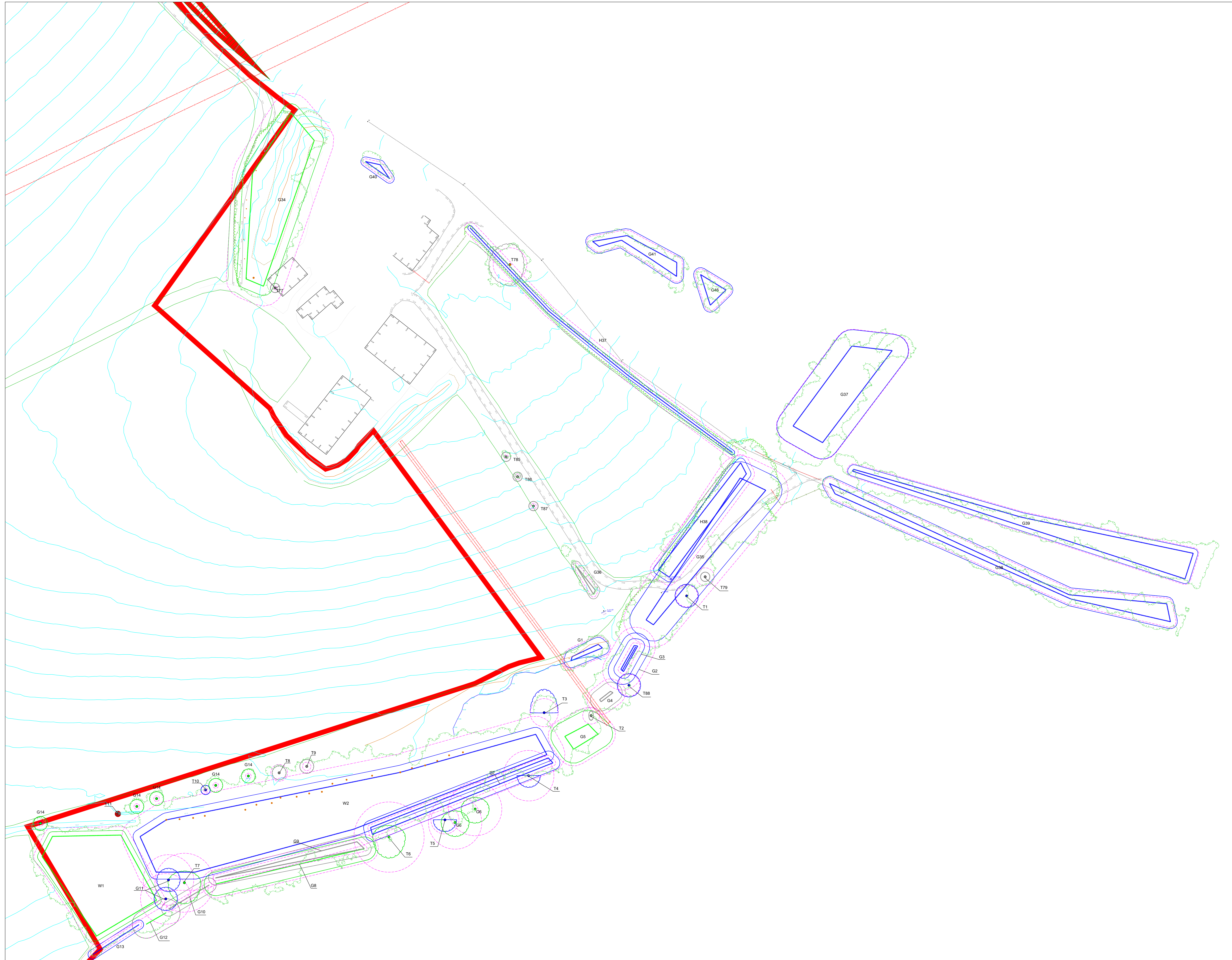
Project **Beane Solar Farm**

Title **Tree Constraints Plan**

Status **For planning** Drawn By **RB** PM/Checked by **TF**

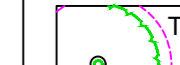
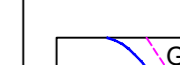
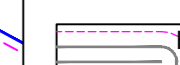
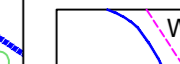





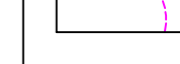

Job Ref **794-PLN-LAN-5038** Scale @ A0 **1:500** Date Created **Nov 23**

RPS Drawing / Figure Number **707** Rev **A**
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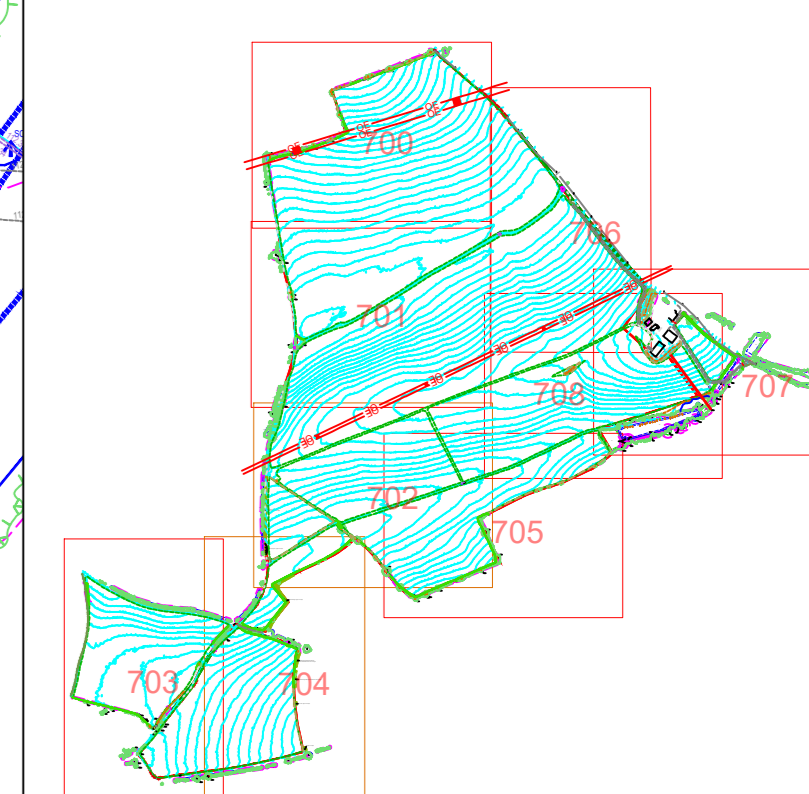
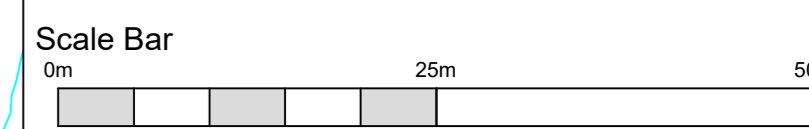
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Rev	Description	By	CB	Date
A	Added scrub to field margins where relevant to planting proposals.	TF	JB	05.06.24

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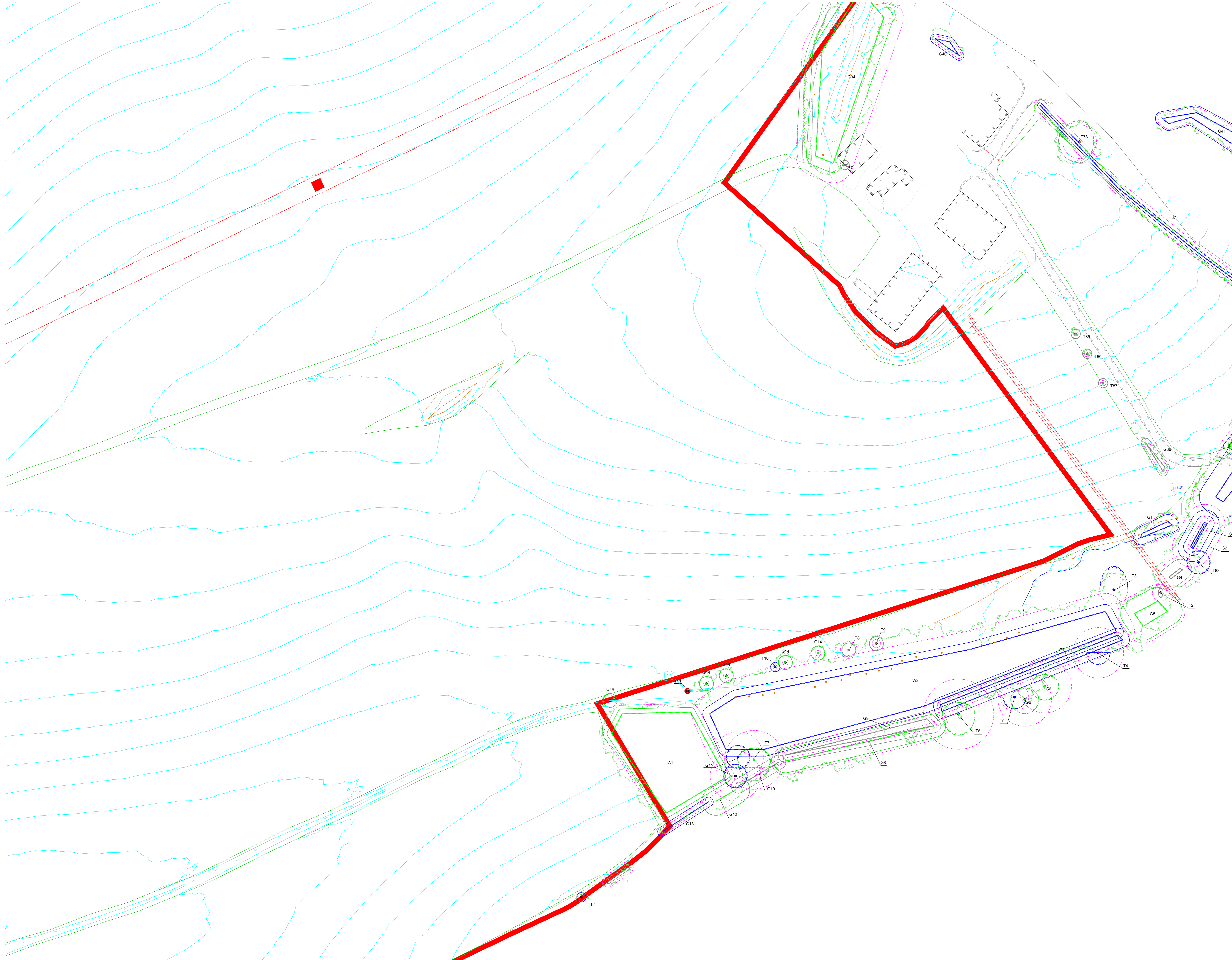
Project **Beane Solar Farm**

Title **Tree Constraints Plan**

Status **For planning** Drawn By **RB** PM/Checked by **TF**

Job Ref **794-PLN-LAN-5038** Scale @ **1:500** Date Created **Nov 23**

RPS Drawing / Figure Number **708** Rev **A**
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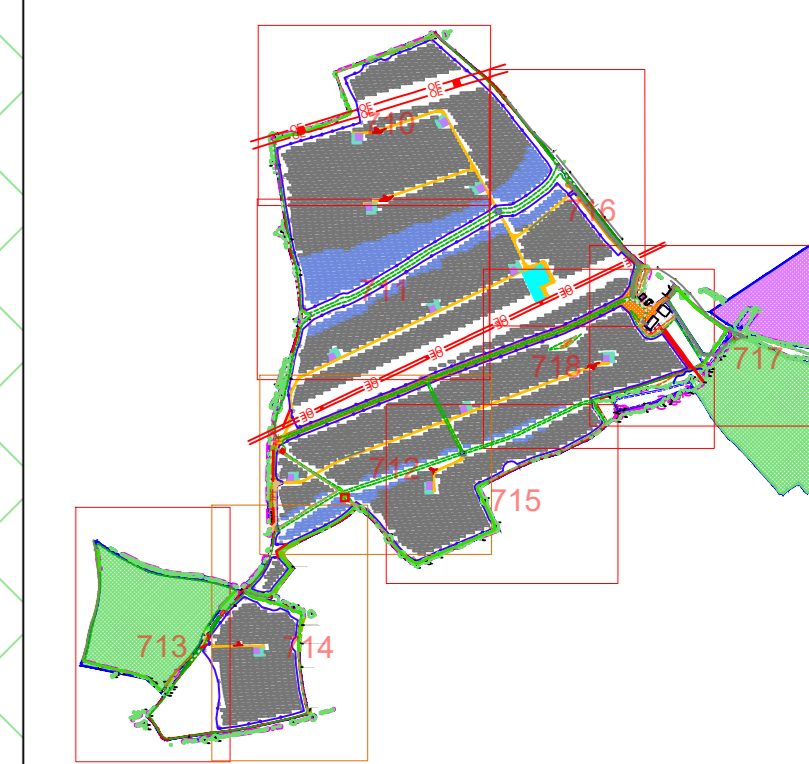
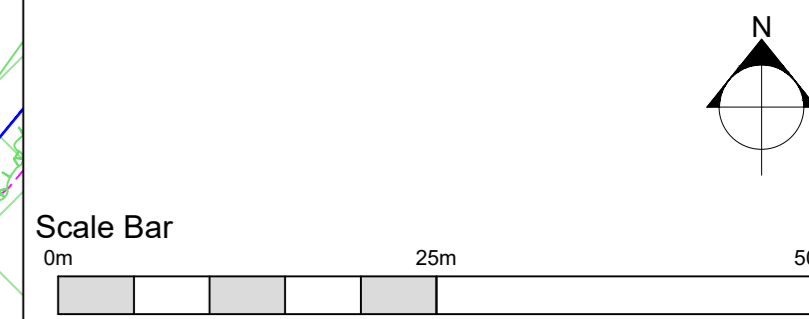
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Rev	Description	By	CB	Date
A	Final layout added	TF	DC	01/12/24
	First issue	TF	DC	02/10/24

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Client **res**

Project **Beane Solar Farm**

Title **Tree Protection Plan**

Status For planning Drawn By TF PM/Checked by DC

Job Ref 794-PLN-LAN-5038 Scale @ A0 1:500 Date Created Oct 24

RPS Drawing / Figure Number 718 Rev A
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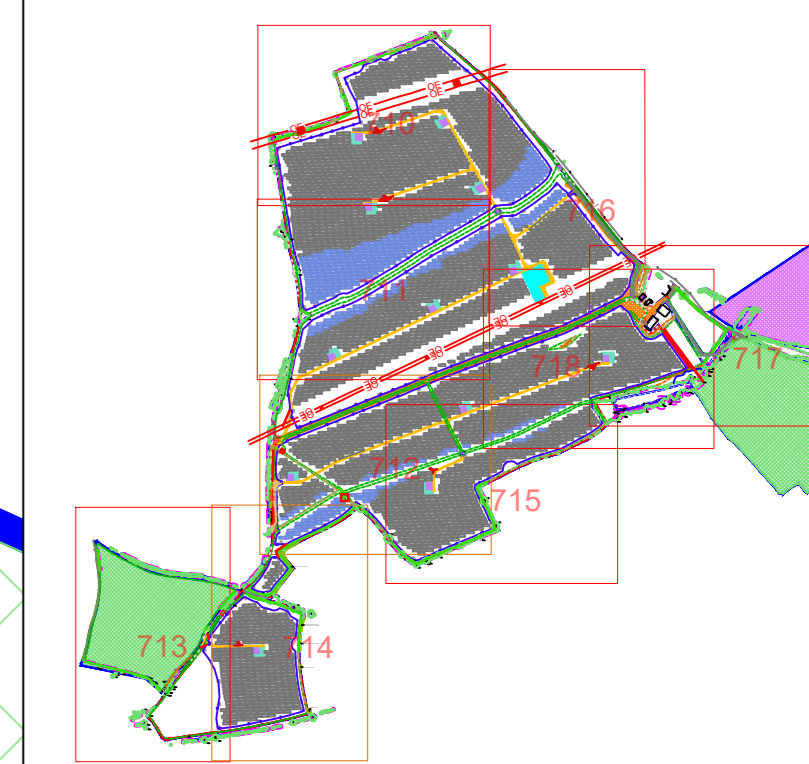
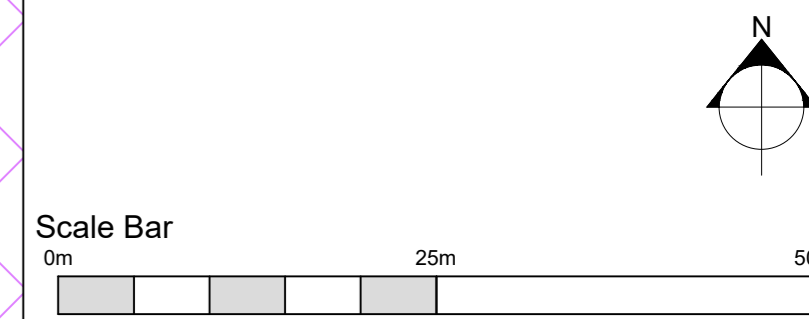
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A	Final layout added	TF	DC	01/12/24
	First issue	TF	DC	02/10/24

Rev	Description	By	CB	Date

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Client **res**

Project **Beane Solar Farm**

Title **Tree Protection Plan**



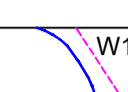







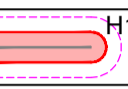
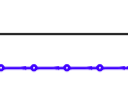
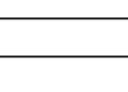

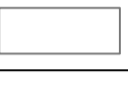
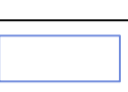
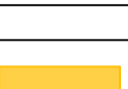
Status For planning Drawn By TF PM/Checked by DC

Job Ref 794-PLN-LAN-5038 Scale @ A0 1:500 Date Created Oct 24

RPS Drawing / Figure Number 717 Rev A
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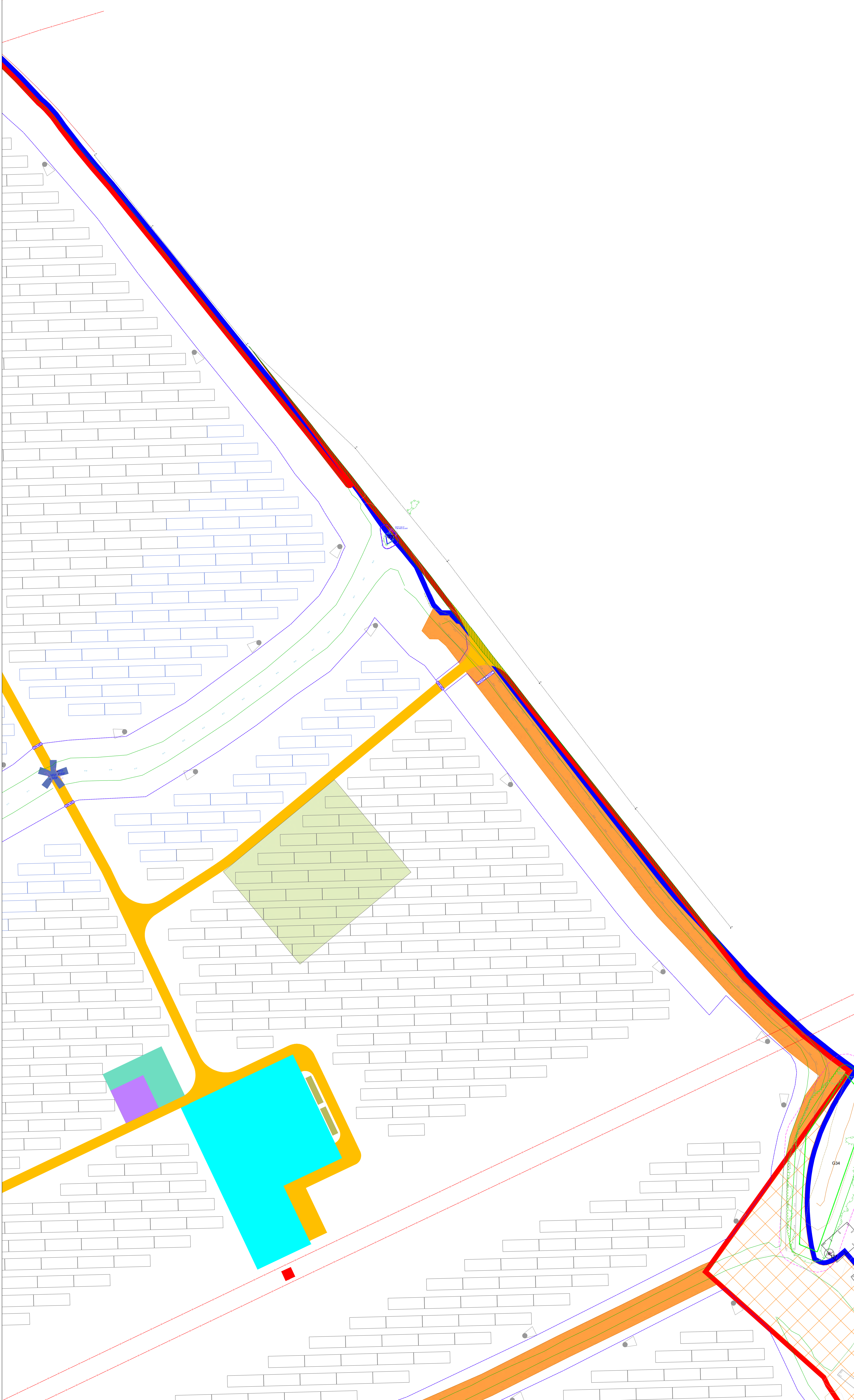
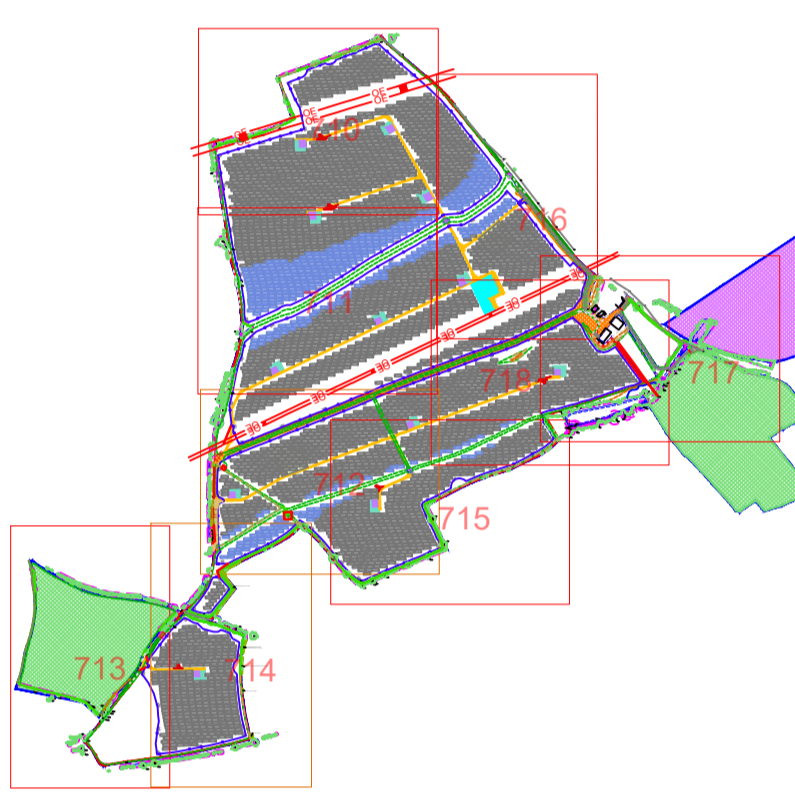
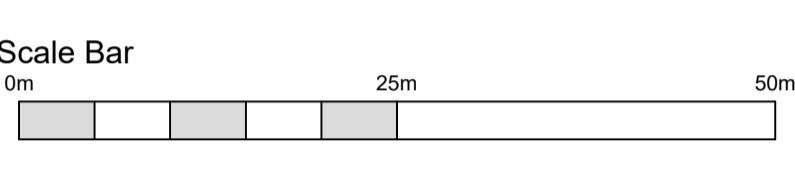


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Rev	Description	By	CB	Date
A	Final layout added	TF	DC	01.12.24
-	Final issue	TF	DC	06.10.24

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Client **res**

Project **Beane Solar Farm**

Title **Tree Protection Plan**

Status	Drawn By	PM/Checked by
For Planning	TF	DC

Job Ref	Scale @ AD	Date Created
794-PL-NLAN-5038	1:500	Oct 24

RPS Drawing / Figure Number	Rev
716	A

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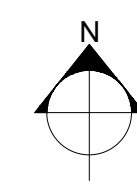
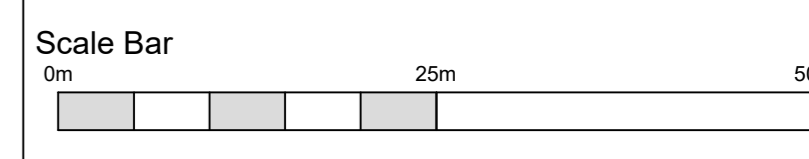
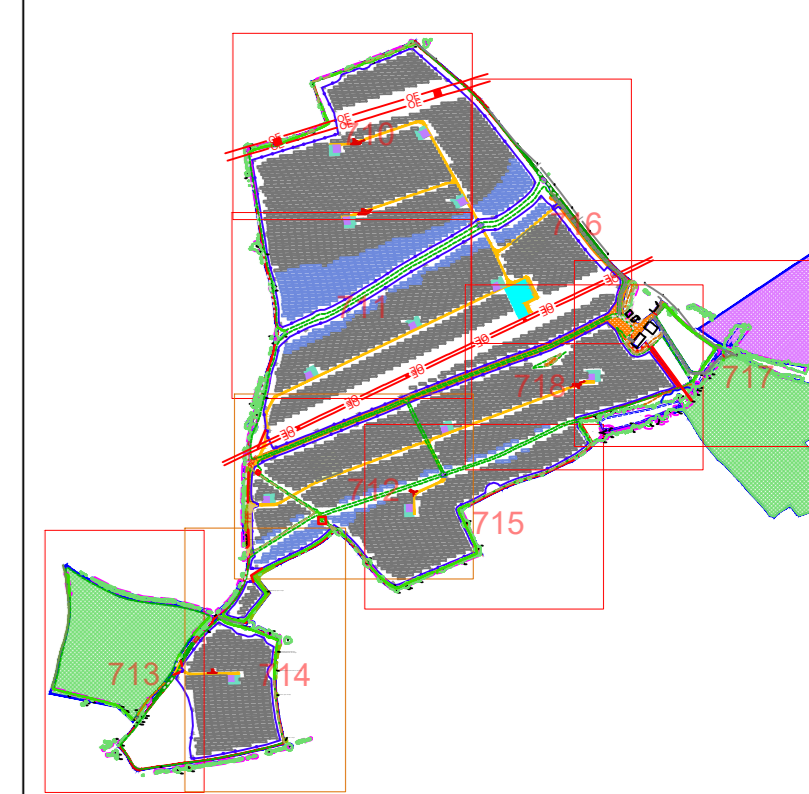
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B	Final layout issued	TF	DC	01.12.24
A	Added notes to field margins where relevant to planting proposals.	TF	RB	05.09.24

Rev	Description	By	CB	Date
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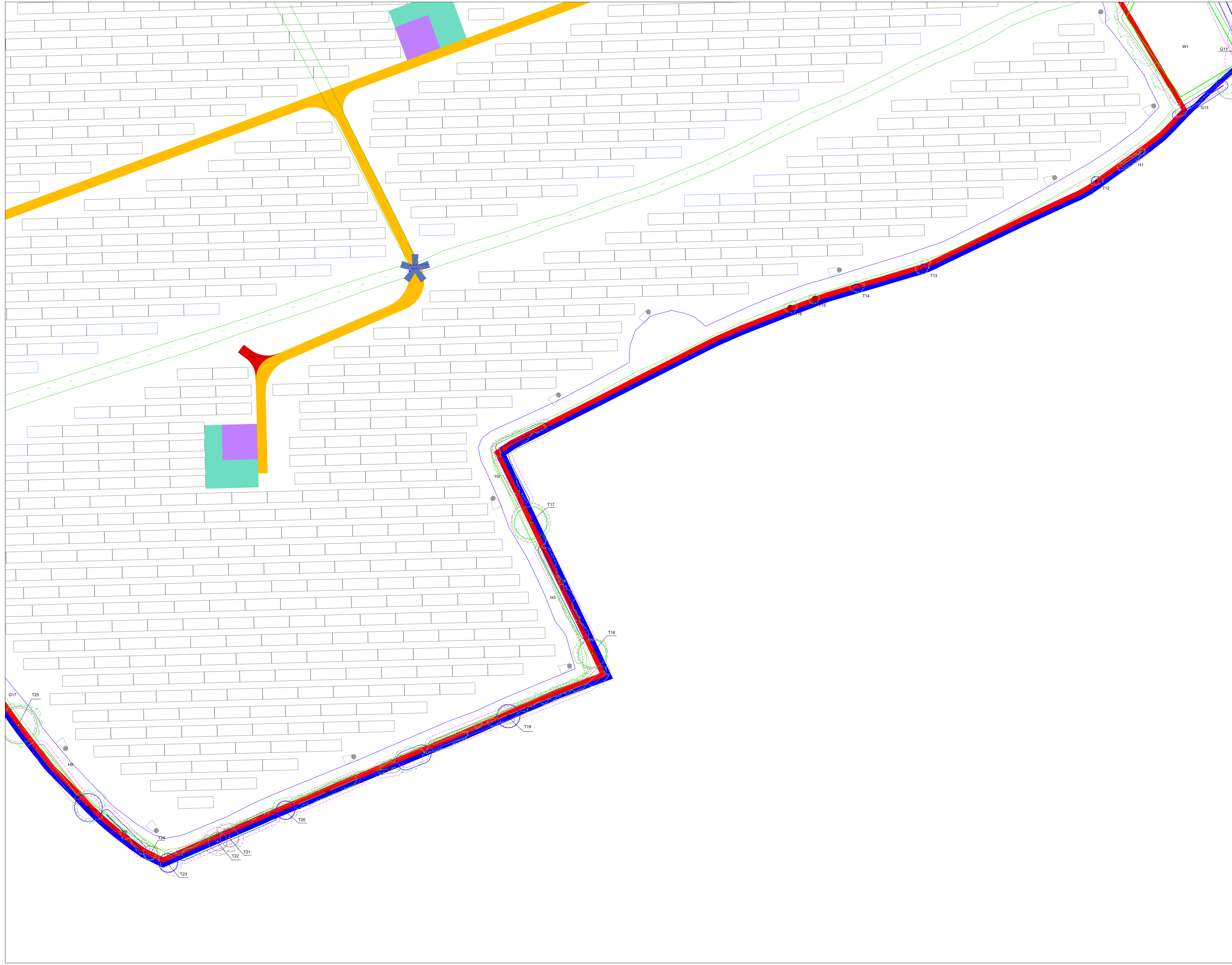
Project **Beane Solar Farm**

Title **Tree Protection Plan**

Status **For planning** Drawn By **RB** PM/Checked by **TF**

Job Ref **JSL5038** Scale @ **A0** Date Created **Oct 24**
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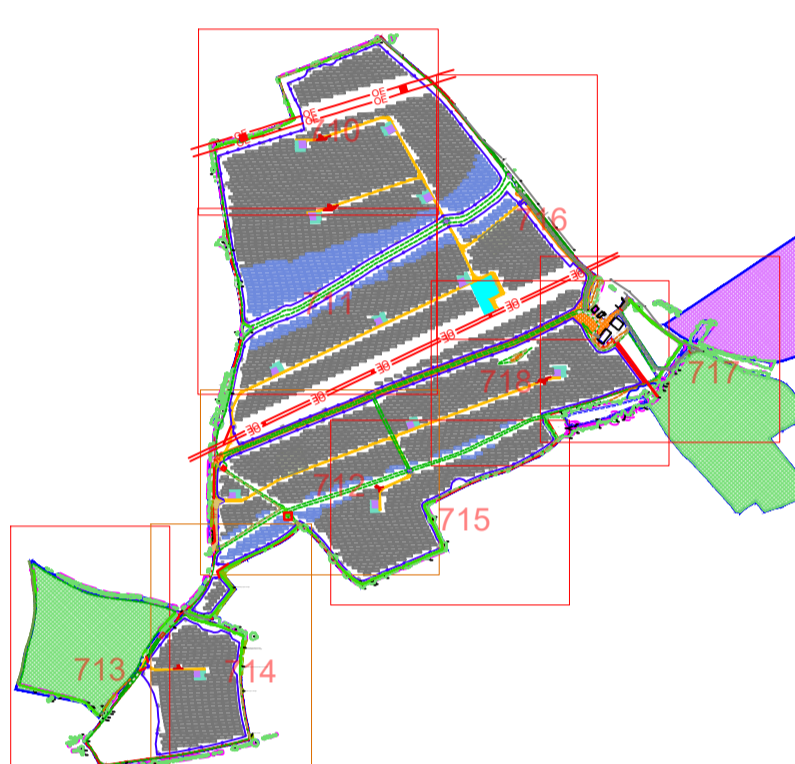
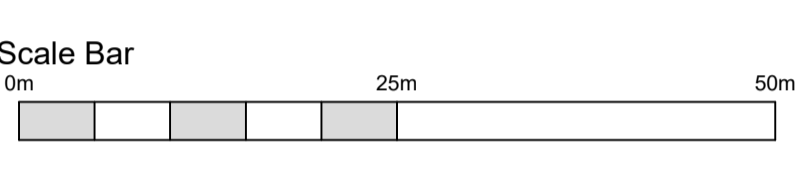
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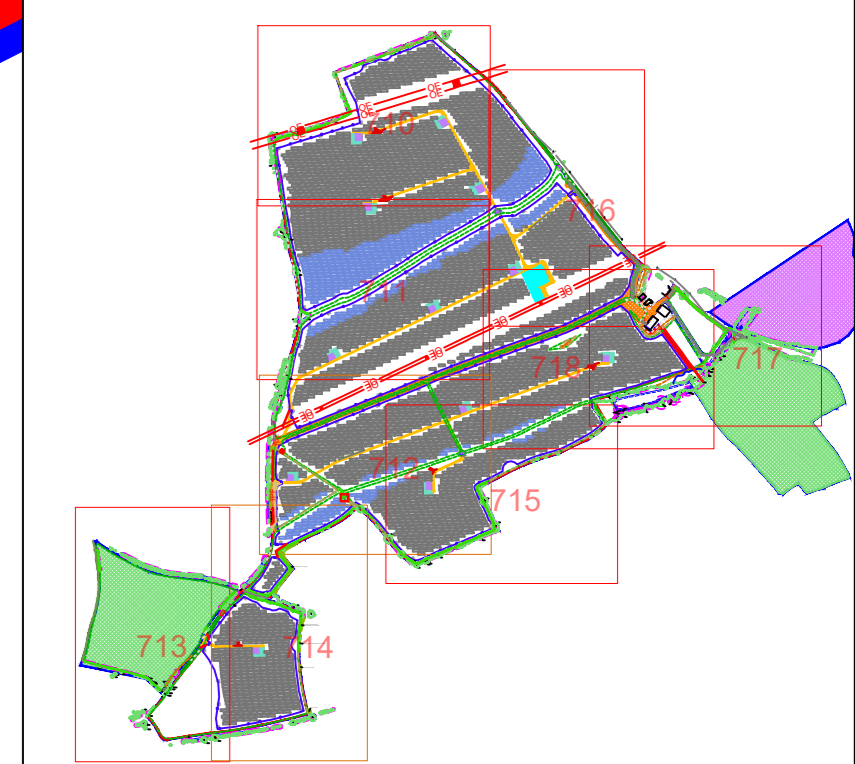
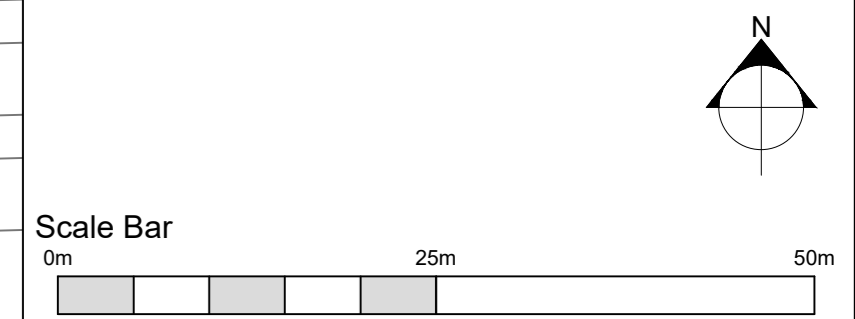


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A	Final layout added	TF	DC	01/12/24
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Tree Protection Specification

All vegetation identified for removal should be removed prior to the start of works. The Tree Protection Plan provides details of vegetation removals and retention.

An assessment of crown impacts should be carried out by the Consultant Arboriculturist or the Clients Landscape Manager prior to implementing tree protection, so that any potential requirements for access pruning have been assessed.

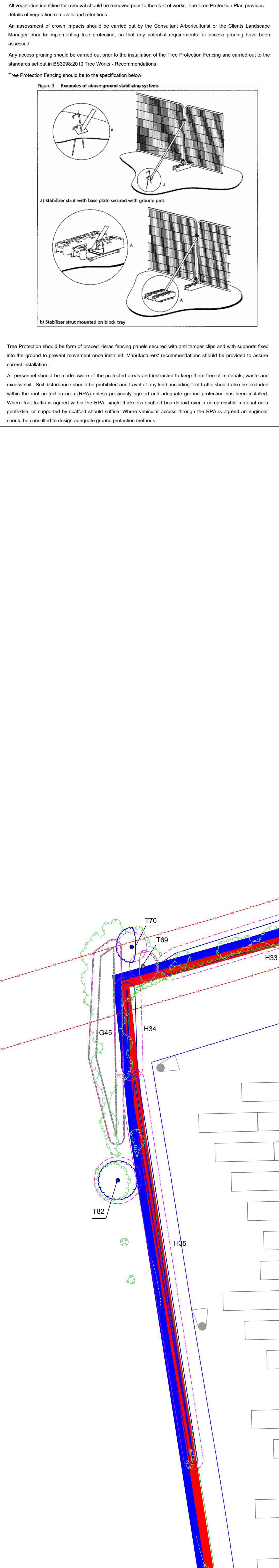
Any access pruning should be carried out prior to the installation of the Tree Protection Fencing and carried out to the standards set out in BS3988:2010 Tree Work - Recommendations.

Tree Protection Fencing should be to the specification below.

Figure 3 - Examples of above-ground stabilising systems

Tree Protection should be form of braced Heras fencing panels secured with anti-tamper clips and with supports fixed into the ground to prevent movement once installed. Manufacturer's recommendations should be provided to assure correct installation.

All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil compaction should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed. Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.



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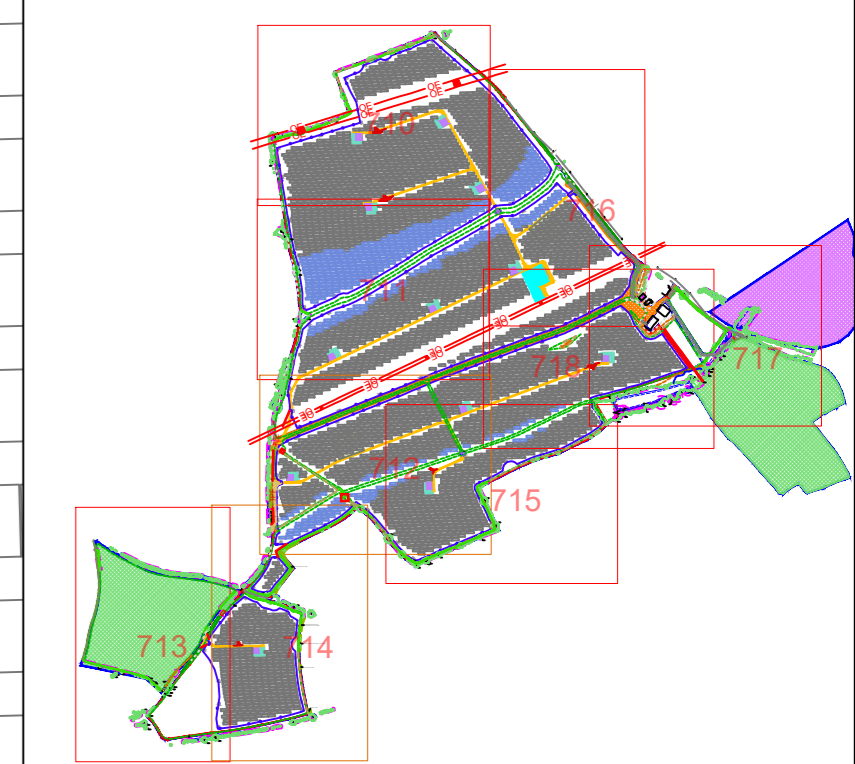
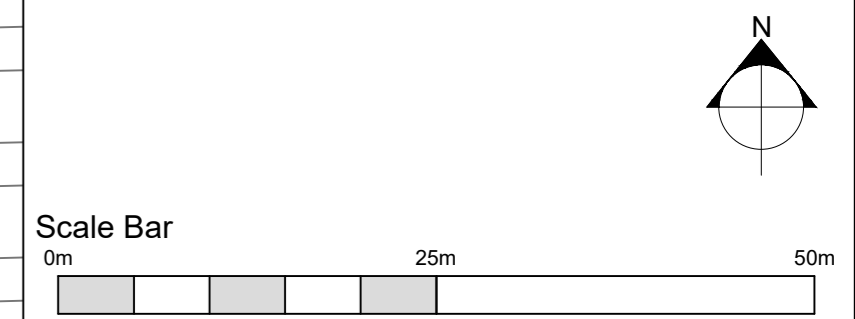
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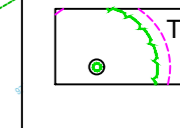
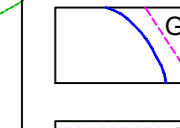
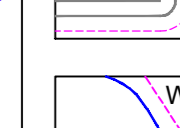
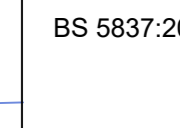

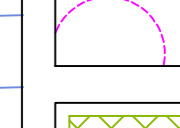



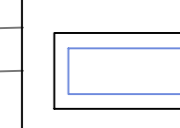

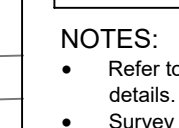
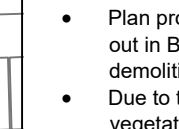
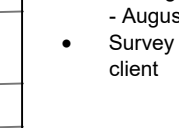
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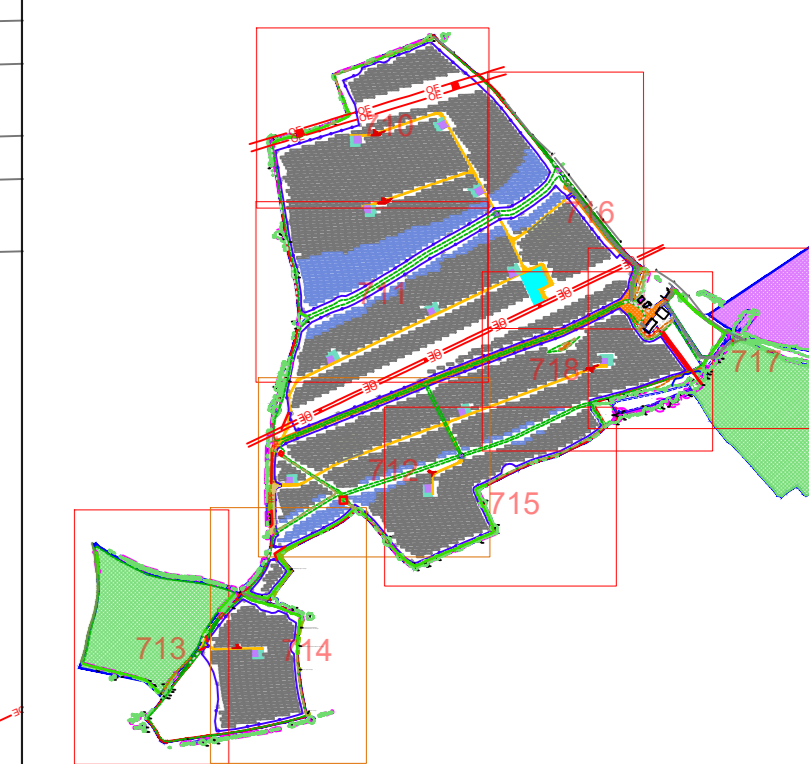
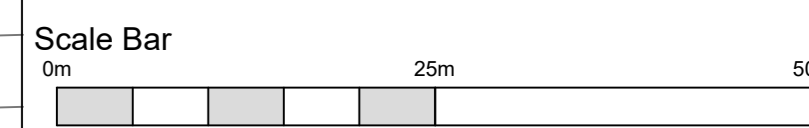
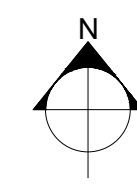
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Appendix A

Survey Methodology

General

This report was authored by Thomas Flood MICFor MArborA, Associate Director of RPS.

The report and survey were carried out in general accordance with the requirements set out in BS 5837:2012 “Trees in Relation to Design, Demolition and Construction – Recommendations”.

Trees were inspected from ground level during a site visit. All data was recorded electronically within a Axciscape 4.02 project and then upon return to the office it was imported into an MS Access database. Individual tree numbers and locations were plotted by eye on to a drawing at the time of the survey. Tree positions were then related to a Topographical survey of the site provided, where not shown on the topographical survey tree positions have been plotted by eye only and require confirmation.

Trees were not climbed or inspected below ground level and inaccessible trees will have best estimates made about the location, physical dimensions and characteristics.

The locations of the trees were based upon topographic survey of the site provided by the client.

The survey assesses individual trees and groups of trees for quality and benefits within the context of proposed development. The quality of each tree or group of trees has been recorded by allocating it to one of four categories as described the table below. These categories have been differentiated on the Tree Constraints Plan (see Figures 700-708).

The survey information was recorded on the attached schedule (Table 1) in general accordance with the guidance contained within Section 4 of BS 5837:2012 “Trees in Relation to Design, Demolition and Construction - Recommendations”.

Tree Constraints Plan

The Tree Constraints Plan (see Figures 700-708) is designed to show the influence that the trees have upon the site by virtue of their size and position. The plan seeks to act as a design tool that shows both the above and below ground constraints presented by the trees.

The information provided within this section of the report is to assist in the interpretation of the Tree Constraints Plan and aims to ensure that those trees selected for retention can be successfully integrated within the proposed development.

It should be noted that some of the tree positions shown on the plan have been plotted using the provided topographical survey and others by eye to an Ordnance Survey base map and as such should be considered to be of a provisional nature.

Root Protection Areas

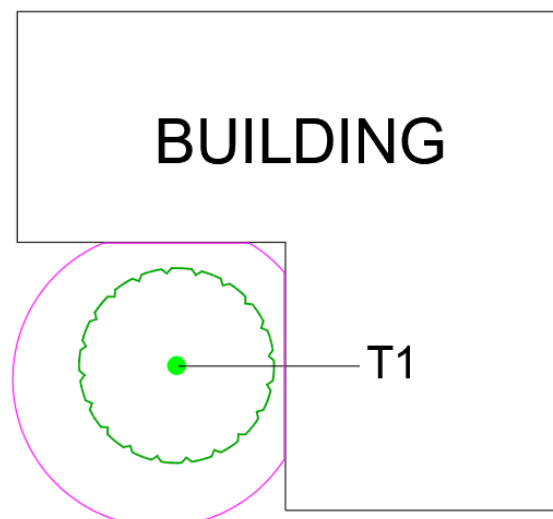
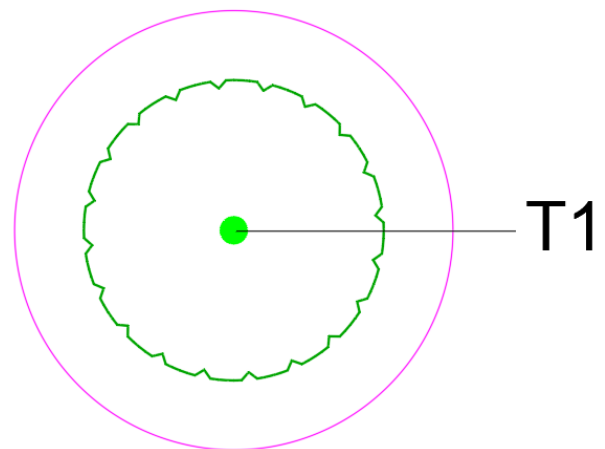
Root Protection Areas for each tree and group of trees surveyed have been determined in accordance with BS5837:2012 and a schedule of Root Protection Areas is attached to this report as Table 2.

As shown to the right, Root Protection Areas (RPA's) for the trees, where no significant constraints to root development are considered to be present, have been plotted onto the Tree Constraints Plan as circles, with the tree located centrally, extending to encompass the area of ground, and thus the rootable soil volume, required for protection.

Where tree root spread is considered to have been influenced by site conditions the trees RPA's have been plotted to the Tree Constraints Plan as a polygon. The plotted polygon is of the **same area** as it would be as a circle and its shape reflects an arboricultural assessment of likely root distribution.

An example of a polygonal RPA, considered appropriate due to the presence of a building in close proximity to a tree, is shown to the right.

Where possible all development, including new hard landscaping, shall be situated outside of the retained trees designated Root Protection Areas.



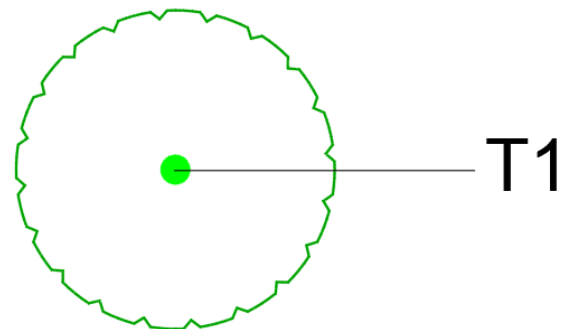
Existing Canopy Spreads

The existing canopy spreads of the trees on site are shown on the Tree Constraints Plan as depicted here.

The current spread of the tree is a constraint due to its dominance, size and movement in strong winds.

It will typically be unacceptable to design any built development within the current spread of a tree.

Where built development is proposed in close proximity to existing trees consideration should be given to the amount of working space required to allow its construction.



Canopy Height / Clearance

The height and growth direction of the lowest branch of each tree is recorded in the Tree Data Schedule contained within this report as Table 1, the lowest branch height of a tree is shown on the Tree Constraints Plan. Additionally, the vertical clearance of the trees canopy above ground level is recorded within the Tree Data Schedule.

The two figures can be used to inform the extent to which a trees crown may be at risk of damage during development as a result of vehicular or plant movements within the site and to assess the need for additional protective measures to be implemented to protect low branches.

In particular it should also be noted that where the Root Protection Areas for retained trees do not extend to the edge of existing canopy spreads it is possible that those parts of the trees extending beyond the RPA fencing may sustain damage during construction. Where this occurs, there are two primary options available to manage and minimise the potential for damage to tree canopies to occur during development and these may be used singularly or in combination. The first option is to create a Construction Exclusion Zone (CEZ), by the erection of protective fencing, around the full extent of the trees. The second is to undertake pre-development pruning works to the trees to reduce the potential for branch damage to occur.



Appendix B

BS5837 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	<input type="checkbox"/> 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) <input type="checkbox"/> Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline <input type="checkbox"/> 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>			Dark Red
	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)	Light Green
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	Mid Blue
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	Grey

Appendix C

Tree Protection Barriers

Root Protection Area Barrier Details

Since trees are living organisms which interact with their immediate environment any changes made to their surroundings may have a bearing on that trees future. Developing a site will undoubtedly place any trees within close proximity under some level of stress, which could predispose them to infection. The aim of this method statement is to limit the amount of stress induced by introducing protection measures.

The most effective way of offering protection is by erecting protective barriers set at a distance from the tree stem using the methods given within BS 5837: 2012 Trees in Relation to Design, Demolition and Construction. Barriers should be braced and constructed to resist impacts; see Figures 2 & 3 (taken from BS5837) below for acceptable barrier specifications. Barriers can be of an alternative specification to that within the BS5837:2012 provided it is approved by the Local Planning Authority Tree Officer.

Barriers should be erected before any works commence on site with the exception of recommended tree work. Areas of retained and future structure planting should be similarly protected.

All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil disturbance should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed.

Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.

Suggested Barrier Specification (as per BS5837: 2012)

Figure 2 Default specification for protective barrier

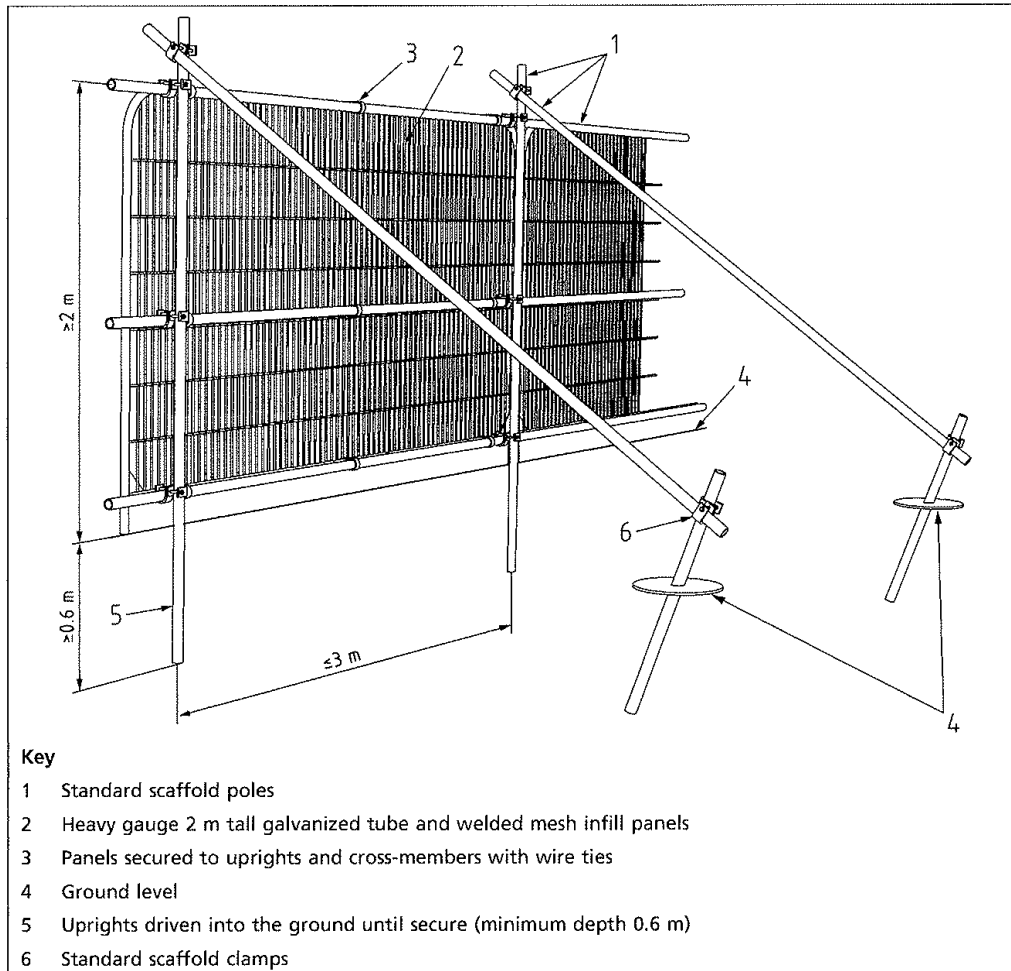
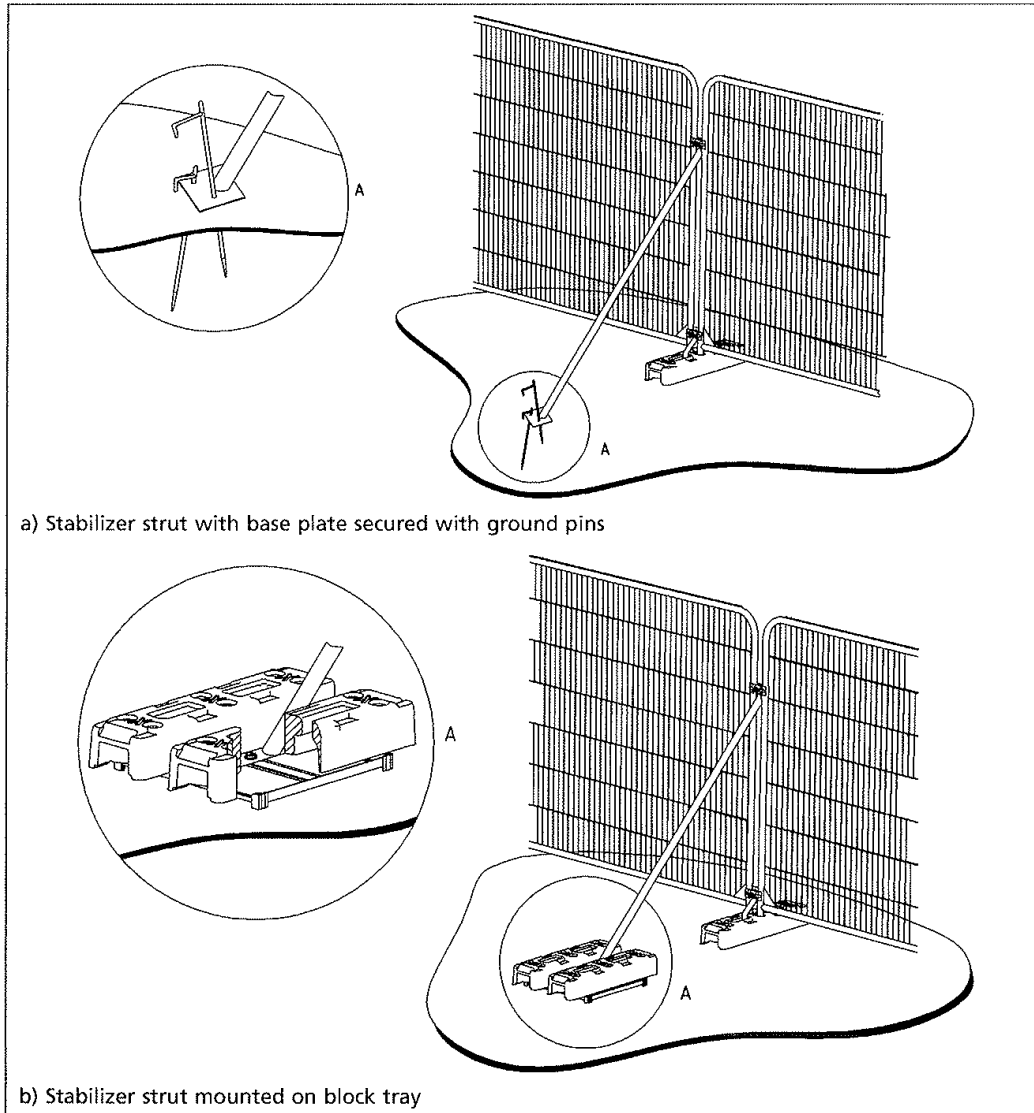


Figure 3 Examples of above-ground stabilizing systems



Appendix D Construction Exclusion Signage – Example



Appendix E

Arboricultural Glossary

Abiotic Factors - Non-living factors of the environment, including temperature & wind.

Age-class - A general classification of the tree into either - young, semi-mature/maturing, mature, over-mature, or senescent.

Apical Bud/Shoot – The apical bud, also known as the leading shoot, is responsible for shoot extension and is dominant.

Apical Dominance – A singular, leading shoot remains dominant.

Arboreal - In connection with, or in relation to, trees.

Arboriculturist – Person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the field of trees in relation to construction.

Arboricultural Impact Assessment (AIA) – Study, undertaken by an arboriculturist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.

Arboricultural Method Statement (AMS) – Methodology for the implementation of any aspect of development that has the potential to result in the loss of or damage to a tree. Note The AMS is likely to include details of an on-site tree protection monitoring regime.

Biotic factors - Living factors. For example, animals and pathogens.

Bottle Butt – Term used to describe shape of stem base, usually associated with an internal defect – refer to 'Reaction Wood' below.

Branch union/junction - The point at which a branch joins a larger stem. Can be a point of weakness, especially in certain species.

Cambium - A lateral meristem (see below) in vascular plants located just beneath the bark responsible for secondary growth, e.g. production of annual growth rings.

Canker – A clearly defined area of dead and sunken or malformed bark, caused by bacteria or fungi. Can have a bearing on structural integrity of infected limb(s) depending on size and location.

Chlorosis/Chlorotic – Abnormal yellow or yellow-green coloration of usually green leaves. Essentially a reduction of chlorophyll levels often as a result disease or nutrient deficiency.

Co-dominant stems - A growth characteristic, where two or more stems of similar size grow from the same point. Can create an inherent weakness.

Compaction - The compressing & hardening of soil around tree root systems, due to vehicular/pedestrian use etc. Loss of pore space between soil granules limits water movement and gaseous exchange, and inhibits root growth.

Competent person – Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached

Note 1 A competent person understands the hazards and the methods to be implemented to eliminate or reduce the risks that can arise. For example, when on site, a competent person is able to recognise at all times whether it is safe to proceed.

Note 2 A competent person is able to advise on the best means by which the recommendations of this British Standard may be implemented.

Condition – Assessment based on a visual and professional view giving consideration to many factors such as tree health, structural integrity and suitability of its position.

Construction Exclusion Zone – Area based on the RPA (in m²), identified by an arboriculturist, to be protected by development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.

Coppice - The method of managing trees by cutting the stems at between 1.0 inch and 1.0 foot from the ground level on a regular cycle, the cut stumps of the trees or shrubs are allowed to re-grow many new stems.

Crown spread - Gives distances between extreme limits of the crown and the stem, usually along the four compass points. Helps to show crown symmetry.

Crown Reduction – The removal of branch ends to reduce the extreme limits of a trees branch spread and height.

Crown Thin – The removal of selected branches within the crown to thin the internal branch structure.

D.B.H. - 'Diameter at Breast Height', an industry standard to gauge tree stem size and development. Within arboriculture, breast height is taken to be 1.5m above ground level.

Dieback - The reduction in crown vigour and extension growth progressing to death of distal parts; often associated with decline.

Epicormic/adventitious growth - New growth from dormant buds that can often form tenuous attachments. Although some species readily form such shoots, it can be an indication of stress.

Feathered Whip – Size of tree for planting, usually ranging from 1.25m to 2.5m in height.

Form - A general assessment of the shape and position of the tree within its' environment.

Frass – Debris such as bore dust left by wood boring insects.

Hanger – Term used to describe a branch that has become detached and is being supported by other branches. Can be a hazard to persons and property below.

Hazard Beam – After the loss of a distal part, a limb concentrates growth upwards creating adverse end weights that can render the limb susceptible to failure.

Heavy Standard – Size of tree for planting, usually above 3.5m in height.

Included bark – Growth characteristic usually caused when two or more stems/branches growing in close proximity 'fuse' together entrapping the bark from when the parts were separate in the middle, creating a structural weakness.

Meristem - The undifferentiated plant tissue from which new cells are formed, such as that at the tip of a stem or root.

Meristematic Disorder – A growth disorder caused by a disruption of the meristem (see above) from any of a number of biotic factors (see above). Manifests as growths such as 'Witches Brooms' & 'Galls'.

Necrosis/Necrotic – Death of tissues usually characterised by a blackening in colour.

Occlusion/Occluded – Normally used to describe the overgrowth of a wound. Also, immovable foreign objects in contact with a tree part can become encased or 'occluded' by the tree as it grows incrementally.

Pathogen - An agent that causes disease, especially a living microorganism such as a bacterium or fungus.

Plasticity index - The table used to calibrate the shrinkability of a clay soil.

Pollard – The removal and subsequent regular re-removal of the crown of a tree above animal browsing height. Can be an effective method of controlling the size of trees in urban areas. This is ideally begun in the trees early stages and maintained throughout its life.

Reaction wood - Essentially additional wood laid down by the tree to compensate for structural defects such as cavities.

Ring barking/Girdling – the removal of bark around the entire circumference of a stem or branch, causing the death of all distal parts.

Root Protection Area (RPA) – Layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree, shown in plan form in m².

Saprophyte – An organism which exists on dead plant material.

Scaffold branches - The main structural branches within the crown.

Services – Any above ground and piped and/or ducted underground infrastructure including water main, electricity supply, gas supply, fibre optic utilities, telecommunications cabling, storm and foul water drainage, including temporary storage for run-off, pumping stations, interceptors and other allied buried structures.

Shrinkable clay – Clay soil which alters in volume depending on moisture content. Property sited on shrinkable clay can suffer subsidence damage due to soil desiccation; this can be due to the water uptake of nearby vegetation, including trees.

Special engineering – design of a structure with the physiological requirements of trees as the priority.

Standard – Size of tree for planting, usually ranging from 2m to 3.5m in height.

Structure – Man-made object, such as a building, carriageway, path, wall, services, and built and excavated earthworks.

Transplant – (1) size of tree for planting, usually ranges from 0.2m to 0.9m in height (2) the relocation of a tree or shrub including a given portion of the root system.

Tree Constraints Plan (TCP) – Plan prepared by an arboriculturist for the purposes of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on layouts through shade, dominance, etc.

Tree Protection Plan – scale drawing prepared by an arboriculturist showing the finalised layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS), which can be shown graphically.

U.L.E – ‘Useful Life Expectancy’ is an estimate based on currently known factors of the possible remaining life of the tree as an asset.

Veteran tree – Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Vigour - A general classification, as to the present and future potential growth and development of a tree. A comment regarding the health status of the tree specific to its species.