



**DALCOUR
MACLAREN**

Arboricultural Impact Assessment and Method Statement

Client: National Grid Energy Distribution (NGED)

Project: EP -Holbeach Primary Substation 22007610

Date: August 2023



Project Details

Project Name	EP Holbeach Primary Substation
Scheme Number	22007610
Report Number	01

Prepared by	
Name	Alex Finn (Treetec Consultancy Limited)

Approved by	
Name	Lucy Davies (Senior Planner)

Contents

1	Introduction.....	5
1.2	Scope.....	5
1.3	Personnel.....	6
1.4	Brief site description.....	6
1.5	Protective status of trees and Hedgerows.....	6
2	Methodology.....	8
3	Plans.....	9
3.1	Tree Constraints Plan.....	9
3.2	Tree Protection Plan	9
4	Proposed Work.....	10
5	Observations.....	11
6	Tree Survey	12
7	Arboricultural Impact Assessment.....	13
7.2	Trees to be removed.....	Error! Bookmark not defined.
8	Arboricultural Method Statement	14
8.2	Tree Protection Fencing	14
8.3	Temporary ground protection.....	15
8.4	Tree Surgery Work	15
8.5	Utilities	15
8.6	Changes in drainage or water runoff within the RPA.....	17
9	Scheduling of Work.....	18
10	Summary and Conclusions.....	20
11	Closure	21

Appendices

Appendix 1	Cascade Chart for Tree Quality Assessment
Appendix 2	RPA Protective Fence Detail
Appendix 3	Extract from NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees
Appendix 4	BS5837 Recommendations for the use of Scaffolding within the Root Protection Areas (RPA's) of trees- (temporary ground protection)
Appendix 5	Glossary of Terms

Drawings

Drawing No.	Title
Tree Constraints Plan Drawings 21.1	Tree Constraints Plan
Tree Protection Plan Drawings 3.1	Tree Protection Plan

1 Introduction

- 1.1.1 Dalcour Maclaren has instructed Treetec Consultancy Limited (Treetec), on behalf of National Grid Electricity Distribution (NGED) to identify and assess the significant trees that could be influenced by proposals to construct a new primary substation site.
- 1.1.2 The purpose of this report is to inform the proposed works by advising on the location and extent of Root Protection Areas (PRAs) in order to minimise the risk of damaging significant trees which are identified to be of amenity value. Where trees cannot be retained, they will be shown as being removed but this will only be considered where there is no other alternative or the trees are in such a condition that their retention is not desirable.
- 1.1.3 This will be by means of an Arboricultural Impact Assessment (AIA) and an Arboricultural Method Statement (AMS), outlining how NGED will safeguard the tree roots whilst the works are implemented.
- 1.1.4 An Arboriculturist from Treetec visited the site on the 10th of May 2023 and surveyed all the significant trees which are considered at risk of being influenced by the proposed work.
- 1.1.5 The weather conditions during the site survey were showery but mild.

1.2 Scope

- 1.2.1 The survey identifies and advises on the general condition and amenity value of significant trees and vegetation situated within the influence of the proposed “development”, including any adjacent trees that may be affected.
- 1.2.2 British Standard BS5837:2012 “Trees in relation to design, demolition and construction, Recommendations” has been used as the basis for the assessment. The information contained in this survey will be used to ensure that the decisions made in respect of future development proposals take into account the tree resource. Trees worthy of retention and which are beneficial to the screening and the softening of the site have been identified. Conversely, less valuable trees, which are of lower importance due to their poor condition or for other reasons, have also been identified; these trees may be considered as suitable candidates for removal.
- 1.2.3 Where trees are located on third party land or are found to be inaccessible due to ground conditions, all measurements are estimated.
- 1.2.4 It is important that this survey is referred to prior to the commencement of any works. The main priority being the protection of those trees identified within this report which are considered to be of amenity value, which are to be retained or are in third party ownership and where they are found to be designated with a Tree Preservation Order (TPO).

- 1.2.5 In general, only trees which are in excess of 150mm dbh are included in the survey.
- 1.2.6 Based on the information and instruction provided by the client, trees considered to be outside of the zone of influence of the development have not been included in the survey and are not recorded on the associated tree survey plans.
- 1.2.7 Where there are trees which have not been included on the original base topographical survey and it is considered necessary to include them, then these have been marked onto the tree survey plans in their approximate positions only and marked “AP” (approximate position). The positions of the trees should therefore be used for reference and general guidance only. Where works are likely to impact upon a tree’s health, then it will be necessary to carry out further surveying work to confirm their exact positions in relation to the development.

1.3 Personnel

- 1.3.1 This report has been prepared by Alex Finn, Principal Arboriculturist at Treetec Consultancy Limited.

1.4 Brief site description

- 1.4.1 The site is located within mainly an arable setting to the southeast of Holbeach. Access is via the public highway of Branches Lane which is located directly to the east of the site.
- 1.4.2 The proposed area for the new substation is located in the southeast corner of a large arable field, which forms the north and western boundaries with Branches Lane to the east, and a row of deciduous trees identified as G3 immediately to the south.
- 1.4.3 The trees to the south are considered important due to the amenity they provide. Furthermore, in particular to the proposed works, they will provide natural screening to the new substation from the south.

1.5 Protective status of trees and Hedgerows

- 1.5.1 Local Councils are able to make TPOs in order to protect trees or woodlands they consider are of amenity value. As such, trees may legally be protected by a TPO or due to their location within a Conservation Area.
- 1.5.2 There is a potential for unlimited penalties to be applied for illegally carrying out works to protected trees without formal permission to do so.
- 1.5.3 It is advised that enquires are made to the local authority if there is a requirement to remove or prune them (including roots) prior to planning permission being granted, to ascertain if they are covered by a TPO or are

located within a Conservation Area (South Holland District Council 01775 761161 info@sholland.gov.uk).

- 1.5.4 Before works commence, permission must be granted unless it forms part of an approved planning application. Where planning permission has been granted but there is a change to the proposed work, it will still be necessary to notify the council for formal permission to do so.
- 1.5.5 Where important hedgerows, or sections of important hedgerows are to be removed and this has not been approved during the planning approval process, it will be necessary to notify the LPA by submitting a Hedgerow Removal Notice as required by the 1997 Hedgerow Regulations.
- 1.5.6 Not all hedgerows are considered as important, and it is advised that further reference to the Hedgerow Regulations 1997 is consulted in the first instance.
- 1.5.7 Where an excess of 5 cubic metres of timber requires felling in any calendar quarter, it will be necessary to obtain a Felling Licence from the Forestry Commission. There are some exemptions to this for dead, dying and dangerous trees and this will only be necessary prior to planning consent or where planning consent is given but there is a change in the proposals.

2 Methodology

- 2.1.1 All of the trees in this survey have been assessed from ground level individually with the aid of the Cascade Chart for Tree Quality Assessment BS 5837:2012 (see Appendix 1).
- 2.1.2 Trees that have been recorded have been given a reference number which can be found within the Tree Survey (refer to Section 6) and on the supplied drawings.
- 2.1.3 Assessment is based mainly around the useful life expectancy of the tree(s) and their condition and contribution (amenity value) to the area, which has been categorised using four letters and four colours, the values of which are shown on the (Appendix 1) Cascade Chart for Tree Quality Assessment. The letters have then been divided further using one to three sub-categories under one of three sub-headings.
- 2.1.4 All the colour categories and reference numbers have been marked onto the Tree Constraints Plan (TCP) and the Tree Protection Plan (TPP).
- 2.1.5 Branch spread in general has been measured on four sides and recorded together with confirmation on which side of the tree the measurement was taken.
- 2.1.6 Stem diameters have been generally measured at 1.5m above ground.
- 2.1.7 Current tree heights have been measured using a SUUNTO Height Meter PM-5/1520, serial number 823208, except where trees are inaccessible when estimated measurements have been recorded.
- 2.1.8 Where it has not been possible to gain direct access to the trees, due to local constraints i.e., impenetrable vegetation or trees located in private properties, field data has been estimated and is referenced by a letter rather than a number.
- 2.1.9 If base topographical plans are not available or additional trees are added, it may be necessary to calculate the approximate position of these trees. Where this occurs trees will be marked with the letters “AP” (Approximate Position).
- 2.1.10 Where groups of trees or areas of woodland are surveyed, average measurements have been recorded in respect of crown spread and height. However, in order to calculate an adequate linear RPA, the largest stem measurements have been taken from the trees closest to the development.

3 Plans

3.1 Tree Constraints Plan

- 3.1.1 The Tree Constraints Plan (TCP) shows the RPAs for each tree or group of trees. These areas are calculated using the tree's trunk diameter which is generally measured at 1.5m above ground level (reference Annex C BS5837:2012). Once calculated the measurements provide a minimum area around the tree which should be left undisturbed during the development, in order to remove the risk of decline and ensure the survival of the trees.
- 3.1.2 There is also scope to carry out some construction works within the RPA using proven measures; however, these should be avoided if at all possible. Where these methods are required, they will be recommended within an Arboricultural Method Statement (AMS) which may be required once the development design has been finalised and planning permission has been consented.
- 3.1.3 Where tree canopies extend further than the RPA, care will be needed not to damage these during construction. Some pruning back may be accommodated where this is an issue. All work, however, should only be carried out after further assessment and advice from the project Arboriculturist and in accordance with BS 3998:2010 "Tree work Recommendations" or latest research and revisions.

3.2 Tree Protection Plan

- 3.2.1 A Tree Protection Plan (TPP) has been included with this report which is represented as a draft plan on a separate plan to the TCP. This plan shows the precise location and specification of the erection of protective fences and any other relevant physical protection measures including ground protection to protect the RPA (construction exclusion zone).
- 3.2.2 Specifications in respect of recommended protective fencing can be found in Appendix 2 at the end of the report.

4 Proposed Work

- 4.1.1 NGED are proposing to construct a new primary substation on land located to the west of Branches Lane, South Holland, Lincolnshire, PE12 8PD (NGR 36964 23463). The site is currently used for agriculture; therefore, a full planning application is required for the change of use of the land for operational purposes.
- 4.1.2 Due to the concern of possible damage to the health of existing trees, as a result of the development, it is essential to adopt suitable precautions to remove the risk of any damage.

5 Observations

- 5.1.1 It is observed that there are a small number of trees that are of risk of damage as a result of the proposed works. The tree survey has identified a row of category B trees, which are of particular amenity value in the landscape and are considered of longevity. It is especially important, therefore, the recommended mitigation for works within the RPAs of the trees is adopted to prevent deterioration in their health and stability.

6 Tree Survey

6.1.1 All the site information used for the assessment and grading of the individual trees and groups has been recorded into the following Tree Survey Table using the Cascade Chart for Tree Quality Assessment BS 5837:2012 (Appendix 1) from which the table template has also been taken.

Table 1: Tree Survey Table

Tree reference number	Species	Height (m)	Stem Diameter m	No of stems	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Preliminary management recommendations	Estimated remaining contribution	Category grading
T1	Ash, sycamore, English oak, cherry, lime, hawthorn.	12	300	1	2.5	2.5	2.5	2.5	0.01	SM	Good	Good	None	20+	B2

7 Arboricultural Impact Assessment

7.1.1 After identifying the position of the trees and calculating the RPAs, the footprint of the proposed works has been overlaid onto the TCP to enable possible areas of conflict to be identified. Trees which could potentially be impacted upon have been identified using this approach which, where practical, will allow mitigation or changes to the final design layout. Where trees or hedges cannot be retained for any reason, they have been identified for removal on the TCP.

7.1.2 Damage to trees can be commonly caused by:

- Compaction around the trees, causing asphyxiation and a reduction in the availability of water and minerals to the roots;
- Physical damage to the roots by cutting and severing or removal of bark;
- Spillage of contaminants;
- Physical damage to the stem and branches.

7.1.3 The effects of the damage may not be immediately apparent. Often it is the case that the tree does not show any symptoms until after the first year. Such symptoms may range from dieback in the crown to deterioration and ultimate death, depending upon the severity of the damage and the ability of the roots to recover and regenerate.

7.1.4 Due to the nature of the work, it is likely that the health of some of the retained trees will be at risk where RPAs are identified as of being affected due to one or more of the following activities:

- Construction of the new electricity substation;
- The use of areas of land outside the immediate working areas for activities such as vehicular access, parking, storage or other construction purposes; and
- Cutting back of low canopies that extend over the site.

7.1.5 It will therefore be necessary to carry out preventative measures to reduce and mitigate damage to trees which are considered to be of value and are deemed practical to be retained.

7.2 Trees to be removed

7.2.1 From the initial site visit, it was found that in the vicinity of the works that there is only one small group of trees (G3), located on the south side of the site. From the plans provided, it does not appear that there will be the need to remove any trees, subject to appropriate protective mitigation being implemented (refer to the AMS in section 8.00).

8 Arboricultural Method Statement

- 8.1.1 It is identified above in section 7.1, that the health of some of the trees in G1 are in danger of being compromised by the proposals to install a new electricity substation, where there is possibility of conflict with their RPAs.
- 8.1.2 In order to minimise any damage from compaction and/or cutting and severing of roots, it will be necessary to ensure protection is adopted to separate the development area from their RPAs. This will be in the form of protective fencing which must be erected prior to works commencing and only removed once all works have been completed (refer to section 8.2 below).

8.2 Tree Protection Fencing

- 8.2.1 Before any materials or machinery are brought onto site and before any excavation and construction work commences, it will be necessary to erect protective fencing around the trees which are to be retained and deemed to be at risk of damage. The positioning of the fencing is shown on the enclosed TPP reference drawing 3.1.
- 8.2.2 Once erected, protective fencing and any ground protection must be regarded as sacrosanct and must not be removed or altered without the prior approval of the project Arboriculturist, or where there is proposed work within these areas and special approved construction and working methods are approved. In areas where this is found to be necessary, alternative routing for protective fencing is detailed on the TPP, to allow the work to be completed.
- 8.2.3 Further advice from the project Arboriculturist will be necessary where alternative approved methods of installation are implemented, and repositioning of fencing is not detailed on the TPP.
- 8.2.4 The protective fencing must remain intact for the duration of the works, and should any breaches occur during this period then work must be stopped until repairs can be completed.
- 8.2.5 Once construction of the substation has been completed, when it is necessary to remove fencing in order to facilitate soft landscaping, it is important to ensure that heavy machinery is not used within the RPAs unless suitable ground protection is provided, following further consultation with the project Arboriculturist.
- 8.2.6 The type and specification of protective fencing is determined by the site suitability. Recommendations for this project can be found in Appendix 2.

8.3 Temporary ground protection

- 8.3.1 Temporary ground protection must be adopted where it is necessary to provide a working platform within RPAs.
- 8.3.2 For temporary protection against heavy traffic and mobile plant, the use of a breathable geotextile membrane overlaid with proprietary systems or pre-cast reinforced concrete slabs or steel plate must be utilised. However, where there is only light traffic, other forms of ground protection may be used subject to approval of the project Arboriculturist. This may be in the form of scaffold or plyboards laid on a wood chip layer on top of a geotextile membrane (ref Appendix 4).

8.4 Tree Surgery Work

- 8.4.1 Before any work commences, it will be necessary to produce a schedule which details the tree work which will be required in order to implement the proposed works. This work is likely to be restricted to lifting or cutting back of low canopies of trees where they are found to be at risk of damage by large machinery.
- 8.4.2 All work must be carried out by a competent tree surgeon to British standard recommendations BS 3998:2010 Tree work- Recommendations or as modified by more recent research. It is advisable to select a contractor from the local authority list and preferably one approved by the Arboricultural Association. Telephone 01242522152, website www.trees.org.uk/contractors.htm
- 8.4.3 Their Register of Contractors is available free from The Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire GL10 3DL.

8.5 Utilities

- 8.5.1 The exact location of any proposed or existing utilities was not available at the time of this survey. It is however advised that where possible, any new utilities are located beyond the RPAs of the identified trees and where applicable, any old utilities left in situ are undisturbed.
- 8.5.2 Where it is unavoidable, and utilities are proposed to be sited within RPAs, it will be necessary to consider the effects that the installation may have on their health. Utilities should only be installed where approved mitigation can be adopted.
- 8.5.3 In these circumstances, where practical, it will be necessary to minimise root damage using broken trench or directional drilling (trenchless) techniques. These should be located at a minimum depth of 1m below ground level, and all receptor pits, where direct drilling is used, must be placed outside RPAs

(refer to extract of Volume 4 National Joint Utilities Group Guidelines Appendix 3).

- 8.5.4 As an alternative to trenchless techniques, which should only be adopted where less invasive methods cannot be used, a possible solution is to hand excavate any trenching. These excavations must be carefully dug using hand tools, in order to avoid any damage to the protective bark covering of larger roots or worse severing of roots. It may be necessary, in long stretches where there are concentrated areas of roots, to use a soil vacuum to remove the surrounding soil. If this is found to be the case, then it is recommended that further advice is sought from the project Arboriculturist.
- 8.5.5 It is important to ensure most roots with a diameter of 25mm and greater are retained, as well as most of the finer roots. It is appreciated that it is not always possible to avoid the removal of some of the finer roots, but this must be kept to a minimum. Where these roots must be cut, then this should extend back to a side root and be undertaken using a sharp tool such as secateurs or a sharp hand saw, to leave the smallest possible wound.
- 8.5.6 Immediately following excavation, all retained exposed roots must be covered and wrapped in damp hessian which must not be allowed to dry out until back filling is carried out. Where back filling is carried out soils must only be lightly compacted and should be backfilled in the order the soil types were excavated.
- 8.5.7 Where inspection chambers and manholes are to be installed, these must ideally be located outside the RPAs of the retained trees to avoid unnecessary damage to tree roots. However, if it is unavoidable or it is necessary to make improvements to existing manholes within RPAs, it will be necessary to consult further with the project Arboriculturist, but generally the same methodology above in protecting roots should be adopted.
- 8.5.8 It is advised that prior to any development, at the pre-commencement meeting, the final route of utility runs, launch and receptor pits and mitigating installation techniques are confirmed, and then approved by the project Arboriculturist and/or the Local Planning Authority (LPA) where relevant.
- 8.5.9 Where existing utilities are found within the RPAs of retained trees, and it is required that they are removed, it will be necessary to consult further with an Arboriculturist to prevent damage to the trees, but in general these should be left in situ where it is possible to do so.

8.6 Changes in drainage or water runoff within the RPA

- 8.6.1 Where it is necessary to divert water away from trees, for example because of changes in drainage run off, consideration should be given to installing irrigation systems to replace natural water sources.
- 8.6.2 This also applies where water is inadvertently directed to trees, which could saturate soils and cause water logging, ultimately ending with reduction of trees health and possibly causing the tree(s) to die. In this case water should be allowed to drain away before it reaches the tree(s). If either of these are found to be a possibility, it may be necessary to consult further with the project Arboriculturist for advice.

9 Scheduling of Work

- 9.1.1 It is essential that a pre-commencement meeting is held on site before any of the construction work begins. This must be attended by the site or project manager/operator, the project Arboriculturist and if requested a Council representative. If a Council representative is not present, where requested the project Arboriculturist must inform the Council, in writing, details of what was discussed and agreed during the meeting.
- 9.1.2 All tree protection measures detailed in this report must be fully discussed so that all aspects of their implementation and sequencing are understood by all the parties. Any clarification or modifications must be recorded and circulated to all parties in writing. It may be appropriate for the tree surgery contractor to also attend this meeting should it be necessary to carry any identified tree surgery works.
- 9.1.3 It will be necessary thereafter to monitor and assess the development throughout the construction period. Provided the guidelines are followed then it is considered that trees shown for retention on the TPP can be retained with minimal damage to their health.

Table 2: Guidance of scheduling of works in order to protect trees to be retained.

Timescale	Task	By whom / responsibility
Pre-development approval	Submission of AMS and final TPP (where applicable) Amendments made as necessary	To be arranged by the NG with the project Arboriculturist
Post approval and predevelopment	Pre commencement meeting with all relevant parties Methodology and location of protective fences agreed	To be arranged by the site operator/project manager with project Arboriculturist
Predevelopment	Preliminary tree work specification drawn up, approved and sent for tender.	As above with the project Arboriculturist
Predevelopment	Pre-construction and installation tree work implemented and supervised	As above
Predevelopment	Protective fencing erected	As above

Timescale	Task	By whom / responsibility
During development	Carry out supervisory visits as agreed and report findings and recommendations	As above
Post development	Inspect retained trees and carry out remedial tree work as necessary. Remove protective fencing and carryout soft landscaping where required	As above

10 Summary and Conclusions

- 10.1.1 NGED propose to construct a new primary substation on land to the west of Branches Lane.
- 10.1.2 Due to the presence of a group of semi-mature trees (G3), it will be necessary to ensure that precautions are taken to remove the risk of inadvertent damage to the trees in the group, which are of considered of amenity value.
- 10.1.3 Some minor pruning to the canopies of trees maybe required where they extend into the working area(s) and are at risk of being damaged by machinery. A schedule of required tree surgery will therefore need to be prepared and approved prior to any works being carried out.
- 10.1.4 It is, however, unlikely these works will have a significant impact on the health and appearance of the trees.
- 10.1.5 In conclusion, provided the protective measures are followed within this AMS, it is reasonable to conclude that the proposed work will not be detrimental to the health of the trees.

11 Closure

- 11.1.1 This report has been prepared by Treetec Consulting Limited with all reasonable skill, care, and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.
- 11.1.2 This report is for the use of DM and their clients; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from Treetec.
- 11.1.3 Treetec disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

Appendices

Appendix 1: Cascade Chart for Tree Quality Assessment

Table 1 Cascade chart for tree quality assessment

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

BS 5837:2012

BRITISH STANDARD

Table 2 Identification of tree categories

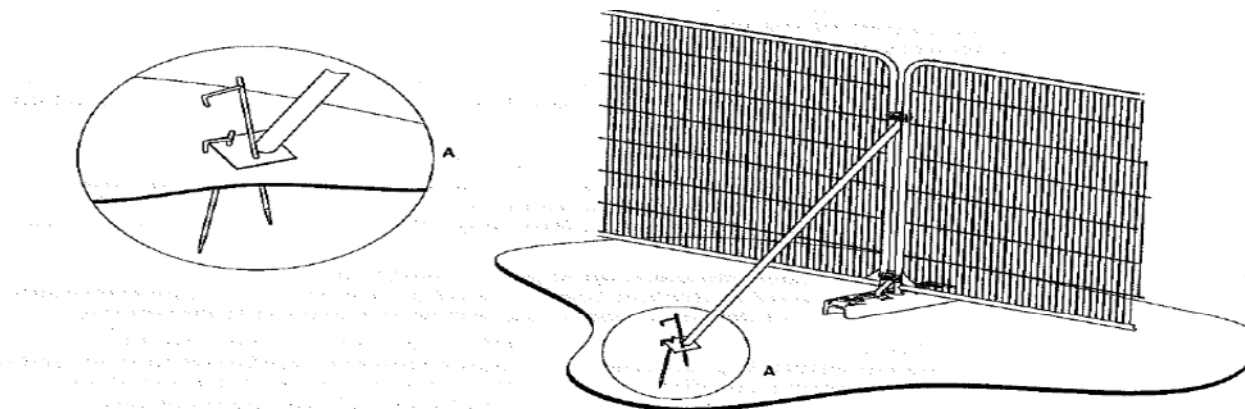
Category (from Table 1)	Colour ^{A)}	RGB code ^{A)}
U	Dark red	127-000-000
A	Light green	000-255-000
B	Mid blue	000-000-255
C	Grey	091-091-091

^{A)} Colours verified against <http://safecolours.rigdenage.com/palettefiles.html#files> [viewed 2012-03-26].

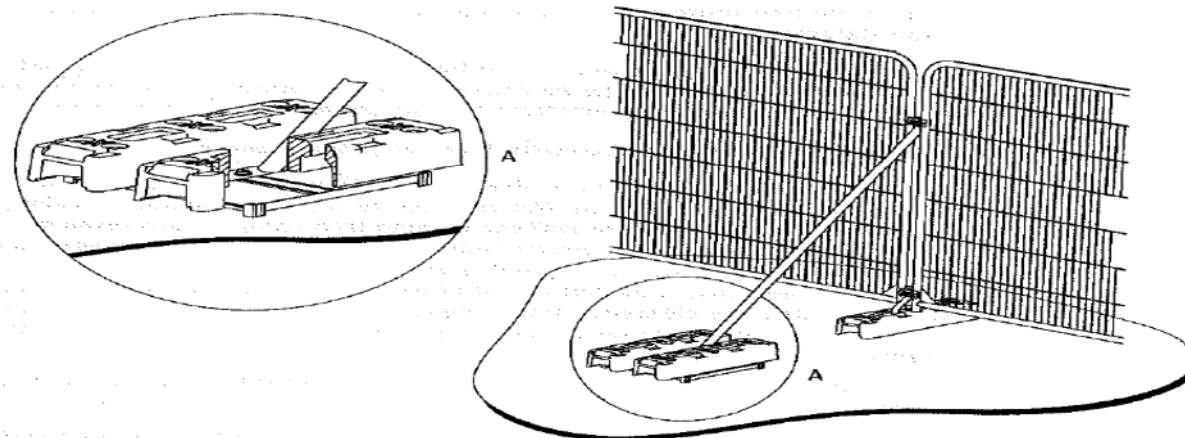
Appendix 2: RPA Protective fence Detail

BS5837 recommended protective fence.

Fence A-Heras type fence

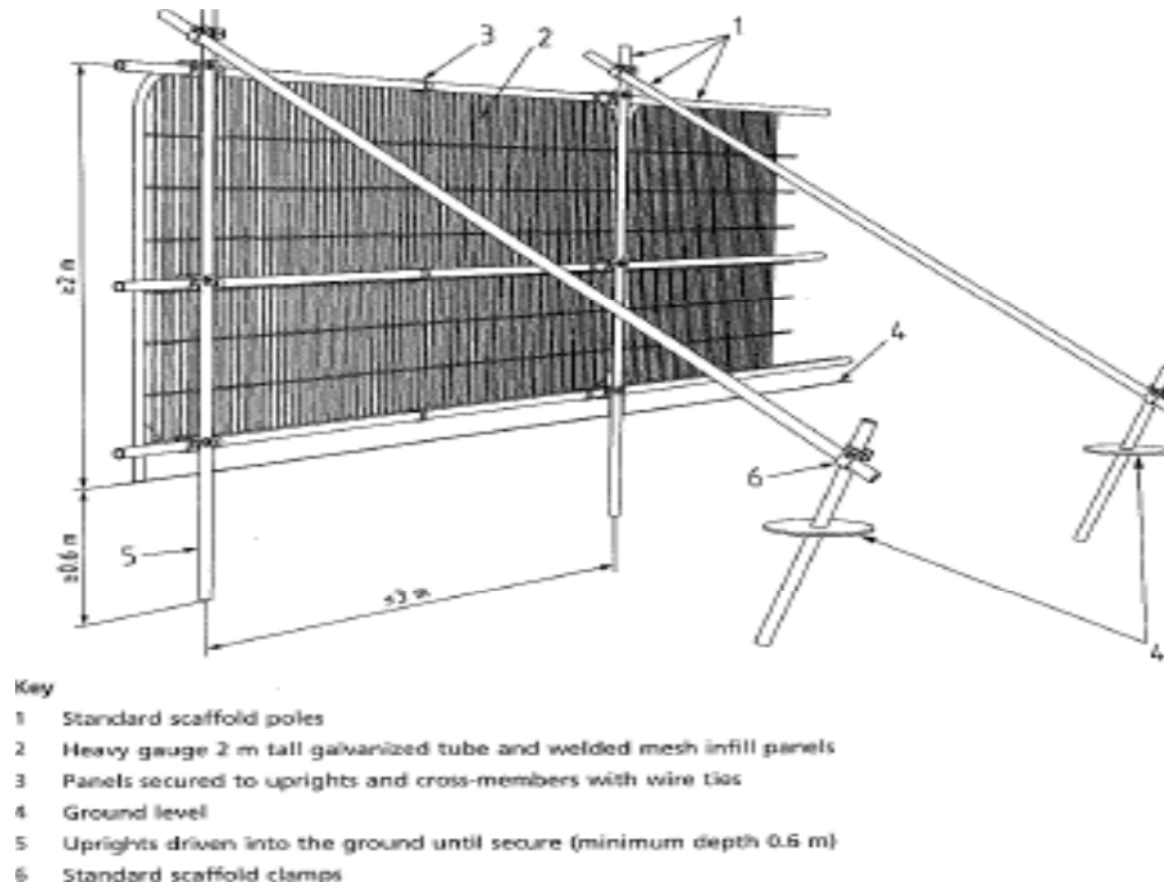


a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

Fence B Scaffolding with wire mesh protective fence



Appendix 3: Extract from NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees



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

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

4. HOW TO AVOID DAMAGE TO TREES

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

4.1 Below Ground

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

4.1.1 Fine Roots

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

4.1.2 Precautions

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

4.1.3 Realignment

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



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

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

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

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

Acceptable techniques in order of preference are;

a) Trenchless

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

b) Broken Trench - Hand-dug

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



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

c) Continuous Trench - Hand-dug

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

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

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

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

4.1.5 Backfilling

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – ‘Legislation and Bibliography’**). In England this relates to the requirements of the code of practice – ‘Specification for the Reinstatement of Openings in Highways’ approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.
- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder’s sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.
- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly “tamped” and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.



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

4.1.6 Additional Precautions near Trees

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.
- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

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

Appendix 4: BS5837 Recommendations for the use of Scaffolding within the Root Protection Areas (RPA's) of trees- (temporary ground protection)

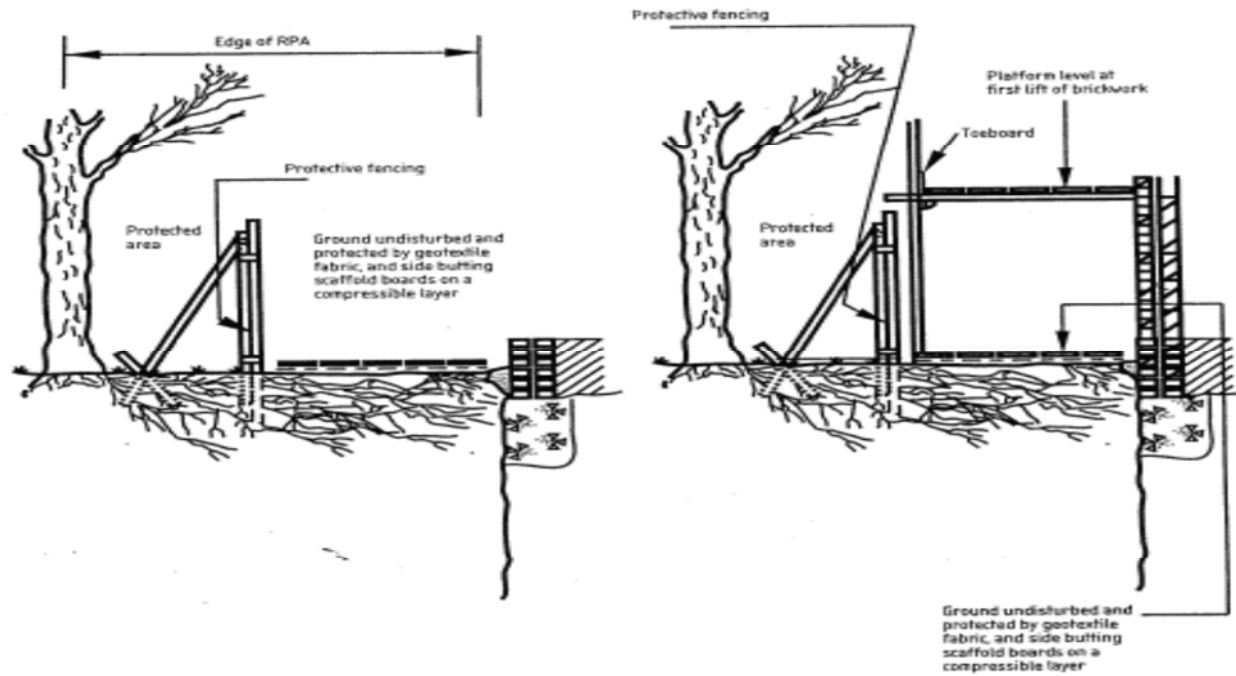


Figure 3 — Scaffolding within the RPA

The use of Scaffolding within the RPA

Appendix 5: Glossary of Terms

Arboricultural Implications Assessment (AIA) A 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) The methodology for the implementation of any aspect of development that has the potential to result in loss of or damage to a tree.

Construction Exclusion Zone Area based on the RPA (in m²), identified by an arboriculturist, to be protected during 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.

Crown or Apron clearance Height or spread in meters of the lowest significant branches above ground level.

Diameter Trunk diameter measured at 1.5 metres above ground level or at the base of trees where they are twin or multi stemmed.

DBH Diameter at breast height.

Height The height of a tree measure using a clinometer.

Management recommendations General comments on the condition of the tree, group or woodland and recommendations for future work.

Pruning The removal of living or dead parts of a plant or tree. Such parts may be soft growth, branches, limbs or sections of the trunk or stem.

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.

Species The species is based on visual field observation and lists the common name. On in depth surveys the botanical name is also listed.

Spread Measurement of the largest extent of the trees branch growth.

Structural condition Description of any decayed or physical defects.

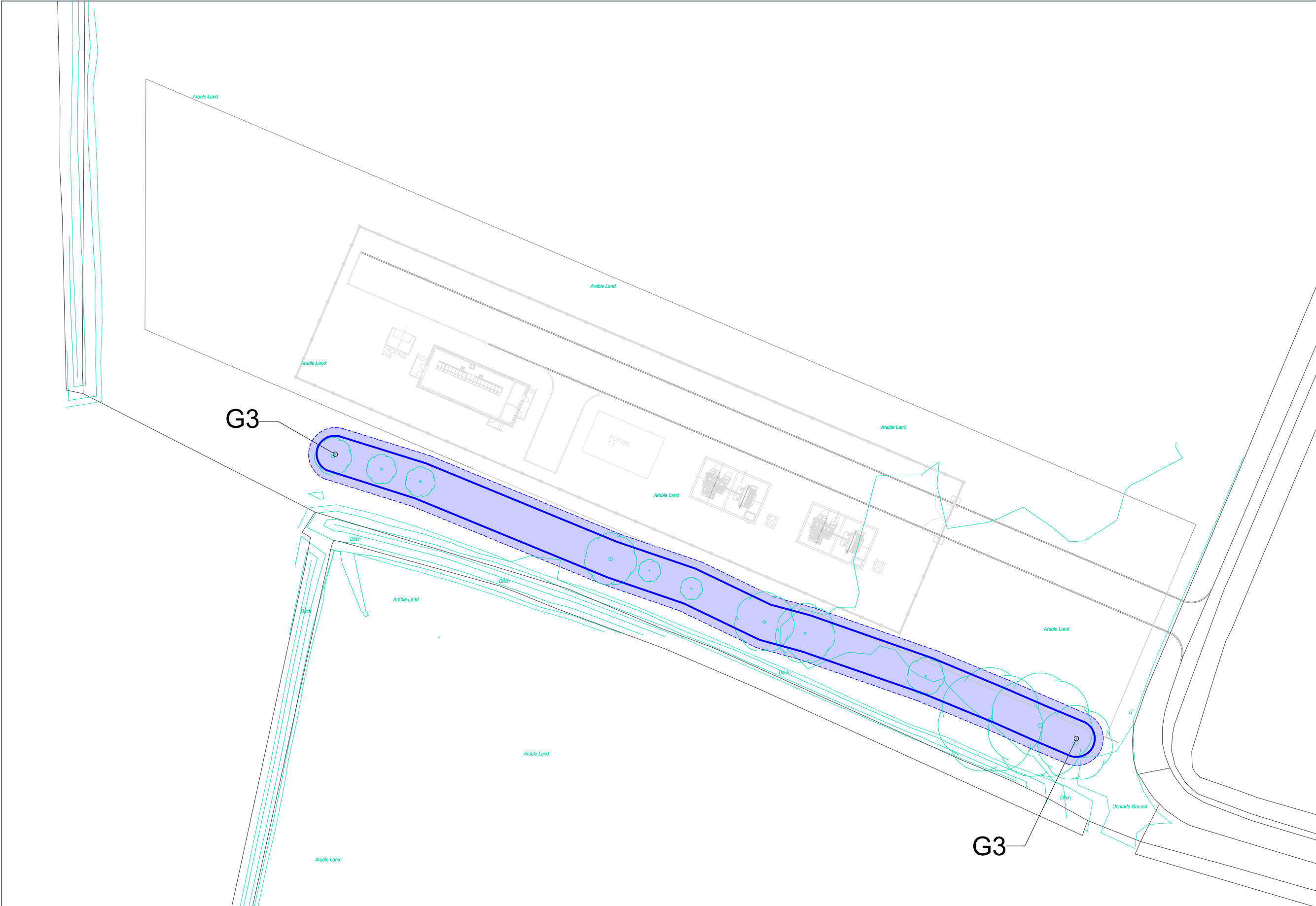
Tree Constraints Plan (TCP) Plan prepared by an arboriculturist for the purposes of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on layouts through shade, dominance, etc.

Tree Protection Plan (TPP) 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.

Tree Root Preservation Service (TRPS) A non-evasive foundation construction system designed to prevent damage to tree roots and adapted for specific site use in conjunction with an arboriculturist.

Drawings



Tree reference number	Species	Height (m)	Dbh	No of stems	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Preliminary management recommendations	Estimated remaining contribution	Category grading
G3	Ash,sycamore,English oak,cherry,lime,hawthorn	12	300	1	2.5	2.5	2.5	2.5	0.01	SM	Good	Good	None	20+	B2

- Key:
- Canopy Spread - Category B Tree
 - Minimum RPA - Category B Tree
 - Proposed Primary Substation

Notes:

Signed:

Date:

Interest:
N/A

Location:
Branches Lane, Cyprus Lodge, Fleet,
South Holland, Lincolnshire, PE12 8PD

Coords: 536923, 323411

Scheme Name:
EP - Holbeach Primary Substation

Drawing Name:
Tree Constraints Plan

Drawing No: 22007610_PLN_TCP_1.1

Rev	Date	Description
-	02.08.2023	First Issue

Drawn:	SG	
Approved:	LD/RH	
Sheet No:	1 of 1	
Sheet Size:	A3	

nationalgrid

The information contained in this document is confidential and protected by copyright. The use, copying or disclosure to a third party, either wholly or in part, except with the written permission of, and in the manner prescribed by National Grid PLC constitutes an infringement of copyright. Dalcour Maclaren does not warrant that this document is definitive nor free of error and does not accept liability for any loss caused or arising from reliance upon information provided herein. Although our best efforts have been made to ensure the accuracy of these plans, all measurements must be confirmed on site. BASED UPON THE ORDNANCE SURVEY MAP WITH THE SANCTION OF THE CONTROLLER OF HM STATIONERY OFFICE. CROWN COPYRIGHT RESERVED. OS LICENCE No. 100024241

Key:

- Canopy Spread - Category B Tree
- Minimum RPA - Category B Tree
- Proposed Primary Substation
- Temporary Protective Fence

Notes:

Signed:

Date:

Interest:

N/A

Location:

Branches Lane, Cyprus Lodge, Fleet,
South Holland, Lincolnshire, PE12 8PD

Coords: 536923, 323411

Scheme Name:

EP - Holbeach Primary Substation

Drawing Name:

Tree Protection Plan

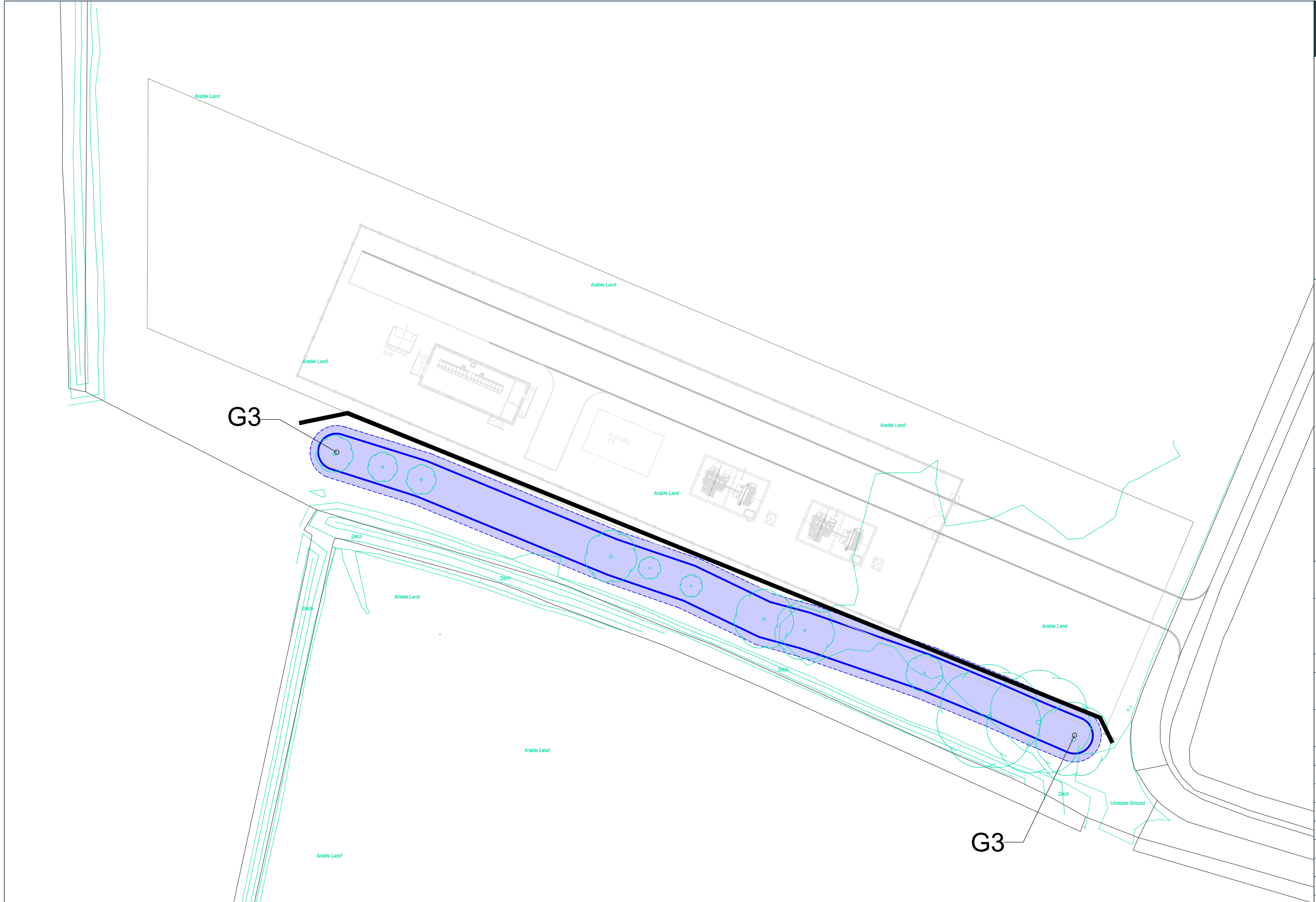
Drawing No: 22007610_PLN_TPP_3.1

Rev	Date	Description
-	02.08.2023	First Issue

Drawn:	SG	
Approved:	LD/RH	
Sheet No:	1 of 1	
Sheet Size:	A3	

nationalgrid

The information contained in this document is confidential and protected by copyright. The use, copying or disclosure to a third party, either wholly or in part, except with the written permission of, and in the manner prescribed by National Grid PLC constitutes an infringement of copyright. Dalcour Maclaren does not warrant that this document is definitive nor free of error and does not accept liability for any loss caused or arising from reliance upon information provided herein. Although our best efforts have been made to ensure the accuracy of these plans, all measurements must be confirmed on site. BASED UPON THE ORDNANCE SURVEY MAP WITH THE SANCTION OF THE CONTROLLER OF HM STATIONERY OFFICE. CROWN COPYRIGHT RESERVED. OS LICENCE No. 100024241





**DALCOUR
MACLAREN**

Midlands

4 Bredon Court
Brockridge Park
Twynning
Gloucestershire GL20 6FF

T: 01684 217 703

E: info@dalcourmaclaren.com

E: EPTeam@dalcourmaclaren.com

dalcourmaclaren.com

