

Scotland England Green Link 2 – English Onshore Scheme

High Level Arboricultural Impact Assessment

National Grid Electricity Transmission

Project number: 60633154

May 2022

Quality information

Prepared by	Checked by	Verified by	Approved by
Andy Wakefield Associate Arboricultural Consultant	Ollie Laycock, Senior Arboricultural Consultant	Thomas Fairhurst, Principal Arboricultural Consultant	Tom Cramond Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
00	26.05.2022	First Issue	26.05.2022	Tom Cramond	Associate Director

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

National Grid

Prepared by:

Andy Wakefield
Associate Arboricultural Consultant
T: +44 (0) 1256 310 496
M: 07741 940872
E: andy.wakefield@aecom.com

AECOM Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

© 2022 AECOM Limited. All Rights Reserved.

This document has been prepared by AECOM Limited (“AECOM”) for sole use of our client (the “Client”) in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

1.	Introduction.....	6
1.1	Background	6
1.2	Trees and the Planning Process.....	6
1.2.1	National Policy for Electricity Networks	6
1.2.2	Local Policy Context.....	7
1.2.3	Selby District Council Local Plan (2005).....	7
1.2.4	Selby District Core Strategy Local Plan (2013).....	7
1.2.5	East Riding Local Plan – Strategy Document (2016).....	7
1.3	Methodology	8
2.	General Arboricultural Principles	9
2.1	General Principles	9
2.2	Below Ground Constraints.....	9
2.3	Soils.....	10
2.4	Above Ground Constraints	10
2.5	Trees and Risk in the Context of Development	10
2.6	Trees and Wildlife	10
2.7	Statutory and Non-Statutory Designations	11
3.	The Proposed Development.....	12
4.	Arboricultural Impact Assessment	12
4.1	Purpose	12
4.2	Trees to be Removed	13
4.3	Tree Works	14
4.4	Incursions within the RPA or Canopy Spread	14
4.5	The Future Impact of Retained Trees	15
4.6	Tree Protection	15
4.7	Site Organisation, Storage and Use of Materials, Plant and Machinery.	15
4.8	Tree Planting	16
4.9	Services.....	16
5.	Conclusions.....	16
5.1	Issues to be addressed by an Arboricultural Method Statement:.....	17
	References.....	19
	Appendix A High Level Tree Constraints Plan and Converter Station Detailed Tree Constraints Plan	20
	Appendix B Converter Station Detailed Tree Survey Schedule.....	21
	Key to Abbreviations Used in the Survey	27
	Appendix C High Level Tree Removal Plan and Converter Station Tree Protection Plan	29
	Appendix D Outline Tree Protection Measures	30
D.1	Outline Tree Protection Measures	30
D.2	Ground Protection	30
D.3	General guidance for the management of exposed roots	31
D.4	Storage, use and mixing of materials	31
	Appendix E Tree Protection Signage (Example)	32

Figures

Figure 1 Default specification for protective barrier	30
---	----

Tables

Table 1: BS5837:2012 Tree Categorisation process	9
Table 2: Summary of Removals, Incursions and Pruning to Facilitate the Scheme.....	13
Table 3: High Level Summary of Removals for wider Scheme.....	13

1. Introduction

1.1 Background

AECOM has been instructed by National Grid Electricity Transmission (The Applicant) to carry out a high-level assessment of the likely arboricultural impacts of the onshore components of the Scotland England Green Link 2 (SEGL2) project in England, also referred to as the English Onshore Scheme (hereafter referred to as ‘the Site’ and ‘the Scheme’) including a detailed assessment of arboricultural impacts at the converter station site (hereafter referred to as ‘the Converter Station Site’).

The high level elements of this assessment are intended to provide information on the likely extent of tree loss to facilitate the Scheme and to form the basis of further more detailed assessment in the future.

1.2 Trees and the Planning Process

The National Planning Policy Framework (NPPF) seeks to ensure that new development is sustainable and underlines the importance of Green Infrastructure, of which trees form an integral part. This encompasses recognition of the importance of trees in relation to the management of air, soil and water quality along with other associated ecosystem services and climate change adaptation. The NPPF also seeks to achieve the protection and enhancement of landscapes and a net gain in biodiversity. Finally, it specifically identifies veteran and ancient trees and woodland as a highly valuable and irreplaceable habitat.

BS5837 provides a framework which sets out how trees should be considered in this context and also explicitly applies to development where planning consent is not required.

BS5837 recommends that a tree survey is undertaken to identify the quality and benefits of trees and the spatial constraints associated with them. This is then used to produce a Tree Constraints Plan showing the above and below ground constraints associated with trees. This drawing is used to inform the design process and to allow the retention of good quality trees where appropriate.

An Arboricultural Impact Assessment is then developed to identify the likely direct and indirect impacts of a proposed development, and a Tree Protection Plan is prepared to identify trees to be removed or retained and to illustrate how retained trees are to be protected. An Arboricultural Method Statement is often required as a condition of planning consent to detail how sensitive operations are to be achieved in proximity to retained trees. These elements are the minimum normally required for a planning application and are intended to ensure both a sustainable and harmonious relationship between trees and new development

1.2.1 National Policy for Electricity Networks

The National Policy Statement for Electricity Networks Infrastructure documents EN-1 and EN-5 (2011) set out the national policy for energy infrastructure in relation to planning and design.

In terms of trees, document EN-1 draws reference to Ancient Woodland and Veteran Trees. Section 5.3.14 details that:

‘Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The IPC should not grant development consent for any development that would result in its loss or deterioration unless the benefits (including need) of the development, in that location outweigh the loss of the woodland habitat. Aged or ‘veteran’ trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. This does not prevent the loss of such trees where the IPC is satisfied that their loss is unavoidable. Where such trees would be affected by development proposals the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons why.’

EN-5 is focused predominantly on overhead transmission and the Holford Rules have limited value in relation to the routing of underground cables.

The Government announced a review of the current suite of energy NPS's in the Energy White Paper: Powering our Net Zero Future in December 2020. The Energy White Paper establishes the goal of a decisive shift from fossil fuels to clean energy, in power, buildings and industry, while creating jobs and growing the economy and keeping energy bills affordable. It addresses how and why our energy system needs to evolve to deliver this goal whilst retaining a secure and operable energy system. Policies EN-1 to EN-5 are being amended to reflect the policies set out in the White Paper and support the investment required to build the infrastructure needed to transition to net zero. '

1.2.2 Local Policy Context

The Scheme is located within two local authority districts. These are Selby District Council and East Riding of Yorkshire Council.

The relevant council websites each contain guidance on how the authority expects to see trees considered in relation to development and design. The relevant policies referring to trees are outlined in separate headings within this section according to the local authority district.

1.2.3 Selby District Council Local Plan (2005)¹

Policy ENV 1: Control of Development

'Proposals for development will be permitted provided a good quality of development would be achieved. In considering proposals the District Council will take account of:

5) The potential loss, or adverse effect upon, significant buildings, related spaces, trees, wildlife habitats, archaeological or other features important to the character of the area'

Policy ENV 11: Ancient Woodland

'Development will not be permitted where it is likely to cause loss of, or damage to, an ancient woodland, unless the reasons for the development outweigh the nature conservation value of the woodland.'

1.2.4 Selby District Core Strategy Local Plan (2013)²

Policy SP15: Sustainable Development and Climate Change B

'Design and Layout of Development states: In order to ensure development contributes toward reducing carbon emissions and are resilient to the effects of climate change, schemes should where necessary or appropriate: e) Include tree planting, and new woodlands and hedgerows in landscaping schemes to create habitats, reduce the 'urban heat island effect' and to offset carbon loss.'

1.2.5 East Riding Local Plan – Strategy Document (2016)³

Policy ENV 2: Promoting a high quality landscape

'Development proposals should be sensitively integrated into the existing landscape, demonstrate an understanding of the intrinsic qualities of the landscape setting and, where possible, seek to make the most of the opportunities to protect and enhance landscape characteristics and features. To achieve this, development should:

3) Ensure important hedgerows and trees are retained unless their removal can be justified in the wider public interest. Where important hedgerows and trees are lost replacements will usually be required.

4) Maintain or enhance the character and management of woodland where appropriate.'

The policies provide an insight into the value afforded to trees and woodland in the planning process and how the local authorities expect impacts on trees and proposed new planting to be managed.

¹ Selby District Council Local Plan (Adopted February 2005)
(https://www.selby.gov.uk/sites/default/files/Documents/local_plan_contents_part1.pdf)

² Selby District Core Strategy Local Plan (Adopted October 2013)
(https://www.selby.gov.uk/sites/default/files/Documents/CS_Adoption_Ver_OCT_2013_REDUCED.pdf)

³ East Riding Local Plan 2012-2029: Strategy Document (Adopted April 2016)
(<https://www.eastriding.gov.uk/EasySiteWeb/GatewayLink.aspx?allid=627778>)

1.3 Methodology

High Level Assessment:

The high-level tree constraints assessment has been based on Ordnance Survey base mapping, hedgerow data provided by AECOM Ecologists (Phase One Assessment) and the National Tree Map (NTM) data set (a proprietary dataset from Bluesky Ltd. which is based on LiDAR and aerial imagery and gives information on tree canopy spread and height).

Approximate tree height and canopy spread information taken from the NTM data set to allow an assessment of the typical approximate spatial constraints associated with trees. A notional buffer zone has been added around each tree to illustrate the maximum likely area of significant constraint associated with above ground (tree canopies) and below ground (tree roots) parts of trees.

The buffer is based on a large data set of trees surveyed in detail by AECOM which cross references recorded tree heights against stem diameter ranges. Stem diameter is the key metric used to determine the Root Protection Area (RPA - the notional key area of tree root development important for tree health and stability) and this approach allows for the calculation of an estimated stem diameter for each tree or group derived from tree height information recorded in the NTM data set. This buffer zone is intended as high-level guidance only based on our experience surveying trees and attempts to illustrate and account for the potential approximate area of constraint around each tree (which may be greater than the canopy spread shown in the NTM data).

Section 4.6.1 of BS5837 recommends that RPAs are capped at 707m² and this is equivalent to a circle with a radius capped at 15m for each individual tree and therefore the buffer zone is capped at this radius around the largest trees within the study area.

The assessment results and information in relation to statutory and non-statutory designations such as Conservation Areas, Tree Preservation Orders (TPOs) and designated Ancient Semi Natural Woodland have been incorporated into the High-Level Tree Constraint Plans, included as Appendix A.

Aerial Imagery and Google Street View have been reviewed in key areas (where available), as well as coordination with the project Ecologists and Lands Agents liaising with landowners where assumed tree cover has been determined to be formed of a variety of agricultural crops and is therefore discounted as tree cover/requiring removal for the scheme. This includes the area at Newsholme, to the South of the Scheme (Sheet 3 of the High Level Tree Constraints Plan), where willow crops are present for biomass.

Detailed Assessment (Converter Station):

A detailed tree survey to BS5837 was carried out for the Converter Station Site to the west of the Scheme.

The tree survey has been based on Ordnance Survey base mapping and the NTM data set and trees have been plotted indicatively with reference to GPS positions, site features and publically available aerial photography. As such all positions must be considered to be indicative only and the relative distances of features must be measured out on the Site.

The survey was otherwise conducted in accordance with the requirements of *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS5837)*.

The initial fieldwork was undertaken on 17th March 2022, during which time dimensional data and observational information were collected. A diameter tape measure was used to measure stem diameters where feasible.

The fieldwork informing this report has comprised a preliminary, non-intrusive, visual survey undertaken from ground level with the specific intention of evaluating the quality and benefits of trees on the Site.

Where further inspection is deemed appropriate to ascertain the condition of the tree or other arboreal features, this has been identified within the preliminary management recommendations. Average dimensions or dimensional ranges have occasionally been used, where appropriate, to best describe features.

A Detailed Converter Station Tree Constraints Plan showing the position of trees and the spatial constraints associated with them is included as part of the High Level Tree Constraints Plan in Appendix A of this report, which corresponds with the Detailed Tree Survey Schedule for the Converter Station presented in Appendix B.

The tree categorisation process recommended by BS5837:2012 is summarised in the table below and corresponds with the tree canopy outline shown on the Detailed Tree Constraint Plan included as Appendix A and the information in the Detailed Tree Survey Schedule included as Appendix B.

Table 1: BS5837:2012 Tree Categorisation process

Category	Definition
A	High quality, minimum of 40+ years remaining contribution
B	Moderate quality, minimum of 20+ years remaining contribution
C	Low quality, minimum of 10+ years remaining contribution
U	Unsuitable for retention, <10 years remaining contribution
1	Arboricultural value
2	Landscape value
3	Conservation or cultural value

2. General Arboricultural Principles

2.1 General Principles

Trees are dynamic living organisms which provide essential benefits to society and the wider environment. Any proposed development with the potential to impact on trees must take into consideration the value of trees on site; the impact of any proposed activity along with any potential future conflicts on the Site.

Suitable measures to safeguard retained trees or mitigate the loss of trees (to be removed) will need to be fully considered and may be subject to a condition of planning consent.

Tree branches and roots frequently grow across site boundaries and off-site trees can pose a significant constraint and should be carefully considered when assessing the developable space within a site.

2.2 Below Ground Constraints

Below ground tree roots and the soil environment in which they grow need to be protected if the tree is to be retained. Trees grow in association with fungi and other soil organisms which are of key importance to tree health. Roots are essential for anchorage, the uptake of water and nutrients, and the storage of energy (carbohydrates) for the future growth and function of the tree.

Roots can be damaged by physical severance or wounding (e.g. following excavation of the soil), which can lead to the development of decay and a decline in vitality and/or instability. Raising the soil level can bury tree roots at a depth where suitable conditions for growth are less available. Toxic materials discharged into the soil (such as cement based aggregates, fuel and chemicals) can lead to root death and dysfunction. Soils can be compacted to levels inhospitable to tree growth with even a single pass of machinery, regular pedestrian traffic or the storage of plant and materials. Relieving compaction can be problematic and may require costly remedial works. Changes in drainage/water levels can also have significant long-term impacts for tree health.

The effects of these incursions may take many years to manifest, with a resulting decline in amenity value and potentially the death or failure of the tree. It should be noted that older trees are particularly sensitive to damage and changes in conditions.

The RPA is a notional area considered to be the minimum zone that must be protected to avoid any adverse impacts on retained trees. This area is deemed to be particularly important for tree stability, growth, function and health. However, roots may extend far greater distances, with the distribution of the root system relating directly to the availability of suitable conditions for growth (namely oxygen, water and nutrients). It is generally accepted that tree roots are predominantly located in the upper 1000mm of soil; however, roots may develop at deeper levels where conditions allow.

RPA's are calculated for the detailed assessment as per BS5837: 2012 Annex C, D and Section 4.6 in the BS 5837 2012 Document.

The RPA of the existing tree stock is an important material consideration when considering site constraints and planning development activities. The RPA of significant trees on site must be determined via a detailed tree survey.

The default position must be that all development, including any associated services will occur outside the RPA's of retained trees. Where this is unavoidable, it may be appropriate to use special measures to install structures, services or surfacing within RPA's which allow the protection of roots and soil structure which are essential for tree growth and keep any incursion to a minimum.

Further steps to improve or increase the useable rooting area available to the tree may also be required.

2.3 Soils

On shrinkable clay soil, tree growth can lead to the differential movement of structures as moisture is removed from the soil during the growing season. Soils must be carefully assessed, and any foundations must be installed following the recommendations of National House Building Council (NHBC) Standards *Chapter 4.2: Building Near Trees* (2021) to avoid potential future damage. Where trees which predate existing structures are to be removed, this can result in heave as the soils are re-wet.

The advice of a suitably qualified engineer must be obtained to inform any potential issue of heave. Specific advice in relation to this issue is beyond the scope of this report.

2.4 Above Ground Constraints

Tree stems and branches can restrict available space on site. Damage or wounding (including excessive pruning) can significantly reduce the amenity contribution of the tree and may lead to the development of dysfunction and decay, with significant long-term implications for tree health. The future impact of existing trees should be carefully considered, including individual species characteristics (such as potential future size, fruit fall, and/or shade) and how the tree will interact with any proposed development and future land use. Annual tree growth can lead to direct damage if stems/branches (or roots) come into physical contact with structures and this must also be taken into consideration.

2.5 Trees and Risk in the Context of Development

Tree owners/managers have a legal duty to prevent foreseeable harm. It is generally accepted that this duty can be fulfilled by undertaking proactive inspections of significant trees to identify obvious defects and by taking appropriate remedial action or gaining further advice as appropriate. Further guidance is available from the National Tree Safety Group⁵.

The walkover assessment carried out as the basis of this report is primarily for early stage design and planning purposes, focusing on the likely quality and benefits of the trees and did not consider the safety of trees.

The Construction (Design and Management) Regulations (2015) states that developers and contractors have responsibilities for health and safety as a result of their actions. Should trees be left in an unstable or hazardous condition the Health and Safety Executive (HSE) could seek to prosecute those responsible along with the potential for further Civil claims for damages.

2.6 Trees and Wildlife

Full consideration must be given to the presence of species, in particular the presence of bats and nesting birds protected under the Wildlife and Countryside Act (1981 - as amended), the Countryside Rights of Way Act (2000) and the Conservation of Habitats and Species Regulations (2017). It is recommended that wherever possible, significant tree/hedge works take place outside of the typical bird nesting season of March to September (inclusive).

2.7 Statutory and Non-Statutory Designations

AECOM checked the Selby District Council online mapping⁴ and the East Riding of Yorkshire Council online mapping⁵ which confirmed that there are no Conservation Areas within the study area, however, there is one Tree Preservation Order (TPO) within the study area and two TPOs bordering the study area.

The TPO within the study area is identified on Sheet 17 (Hutton Cranswick, East Riding of Yorkshire Council). The TPOs bordering the study area are identified on Sheet 1 (Drax and Railway Embankment Long Drax, Selby District Council) of Appendix B of this report.

TPOs protect all trees specified within the TPO schedule and require an 8-week tree works application in advance of any work.

Tree works specifically identified as required (at the application stage) to facilitate full planning permission are exempt from these requirements where full consent is in place.

Prior to any tree works the presence of any TPO or Conservation Area designations must be re-confirmed with the relevant local authority.

A felling licence is required to fell more than 5m³ per calendar quarter unless the work is exempt (such as necessary to implement full planning consent or works necessary on health and safety grounds). Prior to any tree felling works (where full planning consent or other statutory exemption is not in place) this situation must be confirmed with the Forestry Commission.

The Woodland Trust Ancient Tree Inventory⁶ contains a database of recorded ancient or veteran trees. The findings from the interactive mapping tool do not indicate the presence of any recorded ancient or veteran trees within the scheme boundary. The Ecology Phase One assessment noted a small number of potential veteran trees within the study area including a potential veteran sycamore at North Hutton, potential veteran willows at Howden and a large girthed oak at Tollingham and these are clearly identified on the High Level Tree Constraints Plan with spot notes.

Veteran trees are considered to be an irreplaceable resource and should be retained and protected. Current standing advice from Natural England and the Forestry Commission⁷ states that veteran trees require a buffer equivalent to 15 x stem diameter (at 1.5m) or the canopy spread +5m (whichever is greatest).

Following a desk based assessment of environmental records from sources such as Natural England, local records groups and Magic Map⁸ a number of areas within or adjacent to the Scheme are classified as priority habitats (non-statutory designations). River Hull Headwaters SSSI is located directly within the study area (Sheets 20 and 22). No designated Ancient Woodlands are present within the study area.

The non-statutory designations present relate to 'deciduous woodland', 'traditional orchard' and 'wood pasture and parkland'. These non-statutory designations do not require specific consent prior to tree works but are likely to be taken into consideration by the relevant Local Authority when reviewing the planning submission.

The Hedgerows Regulations (1997) protect agricultural or countryside hedgerows which meet the requirements of an 'important hedgerow'. These include a minimum length of 20m (or meets another hedge at each end) and a minimum age of at least 30 years. A wide range of other ecological and archaeological/heritage features can constitute an important hedgerow and further advice from a qualified ecologist is recommended in advance of any planned works which could impact established hedgerows on or bordering agricultural or countryside land. Prior to the removal or destruction of a protected hedgerow an application must be made to the relevant Local Planning Authority. Full planning consent is an exemption to this requirement.

⁴ <https://selby-dc.maps.arcgis.com/apps/webappviewer/index.html?id=def3546e04184c3a852d3ec02cd1d5d1>

⁵ <https://www.eastriding.gov.uk/planning-permission-and-building-control/applications-for-planning-and-building-control/planning-constraints-map/>

⁶ Woodland Trust Ancient and Veteran Tree Inventory (<https://ati.woodlandtrust.org.uk/>)

⁷ <https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences>

⁸ DEFRA Magic Map Application (<https://magic.defra.gov.uk/MagicMap.aspx>)

3. The Proposed Development

The Scheme is detailed on the High Level Tree Removal Plans included as Appendix Cand is described below:

Scheme Wide:

SEGL2 is being developed jointly by NGET and Scottish and Southern Electricity Networks (SSEN) who are developing proposals for a subsea High Voltage Direct Current (HVDC) link between Peterhead, Aberdeenshire and Drax, North Yorkshire. The HVDC connection will allow the transfer of electricity from Scotland to England (and vice versa as required) via sub-sea cables, connected to a converter station and electricity substation in each country via an onshore underground cable. NGET is responsible for consenting the marine works in English waters and all onshore works in England, and is the Applicant of the English Onshore Scheme. This Scheme consists of approximately 69 km of underground HVDC cable in East Riding of Yorkshire and North Yorkshire from the landfall at Fraisthorpe Beach to the proposed converter station adjacent to the existing Drax Power Station in Selby. The converter station will be connected to the existing Drax 400 kilovolt (kV) Substation by approximately 500 m of High Voltage Alternating Current (AC) underground cable.

Converter Station:

The Converter Station Site forms part of the SEGL2 project and is indicated as a layer within the Tree Protection Plan ref: 60633154-ACM-XX-XX-AB-TPP 001.

The Converter Station Site consists of the converter station with HVDC cables linking to the Converter Station Site from the east, across Wren Hall Lane, and HVAC cables to the west crossing New Lane.

The Converter Station Site also includes an attenuation pond to the east of the Converter Station, retaining walls and earthworks around the perimeter of the Converter Station, a permanent access route from New Lane. These are the only permanent above ground features associated with the Scheme. Temporary access routes and construction compound areas will also be required at the Converter Station Site to facilitate construction.

4. Arboricultural Impact Assessment

4.1 Purpose

This impact assessment sets out the likely principal direct and indirect impacts of the Scheme on the trees on or immediately adjacent to the Site and suitable mitigation measures to allow for the successful retention of significant trees or to compensate for trees to be removed, where appropriate.

This assessment is split into two sections, a detailed assessment for the Converter Station Site to the south west of the Scheme where detailed tree survey data has been captured, and a high level assessment for the remainder of the Scheme which focuses on the likely (reasonable worst case) area and distribution of tree loss to facilitate the Scheme. In this area more detailed tree surveys will be undertaken to determine the quality and spatial constraints associated with trees which are potentially impacted by the Scheme.

The high level assessment process has included a desk based review of tree positions which clash or are very close to proposed new features. Tree loss or impact has been discounted where existing access routes are to be utilised with no change in use, where the location of drainage inlets can be flexibly adjusted to avoid tree positions and where Horizontal Directional Drilling (HDD) is proposed (with access and retrieval pits outside of tree positions) and where no access route is required.

For all other proposed features which conflict with tree positions, a reasonable worst case of tree removal has been assumed for the purposes of the high level assessment. It is recognised that the Scheme boundary throughout the underground cable route between the Converter Station Site and the landfall includes for an approximately 20 m Limit of Deviation (LoD) to allow for flexibility in cable installation. The LoD allows for micro-siting of the cable installation activities to avoid areas of risk or sensitive features should they be identified on site. As such not all areas within the scheme boundary are likely to be impacted during construction. Tree loss will therefore be reviewed as part of the detailed design process and will be informed by further detailed tree surveys and tree impacts or removals will be reduced where feasible.

Converter Station (Detailed):

A brief summary of trees to be removed, tree works and incursions related to the Scheme at the Converter Station Site are detailed within the table below.

Table 2: Summary of Removals, Incursions and Pruning to Facilitate the Scheme

Impact	Category A	Category B	Category C	Category U
Trees to be removed to facilitate the Scheme	G42 (part)	0	H40 (part)	T2
Total	1 part group	0	1 part hedge	1 individual tree
Trees which may require some incursion into their construction exclusion zone to allow the Scheme.	T1, G42	0	0	0
Total	1 individual tree, 1 group	0	0	0
Trees to be pruned to facilitate the Scheme	0	0	0	0
Total	0	0	0	0

Table 3: High Level Summary of Removals for wider Scheme

Impact	Length Removed (linear m)	Area to be Removed (m ²)
Hedgerow Removal	23,193m	-
Tree Removal	-	60,204.22m ²

4.2 Trees to be Removed

Converter Station:

One part group and one part hedge are to be removed to facilitate the Scheme. This includes one part group categorised as Category A and one hedgerow identified as Category C.

In addition, one tree categorised as Category U is also to be removed to facilitate the Scheme. However, the condition of this tree is such that its removal can be justified regardless of the Scheme proposals.

All of the trees to be removed are within the red line application boundary and the loss of these trees is necessary to achieve the construction proposals for the Site.

The proposed Converter Station is located within an arable field, positioned to avoid tree constraints along Wren Hall Lane to the south and east and to allow for the retention of trees positioned east to west across the field to the north of the proposed Converter Station position.

As a result the position of the Converter Station and associated permanent access only requires the removal of some sections of a hedgerow which are classified as low quality (Category C). The sections of H40 to be removed are required to allow for the construction of the permanent access from New Road into the Converter Station Site and to install the HVAC cable also across New Road.

The final extent of tree clearance is to be determined on site by an arboriculturist.

The installation of the HVDC cable to the east of the Converter Station will cross Wren Hall Lane through a high value (Category A) group of trees, G42. As a reasonable worst-case, the installation of the cable will require a 15m clearance area, 7.5m to either side of the alignment. HDD would be preferable (with insertion and retrieval pits located outside the RPA and canopy spread of retained trees) to mitigate the potential impact to trees within this group. The final crossing approach will be determined by the appointed Contractor. However, where removal

is necessary it is recommended that the trees within the limits of deviation are individually surveyed in detail to inform the final alignment based on the retention of the most valuable trees.

Tree removals will be mitigated with a high quality scheme of new tree planting and associated landscaping works as detailed in Chapter 3 of the Environment Statement, and also the Design and Access Statement which will represent an opportunity to enhance the quality, benefits and resilience of trees on Site.

All of the remaining recorded trees (via detailed tree survey) can be retained and protected.

Remaining Scheme (High Level):

An estimated 23,193 linear metres of hedgerow and 60,204.22m² of tree canopy is likely to require removal to facilitate the Scheme. This is considered to be a reasonable worst case scenario and the extent of tree and hedgerow loss may be reduced in practice. The design has been developed and interpreted to minimise the loss of trees and especially known significant trees where possible.

Tree loss includes the loss of trees protected by TPO at Hutton. In this location there is a project commitment to minimise the loss of TPO trees, as far as reasonably practicable, through appropriate routing of the cable trench and by minimising working areas to allow appropriate exclusion zones to be established around retained trees.

Potential veteran willow trees at Howden are also at risk of removal. Further detailed surveys will be undertaken to define RPAs and the status of trees in this location. This information will be utilised to aid in the detailed routing of the Scheme by the appointed Contractor in order to minimise the loss of trees as far as reasonably practicable and to establish exclusion zones for works activities to prevent accidental damage to retained trees.

Where trees are at risk of impact or removal further detailed tree surveys will be carried out to determine the constraints associated with unsurveyed trees. Detailed tree survey data will be used to inform the detailed design process which will seek to minimise impacts on trees, especially those of the highest quality and value.

4.3 Tree Works

Converter Station:

Tree removals to facilitate the Converter Station are detailed in the Tree Survey Schedule included as Appendix B.

No additional works to retained trees are likely to be required. All tree work is to follow the principles of *BS3998: 2010 Treework – Recommendations* and must be carried out by suitably qualified and insured contractors. The Arboricultural Association provides a list of contractors who meet these requirements which can be found at www.trees.org.uk.

Should the requirement for additional tree works be identified, this will be discussed with an arboriculturist and no works will be undertaken without the consent of the Local Planning Authority (LPA).

4.4 Incursions within the RPA or Canopy Spread

Converter Station:

To the north of the Converter Station Site two areas of construction compound are proposed, one on either side of existing overhead cables. This area is to the north of the linear group of trees and to the south of a ditch running along the southern boundary of a woodland group (W37). The compounds can be achieved without an incursion into the RPA or canopy spread of retained trees which will be protected by a fenced exclusion zone.

A temporary access route is proposed to the west of the Converter Station Site directly east of T3. The position of this temporary access route will be amended slightly to the south and east to avoid the RPA and canopy spread of T3 which will be an exclusion zone protected by fencing.

To the south of T1 a new retaining wall is to be installed to the north of the Converter Station. This will be constructed from the south to minimise any impact on this tree. A 0.5m working space has been provided to facilitate the construction of the wall and this will be protected by ground protection sufficient to protect soil structure from the heaviest anticipated loading. The detailed design will be developed to avoid the RPA of this tree as fully as possible including any temporary excavation requirements (which could potentially be addressed with temporary geogrids, netting or king post retaining walls or equivalent).

The existing Wren Hall Lane access route, which links Carr Lane in the north to New Road in the west, will be utilised for access to the Converter Station Site but this will not represent a significant change from its existing use as a public road and therefore no impacts are considered likely.

4.5 The Future Impact of Retained Trees

Converter Station:

The future impact of retained trees in conjunction with the Scheme and future use of the Site has been considered.

The majority of trees on the Site are broadleaved and will drop leaves and fruits in autumn and will produce flowers in the spring. This can affect the use of adjacent land and can lead to a management requirement to clear leaves from drains etc.

The layout of the Scheme has been developed so that no trees will significantly overhang any new or temporary features which will reduce the potential management requirement associated with fallen leaves.

The Site contains a significant population of large trees in varying condition. Trees within the Site will require ongoing maintenance and assessment by a competent person to ensure that any risks from tree failure are managed in accordance with best practice.

All tree works recommended as a result of the preliminary tree survey of the Converter Station Site, which considered trees in the context of the current use of the Site (these works are included as preliminary management recommendations in the Tree Schedule in Appendix B of this report), should be actioned within the recommended timescales.

4.6 Tree Protection

Retained trees are vulnerable to damage from construction activities which can include physical damage to stems and branches following impacts with plant, root severance following trenching, root death or dysfunction following damage to soil structure (caused by the movement of people or machinery on unsurfaced ground) or via the spillage of materials toxic to tree health. The default position is that the RPA and Canopy spread of trees to be retained will form an effective Construction Exclusion Zone, secured with robust fencing where no access will be permitted. Where access is necessary within this area special measures such as the use of ground protection and arboricultural supervision are generally required.

Outline tree protection measures are considered in Appendix D of this report. An Arboricultural Method Statement is often required as a condition of planning consent to set out the phasing of site operations, the finalised tree protection measures for the site and to provide detail on how sensitive elements of work are to be achieved in proximity to retained trees. Issues to be addressed by the Arboricultural Method Statement are listed in the Conclusion of this report.

4.7 Site Organisation, Storage and Use of Materials, Plant and Machinery

All construction site facilities including site huts, staff and contractor parking and areas for storage will be located outside of the RPA or crown spread of retained trees, including those not specifically covered in this report. Space is likely to be constrained on Site and will need to be carefully considered. The Construction Exclusion Zones identified on the Tree Protection Plan must be fully respected and their location and significance is to be highlighted to all site staff and contractors during the formal site briefing.

The use, mixing and washing of materials can lead to run off or inadvertent spillage into tree root zones. Many substances often used on construction sites can be toxic to tree roots (such as concrete, fuels, salts, builders sand and herbicides) and can result in the death of tree roots and beneficial soil organisms and can have a significant impact on the future health and appearance of the tree.

The storage of materials and arising's can result in an effective raised soil level. This buries tree roots at depths where air and water are less available and can lead to the decline or death of the tree.

For these reasons the storage of materials and any washing, mixing or refuelling will take place in agreed allocated areas at least 5m from the edge of the RPA of retained trees.

Any slope effect must be taken into account and where there is a potential for run off, heavy duty polythene sheeting and sandbags must be in place as bunding to prevent toxic materials reaching RPAs.

Particular care is required where high sided vehicles, long reach machinery and plant with jibs, booms and counterweights are to operate with in proximity to retained trees. A banksman will be used where the movement of plant or long reach machinery occurs within 5m of any part of a retained tree to ensure no damage is sustained.

4.8 Tree Planting

Existing areas of unsurfaced ground must be protected during the demolition and construction phases if they are to be re-used for new plantings. Protection can be achieved using fit for purpose ground protection measures as set out in BS5837:2012 Section 6.2.3 or by creating a fenced exclusion zone. Where protection is not feasible, soil amelioration or replacement works will be required to ensure suitable growing conditions for new trees to fully establish.

Where new trees are to be planted, the minimum planting distances detailed in Annexe A, Table A.1 of BS5837:2012 must be adhered to, to prevent direct damage to services and structures from future tree growth.

New tree planting should be implemented in accordance with the guidance set out in BS8545: 2014 Trees: from nursery to establishment in the landscape – Recommendations.

4.9 Services

The impact of the new cable alignment is addressed via the *Trees to be Removed* and the *Incursions Within the RPA or Canopy Spread* sections of this report. Where the detailed design results in potential impacts to trees associated with new or diverted utilities the following principles will apply:

- Where existing services become redundant within the RPA of a retained tree, the default position must be that they be decommissioned and left in situ. Where this is not feasible the following principles are to be undertaken:
 - Existing services are to be removed by winching out from an access/inspection chamber located outside of an RPA. It may be acceptable to fill redundant pipe work with an inert material or undertake pipe bursting where necessary within the RPA of retained trees.
 - Excavation to install services has the potential to result in unacceptable root severance which could result in instability, dysfunction or the death of trees. Repeated incursions are particularly damaging and must be avoided by bundling services wherever possible.

The default position will therefore be that all services be routed outside of the RPA of retained trees. The following general principles will apply and where services must be routed within the RPA of a retained tree this process will be subject to a detailed method statement with approval from the Planning Authority. The principles of the National Joint Utilities Group (NJUG) Volume 4 guidance must be adhered to.

All services must be bundled as far as possible and installed within RPAs using hand/compressed air excavation (e.g. for shallow service runs) or trenchless techniques such as impact moling (thrust boring) with all access pits and inspection chambers being located outside of the RPA. The route must run as far from the main stem of a retained tree as possible and must be at a minimum depth so that the upper 1m of the soil profile is undisturbed. The depth of the run may need to be adjusted to account for soil type and species variation and this must be determined subject to the advice of an arboriculturist.

This operation must take place as specified in an Arboricultural Method Statement. Any water pipes must be constructed so as to be resistant to ingress by tree roots (both existing trees, and newly planted trees) which could include the use of root barriers where appropriate.

5. Conclusions

The Scheme has been assessed via a high level desk study with a more detailed assessment (via a walkover tree survey) of the permanent above ground infrastructure at the Converter Station Site and the design has been amended where possible to minimise the impact on the most significant tree features. Further design

amendments to be developed and considered as part of the detailed design have the potential to further reduce the arboricultural impact of the Scheme.

The Converter Station will require the loss of one part tree group and one part hedge. This includes one part group categorised as Category A and one hedge identified as Category C.

In addition, one tree categorised as Category U is also to be removed to facilitate the Scheme. However, the condition of this tree is such that its removal can be justified regardless of the site proposals.

The remaining wider Scheme (the proposed underground HVDC cable) to the north east of the Converter Station Site has been assessed at a high level desk study only and this identifies that an estimated 23,193 linear metres of hedgerow and 60,204.22m² of tree canopy are likely to be removed to facilitate the installation of the HVDC cables.

Areas of tree cover which are likely to be of particular value (such as trees protected by Tree Preservation Order or potentially veteran trees identified via the Ecology survey) are proposed for retention where possible and where some loss is likely to be unavoidable it will be reduced to the minimum feasible following detailed assessment.

Tree loss includes the loss of trees protected by TPO at Hutton, although in this location there is a project commitment to minimise the loss of TPO trees as far as reasonably practicable through appropriate routeing of the cable trench and minimisation of the working area to allow for appropriate exclusion zones to be established around retained trees.

Potential veteran willow trees at Howden are also at risk of removal. Further detailed surveys will be undertaken to define RPAs and status of potentially veteran trees in this location to aid in the detailed routeing of the appointed Contractor to minimise the loss of trees as far as reasonably practicable and establish exclusion zones for works activities to prevent accidental damage to retained trees.

Tree loss will be mitigated with a robust and high quality scheme of new tree planting as detailed in Chapter 3 of the Environmental Statement and the Design and Access Statement which represents an opportunity to increase the quality, impact, diversity and resilience of the local tree stock.

Soil structure for areas of new tree planting where the ground is currently unsurfaced will either be protected using ground protection or fenced exclusion zones; or the soil structure will be ameliorated or replaced following the completion of construction works on Site.

5.1 Issues to be addressed by an Arboricultural Method Statement

An Arboricultural Method Statement sets out measures to ensure the protection of retained tree and is often required as a condition of planning consent. Where determined to be necessary as part of the Scheme, as determined by the Local Planning Authorities, the Arboricultural Method Statement for the Scheme will include the appropriate tree protection measures outlined in Appendix D of this report and will cover the below key issues.

- Conditions of planning consent
- Pre commencement meeting and site briefing
- Order and phasing of operations
- Tree works
- Tree protection fencing
- Ground protection
- Site storage and facilities
- Movement of people, plant and materials
- Installation of new surfacing
- Installation of new services and/or diversion of existing services
- Hard landscaping
- Soft Landscaping

- Removal of tree protection measures

References

British Standards Institution (BSI), BS5837:2012. Trees in relation to design, demolition and construction – Recommendations. BSI

British Standards Institution (BSI), BS3998:2010. Tree work – Recommendations. BSI

British Standards Institution (BSI) BS8545: 2014 Trees: from the nursery to independence in the landscape - Recommendations

Department of Energy and Climate Change (2011) National Policy Statement for Electricity Networks Infrastructure EN-1 and EN-5

East Riding of Yorkshire Council (2016) East Riding of Yorkshire Council Local Plan

Ministry of Housing, Communities and Local Government (MHCLG), 2021. National Planning Policy Framework (NPPF). MHCLG

National House Building Council (NHBC) Standards, (2021). Chapter 4.2: Building Near Trees

National Joint Utilities Group (NJUG) Volume 4, Issue 2, (2007). NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

National Tree Safety Group (NTSG), 2011. Common sense risk management of trees. Forestry Commission.

Selby District Council (2005) Selby District Council Local Plan

Selby District Council (2013) Selby District Council Core Strategy Local Plan

Appendix A High Level Tree Constraints Plan and Converter Station Detailed Tree Constraints Plan