The Great Grid Upgrade

North Humber to High Marnham

Design Development Report

February 2025

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Contents

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Executive summary

National Grid Electricity Transmission plc (NGET), referred to as National Grid in this report, own, build and maintain the high-voltage electricity transmission network in England and Wales. National Grid is responsible for making sure electricity is transported safely and efficiently from where it's produced to where it's needed. It is National Grid that is developing plans for the North Humber to High Marnham Project (the 'Project'). The Project would support the UK's net zero target through a proposed network reinforcement located in the Humber and East Midlands regions.

The Project conducted a non-statutory consultation in summer 2023, this was held for a period of eight weeks, between June 2023 and July 2023. This consultation introduced the Project, explained how National Grid had developed its proposals, and sought the views of the public and stakeholders.

A further localised non-statutory consultation ran in Summer 2024, this was held for a period of four weeks, between July 2024 and August 2024. This consultation presented a potential alternative corridor between South Wheatley and High Marnham in response to feedback received during the 2023 non-statutory consultation and after a backcheck of our work to date and review of the Consultation Preliminary Routeing and Siting Study 2023.

The feedback received during the 2023 non-statutory consultation and the 2024 localised non-statutory consultations has been carefully reviewed and considered, alongside the findings of environmental and engineering studies.

This report presents the changes that have been made to the Project since the 2023 non-statutory consultation, including an explanation of how the preferred alignment for the proposed overhead line reinforcement has been identified.

Following consideration of the feedback received in response to the upcoming 2025 statutory consultation, we will further develop and refine our proposals and continue to backcheck our work to date throughout the process of developing the Project.

Our current proposals for the Project as presently indicated and which are the subject of the statutory consultation comprise:

- Approximately 90km of new overhead line between the new Birkhill Wood and High Marnham 400kV Substations
- Replacement and re-alignment of a section of the existing 400kV 4ZQ overhead line route between Brantingham and east of Broomfleet
- Replacement and re-alignment of a section of the existing 400kV ZDA overhead line route between Ealand and west of Keadby
- A new 400kV Birkhill Wood substation, with a new permanent access. This is proposed to be a gas insulated switchgear (GIS) substation
- Replacement and re-alignment of a section of the existing 400kV 4ZR route to allow for connection into the new Birkhill Wood substation
- A new 400kV High Marnham substation, with a new permanent access. This is proposed to be an air insulated switchgear (AIS) substation.

- Replacement and re-alignment of the existing 275kV 4ZV and XE overhead line routes and existing 400kV ZDA and ZDF overhead line routes, to allow for connection into the new High Marnham substation.

The Project will include other required works, for example, temporary diversions for works on existing overhead line routes, temporary access roads, highway works, temporary works compounds, work sites and ancillary works. The Project will also include utility diversions and drainage works. There would also be land required for mitigation, compensation and enhancement of the environment including biodiversity net gain.

The feedback from the non-statutory and statutory consultations (as applicable) will be used to inform the final designs that will be put forward in the application for development consent. National Grid expects to submit an application for consent for the Project in 2026.

1. Introduction

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1. Introduction

1.1 Purpose of this report

1.1.1 The purpose of this report is to describe how the North Humber to High Marnham Project (the 'Project') has evolved since the non-statutory consultation, which comprised of a first-round of non-statutory consultation across the whole route in June and July 2023, followed by a localised non-statutory consultation on a potential alternative corridor between South Wheatley and High Marnham, which was held between July and August 2024. The Project has evolved in response to feedback collected during these consultation periods and further environmental and engineering studies. Further backcheck of our work to date and reviews and refinement of the Project will be undertaken in response to statutory consultation, and in the light of ongoing surveys and assessments.

1.2 Overview

1.2.1 National Grid Electricity Transmission (NGET) referred to as National Grid within this report, owns and maintains the national high-voltage electricity transmission network throughout England and Wales.

1.2.2 The transmission network connects the power from where it is generated to the regional Distribution Network Operators (DNO) who then supply businesses and homes.

1.2.3 National Grid holds the Transmission Licence for England and Wales, and their statutory duty is to develop and maintain an efficient, co-ordinated, and economical system of electricity transmission and to facilitate competition in the generation and supply of electricity, as set out in the Electricity Act 1989.

1.2.4 National Grid is working to build a cleaner, fairer, and more affordable energy system that serves everyone, powering the future of our homes, transport, and industry. The Project would support the UK's net zero target through the connection in the North of new low carbon energy generation, and by reinforcing the local transmission network.

1.2.5 It is National Grid that is developing plans for the Project.

1.2.6 The Project is a proposal by National Grid to reinforce the transmission network between the proposed new Birkhill Wood Substation, close to the existing Creyke Beck Substation in East Riding of Yorkshire, and the proposed new High Marnham Substation adjacent to the existing High Marham Substation in Nottinghamshire. This would be achieved by reinforcing the transmission network with a new 400 kilovolt (kV) electricity transmission line over approximately 90 kilometres (km).

1.2.7 With growing offshore wind and interconnectors, an anticipated tripling of wind generation connected across the Scottish networks by 2030 and the Government's increased ambition to connect 50GW of offshore wind by 2030, north-south power flows are set to increase. Electricity System Operator (ESO) (now the National Energy Operator (NESO)) in the Electricity Ten Year Statement[1] anticipates that the network

[1] Electricity System Operator (2023), Electricity Ten Year Statement 2023. Available at: https://www.neso.energy/document/286591/download

between the North and Midlands needs to transfer significantly more power by the early 2030s compared to the transfer requirements today

1.2.8 The North Humber to High Marnham reinforcement will increase the capability of the network to carry clean green energy from the north of England to the Midlands. The Project will also transmit power from a range of generation sources and interconnectors that are planned to connect to the network north of Hull.

1.2.9 The Project is classed a Nationally Significant Infrastructure Project (NSIP), and therefore National Grid need to obtain 'development consent' under statutory procedures set by Government. NSIPs are projects which are considered by the Government to be of national importance, hence permission to build them needs to be given at a national level, by the relevant Secretary of State (SoS) (in this case the Secretary of State for Energy Security and Net Zero). Instead of applying to the local authority for planning permission, the developer must apply to the Planning Inspectorate for a Development Consent Order (DCO).

1.2.10 If accepted for Examination, the examining authority would be appointed (consisting of one or more examining inspectors) who, after a period of public examination, would make their recommendation to the SoS for Energy Security and Net Zero, who in turn would decide on whether development consent should be granted for the Project. The timescale between acceptance of the submission and a decision is approximately 18 months.

1.3 The need for the Project

1.3.1 Like much of the high voltage electricity transmission network across the country, the network between the North and the Midlands was largely built in the 1960s, carrying electricity down from Scotland and the North, connecting coal-fired generation in the Aire and Trent valleys with the main centres of the population. In the Trent Valley, the electricity transmission network was built to connect major coal-fired generation at Keadby, Cottam, Staythorpe, West Burton and High Marnham, carrying electricity on towards major population centres.

1.3.2 The existing network serving the Creyke Beck area can export just under 7GW of electricity while remaining compliant with the Security and Quality of Supply Standards to which the network is operated. Although this has been sufficient until today, it is not sufficient to meet the power carrying capability that is required by the end of this decade and beyond.

1.3.3 With the contracted generation and interconnector capacity due to be connected by the early 2030s, the network as it is today, notwithstanding local demand, would not have the capacity needed to export the electricity out of the area across the B8 transmission boundary. National Grid therefore need to reinforce the network to prevent wider system failures and circuit overloads from happening, in addition to reducing constraint costs. Further detail on transmission boundaries and the need case for the Project can be found in the **Project Background Document Addendum (2024)**, and the **Strategic Options Report Update (2025)**.

1.3.4 As part of the development of a project National Grid establishes the need and identifies a preferred strategic proposal to meet requirements. Options are narrowed down, and the best performing options are identified. Alternative strategic options for delivering the preferred solution are developed and appraised to identify a preferred strategic proposal. This will then be the subject of consultation, feedback reviews, design evolution and testing with a back-check and review process.

1.3.5 In May 2023, National Grid carried out an assessment of the strategic options[2] available to meet the needs case.

1.3.6 This assessment identified a range of combinations of circuit options. For each of these combinations of options, National Grid undertook an appraisal of deliverability, considered the system benefit that the reinforcement provided, considered environmental and socio-economic factors, and considered the cost benefit analysis completed by National Grid ESO.

1.3.7 Multiple strategic options have been considered for the Project. Of the strategic options considered, a new 400kV overhead electricity transmission line between a new substation near Creyke Beck and a new substation at High Marnham, approximately 90km in length, is our emerging preference. This option also meets National Grid obligations under Section 9 of the Electricity Act 1989 and aligns with the National Policy Statements (EN-1[3] and EN-5[4]).

1.3.8 Further detail of each of the potential strategic options and the strategic options appraisal is reported in the North Humber to High Marnham and Grimsby to Walpole - Strategic Options Report Update 2025. The strategic options for the Project have been reviewed and updated by National Grid following the **Strategic Options Report 2023**, against an updated needs case, as part of the ongoing strategic options assessment and decision-making process involved in promoting new transmission projects.

[2] National Grid, (2023), North Humber to High Marnham and Grimsby to Walpole Strategic Options Report. Available at https://www.nationalgrid.com/electricity-transmission/document/149041/download.

[3] Department for Energy Security & Net Zero (2023), Overarching National Policy Statement for Energy (EN-1). Available at https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf

[4] Department for Energy Security & Net Zero (2023), National Policy Statement for Electricity Networks Infrastructure (EN-5). Available at https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/nps-electricity-networks-infrastructure-en5.pdf

National Grid Approach

1.3.9 National Grid has adopted a structured approach to project development and consenting (see Figure 1-1).

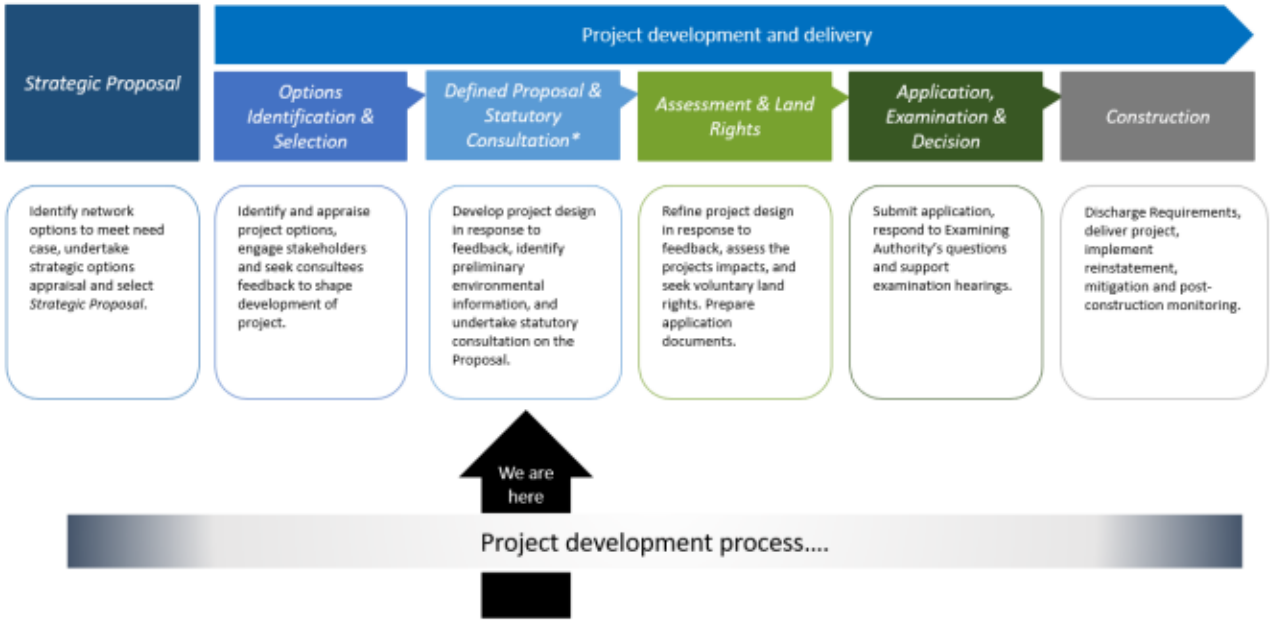

Figure 1-1 National Grid's consenting process

1.3.10 To date National Grid has identified a 'Strategic Proposal' and has undertaken 'Options Identification and Selection' as reported and published in the Corridor Preliminary and Siting Study[5] (CPRSS) and the **North Humber to High Marnham and Grimsby to Walpole - Updated Strategic Options Report 2025**.

1.3.11 The Project is now at the Defined Proposal and Statutory Consultation stage. A list of all the documents produced for the statutory consultation is available on the Project website.

Project Description

1.3.12 The Project includes a new 400 kilovolt (kV) electricity transmission connection of approximately 90 kilometres (km) in overall length between two proposed new substations, Birkhill Wood 400kV Substation and High Marnham 400kV Substation. National Grid will consult on all aspects of the proposed development for the Project, including:

- Approximately 90km of new overhead line between the new Birkhill Wood and High Marnham 400kV Substations;
- Replacement and re-alignment of a section of the existing 400kV 4ZQ overhead line route between Brantingham and east of Broomfleet;
- Replacement and re-alignment of a section of the existing 400kV ZDA overhead line route between Ealand and west of Keadby

[5] National Grid, (2023), North Humber to High Marnham Corridor Preliminary Routeing and Siting Study. Available at https://www.nationalgrid.com/electricity-transmission/document/148821/download.

- A new 400kV Birkhill Wood substation, with a new permanent access. This is proposed to be a gas insulated switchgear (GIS) substation;
- Replacement and re-alignment of a section of the existing 400kV 4ZR route to allow for connection into the new Birkhill Wood substation;
- A new 400kV High Marnham substation, with a new permanent access. This is proposed to be an air insulated switchgear (AIS) substation;
- Replacement and re-alignment of the existing 275kV 4ZV and XE overhead line routes and existing 400kV ZDA and ZDF overhead line routes, to allow for connection into the new High Marnham substation.

1.3.13 The Project will include other required works, for example, temporary diversions for works on existing overhead line routes, temporary access roads, highway works, temporary works compounds, work sites and ancillary works. The Project will also include utility diversions and drainage works. There would also be land required for mitigation, compensation and enhancement of the environment including biodiversity net gain.

The Project Timeline

1.3.14 An initial non-statutory consultation took place for eight weeks between June and July 2023. A further localised non-statutory consultation was undertaken for four weeks between South Wheatley and High Marnham, which was held between July and August 2024. As required under the Planning Act 2008, a statutory consultation is taking place for eight weeks between 18 February and 15 April 2025.

1.3.15 Figure 1-2 sets out the Project timeline through to operation.

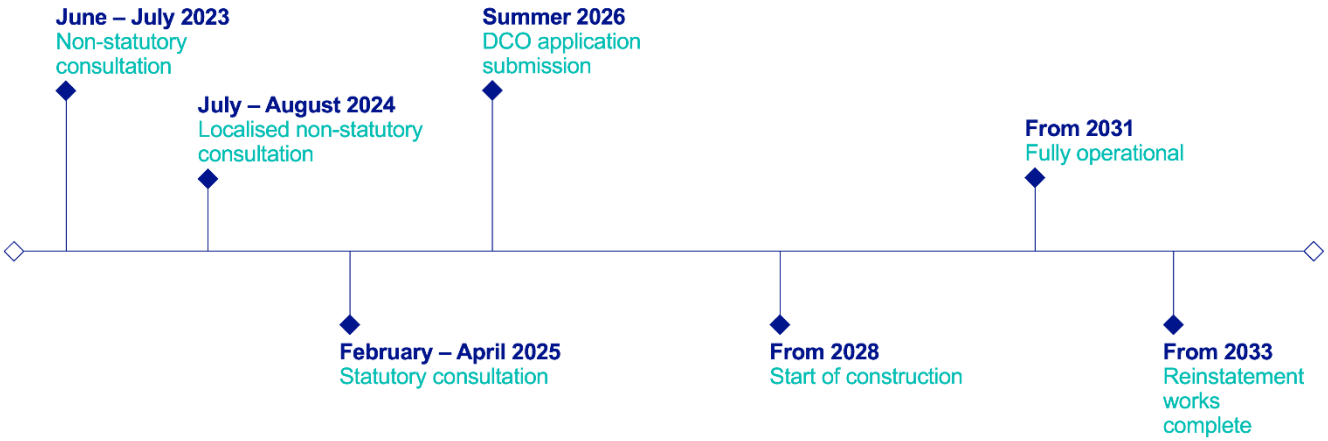

Figure 1-2 Project timeline

1.4 Structure of this report

1.4.1 The report is structured as follows:

- Chapter 2 – provides an overview of the legislation and national policy relevant to the Project
- Chapter 3 – provides an overview of the non-statutory consultation feedback
- Chapter 4 – provides an overview of the backcheck and review process

- Chapter 5 – reviews the Project's emerging preferred corridor and graduated swathe, including an overview of the South Wheatley to High Marnham corridor decision and also provides a summary of where the preferred alignment routes outside of emerging preferred corridor
- Chapter 6 – provides an overview of the design evolution of the Project so far
- Chapter 7 – describes the Project's substations and preferred alignment for the proposed new overhead line, including the different features considered in informing decision making and a description of how the preferred alignment was identified in the context of the graduated swathe presented at non-statutory consultation
- Chapter 8 – provides an overview of the temporary works that will be required
- Chapter 9 – sets out the next steps that will be undertaken prior to the submission of an application for a Development Consent Order.

1.4.2 The report also includes the following appendices:

- Appendix A – Local Plan Policies
- Appendix B – Wireline Visualisations
- Appendix C – Wireline Visualisations at Ellerker
- Appendix D – Chapter 7 (Development of the Preferred Alignment) Inset Figures

1.5 Relationship to other documents

1.5.1 This Design Development Report draws on other published Project documents, including:

- North Humber to High Marnham – Project Background Document 2023
- North Humber to High Marnham – Project Background Document Addendum 2024
- North Humber to High Marnham – Corridor Preliminary Routeing and Siting Study 2023
- North Humber to High Marnham – Supplementary Corridor and Routeing Report 2024
- North Humber to High Marnham and Grimsby to Walpole – Strategic Options Report 2023
- North Humber to High Marnham and Grimsby to Walpole – Strategic Options Report Update 2025

2. Legislation and National Policy Context

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2. Legislation and National Policy Context

2.1 Introduction

2.1.1 This chapter sets out a summary of legislation and national policy relevant to the **design** of the Project.

2.1.2 A summary of the wider regulatory and planning context of relevance to the Project is set out in **Chapter 2 of the PEIR (Regulatory and Planning Context)**. A summary of the relevant local planning policy is set out in **Appendix A** of this document.

2.2 Planning Act 2008

2.2.1 The Planning Act 2008 introduced a new consenting procedure for NSIPs. Under Section 14(1)(b) and Section 16 of the Planning Act 2008 and the Planning Act (Electric Lines) Order 2013 a project that involves the installation of an electric line above ground of more than 2km, which will operate at 400kV in England is an NSIP.

2.2.2 For an NSIP the grant of development consent is required by the making of a DCO under the Planning Act 2008 which includes associated development through Section 115 of the Act. As noted in Chapter 1, the Project is classed as an NSIP for which National Grid will need to obtain 'development consent' under statutory procedures set by Government. Further details of the Planning Act 2008 regime are set out in Chapter 2 of the PEIR.

2.2.3 Section 10 and Section 183 of the Planning Act 2008 set out expectations for good design:

"*the Secretary of State must (in particular) have regard to the desirability of –*

a) Mitigating, and adapting to, climate change;

b) Achieving good design."

2.2.4 Section 104 of the Planning Act 2008 states that the Secretary of State (SoS) *"must have regard to any national policy statement which has effect in relation to development of the description to which the application relates*" and *"must decide the application in accordance with any relevant national policy statement"*.

2.3 Electricity Act 1989

2.3.1 Section 9(2) of the Electricity Act 1989 places general duties on National Grid as a licence holder '*to develop and maintain an efficient, co-ordinated and economical system of electricity transmission…*'.

2.3.2 In addition, Section 38 and Schedule 9 of the Electricity Act 1989 require National Grid, when formulating proposals for new lines and other works, to:

> *"…have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological*

interest; and shall do what [it] reasonably can mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects".

2.4 National planning policy

2.4.1 This section of the report sets out the design considerations of relevance to the Project within the current national planning policy documents for which the SoS must have regard to when determining the DCO application for the Project.

2.4.2 In deciding an application for development consent Section 104 of the Planning Act 2008 requires the Secretary of State to determine the application in accordance with any relevant National Policy Statement (NPS). The NPSs relevant to this Project are the Overarching National Policy Statement for Energy (EN-1) and the National Policy Statement for Electricity Networks Infrastructure (EN-5) which came into force in January 2024.

2.4.3 The National Policy Statement for Renewable Energy (EN-3 2024) also includes support for the onshore infrastructure required to deliver new offshore wind developments. This NPS is considered relevant to the Project as a key driver for the transmission infrastructure proposed is new offshore wind customer connections in the North East.

2.4.4 A more detailed review of the policies contained within the National Policy Statements is set out in **Chapter 2 of the PEIR (Regulatory and Planning Context)**.

Overarching National Policy Statement for Energy (EN-1) (2024)

2.4.5 NPS EN-1[6] sets out the Government's overarching policy with regards to the development of NSIPs in the energy sector.

2.4.6 Section 4.7 of EN-1 sets out detail on the criteria for good design for energy infrastructure projects.

2.4.7 Paragraph 4.7.1 sets out "*The visual appearance of a building, structure, or piece of infrastructure, and how it relates to the landscape it sits within, is sometimes considered to be the most important factor in good design. But high quality and inclusive design goes far beyond aesthetic considerations. The functionality of an object – be it a building or other type of infrastructure – including fitness for purpose and sustainability, is equally important."*

2.4.8 Paragraphs 4.7.2 to 4.7.4 acknowledge the role of good design in energy projects to produce sustainable infrastructure sensitive to place, and a means by which many policy objectives of the NPS's can be met, such as how good design, in terms of siting and use of appropriate technologies can help mitigate adverse impacts.

2.4.9 Paragraph 4.7.6 acknowledges the role of design and sensitive use of materials in ensuring that development such as electricity substations contribute to the quality of the area.

[6] Department for Energy Security and Net Zero (2024). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf

2.4.10 Paragraph 4.7.7 identifies the need for the Applicant to demonstrate how the design process has been conducted and evolved over time:

"*Applicants must demonstrate in their application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected*."

2.4.11 Paragraph 4.7.10 states:

"*In light of the above and given the importance which the Planning Act 2008 places on good design and sustainability, the Secretary of State needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable, and adaptable (including taking into account of natural hazards such as flooding) as they can be*",

2.4.12 Paragraph 4.7.12 states:

"*In considering applications, the Secretary of State should take into account the ultimate purpose of the infrastructure and bear in mind the operational safety and security requirements which the design has to satisfy. Many of the wider impacts of a development, such as landscape and environmental impacts, will be important factors in the design process*."

2.4.13 Furthermore, paragraph 4.7.11 states:

"*In doing so, the Secretary of State should be satisfied that the applicant has considered both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located, any potential amenity benefits, and visual impacts on the landscape or seascape) as far as possible*."

2.4.14 Section 4.6 provides details of how environmental and biodiversity net gain should be considered and confirms that this approach to development aims to leave the natural environment in a measurably better state than beforehand. Projects should therefore not only avoid, mitigate and compensate harms, following the mitigation hierarchy, but also consider whether there are opportunities for enhancements. Applications for development consent should be accompanied by a statement demonstrating how opportunities for delivering wider environmental net gains have been considered, and where appropriate, incorporated into proposals as part of good design of the project.

2.4.15 Section 5.4 further sets out that the design process should embed opportunities for nature inclusive design.

2.4.16 Section 4.10 details how the effects of climate change should be taken into account during the design stage to ensure new energy infrastructure is sufficiently resilient against the possible impacts of climate change. Specifically, as new energy infrastructure is typically likely to remain operational over many decades, the direct and indirect impacts of climate change when considering the project location, design, build, operation and where appropriate decommissioning will need consideration

National Policy Statement for Electricity Networks Infrastructure (EN-5) (2024)

2.4.17 NPS EN-5[7] specifically relates to electricity networks. Section 2 of EN-5 sets out general assessment principles and technology-specific policies relating to matters including site selection and design, climate change adaptation, consideration of good design, biodiversity and geological conservation, landscape and visual, and noise and vibration.

2.4.18 Section 2.2 sets out considerations in relation to site selection and sets out that the SoS should take into account that the development zone of new electricity network infrastructure is not substantially within the control of the applicant. Furthermore, the Section sets out that:

"*Siting is determined by:*

- The location of new generating stations or other infrastructure requiring connection to the network, and/or
- System capacity and resilience requirements determined by the Electricity System Operator."

2.4.19 However, paragraphs 2.2.5 to 2.2.8 acknowledge that applicants retain control in managing the identification of routeing and site selection within the development zone, and that this does not exempt applicants from their duty to consider and balance the site selection considerations and policies on design set out in Section 2.4 of EN-5.

2.4.20 Paragraph 2.2.9 states:

"*In particular, the applicant should consider such characteristics as the local topography, the possibilities for screening of the infrastructure and/or other options to mitigate any impacts…"*

2.4.21 Paragraph 2.2.10 supports the duties set out in Section 9 of the Electricity Act 1989, both in relation developing and maintaining an economical and efficient network. Details of the duties set out in Section 9 of the Electricity Act 1989 are set out in paragraph 2.3.2 of this chapter.

2.4.22 Section 2.3 of EN-5 sets out how applicants should consider climate change adaptation and resilience in the design of new schemes. Paragraph 2.3.2 states that:

"*… applicants should in particular set out to what extent the proposed development is expected to be vulnerable, and, as appropriate, how it has been designed to be resilient to:*

- Flooding, particularly for substations that are vital to the network; and especially in light of changes to groundwater levels resulting from climate change;
- The effects of wind and storms on overhead lines;
- Higher average temperatures leading to increased transmission losses;

[7] Department for Energy Security and Net Zero (2024). National Policy Statement for Electricity Networks Infrastructure (EN-5). Available at: https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/nps-electricity-networks-infrastructure-en5.pdf

- Earth movement or subsidence caused by flooding or drought (for underground cables); and
- Coastal erosion – for the landfall of offshore transmission cables and their associated substations in the inshore and coast locations respectively."

2.4.23 Section 2.4 of EN-5 sets out the consideration of good design for energy infrastructure, with reference to the criteria for good design set out in EN-1 Section 4.7 (paragraph 2.4.6 of this chapter).

2.4.24 Paragraph 2.4.1 notes that "*The Planning Act 2008 requires the Secretary of State to have regard, in designating an NPS, and in determining applications for development consent to the desirability of good design*."

2.4.25 Paragraph 2.4.3 sets out:

"… the Secretary of State should bear in mind that electricity networks infrastructure must in the first instance be safe and secure, and that the functional design constraints of safety and security may limit an applicant's ability to influence the aesthetic appearance of that infrastructure."

2.4.26 Furthermore, paragraph 2.4.4 sets out:

"*While the above principles should govern the design of an electricity networks infrastructure application to the fullest possible extent – including in its avoidance and/or mitigation of potential adverse impacts – the functional performance of the infrastructure in respect of security of supply and public occupational safety must not thereby be threatened*."

2.4.27 Section 2.5 makes consideration for environmental and biodiversity net gain, making specific reference to opportunities to:

"*i. reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or*

ii. connect people to the environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements."

2.4.28 Section 2.9 sets out guidelines on applicant assessment, detailing how applicants must provide information on relevant impacts as directed by EN-5 and the SoS. In relation to design, Section 2.9 sets out expectations of compliance with the Holford and Horlock Rules. Details of the Holford and Horlock Rules are set out at the end of this chapter.

2.4.29 Specifically, paragraph 2.7.1 sets out that "*While the government does not believe that the development of overhead lines is incompatible with applicants' statutory duty under Schedule 9 to the Electricity Act 1989, to have regard to visual and landscape amenity and to reasonably mitigate possible impacts thereon, in practice new overhead lines can give rise to adverse landscape and visual impacts*."

2.4.30 Paragraph 2.9.20 also provides policies on the undergrounding of cables:

"*Although it is the government's position that overhead lines should be the strong starting presumption for electricity networks developments in general, this presumption is reversed when proposed developments will cross part of a nationally designated landscape (i.e. National Park, The Broad, or Area of Outstanding Natural Beauty)."*

2.4.31 Paragraph 2.4.22 goes on to state:

"*However, undergrounding will not be required where it is infeasible in engineering terms, or where the harm that it causes is not outweighed by the corresponding landscape, visual amenity and natural beauty benefits. Regardless of the option, the scheme through its design, delivery, and operation, should seek to further the statutory purposes of the designated landscape. These enhancements may go beyond the mitigation measures needed to minimise the adverse effects of the scheme."*

2.4.32 Section 2.11 provides detail on Secretary of State decision making. Paragraph 2.11.15 states:

"*Where a statutory consultee on the safeguarding of technical facilities identifies a risk that the EMF effect of electricity network infrastructure would compromise the effective and safe operating of such facilities, the potential impact and siting and design alternatives will need to have been fully considered as part of the application*."

Holford Rules

2.4.33 The Holford Rules are guidelines for the routeing of new overhead lines. In brief, the Holford Rules state that applicants should:

- avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if total mileage is somewhat increased in consequence;
- avoid smaller areas of high amenity value or scientific interest by deviation, provided this can be done without using too many tension pylons, i.e. the bigger structures which are used when lines change direction;
- other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer tension pylons;
- choose tree and hill backgrounds in preference to sky backgrounds wherever possible. When a line has to cross a ridge, secure this opaque background as long as possible, cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees;
- prefer moderately open valleys with medium or moderate levels of tree cover where the apparent height of pylons will be reduced, and views of the line will be broken by trees;
- where country is flat and sparsely planted, and unless specifically preferred otherwise by relevant stakeholders, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concentration of lines or 'wirescape'; and
- approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, carefully assess the comparative costs of undergrounding.

Horlock Rules

2.4.34 The Horlock Rules are guidelines for the design and siting of substations. In brief, the Horlock Rules state that applicants should:

- consider environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the

consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.

- seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections.
- protect as far as reasonably practicable areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas.
- take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.
- keep the visual, noise and other environmental effects to a reasonably practicable minimum.
- consider the land use effects of the proposal when planning the siting of substations or extensions.
- consider the options available for terminal pylons, equipment, buildings and ancillary development appropriate to individual locations, seeking to keep effects to a reasonably practicable minimum.
- use space effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation.
- make the design of access roads, perimeter fencing, earth-shaping, planting and ancillary development an integral part of the site layout and design, so as to fit in with the surroundings.
- in open landscape especially, high voltage line entries should be kept, as far as possible, visually separate from low voltage lines and other overhead lines so as to avoid a confusing appearance.
- study the inter-relationship between towers and substation structures and background and foreground features so as to reduce the prominence of structures from main viewpoints. Where practicable the exposure of terminal towers on prominent ridges should be minimised by siting towers against a background of trees rather than open skylines.

National Policy Statement for Renewable Energy (EN-3) (2024)

2.4.35 NPS EN-3 also includes support for the onshore infrastructure required to deliver new offshore wind developments. This NPS contains relevant policies in relation to design including opportunities for co-location and coordination of onshore-offshore transmission.

2.4.36 Paragraphs 2.8.24 to 2.8.33 (inclusive) reiterate the position set out in EN-1 and EN-5 that a co-ordinated approach to onshore-offshore transmission is required. Paragraph 2.8.25 states that *'The previous standard approach to offshore-onshore connection involved a radial connection between single wind farm projects and the shore. A coordinated approach will involve the connection of multiple, spatially close, offshore wind farms and other offshore infrastructure, wherever possible, as relevant to onshore*

networks'. EN-3 is of relevance to the Project as increasing the transmission capability of the network will support delivery of power from a range of renewable energy sources.

2.4.37 NPS EN-3 also includes references to Critical National Priority Infrastructure outlining that the assessment principles outlined in Section 4 of EN-1 continue to apply to this. Applicants must show how any likely significant negative effects would be avoided, reduced, mitigated, or compensated for, following the mitigation hierarchy. Early application of the mitigation hierarchy is strongly encouraged, as is engagement with key stakeholders including Statutory Nature Conservation Bodies (SNCB), both before and at the formal pre-application stage.

National Planning Policy Framework (NPPF) (2024)

2.4.38 The revised National Planning Policy Framework (NPPF)[8] was published in December 2024. The NPPF sets out in Paragraph 5 the *'Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant NPSs for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework (NPFF)'.*

2.4.39 While NPS EN-1 and EN-5 remain the prime decision-making documents, the NPPF does include policies pertinent to generic development management considerations and some of its principles may be considered by the decision-making authority, where relevant to the Project. These principles are concerned with protection and conservation of the natural and built and historic environment, climate change and flooding as well as sustainable growth, development, and a strong, competitive economy.

2.4.40 Section 12 of the NPPF sets out policies relating to "Achieving well-designed and beautiful places". Specifically, paragraph 137 sets out that:

"Design quality should be considered throughout the evolution and assessment of individual proposals. Early discussion between applicants, the local planning authority and local community about the design and style of emerging schemes is important for clarifying expectations and reconciling local and commercial interests. Applicants should, where applicable, provide sufficient information to demonstrate how their proposals will meet the design expectations set out in the local and national policy, and should work closely with those affected by their proposals to evolve designs that take account of the views of the community. Applications that can demonstrate early, proactive and effective engagement with the community should be looked on more favourably than those that cannot."

2.4.41 Furthermore, paragraph 164 of the NPPF states that:

"*New Development should be planned for in ways that:*

a) Avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through incorporating green infrastructure and sustainable drainage systems; and

[8] Ministry of Housing, Communities & Local Government (2024). National Planning Policy Framework. Available at https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf

b) *Can help to reduce greenhouse gas emissions, such as through its location, orientation, and design. Any local requirements for the sustainability of buildings in plans should reflect the Government's policy for national technical standards*."

2.4.42 The NPPF is supported by the National Planning Practice Guidance.

National Infrastructure Commission (NIC) Design Principles for National Infrastructure[9]

2.4.43 The National Infrastructure Commission (NIC) Design Group has engaged widely with a range of bodies to identify a set of four key design principles for national infrastructure.

2.4.44 The four key design principles are as follows:

- Climate: Mitigate greenhouse gas emissions and adapt to climate change.
- People: Reflect what society wants and share benefits widely.
- Places: Provide a sense of identity and improve our environment.
- Value: Achieve multiple benefits and solve problems well.

2.4.45 The four key design principles are set out to be applied to the design of new infrastructure from the start and throughout the project development. In applying the design principles, applicants should: appreciate the wider context, engage meaningfully, and continually measure and improve design.

Nationally Significant Infrastructure Projects: Advice on Good Design (2024)

2.4.46 The Planning Inspectorate published the guidance "Advice on Good Design" in October 2024[10], which sets out how good design might be successfully delivered in applications for NSIPs.

2.4.47 The advice note states that "*achieving good design requires a holistic approach to deliver high quality, sustainable infrastructure that responds to place and takes account of often complex environments. Good design is not primarily about how infrastructure looks, although these considerations (the aesthetics) are important*."

2.4.48 The guidance references the NIC Design Group, which recommends that considering design properly in NSIPs supports the government's ambition to speed up delivery and maximise value by addressing: a structured design process, design principles, and multiple beneficial outcomes. The guidance further makes reference to the NIC Design Principles, as set out above.

2.4.49 The guidance states that a good design process includes the following components:

- *"An effective, intentional, transparent and deliverable process.*
- *A collaborative, multi-disciplinary approach including positive community and land rights engagement.*

[9] National Infrastructure Commission (2024). Design Principles for National Infrastructure. Available at: https://nic.org.uk/app/uploads/NIC-Design-Principles.pdf

[10] Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on Good Design. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-good-design

- *A succinct and ambitious vision for the project, underpinned by a clear analysis of the context for the place, its environment and the opportunities for creating social value, including for the local and wider economy.*
- *A clear statement of design principles that will drive the project and deliver wider value and benefits beyond the core purpose of the scheme.*
- *A narrative that explains how the approach to design has evolved, the reasons for the choices that have been, or will be, made, an explanation of the multiple beneficial outcomes the project will achieve and how they will be secured.*
- *Design leadership supported by an engaged design champion to ensure design governance is secured and the design principles drive a structured design process and hierarchy of design control."*

2.4.50 The guidance sets out four key elements that Applicants should consider during the pre-application process and should be addressed within an NSIP application. The extent to which these elements need to be covered will depend on the nature of the infrastructure proposed and the site. The four elements are set out below:

- ***Assemble***

  This stage requires a brief setting out the project's purpose, a budget, a proposed timeline, a multi-disciplinary team with design skills and gathering of baseline information which can inform consideration of alternatives and eventual site selection.

  The multi-disciplinary project team must use the information that it has assembled to develop a vision. The vision should have a compelling narrative, which goes beyond solving technical problems and policy compliance and considers construction as well as operation. It should define an ambition which goes beyond the Order Limits in line with outcomes that are wider than the project limits. It must include the development of design principles.

- ***Research***

  This stage needs to be iterative. It should analyse the constraints and opportunities of technology and location with a narrative of how the design evolved from the brief. It will need to mitigate adverse effects assessed as part of the EIA process and show how the proposed development will deliver positive outcomes and create a new and distinctive place. During this stage, engagement and consultation with statutory parties, affected persons, local communities and independent design panels should inform the project's design evolution. This should be explained.

- ***Co-ordinate***

  Further iteration must be undertaken to refine choices for details and parameters. This should incorporate consultation responses, independent design input and ensure that design principles are being met. There may be choices to be made. Decisions need to be taken using strong design leadership, driven by the vision. This stage must set out the process by which future post-consent decision-making will be made.

- ***Secure***

  The essential output of this stage must be to set out how the project's good design is secured and will be delivered, including ongoing design advice and community engagement. It is important that applicants are clear about the influence

procurement decisions could have and that any differences with future consenting authorities are aired. Examining authorities will expect designs to be progressed to a detailed level where the outcomes of the applicant's analysis, program and vision are defined. Clarity over how design elements that have less certainty at application stage will be decided and secured post-consent must be provided.

2.4.51 The guidance note also draws attention to the EIA process and highlights how the EIA can and should inform the design process. The influence of the EIA process on the design should be clearly articulated in the Environmental Statement.

2.4.52 Annex A of the guidance note identifies "good design issues" that applicants are encouraged to consider before submitting an NSIP application for Examination. These issues include:

- *The Design Approach Document;*
- *Analysis and research of key site issues;*
- *Response to main significant adverse effects identified in the EIA;*
- *Vision for the completed development and its surrounds;*
- *Design skills;*
- *Design development (including consideration of emerging design principles, use of digital techniques, design outcomes, and presentation of a design narrative);*
- *Independent design review;*
- *Delivery of the design post-consent;*
- *Placemaking and community benefit;*
- *Consultation with statutory consultees, local authorities, communities and people with interest in the land;*
- *Integrated design approach;*
- *Consideration of National Policy Statements;*
- *Application of design principles; and*
- *Consideration of the NIC four principles of good design.*

3. Non-Statutory Consultation Feedback

nationalgrid

3. Non-Statutory Consultation Feedback

3.1 Non-Statutory Consultation 2023

Introduction

3.1.1 National Grid held a non-statutory consultation between 1 June 2023 to 27 July 2023. A further round of localised non-statutory consultation was undertaken between 9 July 2024 to 6 August 2024. Chapter 3.1 of this report provides a summary of the non-statutory consultation 2023 and Chapter 3.2 of this report summarises the localised non-statutory consultation 2024.

Context

3.1.2 The aim of the non-statutory consultation in 2023 was to:

- Introduce and provide an overview of the Project to the public and wider consultees;
- Explain the need to build the reinforcement;
- Set out options considered and how the decision was made on the emerging preferred corridor and graduated swathe;
- Present and explain the preferred corridor and graduated swathe;
- Present and explain the substation siting zones for the two new substations which at the time of non-statutory consultation did not form part of the North Humber to High Marnham Project (further information on substations can be found in Chapter 7.8 and 7.9 of this report.);
- Ensure all stakeholders have the opportunity to provide feedback on work to date; and
- Outline the next steps, programme and how proposals will be developed further.

Consultation corridor

3.1.3 An overview of the emerging preferred corridor, as presented at the 2023 non-statutory consultation, was provided in the 2023 Project Background Document11. The emerging preferred corridor and the associated graduated swathe was split into 11 Route Sections (see Figure 3-1) to make it easier for people to give feedback about any particular areas that they may wish to comment on. A brief description of each of these Route Sections as presented during non-statutory consultation 2023 is set out below.

[11] National Grid (203) North Humber to High Marnham Project Background Document. June 2023. Available at: https://www.nationalgrid.com/electricity-transmission/document/148931/download

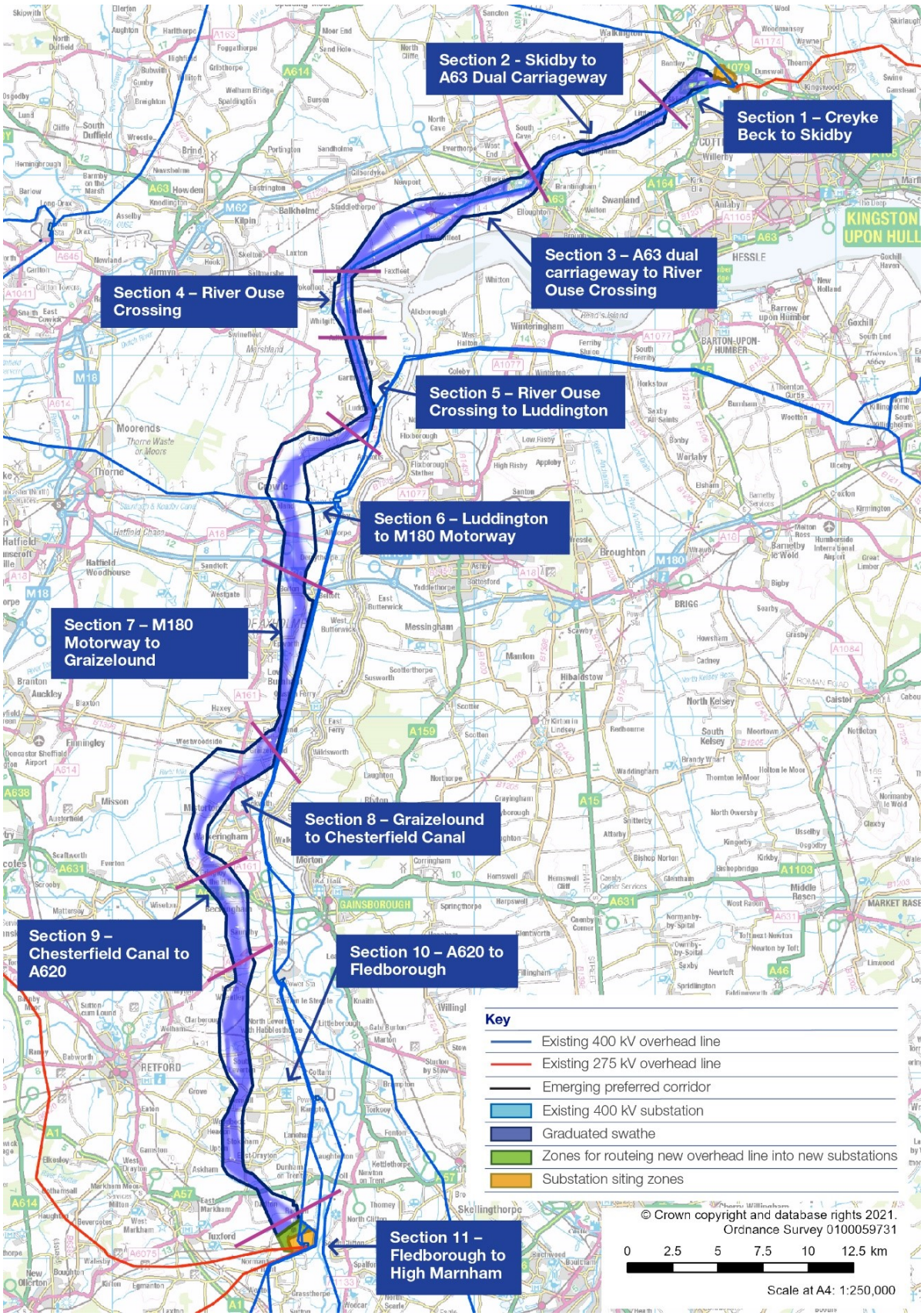

Figure 3-1 North Humber to High Marnham Route Sections

Route Section 1 – Creyke Beck to Skidby

3.1.4 The proposed reinforcement would start at a new substation near Creyke Beck in the authority of East Riding of Yorkshire (where the new overhead line would connect into) to a point immediate north of the village of Skidby. The graduated swathe starts from the edge of the substation search area. The path of the new overhead line within the substation search area will be influenced by the final location of the new substation.

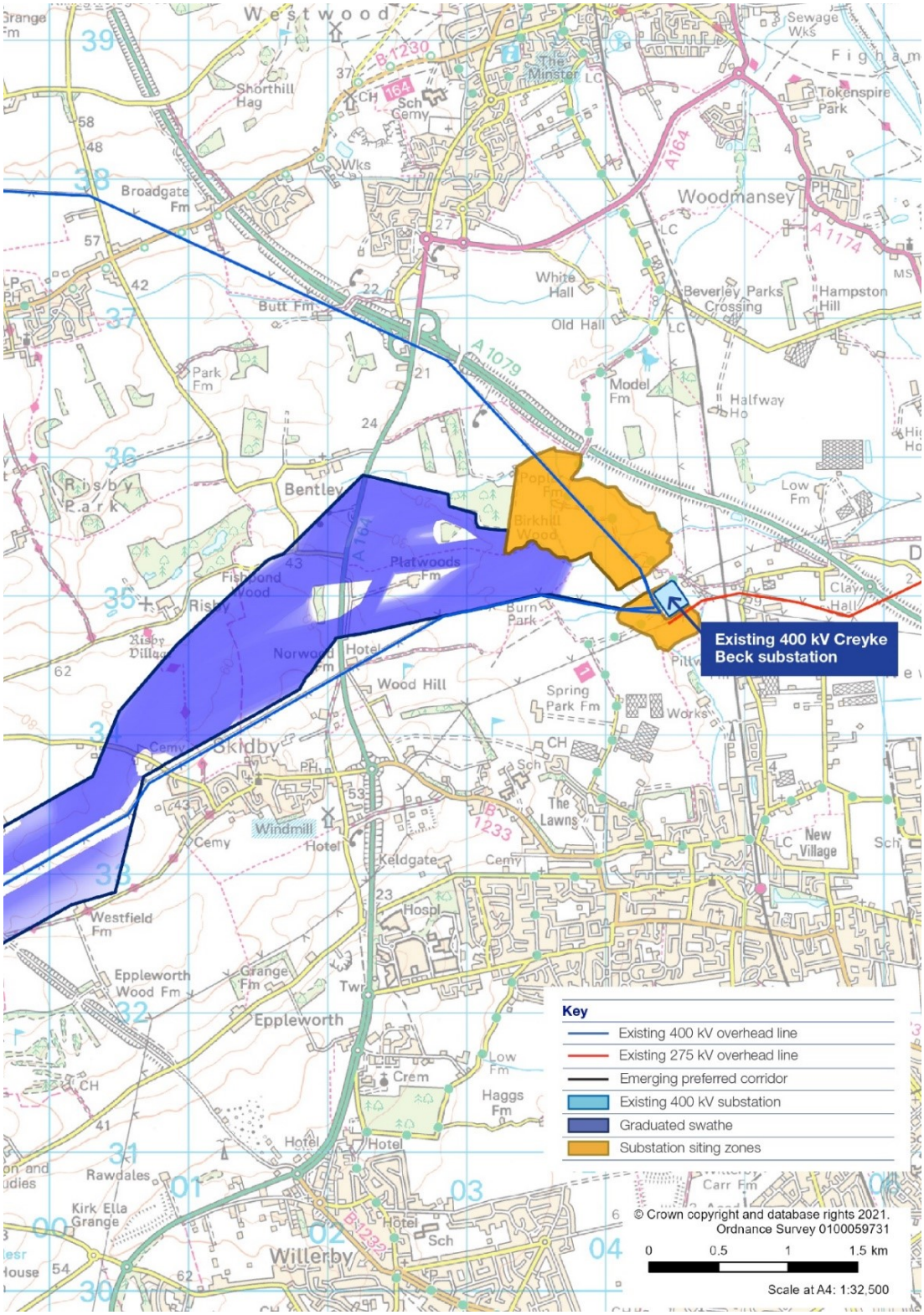

Figure 3-2 Route Section 1: Creyke Beck to Skidby

Route Section 2 - Skidby to A63 dual carriageway

3.1.5 This Route Section runs from the north of Skidby in a south-west direction to the A63 dual carriageway, which is located on the western edge of the Yorkshire Wolds.

Figure 3-3 Route Section 2: Skidby to A63 dual carriageway

Route Section 3 – A63 dual carriageway to River Ouse Crossing

3.1.6 This Route Section runs from the A63 dual carriageway, on the western edge of the Yorkshire Wolds passing the settlements of Ellerker and Broomfleet to Blacktoft Lane, a road in close proximity to the northern bank of the River Ouse.

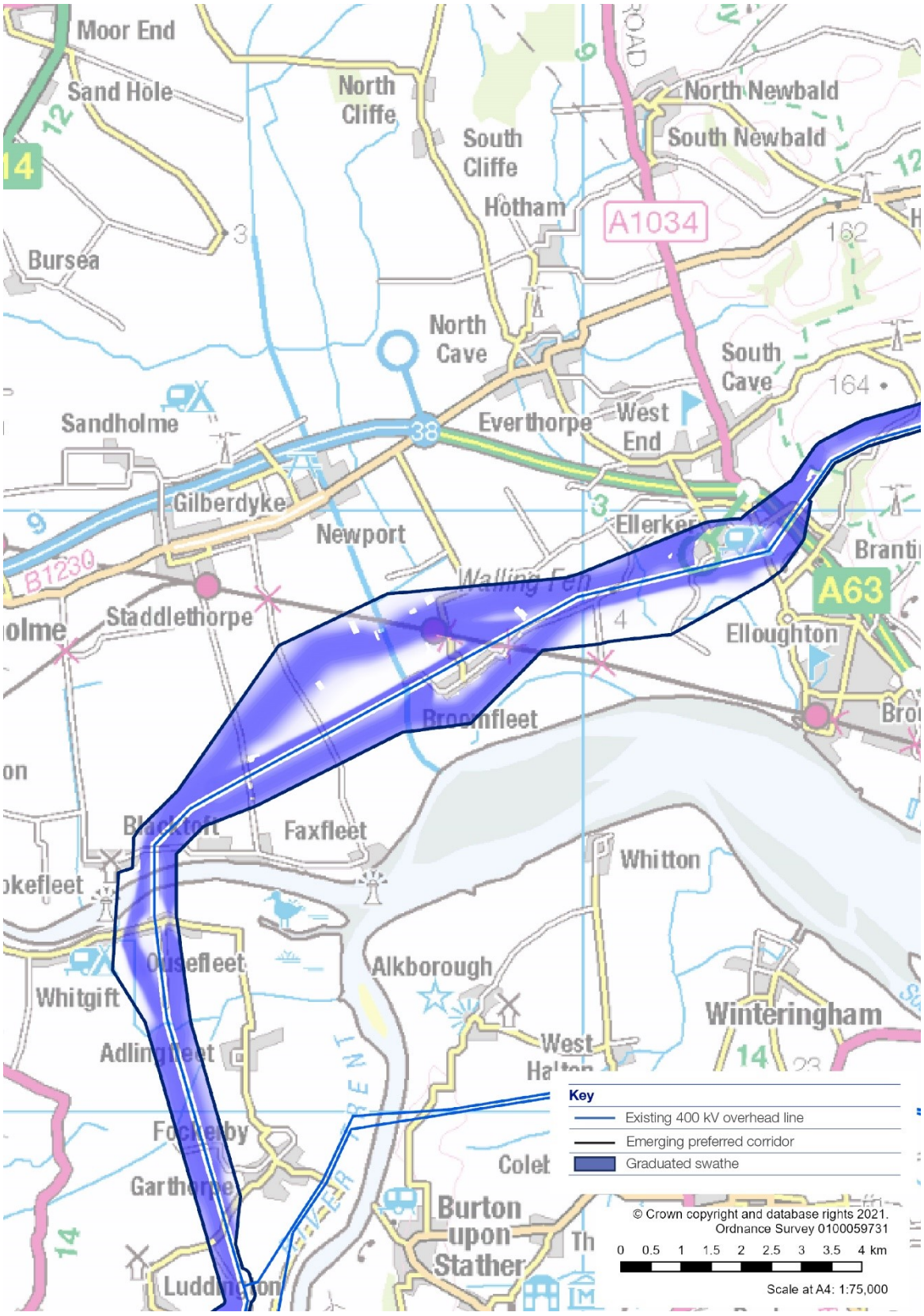

Figure 3-4 Route Section 3: A63 dual carriageway to River Ouse Crossing

Route Section 4 – River Ouse crossing

3.1.7 This is a short 2.5km Route Section of the preferred corridor that crosses the River Ouse and directly interacts with the Humber Estuary internationally designated sites. The corridor extends to the east and west of the existing overhead line that crosses the western-most extent of the RSPB's Blacktoft Sands Nature Reserve. The corridor passes through the village of Ousefleet moving south and to the west of Adlingfleet.

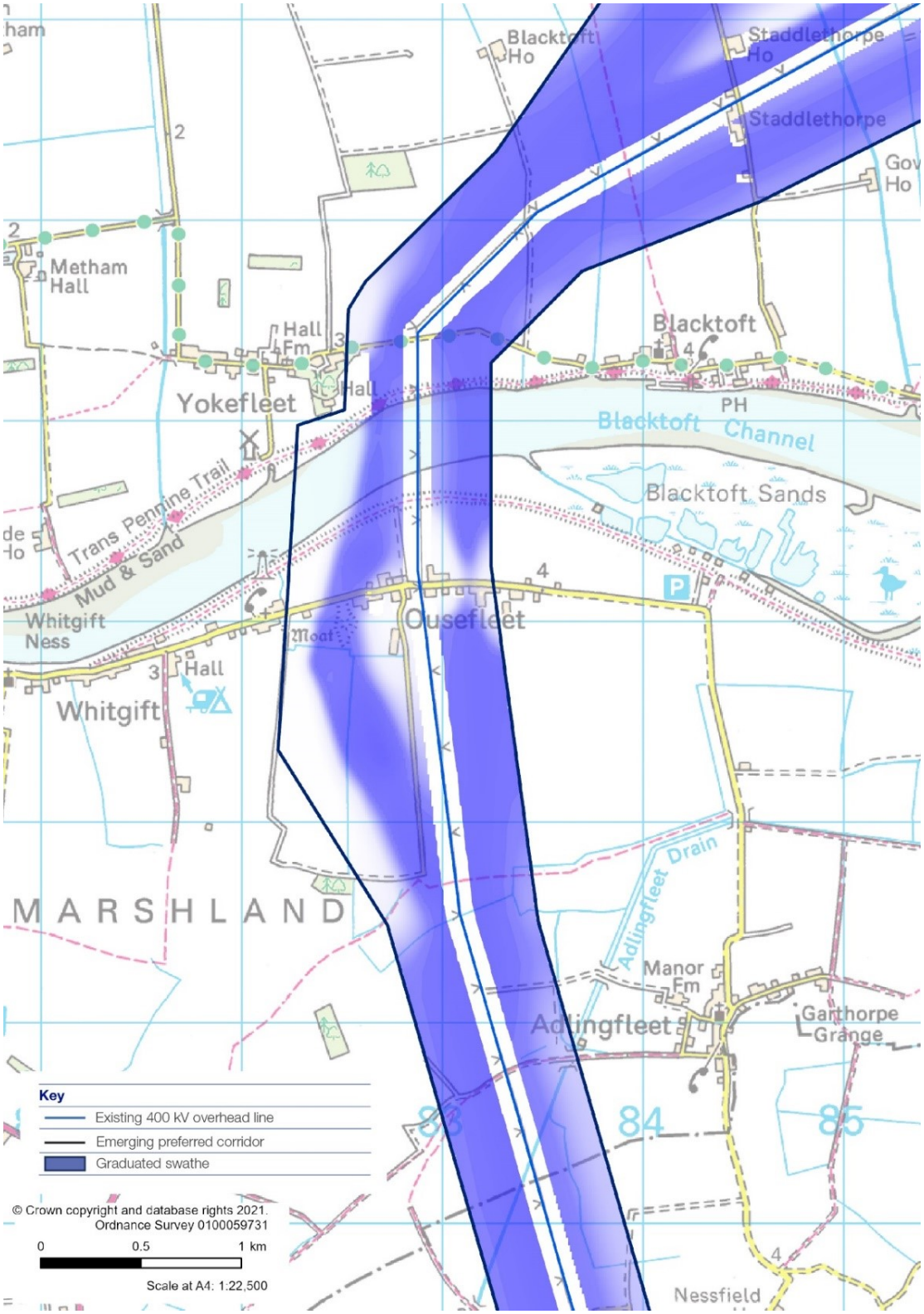

Figure 3-5 Route Section 4: River Ouse crossing

Route Section 5 – River Ouse crossing to Luddington

3.1.8 This Route Section extends south running to the west of Adlingfleet entering the North Lincolnshire authority to the north-west of Garthorpe. The corridor continues in a south-east direction to the B1392 Meredyke Lane, which runs between the village of Luddington and the River Trent.

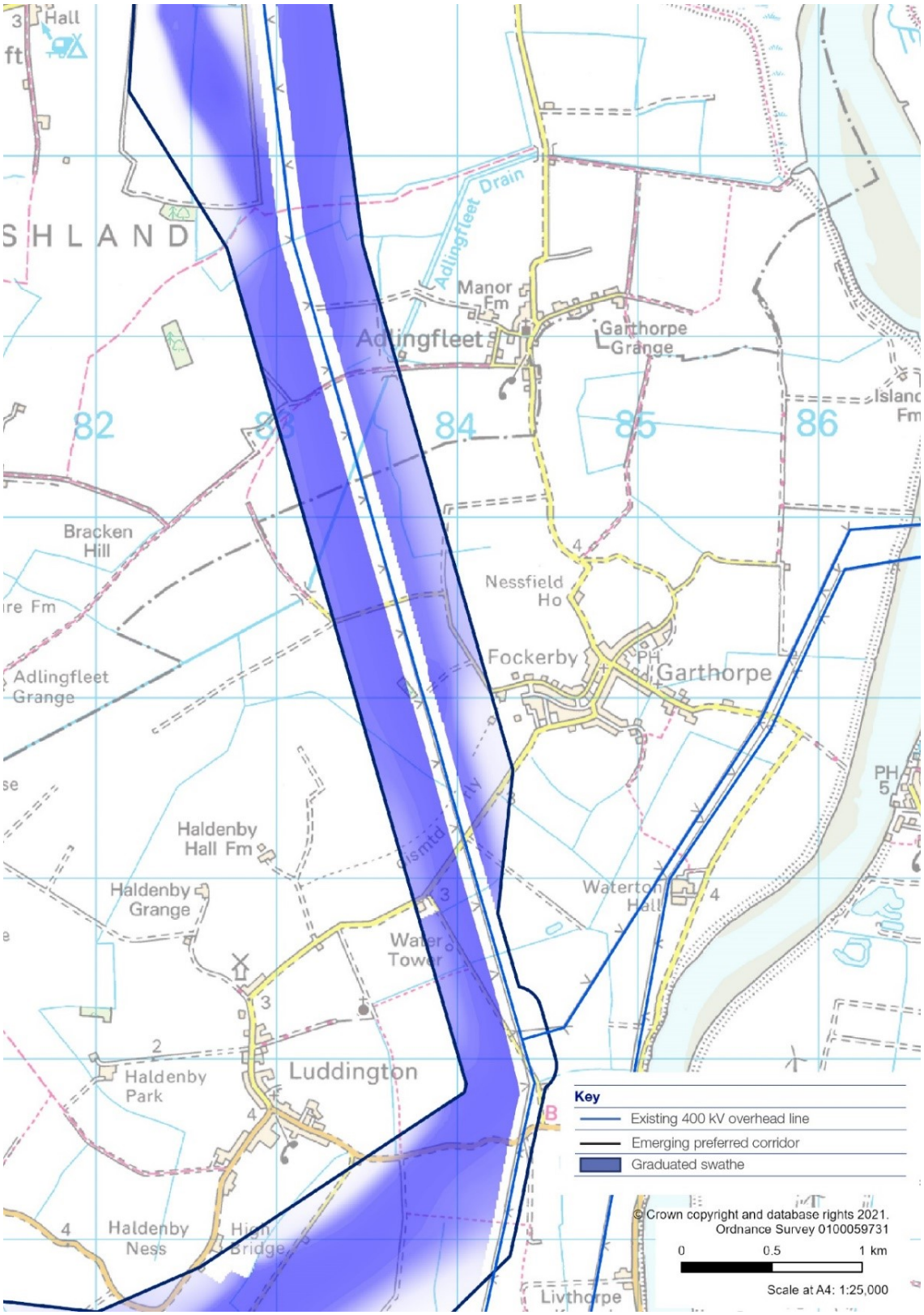

Figure 3-6 Route Section 5: River Ouse crossing to Luddington

Route Section 6 – Luddington to M180 motorway

3.1.9 This Route Section runs between the B1392 Meredyke Lane and the M180 motorway. The corridor routes to the west of the operational Keadby Wind Farm. Approximately 1km south of Crowle Grange, the emerging preferred corridor intersects the route of the existing 400kV overhead line from Keadby Substation.

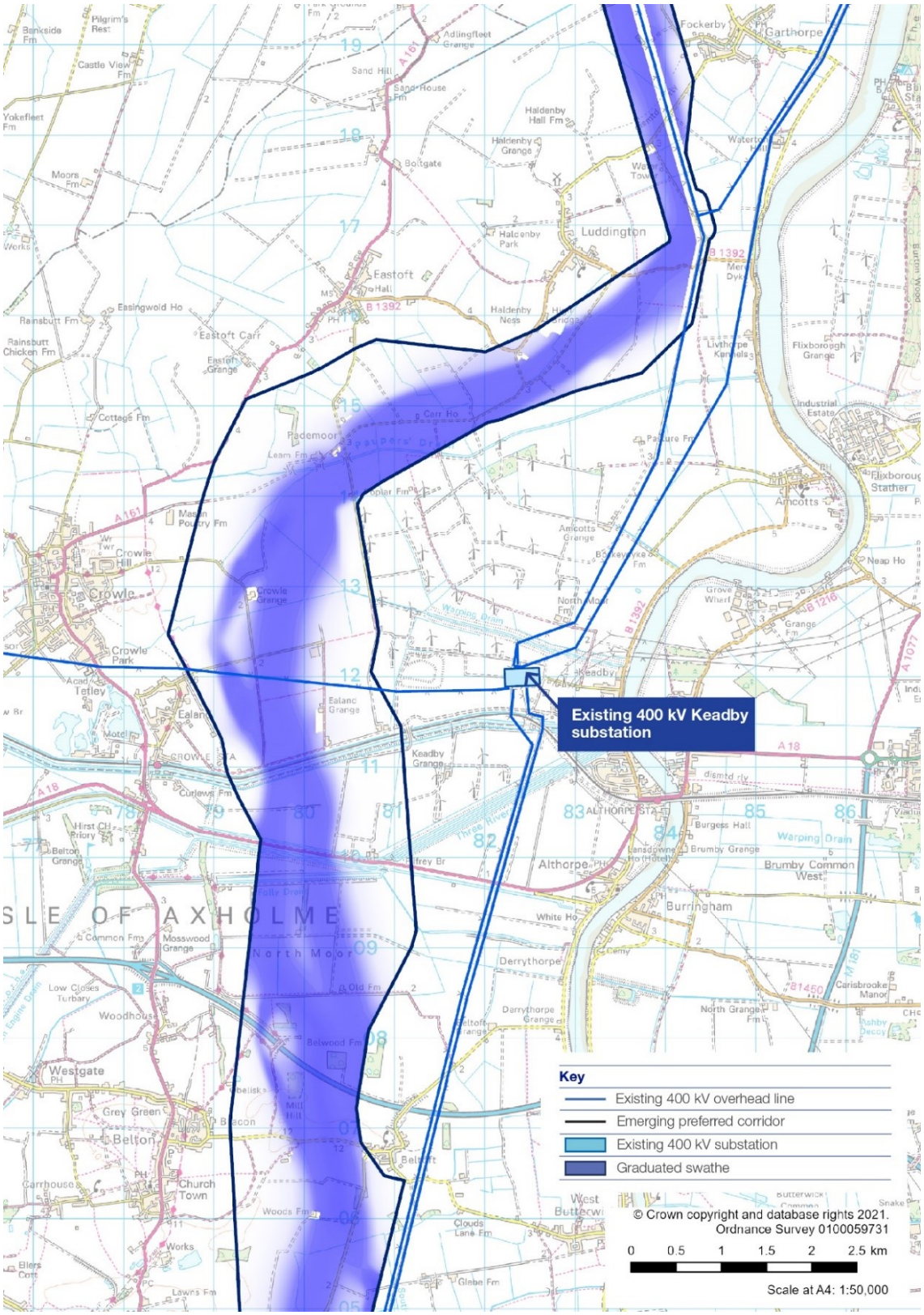

Figure 3-7 Route Section 6: Luddington to M180 motorway

Route Section 7 – M180 motorway to Graizelound

3.1.10 The Route Section runs between the M180 motorway to the north and Stockwith Road/Owston Road between the villages of Graizelound and West Stockwith to the south. Running in a southern direction the corridor passes to the east of the villages of Epworth and Haxey.

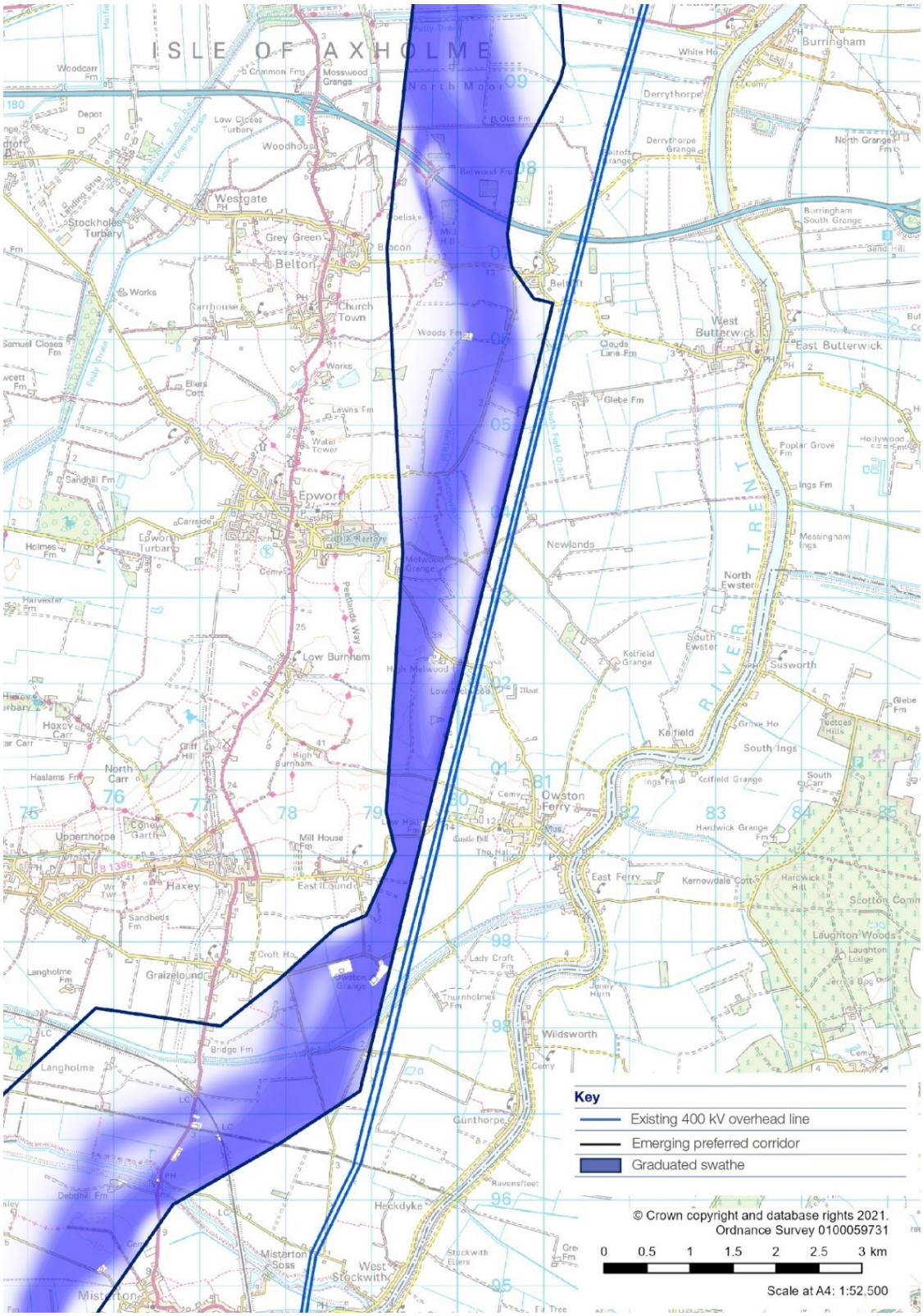

Figure 3-8 Route Section 7: M180 motorway to Graizelound

Route Section 8 – Graizelound to Chesterfield Canal

3.1.11 This Route Section runs between Stockwith Road/Owston Road and Chesterfield Canal to the south, routing into the Bassetlaw District authority to the north of Misterton. This Route Section of the emerging preferred corridor is generally wider than other areas, following a westerly path to avoid the settlement of Misterton. The corridor crosses the Spalding to Doncaster rail line and the River Idle in this Route Section.

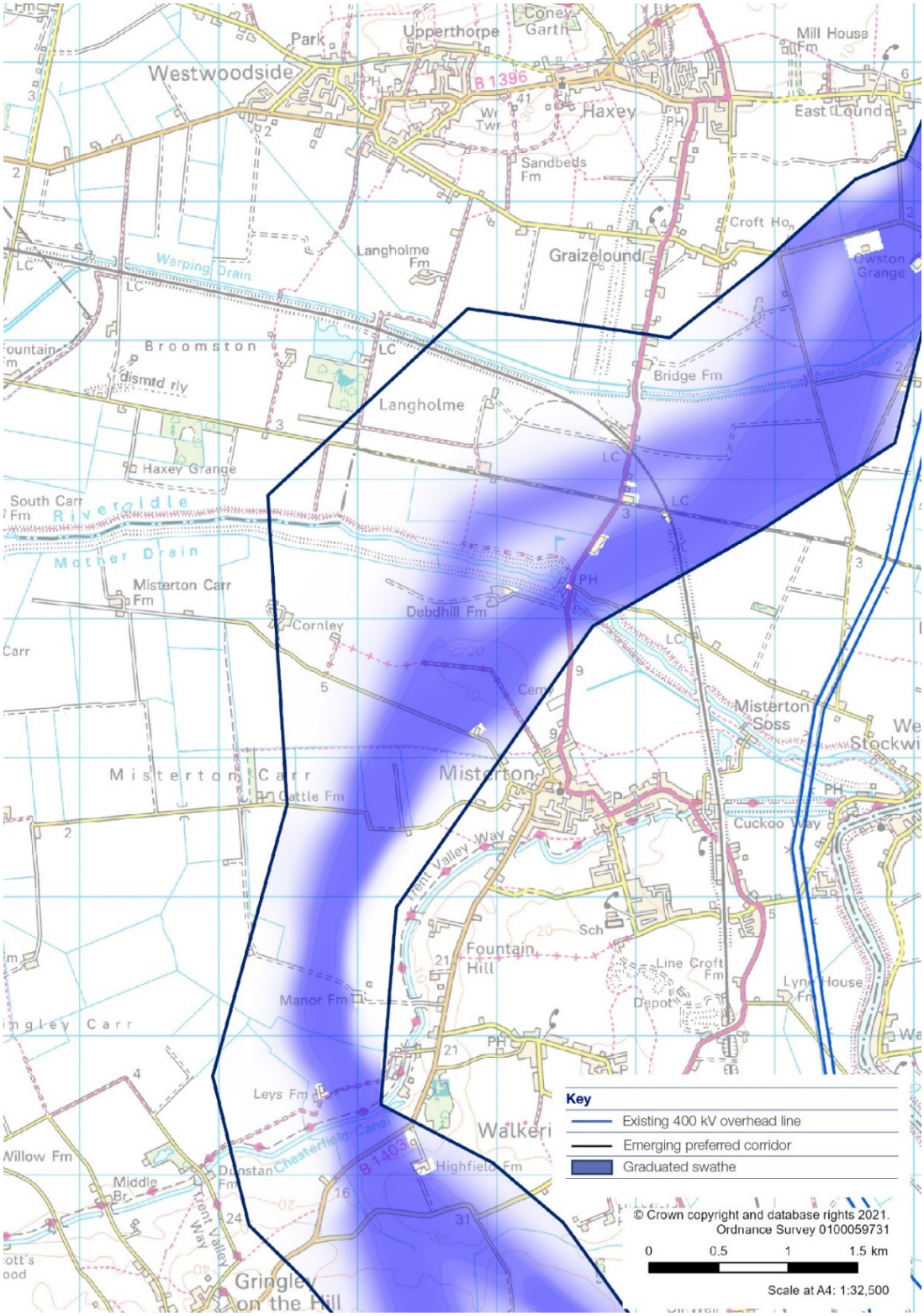

Figure 3-9 Route Section 8: Graizelound to Chesterfield Canal

Route Section 9 – Chesterfield Canal to A620

3.1.12 This Route Section runs south between Chesterfield Canal and the A620 Gainsborough Road, northeast of the village of North Wheatley. The village of Gringley on the Hill lies to the west of the corridor whilst the village of Beckingham lies to the east.

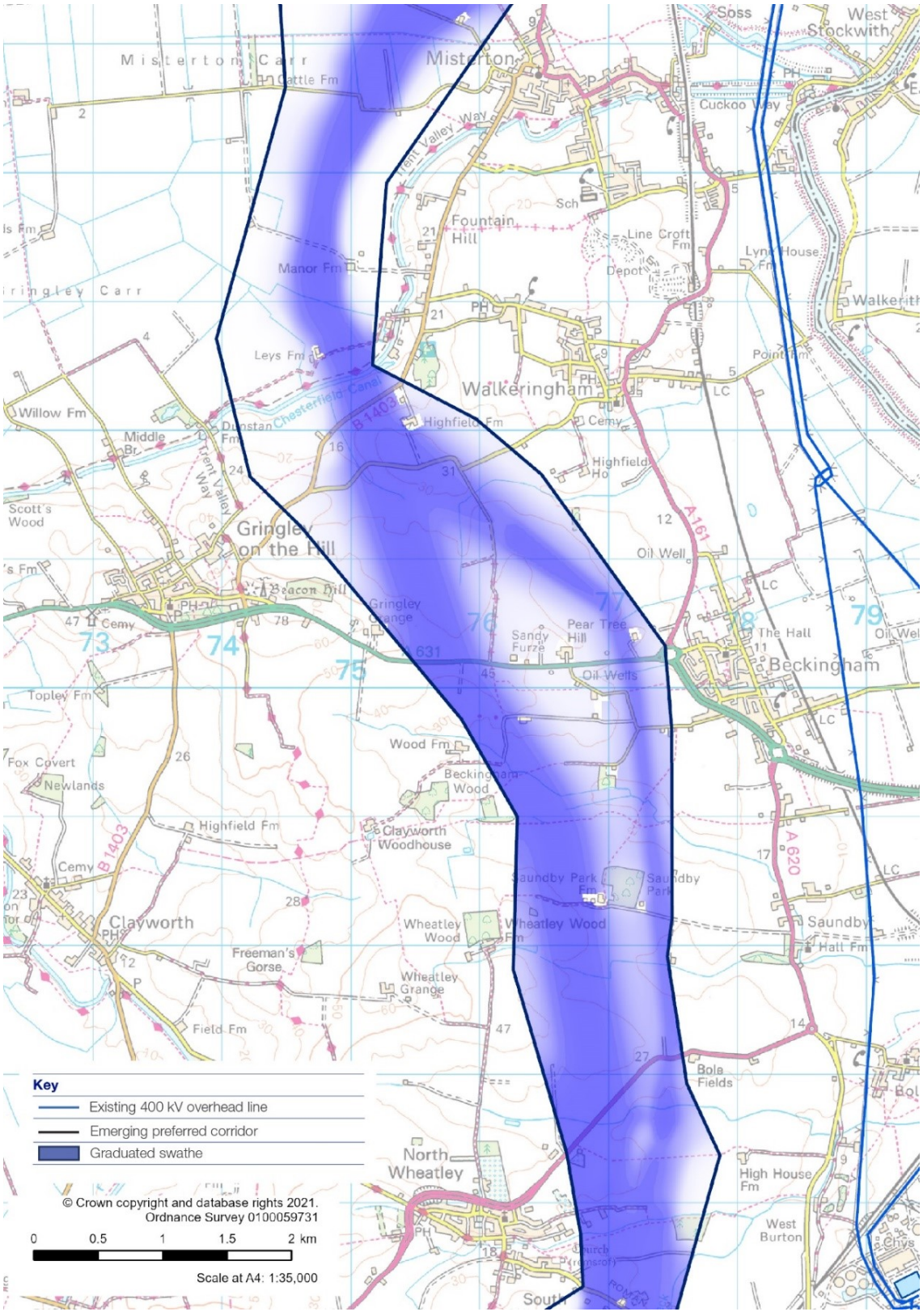

Figure 3-10 Route Section 9: Chesterfield Canal to A620

Route Section 10 – A620 to Fledborough

3.1.13 The Route Section runs from the A620 south to a point approximately 1km from the existing High Marnham 400kV substation. In this Route Section the corridor is routed to avoid the villages of North and South Wheatley, Sturton le Steeple, North Leverton and South Leverton and Treswell to the north, and the settlements of Woodbeck, East Drayton and Darlton further to the south. The corridor crosses a 132kV overhead electricity distribution line in this Route Section and the Sheffield to Lincoln rail line.

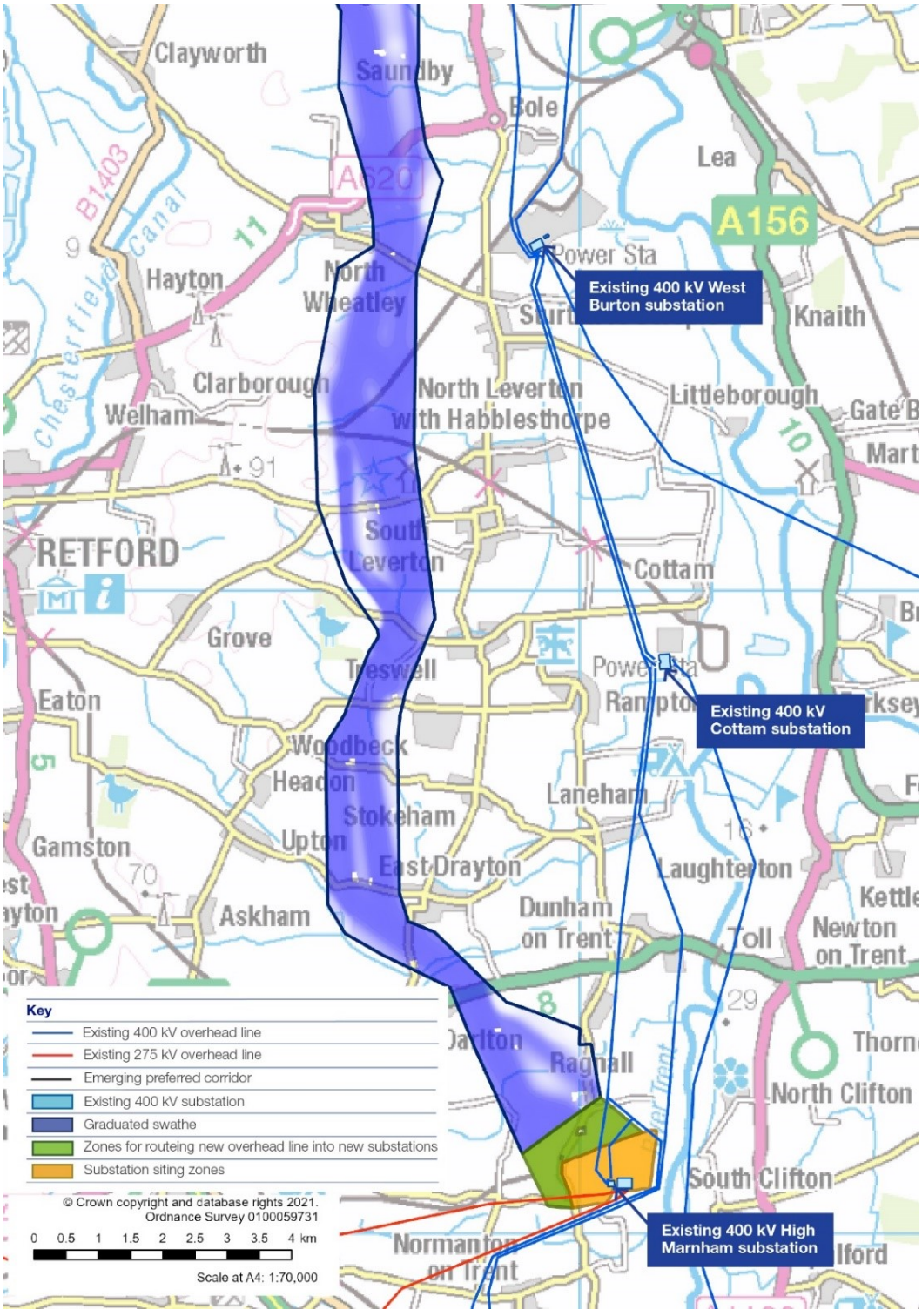

Figure 3-11 Route Section 10: A620 to Fledborough

Route Section 11 – Fledborough to High Marnham

3.1.14 The Route Section begins approximately 1km northwest of the existing High Marnham substation and indicates where the new substation could be located. The location of the new substation within this zone will influence the final route of the new overhead line.

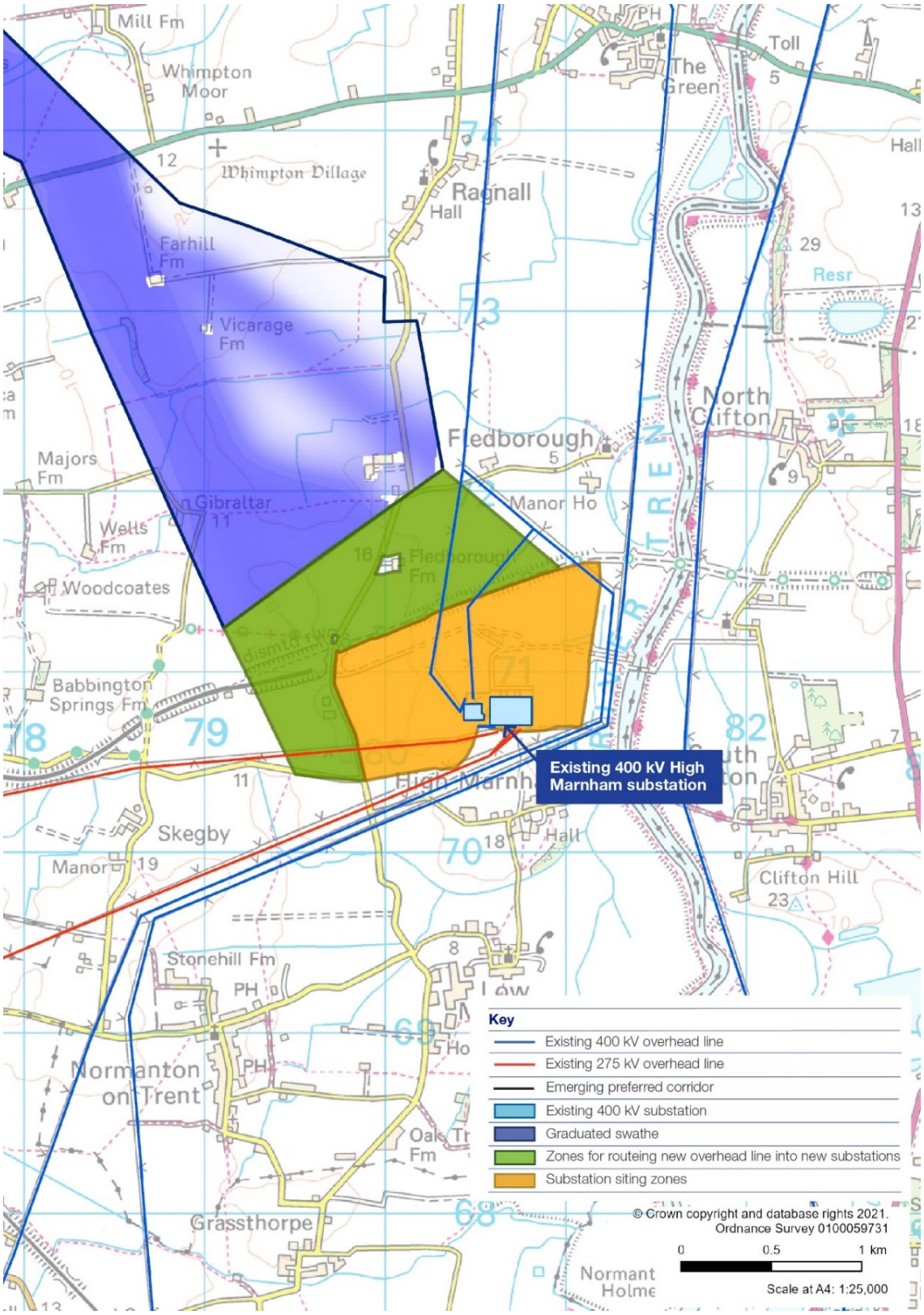

Figure 3-12 Route Section 11: Fledborough to High Marnham

Consideration of consultation feedback

3.1.15 A total of 585 feedback submissions were received during the non-statutory consultation period in 2023 from local communities, stakeholders and other consultees. This comprised of paper response forms, online response forms, emails and letters.

3.1.16 All of the feedback received during the non-statutory consultation has been carefully reviewed and considered, alongside ongoing technical work on the engineering design and further environmental and socio-economic assessment work. A summary of all feedback received, and National Grid's responses is presented within the **Non-Statutory Consultation Feedback Report 2024**. Further consideration of this consultation feedback in relation to design is set out in Chapter 5 of this report.

3.1.17 Feedback that proposed design changes and requests was carefully considered in the context of environmental and socio-economic constraints and opportunities, engineering feasibility and cost, and planning policy considerations.

3.1.18 The process of considering the proposed changes and requests comprised of an initial filter for benefit and feasibility, an assessment incorporating inputs from relevant technical experts, and further stages of additional study if required. This was assessed in conjunction with the results of the closed questions from the feedback form which sought to gauge respondents' views on consultation and Project development processes.

3.1.19 The outcome of the consideration of potential design changes and requests was either that the request informed the current draft proposals, or that the request was not considered further following balanced and informed assessment. The current draft proposals will be subject to ongoing review in response to all feedback and further engineering and environmental assessment work and surveys.

Summary of changes to our proposals in response to consultation feedback

3.1.20 Some feedback responses commented on the location of the consultation corridor and the graduated swathe. We have sought to summarise the requests identified in response to the 2023 non-statutory consultation where these have resulted in changes to our proposals. Further information on the development of the Project design, and technical assessment is provided in the subsequent chapters of this report.

3.1.21 Changes and requests to the consultation corridor are referred to as 'requests outside the consultation corridor'. Changes and requests within the emerging preferred corridor and graduated swathe are referred to as 'requests within the emerging preferred consultation corridor'. These requests informed the development of the preferred alignment for the proposed new overhead line.

Requests outside the consultation corridor

3.1.22 Some changes have been made outside the consultation corridor as a result of further technical and environmental assessment work and with consideration of consultation feedback in this area. These changes are detailed below and in Chapter 5.5 of this report.

- Route Section 2 – the preferred alignment routes outside of the emerging preferred corridor for 3 proposed pylon locations at Brantingham Dale, to the north west of

Dale Road. This is to facilitate a line swap-over which requires a temporary diversion of the existing 4ZQ overhead line.

Requests within the emerging preferred consultation corridor

3.1.23 Some changes have been made within the consultation corridor as a result of further technical and environmental assessment work and with consideration of consultation feedback in this area. These changes are detailed below and in Chapter 5.5 of this report.

- Route Section 3 - the consultation feedback form asked if consultees had any preference for the new overhead line to be routed to the north or to the south of Ellerker. The majority of respondents did not state a preference or requested undergrounding. Of those who responded to this question stating a preference within the graduated swathe, the majority requested to take the southern path within the graduated swathe to facilitate an alignment which routes to both the south of the village of Ellerker and the existing 400kV overhead line to enable a close parallel alignment opportunity in the interests of visual amenity.
- Route Section 3 - the consultation feedback form asked if consultees had any preference for the new overhead line to be routed to the north or to the south of Broomfleet. The majority of respondents did not state a preference or requested undergrounding. Of those who responded to this question stating a preference within the graduated swathe, the majority indicated a preference for the new overhead line to be routed to the north of Broomfleet, with some requesting either the northern or central path within the graduated swathe.
- Route Section 3 – some feedback requested the new overhead line to take the central path within the graduated swathe to enable an alignment which runs parallel to the north of the existing 400kV line at the village of Broomfleet and Blacktoft Sands. This request facilitates a western parallel crossing of the River Ouse, as preferred from an ornithological perspective so as not to introduce a new barrier to bird movements and collision risk.
- Route Section 5 – Some respondents requested the new overhead line be routed within the eastern path of the graduated swathe in Route Section 5 whilst others requested a route within the western path to enable a western route which closely parallels the existing 4ZQ overhead line and routes further away from the Early Enclosed Land character area (within the locally designated Isle of Axholme) located between and around Fockerby and Garthorpe.
- Route Section 6 - request to route the new overhead line within the central/eastern part of the graduated swathe to maximise distance from the villages of Ealand and Crowle in the interests of residential amenity and impact on these local communities.
- Route Section 7 - request to route within the eastern part of the swathe to facilitate a close parallel with the existing 4TM and ZDA 400kV overhead lines in Route Section 7 to keep the new overhead line close to the existing overhead lines, thereby limiting spread of infrastructure.
- Route Section 8 - request to route in the western path of the graduated swathe to facilitate an alignment which reduces impacts on heritage assets, namely the Grade II listed Haxey Gate Inn whilst also avoiding interaction with the Nottinghamshire Local Wildlife Sites, Tindale Drain, Mother Drain and River Idle and Banks.

- Route Section 8 - request to follow a westerly alignment within the corridor but outside of the graduated swathe across the Carrs area north of Gringley to reduce impacts to residential amenity, views and tourism businesses.
- Route Section 11 - request to route within the western part of the swathe in Route Section 11 in the interests of residential amenity.

3.1.24 Further details on the consideration of changes to and within the consultation corridor summarised above, are provided in Chapters 5.4 and 5.5 of this report.

3.1.25 The above requests within the 2023 consultation corridor have been taken forward and have fed into the development of the preferred alignment. Further review of these proposed changes will be undertaken in response to feedback and further environmental and engineering investigations. A summary of all feedback received, and National Grid's responses is presented within the **Non-Statutory Consultation Feedback Report 2024**.

3.2 Localised Non-Statutory Consultation 2024

Introduction

3.2.1 Following non-statutory consultation in 2023, National Grid reviewed all consultation feedback and undertook a review of the CPRSS 2023, taking into account new information, including consultation feedback and design and assessment work. As a result of this further work National Grid identified a potential alternative corridor in the southernmost section of the route, between the villages of South Wheatley and High Marnham. The potential alternative corridor was referred as the 'eastern corridor'.

3.2.2 A proportion of the feedback received regarding the proposals between South Wheatley and High Marnham in 2023 (Route Sections 10 and 11) suggested that the new overhead line should be routed further to the east, placing it closer to the existing overhead lines, and further from villages that would otherwise be located closer to the proposed overhead line, as a result of the Project. There were also suggestions that the new overhead line should be routed in close parallel with the existing overhead lines wherever possible, as respondents believed this would reduce the impact of the new infrastructure in the area.

3.2.3 In addition, feedback from residents of a number of villages noted that the new overhead line corridor would result in their encirclement by the new overhead line to the west, and the existing 400kV overhead lines to the east. Some respondents noted this concern including residents of the villages Saundby, Bole, Sturton le Steeple, North Leverton, South Leverton, Habblesthorpe, Treswell, Rampton, East Drayton, Laneham, Dunham on Trent and Ragnall. Some respondents suggested that the new overhead line should be routed further to the east, or in close parallel with existing overhead lines, to prevent the new overhead line being routed on the opposite side of the village/s to the existing overhead lines. A number of requests were made in consultation feedback to route the overhead line further from several unlicenced airstrips, including the Forwood Farm Airfield, Headon Airfield, Grove Moor Farm Airfield, Treswell Airfield and Darlton Gliding Club. The feedback requested that the new overhead line be routed further to the east, in order to reduce potential safety and operational impacts on the unlicenced airstrips.

3.2.4 Concerns were also raised regarding the Project's potential to impact on North Leverton Windmill, a popular local Grade II* Listed cultural heritage asset in the area. Consultees

indicated that routeing the overhead lines further to the east, in close parallel with the existing overhead lines in this area, would reduce the impact of the Project on the North Leverton Windmill and its setting, preventing the spread of infrastructure.

3.2.5 Further concerns were raised around the potential negative impacts of routeing the overhead line in close proximity to the Treswell Wood Site of Special Scientific Interest (SSSI) and Nature Reserve.

3.2.6 Following identification and initial environmental, socio-economic and technical assessment of the eastern corridor, engagement was undertaken with planning officers at the relevant host local authorities, Bassetlaw District Council and Nottinghamshire County Council. It was considered a localised public consultation should be undertaken on this potential alternative prior to making any overall decision on routeing. This consultation would run parallel with further technical and environmental assessment work on the eastern and western corridors.

3.2.7 A localised non-statutory consultation was held from 9 July 2024 to 6 August 2024 on the area between South Wheatley and High Marnham.

3.2.8 The aim of the localised non-statutory consultation in 2024 was to:

- provide an overview of the proposal to the public;
- present the eastern corridor and graduated swathe;
- ensure all stakeholders had the opportunity to provide feedback on the work to date and to state their preference regarding where we should route the new overhead line within the eastern corridor and graduated swathe, should the eastern corridor be taken forward; and
- outline next steps and the programme, and how proposals would be developed further.

Localised non-statutory consultation corridor

3.2.9 An overview of the eastern corridor and graduated swathe, as presented at the 2024 localised non-statutory consultation, was provided in the Addendum to Project Background Document 2024[12] and is set out below.

3.2.10 The eastern corridor lies to the east of South Wheatley and then routes in a south-easterly direction, passing to the south of Sturton le Steeple. The route avoids West Burton Power Station. From here, it routes south alongside the two existing overhead lines passing to the east of Rampton.

3.2.11 The corridor is narrow between North Leverton with Habblesthorpe and South Leverton and widens to the village edges of South Leverton, Treswell and Rampton.

3.2.12 The corridor continues in a south-easterly direction to the west of villages Laneham and Ragnall and to the east of Stokeham and East Drayton. The southern extent of the eastern corridor overlaps with the southern extent of the western corridor between Ragnall and the former High Marnham Power Station. Figure 3-13 illustrates the extent of the eastern corridor and graduated swathe and also shows this in the context of the western corridor presented in 2023.

[12] www.nationalgrid.com/electricity-transmission/document/155956/download

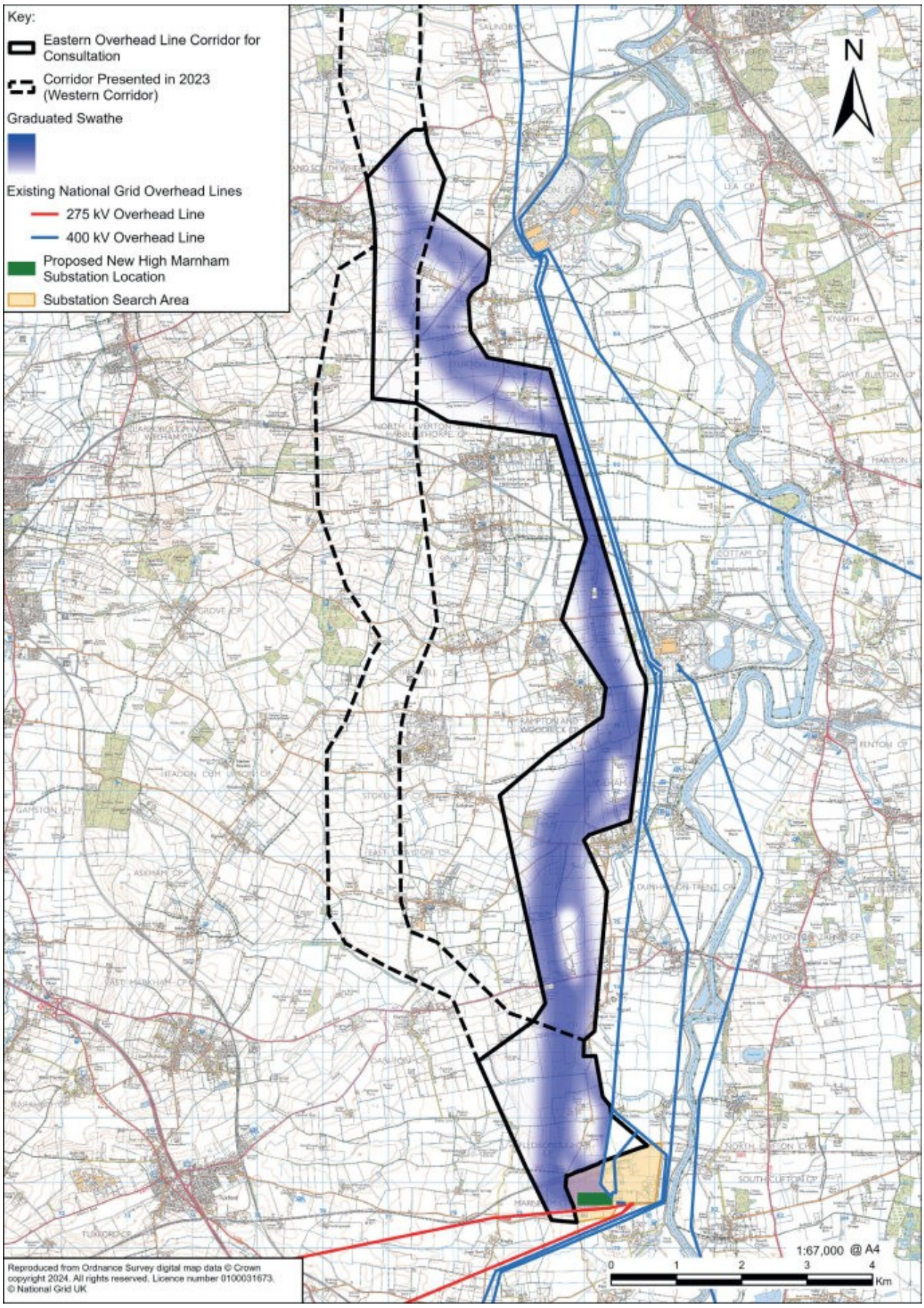

Figure 3-13 Eastern Corridor option between South Wheatley and High Marnham

Consideration of localised non-statutory consultation feedback

3.2.13 A total of 142 feedback submissions were received during the consultation period from local communities and stakeholders. This comprised of paper response forms, online response forms, emails, and letters.

3.2.14 All of the feedback received during the localised non-statutory consultation has been carefully reviewed and considered, alongside ongoing technical work on the engineering design and the environmental impact assessment process.

3.2.15 Feedback that proposed design requests was carefully considered in the context of environmental and socio-economic constraints and opportunities, engineering feasibility and cost, and planning policy considerations.

3.2.16 The process of considering the proposed changes and requests comprised of an initial filter for benefit and feasibility, an assessment incorporating inputs from relevant technical experts, and further stages of additional study if required. This was assessed in conjunction with the results of the closed questions which sought to gauge respondents' views on consultation and Project development processes.

3.2.17 The outcome of the consideration of potential design changes and requests was either that the request informed the development of the preferred alignment, or that the request was not considered further following balanced and informed consideration. The preferred alignment will be subject to ongoing review in response to all feedback and further engineering and environmental studies.

Summary of our changes in response to localised non-statutory consultation feedback

3.2.18 A summary of all feedback received and National Grid's responses is found within the **Non-Statutory Consultation Feedback Report**.

3.2.19 A review of all the feedback from the 2023 and 2024 consultations and further environmental and technical assessment has informed a project decision to discount the eastern corridor, with further information on this decision making set out in Chapter 5.3 of this report. As the eastern corridor and associated graduated swathe have been discounted there are no changes to report resulting from consultation feedback in regard to these elements of the Project.

3.2.20 Whilst the eastern corridor has been discounted, it should be noted the preferred alignment deviates outside the original emerging preferred corridor as presented in 2023 at Sturton le Steeple before routeing back within the emerging preferred corridor. This change is explained in Chapter 7.7 of this report.

4. Backcheck and Review

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4. Backcheck and Review

4.1 Context

4.1.1 The Project is continuously developing as the potential areas in which it will be sited, evolve and change. Throughout the Project's consultation and engagement process, previous preliminary assumptions are subject to review and backchecking of information gathered and assessments undertaken to date. Therefore, description of the assessment and rationale for decision making (particularly at non-statutory stages of the Project) must be understood in that context.

4.1.2 The following Chapter summarises a backcheck and review of our work to date, following the non-statutory consultation in 2023 and the localised non-statutory consultation in 2024, of the previous development stages of the Project including the strategic proposal stage and options identification and selection stage, as set out in:

- The **Strategic Options Review 2023**[13];
- The **CPRSS 2023**[14];
- The **Supplementary Corridor and Routeing Report (SCRR) 2024**[15].

4.2 Strategic Proposal

Background

4.2.1 The **Strategic Options Report 2023** set out the needs case for the Project and describes how a strategic options appraisal exercise was undertaken, leading to the identification of a preferred strategic proposal.

Strategic Proposal Review

4.2.2 The North Humber to High Marnham and Grimsby to Walpole - Updated Strategic Options Report (hereafter referred to as the **Strategic Options Report 2025**) was prepared by National Grid to review the conclusions of the SOR 2023 as part of the ongoing strategic options assessment and decision-making process involved in promoting new transmission projects. The **Strategic Options Report 2025** was prepared after close of both the non-statutory consultation 2023 and the localised non-statutory consultation 2024.

[13] National Grid, North Humber to High Marnham and Grimsby to Walpole Strategic Options Report, May 2023. Available at: https://www.nationalgrid.com/electricity-transmission/document/149041/download

[14] National Grid, North Humber to High Marnham Corridor Preliminary Routeing and Siting Study, June 2023. Available at: https://www.nationalgrid.com/electricity-transmission/document/148821/download

[15] National Grid, North Humber to High Marnham Supplementary Corridor and Routeing Report, July 2024. https://www.nationalgrid.com/electricity-transmission/document/155976/download

4.2.3 The **Strategic Options Report 2025** outlined that, without reinforcement, the transmission system between the North and South of England in the B8 and B9 system boundaries, will have insufficient capacity to accommodate contracted and predicted generation connections in the area.

4.2.4 Following the consideration of options to meet system need the **Strategic Options Report 2025** proposed to continue to take forward the following options:

- A new primarily overhead line connection between a new Creyke Beck substation to a new High Marnham substation. This Option forms the North Humber to High Marnham project.
- A new primarily overhead line connection between a new Grimsby West substation to a new Walpole via Lincolnshire Connection substation(s). This Option forms a separate project to North Humber to High Marnham, which will be consented under a separate DCO application.

4.3 Corridor and Preliminary Routeing and Siting Study

Options identification and selection

4.3.1 Following the optioneering process and the identification of the strategic proposal, a routeing exercise was undertaken in accordance with National Grid's Approach to Consenting for major infrastructure projects[16], identifying and considering numerous corridors and resulting in the identification of an emerging preferred corridor as reported in the **CPRSS**. This emerging preferred corridor was consulted on at the non-statutory consultation in 2023. The backcheck and review of the strategic options described above has concluded that at the current stage the preferred Strategic Proposal which provided the context for the CPRSS remains the same.

4.3.2 A backcheck and review exercise was undertaken following the close of non-statutory consultation in 2023 to identify any changes since that the CPRSS was published which may alter the conclusions of the CPRSS. The backcheck and review considered whether the changes set out below would have resulted in a different outcome for the CPRSS:

- Changes to the legislative and policy context (including revised National Policy Statements in 2023);
- Changes to project assumptions and parameters;
- Changes to baseline; and
- Changes proposed in feedback to the 2023 non-statutory consultation.

[16] National Grid, Our Approach to Consenting, April 2022. Available at: https://www.nationalgrid.com/electricity-transmission/document/142336/download

Legislative and Policy Context

4.3.3 In terms of the legislative and policy evolutions considered in the backcheck and review the following have been reviewed:

- In 2023 the revised National Policy Statements (EN-1, EN-3, and EN-5) were published (and came into force) in 2024 and no changes have been identified that would have implications for our backcheck.
- In 2024 a revised National Planning Policy Framework (NPPF) was published. A review of the revised NPPF was undertaken and no changes have been identified that would have implications for the backcheck of our work to date.
- AONBs were renamed as 'National Landscapes'. AONBs were considered within the **CPRSS**, and the recent changes to the way in which they are described would not have affected the conclusions.
- A consultation opened on the Yorkshire Wolds Proposed AONB Project, which sets out the area proposed for designation. The area proposed for designation does not affect the Project based on current proposals. The consultation opened on 8 October 2024 and is due to conclude on 13 January 2025. It is not considered that the outcome of the consultation will be available prior to launching the Project's statutory consultation, however the outcome will be considered as part of ongoing backchecks of our work following statutory consultation.

Assumptions and Parameters

4.3.4 The high-level assumptions and parameters have been reviewed and the following is concluded:

- The objectives and strategic context of the Project are unchanged and remain valid. The inherent need for the Project to reinforce the National Electricity Transmission System and connect new low carbon generation to meet the government's Net Zero commitments remains with new connections exceeding system capacity.
- The approach to Routeing and Siting and the Options Identification and Selection Process continues to be as set out in **Chapter 4 of the CPRSS**.
- **Chapter 2 of the CPRSS** set out that the two new substations to be built in the vicinity of Creyke Beck Substation and the former High Marnham Power Station site do not form part of the Project as these are expected to be constructed and commissioned by 2029 in advance of construction activities commencing. National Grid is applying for planning permission for the two new 400kV substations from the relevant local planning authorities under the Town and Country Planning Act. While the new substations did not form part of proposals for the Project during non-statutory consultation in 2023, both substations are now included within the statutory consultation for the Project. This approach allows National Grid to demonstrate that the Project can be delivered independently and that it can connect to the national transmission network. National Grid is obligated to meet certain timescales for the delivery of the network reinforcement through the proposed new 400kV overhead line, and the substations are integral to this. National Grid will also continue to progress with the separate planning applications for each substation. Inclusion of the substations in the Project does not change the conclusions set out in the **CPRSS**. Further information on the substations can be found in Chapter 7.8 and 7.9 of this report.

- At the non-statutory consultation 2023, a preliminary assumption was made to underground a section of the existing 400kV ZDA overhead line route between Ealand and the West of Keadby, to facilitate the crossing of the proposed new 4AF overhead line. Following further technical assessment, an overhead line crossing arrangement (as opposed to undergrounding) would be preferred and now forms part of the more detailed proposals. Further explanation is set out below, and details of the preferred alignment at the existing ZDA overhead line crossing can be found in Chapter 7.5 of this report.

Crossing of the existing ZDA overhead line

4.3.5 At the 2023 non-statutory consultation, a preliminary assumption was made to underground a section of the existing 400kV ZDA overhead line route between Ealand and the West of Keadby, to facilitate the crossing of the new 4AF overhead line.

4.3.6 Further technical, cost, environmental and socio-economic assessments have been conducted to appraise different crossing options, including options for an overhead crossing and underground crossing.

4.3.7 As a result of the assessment, an alternative option to undergrounding emerged as a preference. The preferred option consists in a full overhead line crossing arrangement, known as a “diamond duck under”, examples of which are also present and maintained in other areas of the transmission network.

4.3.8 While an undergrounding solution requires to transition a section of the existing ZDA overhead line route into multiple underground cables to achieve the 400kV electrical rating as well as two permanent compounds to allow the ends of the buried cables to safely connect onto the overhead line, an overhead line diamond duck under solution is able to utilise existing structures on a section of the existing ZDA overhead line route with 6 existing pylons to be modified, 2 existing pylons to be dismantled, 2 new temporary pylons (if required), and 6 new permanent structures to be introduced, in order to allow the ZDA conductors to run safely underneath the proposed new 4AF overhead line.

4.3.9 The amount of excavation works for a diamond duck under crossing arrangement is limited to the new pylon foundations, instead of two new permanent compounds, typically, 30m x 80m in size (although this varies dependant on local considerations and cable system design requirements), and multiple underground cables which would be required for an underground crossing.

4.3.10 An underground crossing solution would be more intrusive and is considered to lead to increased impacts on the environment compared to an overhead crossing. Works to install underground cables take considerably longer than the works associated with installing an equivalent length of overhead line. In addition, they have the potential for greater adverse impacts upon any archaeological resource, soils and drainage, agricultural operations, vegetation and wildlife along the working width. It is considered an overhead line crossing in this location would meet the national policy expectations set out in NPS EN-5.

4.3.11 The permanent land use would be limited to an area in close proximity to the proposed alignment for the 4AF overhead line, which reduces potential impacts to landowners.

4.3.12 An overhead crossing is also assessed to have a lower indicative construction carbon intensity than an underground crossing.

4.3.13 There is a significant cost associated with undergrounding a 400kV electrical circuit, which can be avoided by the proposed diamond duck under crossing. At the transmission voltage of 400kV the use of buried cables represents a significant technical complexity. The size and complexity of the underground cables required is far greater than those that operate at lower voltages. As a result, direct buried transmission cables at the capacity required for the Project are typically around 10 times the cost compared to an equivalent overhead line.

4.3.14 National Grid develops its projects in accordance with its statutory duties under the Electricity Act 1989 to be economic, efficient and have regard to the environment and amenity and national planning policy. It is considered the proposed overhead line crossing arrangement utilising the diamond duck under approach is the most appropriate solution and best meets National Grid's statutory duties.

4.3.15 Details of the preferred alignment at the existing ZDA overhead line crossing can be found in Chapter 7.5 of this report.

Baseline Conditions

4.3.16 The baseline information for the topics covered by the **CPRSS 2023** has been revisited to establish if there have been any relevant material changes since completion of the **CPRSS 2023** that may have altered the decision making of the Project. In conclusion:

- Landscape character: Natural England's consultation on a new Yorkshire Wolds Area of Outstanding Natural Beauty (AONB) closed on 13 January 2025. The consultation was based on a proposed boundary set out in the consultation document published at the start of the consultation in October 2024[17]. The nearest part of the proposed boundary for the Yorkshire Wolds National Landscape is near Market Weighton approximately 11.9km to the north of the preferred alignment. This would not have altered the 2023 consultation corridor as the preferred option.
- Biodiversity, historic environment, water environment, socio-economics and recreation, traffic and transport: There have been no material changes to the baseline identified.
- Planning allocations and applications:
  - There has been no change to the planning allocations baseline, however, there have been a number of planning applications for development within the consultation corridor, for example solar farms. Whilst important considerations for the development of an alignment, none of these applications would have altered the identification of the 2023 consultation corridor as the preferred option.

Backcheck and review of the corridors presented in the CPRSS

4.3.17 All alternative corridors previously discounted in the **CPRSS 2023** were reconsidered as part of the backcheck and review process. The outcomes of the backcheck and review agreed with the conclusions made at the Strategic Proposal Stage and the Options Identification and Selection stage of the **CPRSS 2023**, with the exception of environmental and socio-economic disciplines identifying the need for further assessment work to re-evaluate the previously discounted alternative CPRSS Corridor

[17] Natural England (2024). Yorkshire Wolds Proposed Area of Outstanding Natural Beauty Designation Project. [Online]. Available at: https://consult.defra.gov.uk/ne-landscape-heritage-and-geodiversity-team/yorkshire-wolds-designation/user_uploads/yw_consultation-pack_consultation-document_bp_digital_r02.pdf

3 option between South Wheatley and High Marnham. The main area which required further evaluation and assessment focused on the potential for a triple parallel alignment broadly following the route of the existing overhead transmission lines that are routed to the south and south-east from the substations at West Burton and Cottam which could have the potential to move the route further east away from designated ecological sites and unlicenced airfields, while also keeping the new overhead line closer to existing overhead lines within the landscape.

Consultation Feedback

4.3.18 The following consultation feedback had also been received in relation to Route Sections 10 to 11 between South Wheatley and High Marnham and was relevant to consider in the context of the findings of the backcheck and review of previously discounted corridors as set out above:

- Requesting further consideration of Corridor 3 between South Wheatley and High Marnham;
- Requesting routeing the emerging preferred corridor further to the east, placing it closer to the existing overhead lines and further from villages that would otherwise be located closer to the proposed overhead line;
- Requesting routeing the corridor in close parallel with the existing overhead lines, in order to reduce the impact of new infrastructure in the area;
- Concerns around impact on sensitive ecological sites, cultural heritage assets and other valued local features in the area;
- Concerns raised by a number of unlicensed airstrips regarding disruption to and safety of operations. Feedback set out a preference for a more easterly route closer to existing lines in this Route Section;
- Concerns over some villages having an overhead line to both the east and the west.

4.3.19 Further detail of the consultation feedback relating to this part of the route can be found in the **Non-Statutory Consultation Feedback Report**.

Identification of the Eastern Corridor

4.3.20 The eastern corridor is comprised of some areas of Corridors 2 and 3 from the **CPRSS 2023**. Considering consultation feedback, a review of Corridors 2 and 3 helped to inform identification and refinement of the possible alternative corridor (referred to as the 'eastern corridor') which predominantly lies within the western edge of Corridor 3 between South Wheatley and High Marnham (see Figure 5-1 of the **Supplementary Corridor and Routeing Report (SCRR) 2024**).

4.3.21 The extent of the eastern boundary of Corridor 3 in the **CPRSS** was defined, having regard to the possibility of approaching Corridor 3 from the eastern direction in the Cottam area as shown in **Figure 5-1 of the SCRR 2024**. This corridor option was appraised in conjunction with a second corridor (referred to as 'Corridor 4' in the **CPRSS 2023**). Based upon these appraisals, National Grid concluded that a route from Corridor 4 into Corridor 3 did not represent the most appropriate route for the new line, as explained in the **CPRSS 2023**.

4.3.22 Whilst not favouring a route from the east into Corridor 3, it would be technically possible to route a new line on the eastern side of the existing overhead lines even if

approaching Corridor 3 from the west i.e. from the 'western corridor'. In order to achieve this arrangement, the existing overhead lines would need to be crossed by the new line. Dependent upon where the crossing to the east of the existing lines was made, up to six existing transmission lines might need to be crossed.

4.3.23 Given the number and importance of the transmission routes involved, any crossing would need to be achieved through the use of underground cables. This could require the use of up to five separate sections of cable depending upon the location where the new line first crosses the existing routes. Each section of cable would generally need two separate secure compounds; one at either end, to allow the ends of the buried cables to safely connect onto the overhead line. Given the capacity requirements, it is estimated that a single 1km section of underground cabling would cost between £40-£50 million. The works that would be associated with underground cables of the capacity required for the new North Humber – High Marnham route is summarised in **Appendix A of the SCRR 2024**.

4.3.24 To help define the eastern corridor for consultation, National Grid considered which design solutions required detailed assessment. Following this assessment, it was considered that routeing to the east of the existing overhead lines from the 'eastern corridor' in Route Section 9 or from the western side of the existing lines in Route Section 10 of the route would not be appropriate. This assessment had regard to the environmental effects, technical complexity and significant additional costs that would likely result when considered in the context of available alternatives, relevant policy tests and National Grid's statutory duties.

4.3.25 Further information on the identification and assessment of the eastern corridor between South Wheatley to High Marnham can be found in the **SCRR 2024**.

4.3.26 The eastern corridor was presented during a localised non-statutory consultation in 2024. Feedback collected from the non-statutory consultation in 2023 and the localised non-statutory consultation in 2024 has informed an overall decision on the preferred corridor in this part of the route and the development of a preferred alignment for the proposed new overhead line. Details of the routeing as a result of the feedback collected are set out in Chapter 7.7.

4.4 Supplementary Corridor and Routeing Report overview

4.4.1 The Project's **Supplementary Corridor and Routeing Report (SCRR)** was published in July 2024 to support the localised non-statutory consultation. The report documents the outcome of a localised corridor and routeing study for the southernmost section of the proposed North Humber to High Marnham overhead line which has been carried out following non-statutory consultation held in 2023. The report is presented as a supplement to the **CPRSS 2023** and was published to support and inform localised non-statutory consultation on the eastern corridor. The **SCRR** provides a more detailed consideration of the non-statutory consultation feedback from 2023 and a backcheck of the **CPRSS 2023** that led to the identification of a potential alternative corridor between South Wheatley and High Marnham referred to as the eastern corridor. To avoid confusion, the section of the 'emerging preferred corridor' located between South Wheatley and High Marnham which was previously consulted on in 2023 is referred to as the western corridor within the **SCRR**.

4.4.2 A robust and transparent process was undertaken in accordance with National Grid's Approach to Consenting for major infrastructure project[18], to assess the potential impacts that the eastern corridor may have across a wide range of criteria. The report summarises the environmental, socio-economic, cost, programme and technical considerations that could influence design and routeing if an overhead line were developed within an eastern corridor in the area between the village of South Wheatley and High Marnham.

4.5 Corridor decision outcome

4.5.1 Following further technical and environmental assessment work and consideration of feedback from both the 2023 and 2024 consultations, it was concluded that the western corridor is preferred (subject to some amendments in the West Burton area) and the original findings of the **CPRSS 2023** remain valid. Further details of the South Wheatley to High Marnham corridor decision are set out in Chapter 5 of this report, which explains the assessment undertaken from technical, cost, environmental, and socio-economic perspectives.

4.5.2 As set out above, the western corridor (emerging preferred corridor presented in 2023) has been subject to some change in the West Burton area. Details of this change which deviates outside the western corridor are set out in Chapter 5.5.

4.6 Conclusion

4.6.1 The backcheck and review information set out above concluded that the preferred Strategic Proposals which provided the context for the **CPRSS** remains valid and an appropriate basis on which to take the Project forward at this stage. The backcheck of the **CPRSS**, review of all consultation feedback from both non-statutory consultation 2023 and localised non-statutory consultation 2024, together with further assessment work has confirmed that the emerging preferred corridor identified within the **CPRSS** remains the overall preferred option, subject to some minor changes where routeing will be required outside the original corridor.

4.6.2 National Grid will continue to backcheck and review its proposals as the Project progresses and will respond to any new baseline information, legislative changes and feedback received.

[18] National Grid, Our Approach to Consenting, April 2022. Available at: https://www.nationalgrid.com/electricity-transmission/document/142336/download

5. Review of the Emerging Corridor and Graduated Swathe

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5. Review of the Emerging Preferred Corridor and Graduated Swathe

5.1 Introduction

5.1.1 This chapter provides an overview of the Project decisions relating to the emerging preferred corridor and graduated swathe since the publication of the **CPRSS 2023**[19] and the **SCRR 2024**[20]. This includes:

- An explanation of the overall corridor decision between South Wheatley to High Marnham;
- Summary of preferred alignment routeing outside of emerging preferred corridor; and
- Inclusion of the substations for statutory consultation.

5.2 The Eastern corridor between South Wheatley and High Marnham

5.2.1 As explained in Chapters 3 and 4, following a review of the **CPRSS 2023**, including taking account of additional information received and feedback gathered from the non-statutory consultation in 2023, National Grid undertook an exercise to consider a potential alternative corridor between South Wheatley and High Marnham. This potential alternative corridor was referred to as the eastern corridor. National Grid undertook early engagement with stakeholders on this eastern corridor.

5.2.2 A localised non–statutory consultation was held from 9 July 2024 to 6 August 2024. This localised non-statutory consultation focused on the eastern corridor extents to allow stakeholders and consultees to provide feedback on the eastern corridor.

5.2.3 To support and inform the 2024 localised non-statutory consultation events, an appraisal was undertaken on the eastern corridor which covered a range of criteria such as environmental, socio-economic, technical and cost factors. This decision process and appraisal is reported in the **SCRR 2024**.

[19] North Humber to High Marnham Corridor Preliminary Routeing and Siting Study (CPRSS) nationalgrid.com/electricity-transmission/document/148821/download

[20] North Humber to High Marnham Supplementary Corridor and Routeing Report 2024 nationalgrid.com/electricity-transmission/document/155976/download

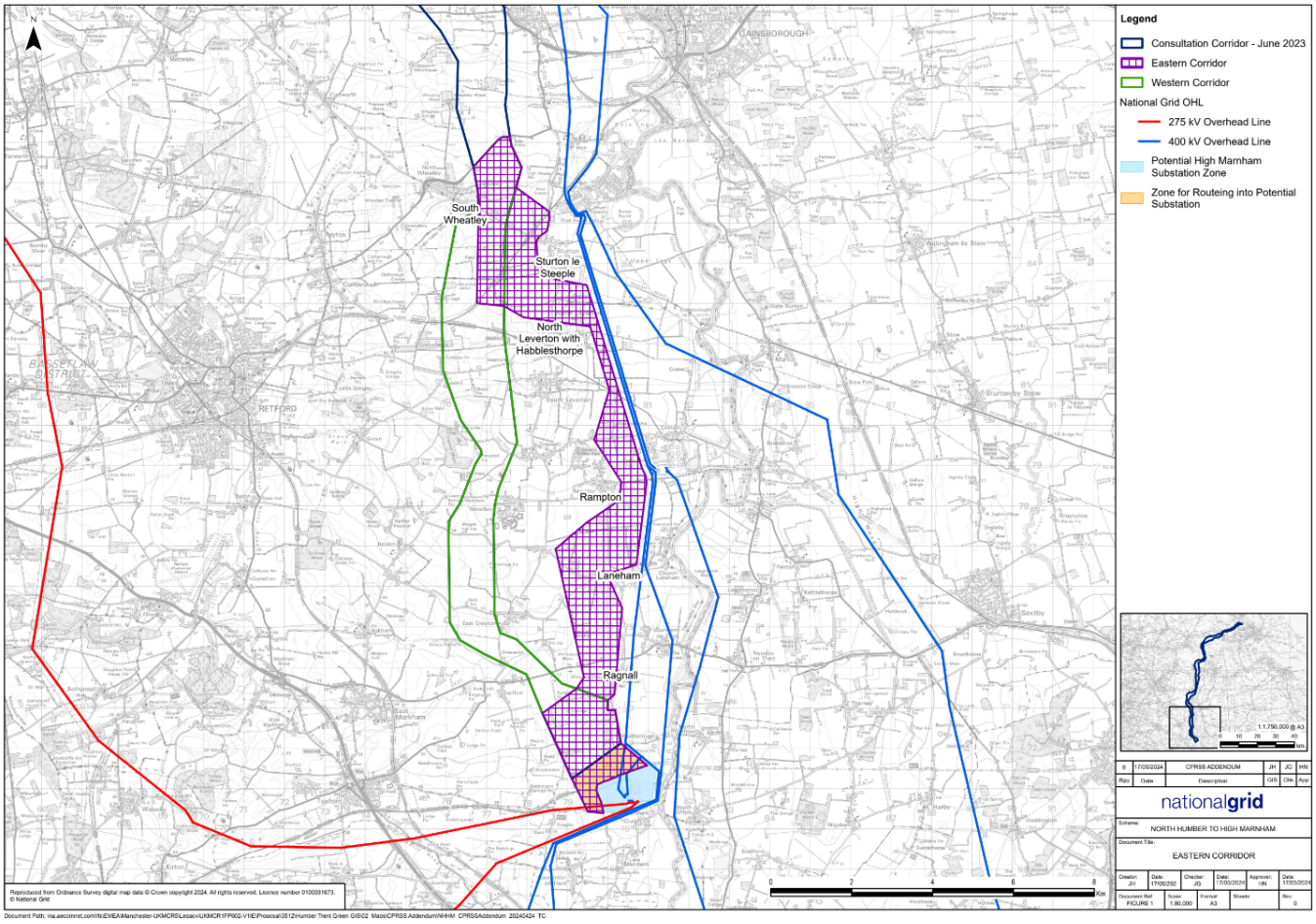

Figure 5-1 Extent of the Eastern Corridor option between South Wheatley and High Marnham

5.2.4 Figure 5-1 presents the difference between the eastern and western corridors and also shows for reference, the part of the consultation corridor immediately north of the two corridors that was taken to non-statutory consultation in 2023.

5.2.5 The eastern corridor lies to the east of South Wheatley and routes in a south-easterly direction, passing to the south of Sturton le Steeple. The corridor avoids West Burton Power Station. From here, the eastern corridor continues south, passing to the east of Rampton, in proximity to the existing 400kV overhead lines.

5.2.6 The corridor is narrow between North Leverton with Habblesthorpe and South Leverton and widens to the village edges of South Leverton, Treswell and Rampton.

5.2.7 The corridor continues in a south-easterly direction to the west of villages Laneham and Ragnall and to the east of Stokeham and East Drayton. The southern extent of the eastern corridor overlaps with the southern extent of the western corridor between Ragnall and the former High Marnham Power Station.

5.2.8 A preliminary exercise was undertaken to identify where it might be appropriate to route the Project within the eastern corridor. The outcome of this exercise identified a 'graduated swathe' within the eastern corridor with coloured shading of varying intensity to indicate areas more likely (darker colour) or less likely (lighter colour) to be the location of proposed Project infrastructure. Both the eastern corridor and graduated swathe within it were consulted on during localised non-statutory consultation in 2024.

5.3 South Wheatley to High Marnham corridor decision

5.3.1 The feedback received during the localised non-statutory consultation 2024 has been carefully reviewed and considered in the context of environmental and socio-economic constraints and opportunities, technical feasibility and cost, and planning policy considerations.

5.3.2 Feedback from both the 2023 and 2024 consultations is summarised and responded to in our **Non-Statutory Consultation Feedback Report 2025** which has been published for our statutory consultation.

5.3.3 Further technical and environmental assessment work, together with feedback from both 2023 and 2024 consultations has informed a Project decision on the overall preferred corridor between South Wheatley and High Marnham. An overview of the technical, cost, environmental and socio-economic considerations which have informed the decision on the overall preferred corridor in this area of the route are set out below.

Technical assessment

5.3.4 Large sections of the eastern corridor are within Flood Zone 3 and are therefore at higher risk of flooding, compared to the western corridor, which has only a few isolated pockets of Flood Zone 3 areas that the permanent Project infrastructure could likely avoid. Routeing in Flood Zone 3 areas could increase the risk of construction programme delays should seasonal working restrictions be required and should flood events occur during the construction period.

5.3.5 Furthermore, the increased likelihood of flooding may also require more complex foundation designs which could increase Project costs and length of construction programme should a route within the eastern corridor be taken forward.

5.3.6 Routeing flexibility is reduced in the eastern corridor between Fenton and Laneham, due to the presence of multiple constraints including multiple existing 400kV overhead lines to the east, North Leverton with Habblesthorpe to the west, scattered properties, in addition to planned renewable energy developments, Cottam Power Station and existing utilities. This has led to challenges achieving a continuous triple close parallel alignment in this area, necessitating multiple changes in direction and thus additional tension pylons. From an engineering perspective it is preferable to avoid multiple changes in direction as this would require additional tension pylons. Tension pylons would require more steel and larger foundations, compared to standard suspension pylons.

5.3.7 Introducing a third overhead line in close parallel in this section of the eastern corridor would lead to three 400kV overhead lines being located in the Flood Zone 3 area, which would increase risk during operation and maintenance due to risk of flood events, potentially preventing access to pylons during flood events. Although this risk is considered manageable, the risk can be removed entirely by routing in the western corridor.

5.3.8 Overall, a route within the western corridor is preferred from a technical perspective due to the increased risks associated with engineering complexity during both construction and maintenance, increased safety risks and risk to programme delay. The exception to this is in the West Burton area where it is technically preferred to route briefly outside of the western corridor, the reasons for this are explained at Chapter 7.7 of this report.

Cost Assessment

5.3.9 The increased presence of consented renewable developments within the eastern corridor compared to the western corridor increases costs from a land rights and compensation perspective due to the need to negotiate with landowners and developers who may have already incurred capital expenditure related to their consented projects. Compensation may be required not only for restrictions on the future development potential of these projects but also to account for investments already made, such as planning, infrastructure, and preliminary construction costs.

5.3.10 In addition, the likelihood of requiring complex foundation designs and seasonal working restrictions is increased due to the eastern corridor containing a large section of Flood Zone 3, compared to the western corridor. This has the potential to increase costs and could lead to programme delays.

Environmental assessment

5.3.11 Environmental considerations were considered when assessing the eastern and western corridor options. This included consideration of: landscape, visual, cultural heritage, ecology, water environment, air quality, noise, vibration, agriculture and soils, and traffic and transport. A summary of the assessment of each of these topics regarding routeing within the eastern and western corridors is set out under the subheadings below.

Landscape and Visual

5.3.12 Neither the eastern or western corridors are subject to any landscape designations, and it is considered an overhead line would remain the appropriate technology choice.

5.3.13 Routeing the proposed new overhead line within the western corridor would alter the character or perception of the landscape by introducing a new overhead line into an area of predominantly agricultural land which is unaffected by high voltage electricity infrastructure beyond long distance views to the east in the Trent Valley. In doing so it would affect the scenic quality of the landscape and reduce perceptions of rurality and tranquillity.

5.3.14 Routeing within the eastern corridor would introduce an additional overhead line in an area already affected by existing 400kV overhead lines and it is considered this would therefore not alter the character or perception of the landscape. However, it is not feasible for the new overhead line to run in close parallel with the existing overhead lines in the Trent Valley for the duration of the route between South Wheatley and High Marnham due to the need to avoid and route around certain constraints such as the villages of Sturton le Steeple, Fenton, Laneham and Ragnall, together with a number of isolated residential properties and planned development such as the Tillbridge solar farm. As a result, a triple close parallel alignment can only be achieved for the sections of the route between North Leverton with Habblesthorpe and South Leverton and between Rampton and Laneham. As such, any landscape and visual benefits associated with a continuous triple parallel alignment in this location cannot be achieved through routeing in the eastern corridor.

5.3.15 The potential for cumulative adverse impacts resulting from the introduction of an additional overhead line remains in the eastern corridor. Routeing within the western corridor would reduce the potential for adverse cumulative impacts with the existing converging and diverging overhead lines in accordance with Holford Rule 6.

5.3.16 In terms of visual appraisal the existing infrastructure within the Trent Valley is already present in many of views experienced by communities using the local Public Right of Way (PRoW) and road network within and surrounding the eastern corridor. However, pylons are not an existing key element in the views experienced by people living and moving around the settlements on the higher ground to the west.

5.3.17 Routeing within the western corridor would bring the proposed new overhead line closer to some visual receptors including receptors to the north of Sturton le Steeple, South Leverton, Woodbeck, East Drayton and Darlton.

5.3.18 Routeing within the eastern corridor would bring the proposed new overhead line closer to visual receptors including receptors to the south of Sturtlon-le-Steeple, Fenton, North Leverton and Habblesthorpe, Rampton, Laneham, Dunham, and Ragnall. Routeing the new overhead line within the eastern corridor south of Sturton le Steeple would result in this village having the new overhead line to the west and south of the village (to enable a triple close parallel alignment to the south) and the existing overhead lines to the east of the village. Existing overhead lines are already part of the local landscape, and the new overhead line would add to the number of pylons present in views from Sturton le Steeple rather than being an entirely new element, although it is acknowledged that there are no pylons in the landscape to the west of Sturton le Steeple currently. Further south within the eastern corridor, the introduction of a new overhead line would also result in the villages of Laneham and Ragnall having overhead lines to both the east and west.

5.3.19 The presence of a new overhead line within the eastern corridor in combination with the existing overhead lines and the proposed Tillbridge solar farm development would potentially lead to some significant effects on visual receptors including those around Sturton le Steeple and south of Ragnall in proximity to proposed solar farms.

Cultural Heritage

5.3.20 Routeing within both the eastern and western corridors would potentially impact the Grade I Listed St Helen's Church and associated scheduled remains in South Wheatley. Routeing within the eastern corridor would introduce a new overhead line on the approach to and from Sturton le Steeple from the south which include views of the Grade II* Listed Church of St Peter and St Paul.

5.3.21 Routeing within the western corridor would bring the new overhead line closer to the Grade II* Listed North Leverton Windmill, though there may be opportunity to reduce potential effects on this cultural heritage asset by taking a more westerly route within the western corridor. A route within the eastern corridor would also bring the new overhead line closer to the Grade I Listed Church of All Saints at Rampton and the Grade II* Listed Church of St Leonard at Ragnall.

5.3.22 Both the eastern and western corridors pass Wimpton Moor Medieval Village and Moated Site scheduled monument and routeing would have the potential to affect setting. However, routeing within the eastern corridor also besets the views between the former medieval village and its nearest medieval settlement of Ragnall.

5.3.23 Routeing within the western corridor would bring the new overhead line closer to the Grade II* Listed Church of St Giles in Darlton.

5.3.24 There is the potential for the Project to have adverse impacts on the setting of heritage assets, however, such impacts could be minimised by careful routeing of the overhead line and siting of pylons.

5.3.25 A route within the eastern corridor would also surround the historic settlements of Laneham and Ragnall which currently have the existing overhead lines to their east.

Ecology

5.3.26 Routeing within the eastern corridor would keep the new overhead line further east from designated sites including Treswell Wood SSSI and Local Nature Reserve (LNR). However, it is not considered that a route within the western corridor would lead to significant adverse effects on the SSSI. Routeing within both the eastern and western corridors would require careful consideration to avoid or minimise impacts to more localised ecological features and sites within the corridors including areas of woodland, priority habitat, and Local Wildlife Sites (LWS).

Water Environment

5.3.27 Routeing within the western corridor would require the crossing of several watercourses. The western corridor is primarily located within an area of low flood risk (Flood Zone 1) and is subject to a low risk of flooding from surface water sources.

5.3.28 Routeing within the eastern corridor would cross through the flood plain of the River Trent which is at higher risk of flooding (Flood Zone 3). This area has experienced flooding in the recent past and the eastern corridor also crosses a larger number of watercourses than the western corridor.

5.3.29 National Grid own and operate existing overhead lines within the Trent Valley and areas of higher risk of flooding. Whilst the likelihood of flooding does not prevent construction, operation and maintenance of overhead line infrastructure, it does introduce additional challenges and risks which must be considered when planning new infrastructure. These challenges are discussed further under the ‘technical assessment’ heading above.

Other environmental considerations

5.3.30 Wider considerations included impact on air quality, noise, vibration, agriculture and soils. Initial assessments concluded that there was no significant or material differentiating factors between the two corridors for these environmental disciplines. Careful consideration for these disciplines will be required to inform identification of a preferred alignment.

Socio-economic assessment

5.3.31 The socio-economic considerations, including communities, businesses, aviation, solar energy and public rights of way, were considered for both corridor options. Both corridors avoid impacting communities directly but do have community facilities within 500m.

5.3.32 The western corridor passes within 500m of the villages of Sturton le Steeple, South Leverton, Woodbeck, East Drayton and Darlton. The eastern corridor passes within 500m of Sturton le Steeple, Fenton, North Leverton and Habblesthorpe, Rampton, Laneham, Dunham and Ragnall. There are a number of community facilities within approximately 500m of each corridor including churches, villages halls, North Leverton Surgery and a number of primary schools. Whilst both corridors avoid communities there are two more communities in closer proximity to the eastern corridor than the western corridor.

5.3.33 There are business, recreation and tourism facilities within the study area of both corridors, North Leverton Windmill is a consideration for the western corridor and Foxcovert Fisheries and Caravan Park at Laneham, Wild Acre Village at Rampton and a planning application for Dalton Road Holiday Lodges near Dunham are a consideration for the eastern corridor.

5.3.34 The western corridor is located in proximity to a number of unlicenced airstrips, including West Burton Airstrip, Darlton Gliding Club, Headon Airfield, Forwood Farm and Grove Farm. The eastern corridor is located further from the majority of these airstrips with the exception of West Burton Airstrip.

5.3.35 National Grid has engaged with each of these airstrips to understand more information regarding their operations, uses and to gather feedback through public consultation. The airstrips range from personal use only to commercial use, including flight training schools. Some of these airstrips have ancillary uses such as caravan sites.

5.3.36 It is not currently considered there would be a need for the majority of these unlicensed airstrips to cease operations with either corridor option. However, it is acknowledged that from an aviation perspective the eastern corridor would be preferable as it increases overall distance from the majority of these unlicenced airstrips.

5.3.37 The proposed Steeples Renewables solar farm interacts with both the eastern and western corridors, though following engagement with this developer it is understood there would be a greater impact as a result of routeing within the eastern corridor. The proposed Wood Lane solar farm interacts with both corridors though could potentially be avoided by routeing within the eastern corridor subject to detailed routeing work. Both the eastern and western corridors interact with the proposed One Earth solar farm.

5.3.38 A route within the eastern corridor may interact with the proposed Trent Valley BESS development and the proposed Tillbridge solar farm. Both would be avoided entirely by a route within the western corridor. In summary, the western corridor would result in direct effects on Steeples Renewables and One Earth while the eastern corridor would result in direct effects on Steeples Renewables, Wood Lane Solar, (potentially) Trent Valley BESS and One Earth Solar.

5.3.39 There are a similar number of PRoW and recreational routes crossing the two corridors.

Traffic and transport

5.3.40 As the river Trent runs to the east, effectively all traffic associated with construction has to come from the west, south and north therefore, the eastern corridor has the potential to result in additional construction impacts on the villages of North Leverton, South Leverton, Sturton le Steeple, Rampton, and Laneham.

5.3.41 As the eastern corridor is further from the main access routes to the west there is the potential for a greater impact from construction traffic through these settlements, therefore a route within the western corridor would be preferable to minimise traffic impacts. Detailed consideration will need to be given to the identification of construction access routes and construction compounds in identifying a preferred alignment for the new overhead line.

Overall corridor decision between South Wheatley to High Marnham

5.3.42 Further technical and environmental assessment work, together with feedback from both 2023 and 2024 consultations has informed a Project decision on the overall preferred corridor between South Wheatley and High Marnham.

5.3.43 The eastern and western corridors present different challenges and opportunities for a number of environmental and socio-economic topics as summarised above. Neither the eastern nor western corridors are considered to be unfeasible.

5.3.44 Consultation feedback from both the non-statutory consultation and localised non-statutory consultation commented on a range of local features and noted concerns associated with the eastern and western corridors. Feedback from both consultations is summarised and responded to in the non-statutory consultation feedback report. No feedback received during either consultation provided information to suggest a route within either the eastern or western corridors between South Wheatley to High Marnham would be unfeasible and no clear preference emerged.

5.3.45 Whilst it is recognised there are landscape and visual opportunities to reduce potential effects by routeing within the eastern corridor, largely due to the existing baseline being defined by the presence of existing energy transmission infrastructure, in the absence of landscape designations in either eastern or western corridors it is considered that routeing a new overhead line in either corridor would comply in principle with relevant landscape and visual planning policy.

5.3.46 To realise the full benefits of routeing closer to the existing overhead lines in the Trent Valley, thereby keeping new and existing infrastructure within the same corridor it would be necessary to close parallel with the existing overhead lines for the duration. Due to the need to accommodate sufficient stand-off distance from the existing overhead lines and the presence of a number of existing villages, isolated residential properties and features to the west of the existing overhead lines, a triple close parallel alignment can only be achieved for the sections of the route between North Leverton with Habblesthorpe and South Leverton and between Rampton and Laneham.

5.3.47 It is concluded that routeing within the western corridor would help to avoid the potential for adverse cumulative impacts with the existing converging and diverging overhead lines as originally concluded in the **CPRSS 2023** and in accordance with Holford Rule 6.

5.3.48 When considering flood risk the western corridor is preferred as this avoids an extensive area at high risk of flooding within in the eastern corridor. A route within the western corridor also presents an opportunity to limit traffic impacts during construction as the eastern corridor is further from the main access routes to the west there is the potential for a greater impact from construction traffic through a number of settlements.

5.3.49 Whilst there was a combination of factors including benefits and disbenefits of both the eastern and western corridors from an environmental and socio-economic perspective, it is considered a route within the western corridor remains feasible and policy compliant. In addition, some potential environmental impacts are likely to be reduced by routeing in the western corridor (compared to the eastern corridor) including a number of cultural heritage assets, socio-economic impacts on a number of affected communities and solar farms. Temporary construction phase benefits could be achieved with the western corridor by avoiding routeing through Flood Zones and routeing closer to main access routes to the west.

5.3.50 It is acknowledged that a route within the eastern corridor would keep the new overhead line further east from designated sites including Treswell Wood SSSI and Local Nature

Reserve (LNR). However, it is not considered a route within the western corridor would lead to significant adverse effects on the SSSI. National Grid will continue to engage with relevant consultees such as Natural England regarding any potential impacts on ecological designated sites and discuss any mitigation which may be required.

5.3.51 It is also recognised that a route within the eastern corridor would be preferred by the operators of a number of unlicenced grass airstrips. National Grid, with the support of a specialised aviation advisor, will continue to engage with aviation interests as the Project develops to understand and discuss remaining concerns.

5.3.52 Overall, a route within the western corridor is preferred from a technical perspective due to the increased risks associated with engineering complexity during both construction and maintenance, increased safety risks and high risk to programme delay. The exception to this is in the West Burton area where it is technically preferred to route briefly outside of the western corridor.

5.3.53 Routeing in the eastern corridor has the potential to introduce additional costs due to the increased likelihood of requiring complex foundation designs and seasonal working restrictions due to the eastern corridor containing a large area of Flood Zone 3.

5.3.54 Routeing within the eastern corridor is also likely to result in increased interactions with third party developments, including a number of planned or consented solar farms which could result in increased compensation costs. Where possible and subject to consideration of other constraints and factors, it is preferable to avoid or minimise interactions with third party developments.

5.3.55 National Grid develops its projects in accordance with its statutory duties under the Electricity Act 1989 to be economic, efficient and have regard to the environment and amenity and national planning policy. On balance it is considered the western corridor is preferred and would best meet National Grid's duties and obligations.

5.3.56 Overall, the western corridor emerging preferred corridor (i.e. emerging preferred corridor as presented during the non-statutory consultation 2023) is considered to offer the most appropriate balance between environmental, socio-economic, technical and cost considerations.

5.4 Summary of preferred alignment routeing outside of emerging preferred corridor

5.4.1 The following sections provide a high-level overview of the changes made outside of the emerging preferred corridor, following a review of feedback received during non-statutory consultation, the localised non-statutory consultation and further technical assessment work.

Route Section 2 Skidby to A63 dual carriageway

5.4.2 As a result of further technical assessment work the preferred alignment routes to the north outside the emerging preferred corridor in Route Section 2, to the west of Skidby.

5.4.3 This routeing avoids existing 11kV and 33kV wood pole overhead lines near Little Weighton Road, whilst increasing stand off to the Northern Gas Networks (NGN) high pressure gas pipeline and minimising construction and operational challenges with siting pylons and 400kV overhead cables in close proximity to the high pressure gas pipeline. Furthermore, this routeing provides greater opportunities for a straighter

alignment to be consistent with the Holford rules. The route would come back within the emerging preferred corridor before taking the northern swathe to route parallel to the existing 400kV overhead line, reducing potential visual impacts.

5.4.4 Further location specific considerations and analysis are provided on this decision in Chapter 7.3.

5.4.5 Continuing in Route Section 2 the preferred alignment routes outside of the emerging preferred corridor again for 3 proposed pylon locations at Brantingham Dale, to the north-west of Dale Road. This is to facilitate a line swap-over which requires a temporary diversion of the existing 4ZQ overhead line.

5.4.6 Following review of consultation feedback an alternative line swap-over design is now proposed in this location, where the line swap-over between the new and existing lines would occur at the top of Ellerker North Wold rather than at the foot of the scarp slope as presented during the 2023 non-statutory consultation. This swap over position would allow more of the new overhead line to be routed in close parallel to the existing 4ZQ overhead line, where the two lines descend the scarp slope from the Wolds. Despite the resultant removal of a strip of plantation woodland at Bilks Hill it is considered that this close parallel alignment would help reduce the scale of landscape impacts in this sensitive section of the Yorkshire Wolds Important Landscape Area. This line swap-over also enables the preferred alignment to be routed to the south of Ellerker and avoids the need for overhead lines both north and south of the village in accordance with feedback received during non-statutory consultation.

Route Section 10 A620 to Fledborough

5.4.7 As a result of further technical assessment work the preferred alignment routes to the east of the emerging preferred corridor, to the north of Sturton le Steeple, and equidistant between North and South Wheatley and Bole.

5.4.8 This routeing avoids interactions with the existing 132kV overhead line and Wood Lane solar farm which would be unavoidable in the emerging preferred corridor.

5.4.9 Further location specific considerations and analysis are provided on this decision in Chapter 7.7.

5.5 Summary of preferred alignment routeing outside the graduated swathe

5.5.1 The following section of this report provides a high-level overview of the routeing of the preferred alignment outside of the graduated swathe, following a review of feedback received during the 2023 non-statutory consultation, the localised non-statutory consultation, and further environmental and technical assessment work.

Route Sections 8 and 9 Graizelound to South Wheatley

5.5.2 The preferred alignment follows a westerly alignment within the emerging preferred corridor, extending outside of the graduated swathe and across the Carrs area to the north of Gringley on the Hill.

5.5.3 As a result of further technical and environmental assessment work, it was considered that routeing outside of the graduated swathe at this location seeks to reduce landscape and visual impacts to residential amenity, views and local tourism businesses.

5.5.4 Further location specific considerations and analysis are provided on this decision in Chapter 7.7.

5.6 Inclusion of the substations for statutory consultation

5.6.1 The Project would need to connect to two new substations – one at Creyke Beck, Cottingham, (known as Birkhill Wood Substation) in the East Riding of Yorkshire and a new substation at High Marnham in Nottinghamshire (part of a project called 'Brinsworth to High Marnham'). National Grid is applying for planning permission for the two new 400kV substations from the relevant local planning authorities under the Town and Country Planning Act. Further detail on the design of the substations is set out in Chapters 7.2 and 7.9

5.6.2 In 2025, a planning application is proposed to be submitted to East Riding of Yorkshire Council for the new Birkhill Wood substation. In 2025, a planning application is proposed to be submitted to Bassetlaw District Council for the new High Marnham substation. Separate pre-application public consultations have been undertaken for the substation applications ahead of these planning applications being submitted.

5.6.3 While the new substations did not form part of our proposals for North Humber to High Marnham during non-statutory consultation, we have made the decision to include both substations within the stage 2 (statutory) consultation for the Project. This approach allows National Grid to demonstrate that the Project can be delivered and that it can connect to the national transmission network.

5.6.4 National Grid is obligated to meet certain timescales for the delivery of the network reinforcement through the proposed new 400kV overhead line, and the substations are integral to this. The inclusion of the substations within the Project does not change our intention to continue to progress with the separate planning applications for each substation, and it does not affect our continuing discussions and negotiations with relevant landowners and interested parties. We are committed to, and fully intend to pursue and deliver, the substations pursuant to those permissions and land agreements.

5.6.5 National Grid will continue to keep this approach under review as the Project progresses. The new proposed substations will play an important role in building a more secure and resilient future energy system.

6. Design Evolution

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6. Design Evolution

6.1 Overview

6.1.1 This chapter outlines the overarching design and technical considerations of the preferred alignment and sets out how these have evolved through the Project's development and non-statutory consultations. These decisions are to align with the legislative and policy context set out in Chapter 2.

6.2 Technical Design Considerations

Line Swap Overs

6.2.1 Line swap overs comprise reconfiguration of an existing overhead line to allow the overhead line routes to remain parallel without the need for a line 'duck under'. Line swap overs allow for the continuation of a route from a section of new pylons to a section of existing pylons, whilst the parallel route is a continuation of a route from a section of existing pylons to a section of new pylons.

6.2.2 Line swap overs are achieved by removing a section of existing line and forming two unconnected ends, which are then each connected to a new line approaching from either side.

6.2.3 Swapping over from one side of an overhead line to the other increases construction, delivery and engineering complexity. Outages would be required on the electricity transmission network to undertake work safely on the existing overhead line, which would be subject to availability dependant on network conditions and other planned works on the network, leading to programme risk in the event an outage is cancelled, or delayed. Specialist personnel are required to plan the system outages and ensure the existing pylons, which transmit 400kV electricity, can be worked on safely. Temporary structures such as masts, or pylons, would be required to re-route power from the existing overhead line and ensure continuity of power flow in the area whilst the line swap work takes place. Assessment of the existing structures, foundations, conductors and fittings would be required to ensure the existing overhead line can connect to the new overhead line and subject to the final design and outcome of these assessments it may be that upgrades/replacements are required which could in turn lead to further outages being required. In addition, and subject to the configuration and number line swap overs, the line swap over could lead to existing overhead line connecting into a different substation on the network, which would lead to reconfiguration of control systems, and existing drawings having to be updated. Figure 6-1 sets out a schematic of a line swap over.

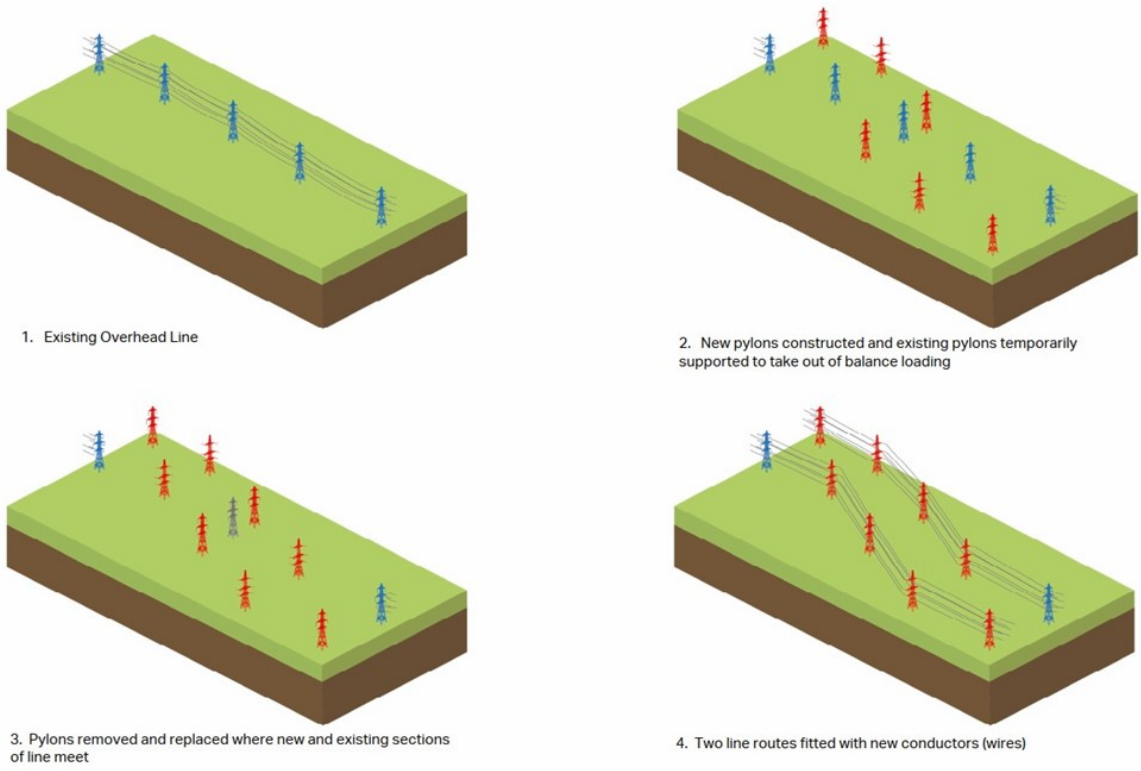


Figure 6-1 Schematic of a line swap over

6.2.4 The Project includes two line swap overs in Route Sections 2 and 3. These described in more detail in Sections 7.3 and 7.4 of this report.

Close Parallel Opportunities

6.2.5 National Grid recognises that close paralleling has the potential to reduce the overall extent of environmental impacts arising from the Project by intensifying the degree of impact on receptors already affected by existing overhead lines, rather than spreading impacts to areas not currently affected.

6.2.6 Whilst the efficacy of close paralleling in reducing environmental impacts is strongly influenced by local factors (e.g. topography, settlement patterns, woodland cover etc.), the optimum level of benefit is likely to result from lines that, as stated in Holford Rule 6, are planned with pylon types and conductors forming a coherent appearance. In most circumstances, this is likely to be more achievable the closer the overhead lines are to each other, as local conditions are likely to be similar for both overhead lines.

6.2.7 The minimum distance between lines is determined by technical and safety constraints and would typically be 85m. When routeing a new overhead line parallel to two existing overhead lines that are already sited close together, a greater separation between the new line and the closest existing line would be required. This is to allow space for construction, maintenance and refurbishment activities to be carried out on (what would become) the middle line of the three. In these instances, a minimum separation distance of 150m would normally be required between the new and closest existing line. Whilst the maximum distance at which the benefits of close paralleling might be achieved depends on local factors, this is considered to be approximately 200m in most circumstances.

6.2.8 There are technical challenges associated with the construction and operation of a close parallel alignment, including difficulties with achieving the required offset from the existing overhead line and access where the existing overhead line is already within a relatively constrained working area.

6.2.9 There are locations within the preferred route alignment where there are opportunities for close parallel with existing overhead lines. These areas are discussed in detail in Chapter 7.

6.3 Pylon Type Considerations

6.3.1 Whilst the vast majority of transmission lines in Britain use lattice steel pylons with three sets of cross arms, alternative pylon types have been approved for use which may achieve the technical performance required for the Project. These pylon types are set out below. The choice of pylon design for overhead lines should be considered on a project by project basis. This section of the report provides information on the features of 'traditional' lattice pylons, low height lattice and the T-pylon, including their construction, operation and maintenance. For the overhead line connection consideration must be given to both:

- the conductor, which must be capable of carrying the required power; and
- the pylon type, which needs to be able to support the conductor bundles (wires) and an earth wire.

Conductor Options

6.3.2 The overhead wires that transport the electrical power are known as conductors and these are usually installed in a set (or bundle) on both sides of the pylon. Overhead lines can have different conductors, in terms of size (diameter), current carrying capacity, and the number combined to form a bundle. At 400kV, conductor bundles can be twin (two), triple (three), or quad (four).

6.3.3 The type of conductor selected depends largely on the required rating of the overhead line (the maximum amount of electrical power that the new line needs to be capable of transmitting). The conductor choice will also dictate the range of pylon designs available, as not all are capable of carrying heavier conductor bundles.

Pylon Options

Design Characteristics

6.3.4 There are two main types of pylon used by National Grid in England and Wales -- steel lattice pylons and the new T-pylon.

6.3.5 Whilst there are differences between the steel lattice and T-pylon designs, they share a number of technical characteristics. These include:

- they are above ground structures built on permanent foundations;
- they can (typically) support two discrete electrical circuits (one on either side of the structure)
- they are capable of supporting the weight of the required conductor bundles under a wide range of conditions;

- the height of the structures can be adapted to suit different terrains and physical obstacles (such as river/road crossings) to ensure statutory clearance distances from the conductors, although it should be noted that low height pylons can be subject to height extension limitations.

6.3.6 Wireline visualisations showing pylon comparisons from a selection of viewpoints are provided in **Appendix B** and **Appendix C**.

6.3.7 For steel lattice pylons, each of the arms supports a single conductor bundle and the top of the pylon supports an earth wire. Low height lattice pylons comprise just two sets of cross arms; a wide lower cross arm and a standard width upper crossarm. The lower crossarms each support two bundles of conductor, meaning four bundles are arranged in a horizontal alignment beneath this pair of cross arms. The upper cross arm supports just one conductor bundle in the same way that a standard lattice pylon does.

6.3.8 In comparison, the T-pylon design connects all three conductor bundles together in a diamond configuration using solid insulated bars. One of these diamond configurations (comprising all three bundles of conductors) is then suspended from each side of the single cross beam of the T-pylon with a separate earth wire for each side of the pylon supported above the conductors.

6.3.9 For traditional steel lattice pylon, where an overhead line changes direction, and where lines terminate at substations, stronger tension structures (tension pylons) are required. These have larger foundations, heavier steelwork and larger footprints than the suspension pylons used where an overhead line runs in a straight line. Taller and heavier pylons with larger footprints may also be required to negotiate more complex terrain.

6.3.10 As with the traditional lattice pylons, where an overhead line changes direction, and where lines terminate at substations, stronger and heavier T-pylons (with an additional supporting member stabilising the diamond to the main structure, are required). T-pylons are shorter than traditional lattice.

6.3.11 Low height lattice pylons are also lower in height but wider than traditional lattice pylons and are generally used over relatively short straight sections of an overhead line route. Low height lattice may be incorporated into a design to mitigate specific circumstances for example, this may be considered on a case-by-case basis in the vicinity of airfields where additional clearance from an overhead may be required or to reduce the visual effect of the overhead line where landscape character and the distribution and orientation of local viewpoints afford this opportunity.

6.3.12 Exceptionally, where a pylon only needs to support a single circuit (comprising just three bundles of conductors) a horizontal conductor arrangement may be considered, supported on a lattice steel gantry structure. This results in a further reduction in the height of the structures used, but if two circuits are needed two separate overhead lines would be required. Two lines would give rise to additional impacts and such structures are therefore employed in very limited situations where the lower height is needed to maintain operational clearances such as locations where one overhead line needs to pass under another. This would be the case east of Crowle and Ealand in Route Section 6 where the proposed new line would cross above a proposed reduced-height section of the existing ZDA overhead.

6.3.13 Minimum statutory clearances must be maintained between conductors and the ground, trees, buildings and any other structures such as street lighting columns. The clearance required depends on factors such as the operating voltage of the line, the use of land crossed by the line and the nature of any nearby structures. The required height of the

pylon is therefore influenced by the sag profile of the conductor and the span distance between adjacent pylons. Pylons need to be sufficiently tall to ensure that statutory clearances from the bottom conductors are achieved in all weather conditions and for the maximum permissible operating temperature.

6.3.14 Steel lattice pylon heights are adjusted by adding extension pieces, each typically adding around 3m. For a typical T-pylon height extensions are limited to 3m for suspension pylons and 7m for tension structures.

Construction

6.3.15 As construction methods for traditional steel lattice pylons and T-pylons pylons are similar, this section of the report provides a brief comparison of the main differences in construction. In summary:

- Although construction work areas for both the T-pylon and lattice pylons are similar in size, T-pylon work areas require a fully stoned and compacted level work area for delivery of the large tubular sections of pylon. Earthworks to level out sloping terrain would be required for all T-pylons;
- In general foundation installation is similar, utilising common piling or concreting techniques, however the T-pylon requires a level, compressed surface to facilitate the specialist installation of the base flange which upon the pylon sits;
- Both pylon types are erected by mobile crane however due to larger components a greater capacity crane is required for T-pylons;
- As T-pylons cannot be climbed, access for the installation of conductors and fittings is made from a specialised Mobile Elevated Work Platform (MEWP). This requires a suitable access route to a level work area; both will be required to be left in situ for future maintenance and defect repairs; and
- Conductors and fittings should be installed soon after the construction of T-pylons to reduce the impact of weather induced fatigue. A more critical, sequenced construction programme is therefore required. Lattice pylons can be erected in advance of conductor installation with less risk of fatigue.

Operation and Maintenance

6.3.16 Overhead conductors have a life expectancy of approximately 40 - 60 years. Maintenance operations include painting, corroded or damaged member replacement, insulator & fittings and conductor fittings replacement, pylon furniture repairs and other activities. Painting of the structures occurs approximately every 20 years and is based on a condition assessment. Painting of the crossarms and some sections of the pylon bodies requires the circuits to be switched out. Pylon inspection is currently done by helicopter or drone. These are able to travel swiftly between structures and hold steady during pylon inspection whilst taking HD resolution video for better analysis back in the office.

6.3.17 All lattice pylons on the network are climbable so many activities can be carried out without equipment such as specialised MEWPs.

6.3.18 Bespoke and conventional maintenance and defect rectification procedures, manuals and methodologies for steel lattice pylons are widely available within National Grid. These procedures have been developed over many years and are compliant with

National Grid's and UK safety requirements, covering not only structures but also insulators, conductor systems and other overhead line components.

6.3.19 For the T-pylon, challenges may be anticipated when carrying out maintenance, defect rectification or refurbishment works on these lines, including painting, insulator & conductor and fitting replacement. Maintenance works are especially intricate due to the complex nature of the insulator arrays installed. Due to access requirements repair times could be increased and may need longer outages.

6.3.20 Access using conventional methods such as climbing will not be possible and MEWPs will be required to access overhead line components for repair and/or replacement. A permanent access may therefore be required to be left in situ to each individual T-pylon site.

Project Specific Appraisal

Pylons Options Available to the Project

6.3.21 For the Project, the aluminium alloy (AAAC) conductor type needed to meet the rating requirements for the new Birkhill Wood to High Marnham circuits is a triple bundle of 37 mm diameter (Araucaria) conductor. Only the larger standard lattice steel design suites are capable of supporting this conductor bundle. However, a mix of pylon types is currently proposed, with a more modern lattice pylon design being employed for larger changes of direction where some of the historically utilised designs are no longer available.

6.3.22 The proposed new overhead line would cross the existing ZDA overhead line east of the village of Ealand, in Route Section 6. It is proposed that a section of the ZDA would be replaced with lower height structures to facilitate the crossing of the proposed new line above the ZDA line. The existing line has a lower power transfer requirement than the proposed new line and therefore a more slender form of lattice pylon could carry the lighter conductors required, whilst low height structures (as described at paragraph 6.3.12) would also be used to replace one of the existing pylons. These pylons are illustrated in Figure 6-2 below.

6.3.23 Newer conductor types constructed with composite cores may also be considered for the North Humber - High Marnham project. If it is appropriate to use these newer conductor types then a slightly lighter form of pylon design could potentially be utilised throughout as this design of pylon would be capable of carrying the twin conductor bundles that would then be adequate.

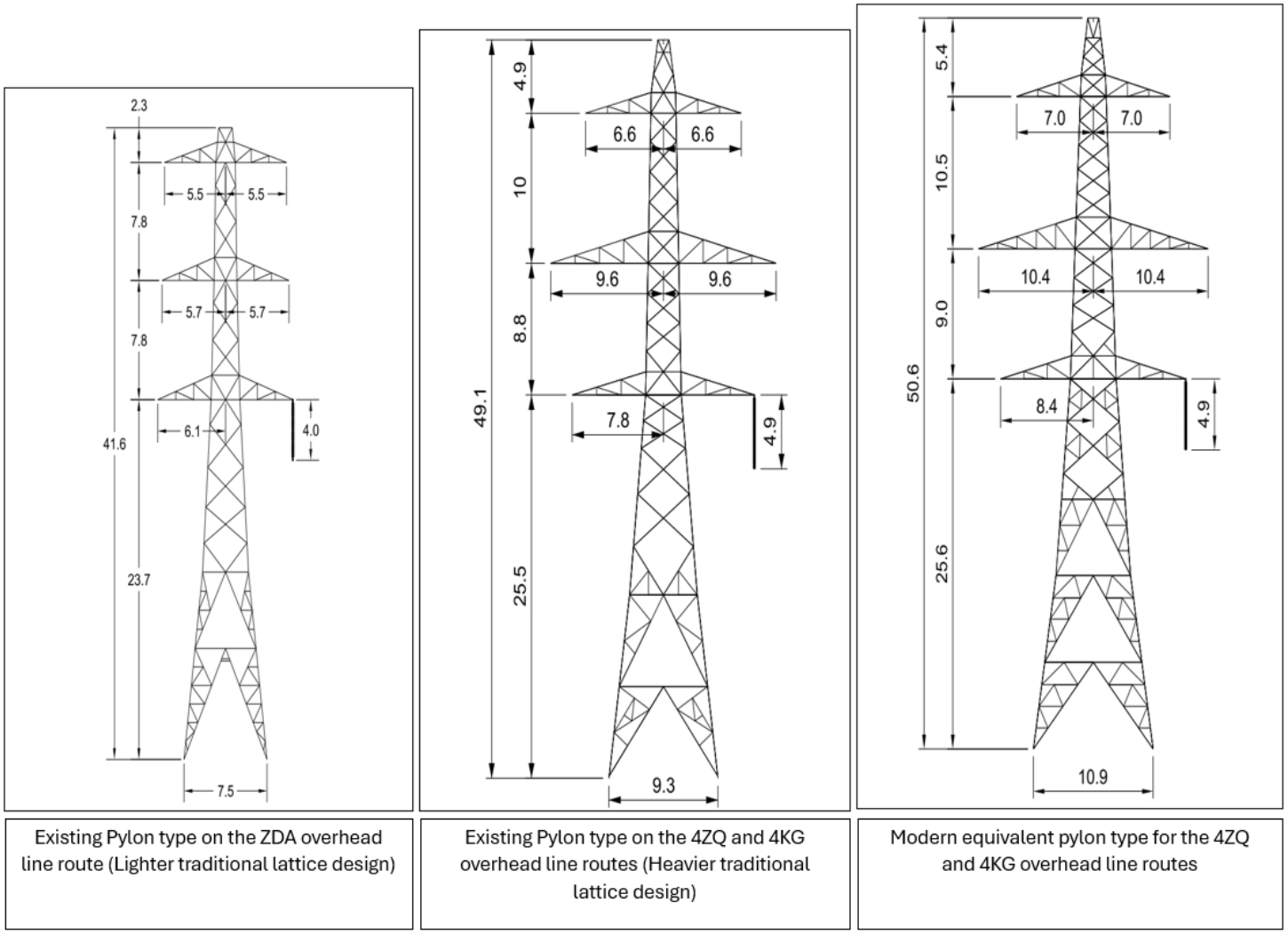
Relationship with Existing 400kV Overhead Lines

6.3.24 A major design consideration for the North Humber to High Marham Project is its relationship with the existing 400kV overhead lines, both between the Creyke Beck area and Keadby, and also southwards through the Trent Valley. The emerging Preferred Route Corridor from the **Corridor Preliminary Routeing and Site Study (CPRSS)** was taken forward for a number of reasons, not least because it offered the opportunity to route the new line within landscapes where high voltage electricity infrastructure already forms a significant component. Here the environment is to a degree already de-sensitised to the presence of overhead lines.

6.3.25 As discussed in the CPRSS, there are potential benefits in an alignment for the new line that closely parallels the existing overhead line(s) to minimise the geographical spread of the effects of the Project. The CPRSS also recognised that this may not always be practicable due to other considerations, such as the proximity of designated sites and settlements, which would likely require deviations from a close parallel route alignment or consideration of wider non-parallel route options.

6.3.26 The proposed route alignment now presented has taken into account the existing 400kV overhead lines and their potential relationship with the Project. In developing the routeing proposal consideration was given to the potential for synchronising both the existing and proposed pylon positions (i.e. mirroring their locations) in order to achieve visual consistency and lessen potential visual effects. It is acknowledged that this may not be possible in all cases.

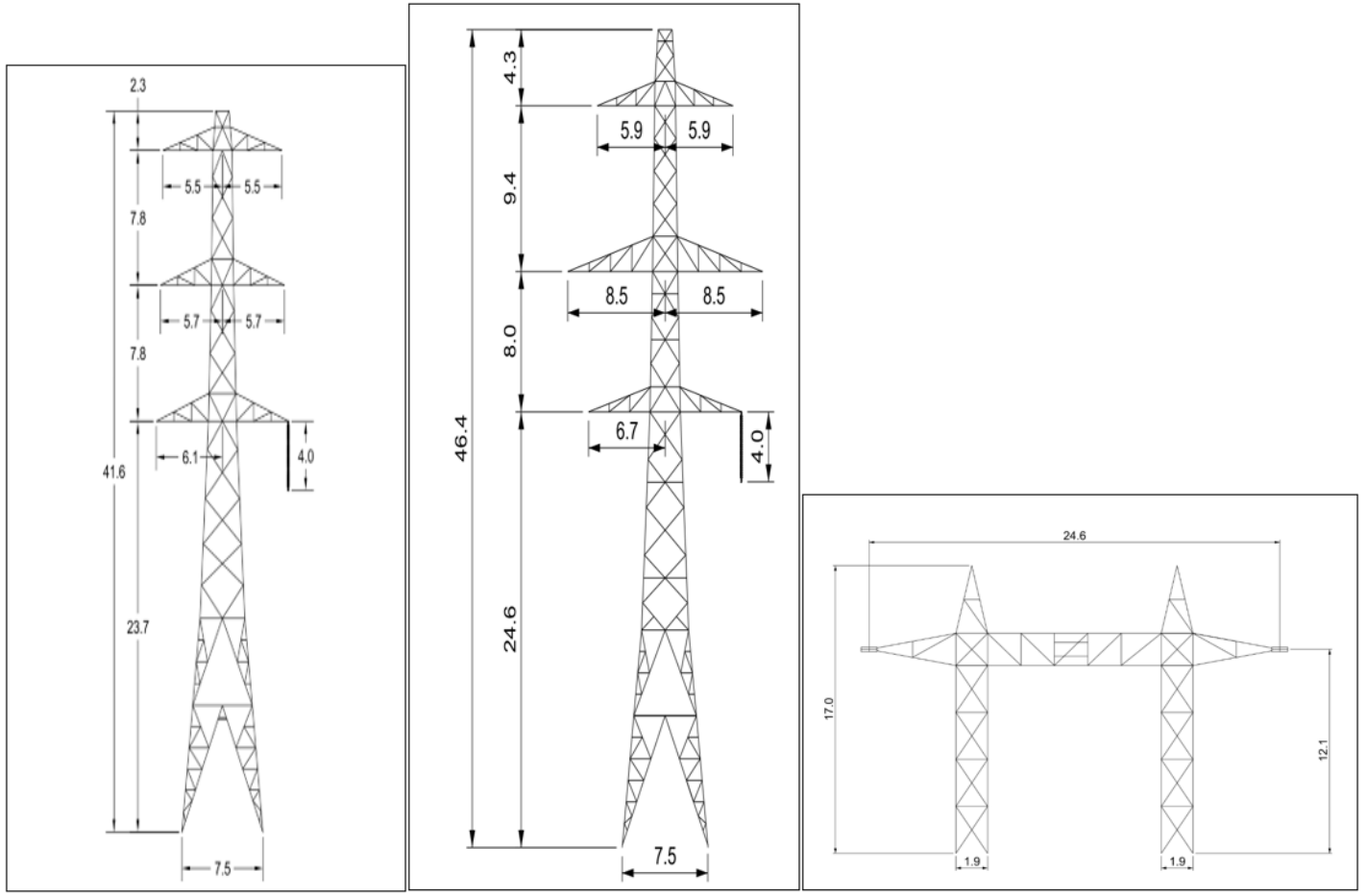
6.3.27 There are a variety of existing 400kV overhead lines along the route of the Project, all comprising full height lattice pylons, although of various designs, as illustrated in Figure 6-2 and Figure 6-3.



Existing Pylon type on the ZDA overhead line route (Lighter traditional lattice design)	Existing Pylon type on the 4ZQ and 4KG overhead line routes (Heavier traditional lattice design)	Modern equivalent pylon type for the 4ZQ and 4KG overhead line routes

NB: Drawings are not to scale. Drawings are high level. Drawings do not contain all pylon details. Drawings not fit for construction or any other use than specified below. Drawing dimensions rounded to one decimal point. Final design/ pylon choice will require approval by the Contractor.

Figure 6-2 Pylon types used throughout preferred alignment



Existing standard lattice pylon type on the ZDA overhead line route

Proposed replacement standard lattice pylon type on the ZDA overhead line route crossing

Proposed replacement low height gantry structure on the ZDA overhead line route crossing

NB: Drawings are not to scale. Drawings are high level. Drawings do not contain all pylon details. Drawings not fit for construction or any other use than specified below. Drawing dimensions rounded to one decimal point. Final design/ pylon choice will require approval by the Contractor.

Figure 6-3 Illustrative pylon forms at proposed ZDA overhead line crossing (east of Ealand)

Factors Considered for Appraisal

6.3.28 The following factors have been considered in arriving at a proposed pylon design for the new overhead line:

- landscape and visual;
- historic environment;
- biodiversity;
- socio-economic (for the purposes of the appraisal, civil and military aviation and defence interests, land use, and socio-economic considerations have been described under this heading);
- water resources;
- operational noise; and
- technical considerations.

6.3.29 The following summary of the appraisal undertaken identifies areas where mitigation through the use of a different pylon type e.g. low height lattice or T-pylon, may provide necessary mitigation for a potential effect. A selection of views illustrating the use of the alternative pylon forms is included at **Appendix B**.

New Birkhill Wood Substation to Little Weighton (Route Sections 1 and 2)

6.3.30 In this part of the route between Creyke Beck and Little Weighton, the Project routes to the north of the existing 4ZQ which comprises the bulkier standard lattice pylons. The proposed new overhead line is routed approximately 500m to the north of the existing line and passes over slightly higher ground between the A184 and Little Weighton Road. As the route is slightly removed from the existing and passes some sensitive receptors, including Risby Hall Registered Park and Garden (RPG) and a Scheduled Monument, this part of the route has been considered for alternative pylon types.

6.3.31 View 1 presented in Appendix B shows the view from the edge of Risby Hall RPG in Route Section 2.

6.3.32 The review of alternative pylon types concluded that although the use of low height pylons would reduce the prominence of the new overhead line as it passes over the higher ground in the section between the A164 and Little Weighton Road, this would not reduce the level of significance of the Project on the local landscape, views and the setting of heritage assets. From a biodiversity aspect, the use of low height pylons may require additional vegetation removal from the wider swathe required for conductors. Combining different pylon types along the route of the new overhead line would also add technical complexity to the Project, both during the construction and operational phases, as certain pylon types cannot support certain conductor configurations.

6.3.33 In summary it is considered that, on balance, there is not a strong justification to utilise an alternative pylon design to that of the standard lattice pylons in this Route Section.

Little Weighton to Luddington (Route Sections 2 - 5)

6.3.34 In this part of the route between Little Weighton and Luddington, the preferred alignment for the new overhead line is parallel to the existing 4ZQ route as closely as possible, synchronising the pylon positions with the existing route where possible. Using a similar pylon type with similar spans would help create a more coherent appearance with the existing line.

6.3.35 View 2 in **Appendix B** shows a view where the Project would be parallel to the existing 4ZQ route and how each of the pylon options would look with the existing overhead line. View 3 shows the view from the edge of Fockerby where a number of overhead lines converge and other infrastructure such at wind turbines and the water tower create existing clutter.

6.3.36 It is considered that the introduction of low height lattice or T-pylon designs in this Route Section would add to the visual 'clutter' within the view, which is already significantly affected by overhead lines. View 4 shows the view from Luddington Church, showing that the standard lattice pylon design now proposed would be most consistent with existing pylon types in this section.

6.3.37 Having regard to the factors considered as part of the appraisal, it is considered that the standard lattice pylon design is the most appropriate form of pylon in these Route Sections.

Luddington to Beltoft (Route Section 6)

6.3.38 In this Route Section the Project diverges from the existing overhead lines to route around the Keadby Windfarm from Luddington, before rejoining a parallel alignment with the two existing overhead lines at a point south of Beltoft. Where the proposed route is remote from the existing 4ZQ and 4TM overhead lines and the relationship with the existing pylons is less relevant in design terms the use of alternative forms of pylons in has been considered in more detail.

6.3.39 There are very few visual receptors in close proximity to the proposed new line in this Route Section, which hugs the western edge of Keadby Windfarm. There are a few scattered properties to the east of Ealand; Crowle and Ealand being the closest settlements. Properties in this area have views of the existing ZDA overhead line, which runs from the west into Keadby Substation, as well as the numerous wind turbines at Keadby Wind Farm.

6.3.40 The T-pylon is of a similar form to the wind turbine monopiles in the Keadby Windfarm and therefore may provide more visual coherence in those short lengths of the route where the turbines rather than existing pylons form the dominant element of the view. For example, in views south and east towards Keadby Wind Farm between the proposed 4AF105 pylon position and a point north of the existing ZDA overhead line. However, in this Route Section there are relatively few and remote visual receptors experiencing these views.

6.3.41 Elsewhere existing standard lattice pylons form an increasingly significant element in views, as the proposed new route converges towards the existing overhead lines. This is especially the case south of Keadby where both the slenderer (ZDA overhead line) and bulkier forms (4TM overhead line) of standard lattice pylon are sited closely parallel to one another.

6.3.42 Having regard to the factors reviewed as part of the appraisal and the relatively short lengths of route with few visual receptors present where the T-pylon may provide marginal visual advantage, it is considered that there is not a strong driver to utilise the T-pylon (or other low height lattice pylon design) rather than the standard lattice pylon design between Luddington and Beltoft.

Beltoft to Graizelound (Route Section 7)

6.3.43 In this Route Section, the preferred alignment runs more broadly parallel to the existing 4TM overhead line through much of the Isle of Axholme. Where local siting considerations allow, the proposed pylon positions have been synchronised with the pylon positions on the 4TM overhead line; the nearest (westernmost) of the two existing routes.

6.3.44 It is considered that using a similar pylon type with similar spans will help create a coherent appearance with the existing 4TM overhead line, as shown in View 5 in Appendix B. It should however be noted that the presence of the existing ZDA overhead line to the east, which comprises the smaller standard lattice pylon designs, means that pylons along the two existing lines are not synchronised due to the smaller spans of the lighter design.

6.3.45 Having regard to the factors reviewed as part of the appraisal, it is considered that the bulkier standard lattice pylon design (as proposed) is the most appropriate form for the proposed new pylons in these sections.

Graizelound to West Burton (Route Sections 8 and 9)

6.3.46 In this part of the proposed route, between Graizelound and West Burton and to the south of the Isle of Axholme, the preferred alignment diverges southwest away from the existing overhead line routes. The preferred alignment thereby avoids the villages of Misterton, Walkeringham and Beckingham before converging with the existing overhead lines towards West Burton. At its furthest distance the proposed route is some 4km west of the existing overhead lines and passes some sensitive receptors, including a number of listed buildings, the Trent Valley Way, Chesterfield Canal and Beacon Hill Scheduled Monument at Gringley on the Hill.

6.3.47 The main visual receptors in this Route Section are the properties located along Fountain Hill and those on the edge of the village of Gringley on the Hill, both of which are elevated and therefore have long views across open countryside. In views to the west there is no existing overhead infrastructure. In views to the north and east from Gringley on the Hill, existing overhead lines are distant and form part of the backdrop along with wind turbines.

6.3.48 View 6 in Appendix B shows the views west from the Chesterfield Canal and View 7 shows the views from Beacon Hill and Gringley on the Hill. These two sets of images illustrate that although one pylon type might perform better for one set of receptors, it could be worse for another. Although the T-pylon appears to perform well in views westwards, e.g. from the Chesterfield Canal and Fountain Hill, from Gringley on the Hill the proposed overhead line would be back clothed and therefore lattice pylons are considered a more appropriate design from a visual perspective.

6.3.49 In one short length of the proposed route, where it passes over the higher ground between Gringley on the Hill and Beckingham between proposed pylon locations 4AF189 and 4AF194, it is considered that the use of low height lattice pylons could reduce the prominence of the new line in views and within the wider landscape. This could also have some benefit in reducing impacts upon the setting of heritage assets in the area. However, it is considered that the use of low height lattice pylons would not be so advantageous as to reduce the level of significance of these effects.

6.3.50 Having regard to the factors reviewed as part of the appraisal and the relatively short lengths of route where the use of just six low height pylons may provide marginal visual advantage, it is considered that the technically preferred standard lattice pylon design is

the most appropriate form for the proposed new pylons in this Route Section of the preferred alignment.

West Burton to High Marnham (Route Sections 10 and 11)

6.3.51 In this part of the proposed route, between West Burton and High Marham, the preferred alignment diverges southwest away from the existing overhead line at West Burton near Sturton le Steeple. It routes east of the villages of North Leverton with Habblesthorpe, South Leverton, Treswell, Woodbeck and East Drayton before heading south east to converge with the existing overhead lines at High Marnham. The preferred alignment thereby avoids the villages of Rampton, Laneham and Dunham on Trent. At its furthest distance the proposed route is some 4km west of the existing overhead lines and passes some sensitive receptors, including a number of listed buildings and the Trent Valley Way to the south of Sturton le Steeple. Listed buildings include the North Leverton Windmill which is a feature within the landscape to the east of North Leverton and Habblesthorpe and a visitor destination.

6.3.52 The main visual receptors in this Route Section are the properties located on the edges of the villages of Sturton le Steeple, North Leverton with Habblesthorpe, South Leverton, Treswell, Woodbeck, East Drayton and Darlton.

6.3.53 Between Sturton le Steeple and Darlton the landform becomes more elevated, and views east become less influenced by existing overhead lines within the Trent Valley, the existing lines forming part of a distant backdrop. In views to the west there is no existing overhead infrastructure.

6.3.54 A number of unlicenced airstrips are located within this Route Section at West Burton Airstrip, Grove Farm, Forwood Farm, Headon Airfield and Darlton Gliding Club. National Grid has engaged and will continue to engage with the owners and operators of all aviation interests along the route as we continue to refine our proposals, including holding discussions around pylon types.

6.3.55 View 8 in **Appendix B** shows the views west towards the North Leverton Windmill, and Views 9 and 10 show views east from Treswell Woods and Darlton respectively. Although the T-Pylon appears to perform well in these selected views it is considered that in views within the northern areas of Section 10 and in Section 11, the presence of the existing lattice overhead lines is more prominent and therefore lattice pylons are considered a more appropriate design from a visual perspective in these areas. In areas located further from the existing overhead line, the presence of increased amounts of vegetation mean that a lattice form would more easily be incorporated into the landscape, being a less solid structure which would benefit more from filtering vegetation in views.

6.3.56 Although it is considered that the technically preferred standard lattice pylon design is the most appropriate form for the proposed new pylons in this Route Section of the preferred alignment, for the Route Section between West Burton and High Marnham, the use of low height pylons will be reviewed.

6.4 Substation Considerations

6.4.1 The Project would need to connect to two new substations – one at Creyke Beck, Cottingham (known as Birkhill Wood Substation) in the East Riding of Yorkshire and a new substation at High Marnham in Nottinghamshire (part of a project called ‘Brinsworth to High Marnham’). National Grid intends to apply for planning permission for the two

new 400kV substations from the relevant local planning authorities under the Town and Country Planning Act (TPCA). More information on the proposed substations can be found at Sections 7.8 and 7.9 of this report.

Birkhill Wood Substation

6.4.2 The existing Creyke Beck substation does not have sufficient capacity to accommodate new customers requiring a connection to the electricity network. National Grid have therefore identified the need for a new substation close to the existing Creyke Beck substation to connect a number of new customers, including the proposed Dogger Bank South and Dogger Bank D offshore windfarms and two proposed interconnectors in the North Sea (Atlantic Superconnection and Continental Link). The new substation will also serve as the connection point for the North Humber to High Marnham project.

6.4.3 The proposed development would comprise a new 400kV gas insulated substation (GIS) and associated works, comprising:

- A new 400kV GIS substation (operational footprint of 2.5ha) containing:
  - 400kV GIS equipment building/switch house with attached annex to house protection and control, ancillary equipment and welfare facilities;
  - Customer protection and control rooms;
  - Gas insulated and air insulated switchgear;
  - Gantries to interface between overhead line and substation;
  - Backup generator;
  - Water tank (for emergency fire-fighting purposes);
  - Ground deployed solar array to support the substation building services power supply;
  - Foul water cess pit;
  - Lighting columns and CCTV equipment;
  - Electrified fence around the perimeter;
  - Carparking;
  - 11kV/415V Utility Distribution Equipment enclosure;
  - Ground treatment comprising loose stone and gravel substrata with hardstanding buildings and transmission assets.
- A new vehicular access off the A1079 and approximately 1.2km of new permanent access road to serve the new and existing substation, including new culvert crossings over ditches. (Note: The vehicular access and the first 0.7km of the access road has already been consented through the Hornsea Four DCO);
- Temporary haul road, construction compounds and laydown areas;
- Drainage, landscaping and areas for biodiversity net gain provision;
- Removal of the existing wind turbine southwest of the proposed Birkhill Wood substation site to facilitate the substation development.

6.4.4 Overhead line works are also proposed, including the erection of two new pylons along the existing 4ZR overhead line alignment which are required to turn-in the power lines into the new substation. A temporary section of overhead line will be required to divert the lines whilst the new pylons are built.

6.4.5 The temporary section of overhead line would be approximately 1km in length would be required for approximately 6 months. Up to 6 temporary poles would be used for the temporary diversion which would be held in place by wire stays.

High Marnham Substation

6.4.6 The development of the new High Marnham substation will assist in rationalising the electricity transmission network between South Yorkshire and the North Midlands area to improve operational flexibility, to meet localised demand and to address anticipated customer connections at that location. In addition, the new High Marnham substation will connect a number of new customers.

6.4.7 The site is located directly adjacent to the existing High Marnham 400/275kV substation and would comprise:

- A new 400kV air insulated switchgear (AIS) substation, containing:
  - Approximately 22 bays.
  - Approximately 10 overhead line gantries.
  - Standard substation plant, inclusive of two new super grid transformers; 1 x 400/275kV, and 1 x 400/33kV transformers.
  - A new substation control building, and relay rooms.
  - Security fencing.
  - Lighting columns.
  - CCTV surveillance.
  - A new vehicular permanent access route off an existing private road to serve the new substation.
  - Temporary access route during construction.
  - Temporary construction compounds, welfare and laydown areas.
  - Landscaping, drainage features and BNG areas.

6.4.8 The new High Marnham substation is proposed to be served by a new access road off an existing private road from Fledborough Road, which is configured similarly to the current existing access.

6.4.9 The construction works will involve temporary diversions of the existing Chesterfield to High Marnham, High Marnham to Stoke Bardolph and High Marnham to West Burton overhead electricity lines, currently connecting to the existing 275kV and 400kV substations. These temporary diversions are expected to be in place for up to three years.

6.4.10 The construction works will involve the reconfiguration of the existing overhead electricity lines, to be turned into the new High Marnham substation. As part of these works, nine new pylons will be built, seven to the south and two to the north. 26 existing pylons will be removed.

Substation Design Considerations

6.4.11 The specific design considerations of the new substations are set out in Chapter 7.8 for the Creyke Beck Substation and Chapter 7.9 for the High Marnham Substation. These sections set out how the designs proposed respond to the local environmental and socio-economic considerations, and feedback from previous public consultation undertaken ahead of the proposed applications.

6.5 National Grid's Approach to Routeing and Siting

6.5.1 Through the Electricity Act 1989, as set out in Chapter 2, National Grid has statutory duties placed upon it to operate under the terms of its transmission licence. In addition, the Holford and Horlock rules are used as two sets of guidelines for National Grid's routeing and siting approach, this is further explained in Chapter 6.7 below.

6.6 Planning and environmental considerations

6.6.1 Several planning and environmental features have been considered throughout the routeing and siting process. A buffer was applied to some of these features at the CPRSS stage in order to inform the routeing of the graduated swathe. These features have continued to be considered as part of assessments informing the preferred alignment. The features considered include, but are not limited to, the following:

- **Air Quality**: Residential Properties, Education Establishments (such as schools and colleges), Buildings (other than residential properties e.g. retail, industrial estates), and Air Quality Management Areas (AQMA).
- **Aviation and Defence**: Radar, Radio Navigation Beacon, or Radio Sites, Ministry of Defence Low Flying Zone (only high priority and regular), Licensed Airfields, Unlicensed Airfields with Buildings, Unlicensed Airstrips, Ministry of Defence Properties, Civil Aviation Authority Airports, Civil Aviation Authority Aerodromes, Military Airfield/Passenger Airport.
- **Ecology**: Ancient woodland, National Nature Reserves, Ramsar, Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI), Local Nature Reserves (LNR), National Forest Inventory Woodland, Important Bird Area, Priority Habitat Inventory, and RSPB Reserves.
- **Socio-economic Activity**: Buildings (other than residential properties e.g. retail, industrial estates), Aggregate and Mineral Resource Areas, Woodland/Forestry Operations, National Trust Inalienable Land, Wind Farms and Solar Farms, Planning Applications/Consents (only for NSIPs registered with the Planning Inspectorate), and Local Plan Allocations.
- **Geology and Soils**: Geological Sites of Scientific Interest, Local Geodiversity Sites, Peaty Soils, Landfill Sites (historic and authorised), and Mines.
- **Historic Environment**: Scheduled Monuments, Listed Buildings (Grade I, II and II*), Registered Parks and Gardens, Conservation Areas, and National Trust Inalienable Land.
- **Landscape and Visual**: Area of Outstanding Natural Beauty (AONB) (now known as National Landscapes), Important Landscape Area (ILA), Residential Properties, National Trails, National Cycle Network, National Trails, European Long-Distance

Paths, Viewpoints, Recreational areas (e.g. country parks, Countryside and Rights of Way (CROW) access land), and Outdoor Recreational Facilities (e.g. canals, caravan parks, mountain bike centres).

- **Noise and Vibration**: Residential Properties, Education Establishments (e.g. schools and colleges), Buildings (other than residential properties e.g. retail, industrial estates).
- **Traffic and Transport**: National Cycle Network, National Trails, European Long-Distance Paths, Rail Network (including Railway Stations), and Trunk Road Network.
- **Water**: Statutory Main Rivers, Water Framework Directive (WFD) Surface Waters, Floodplains (including storage areas), Groundwater Dependent Terrestrial Ecosystems, and Groundwater Source Protection Zones – Inner/Zone 1.

6.7 Approach to mitigation

6.7.1 The primary mitigation strategy of the Project is to ensure that the design considerations of the preferred draft alignment champion the mitigation of impacts through avoidance. Where this has not been possible, essential mitigation measures have been employed in order to ensure that the Project is compliant with relevant planning policy and other regulatory requirements. In addition to these measures, environmental enhancement measures have been put in place to provide local environmental benefits from the scheme. Each of these approaches to mitigation is set out in detail below.

Avoidance (Embedded mitigation)

6.7.2 Avoidance, otherwise known as embedded mitigation, seeks to avoid or reduce potential adverse impacts of the scheme through careful design of the main works. In addition to the technical design considerations set out in Chapter 6.2, the following embedded mitigation measures have been used.

Routeing and compliance with Holford Rules

6.7.3 As identified in Chapter 2.4, the Holford Rules set out guidelines for the routeing of new overhead line development. National Grid employs the Holford Rules as the basis of the approach to overhead line routeing. The Project's compliance with the Holford Rules is set out in the table below.

Table 6.1 Consideration of Holford Rules in approach to preferred alignment routeing

Holford Rules	Project compliance
Rule 1: Avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the first line in the first place, even if the total mileage is somewhat increased in consequence. Investigate the possibility of alternative routes, avoiding if possible the areas of highest amenity value. The consideration of	The **CPRSS 2023** sets out how the routeing of the overline line has sought to avoid areas of the highest amenity value. The preferred alignment does not currently route through any areas of highest amenity value (as defined in the Holford Rules supporting text) however it is noted that the Yorkshire Wolds Important Landscape Area is currently being consulted upon to be designated as a National Landscape. The

Holford Rules	Project compliance
alternative routes must be an integral feature of environmental statements. Areas of highest amenity value are: • Areas of Outstanding Natural Beauty (now known as National Landscapes) • National Parks • Heritage Coasts • World Heritage Sites	Project team are keeping this emerging designation under consideration. In addition, several alternative corridors have been considered for the Project. These are detailed in the **CPRSS 2023** and in the **PEIR Chapter 3**. Location-specific considerations to inform the preferred alignment are set out in Chapter 7. The routeing of the preferred alignment has sought to be compliant with Rule 1.
Rule 2: Avoid smaller areas of high amenity value, or scientific interests by deviation; provided that this can be done without using too many tension pylons, i.e. the more massive structures which are used when lines change direction. Some areas (e.g. Sites of Special Scientific Interest) may require special consideration for potential effects on ecology (e.g. to their flora and fauna). Where possible choose routes which minimise the effects on the setting of areas of architectural, historic and archaeological interest including Conservation Areas, Listed Buildings, Listed Parks and Gardens and Ancient Monuments.	The **CPRSS 2023** sets out how the routeing of the overhead line has sought to avoid areas of the highest amenity value and other designated sites, as listed in the supporting text. Location-specific considerations to inform the preferred alignment are set out in Chapter 7. The routeing of the preferred alignment has sought to be compliant with Rule 2.
Rule 3: Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer tension pylons. Where possible choose inconspicuous locations for tension pylons, terminal pylons and sealing end compounds.	Where possible, the preferred alignment has used the most direct route between the new Birkhill Wood substation and the new High Marnham substation. All routeing has been informed by identification of environmental sites and features or technical considerations that constrain routeing, as set out in the **CPRSS 2023**. The feedback received during the 2023 non-statutory consultation and 2024 localised non-statutory consultation, in addition to further technical assessment, has further informed the preferred alignment. Details of these considerations are set out in Chapter 3, Chapter 5 and Chapter 7. The routeing of the preferred alignment has sought to be compliant with Rule 3.
Rule 4: Choose tree and hill backgrounds in preference to sky backgrounds wherever possible; and when the line has	Where possible, the preferred alignment has been located on lower topography in order to

Holford Rules	Project compliance
to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.	reduce visual impact. Details of this consideration are set out in Chapter 7. The routeing of the preferred alignment has sought to be compliant with Rule 4.
Rule 5: Prefer moderately open valleys with woods where the apparent height of the pylons will be reduced, and views of the line will be broken by trees. Utilise background and foreground features to reduce the apparent height and domination of pylons from the pan viewpoints. Minimise exposure of numbers of pylons on prominent ridges and skylines. Where possible avoiding cutting extensive swathes through woodland blocks and consider opportunities for skirting edges of copses and woods. Protecting existing vegetation, including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape.	Micro-siting of pylons has sought to avoid or minimise loss of woodland or trees as far as practicable noting that pylon siting is still subject to Limits of Deviation. Vegetation will be retained where practicable. Where vegetation is lost and trees cannot be replaced in situ, due to the restrictions associated with land rights required for operational safety, native shrub planting will be used as a replacement. Details of these considerations is set out in Chapter 7. The routeing of the preferred alignment has sought to be compliant with Rule 5.
Rule 6: In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concentration or 'wirescape'. In all locations minimise confusing appearance. Arrange wherever practicable that parallel or closely related routes are planned with pylon types, spans and conductors forming a coherent appearance; where routes need to diverge, allow where practicable sufficient separation to limit the effects on properties and features between the lines.	As set out in Chapter 6.2, close paralleling is an important technical design consideration in the routeing of the preferred alignment. Where possible, the preferred alignment routes in close parallel with existing overhead line assets and utilises pylon synchronisation in order to reduce the cumulative visual impact of the overhead lines. Commentary on specific locations where this design approach has been applied is set out in Chapter 7. Where possible, the preferred alignment seeks to avoid routeing either side of settlements or individual properties. Commentary on specific locations where this design approach has been applied is set out in Chapter 7. The routeing of the preferred alignment has sought to be compliant with Rule 6.
Rule 7: Approach urban area through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, go carefully into the	A guiding principle in defining the Project corridor was the avoidance of built-up urban areas and areas of residential development. This approach is clearly illustrated through the development of the graduated swathe,

Holford Rules	Project compliance
comparative costs of the undergrounding, for lines other than those of the highest voltage. When a line needs to pass through a development area, route it so as to minimise as far as possible the effect on development. Alignment should be chosen after consideration of effects on the amenity of existing development and on proposals for new development. When siting substations take account of the effects of the terminal pylons and line connections that will need to be made and take advantage of screening features such as ground form and vegetation.	which avoids any routeing through or in close proximity to these areas. Where the corridor is located in close proximity to residential receptors, technical assessment has been undertaken in order to understand the potential visual impact and to inform the location of the preferred alignment. Commentary on specific locations where this has been applied is set out in Chapter 7. Careful consideration has been applied to the potential undergrounding of Route Sections, and assessment has been undertaken from an environmental, technical and cost perspective. Whilst the preferred alignment remains entirely above ground, details of the consideration for undergrounding at the relevant Route Section is detailed in Chapter 7. The landscape and visual amenity impacts of the terminal pylons and the substation have been taken into consideration in the substation siting studies. Details of these studies are set out in Chapter 7.8 and 7.9 The routeing of the preferred alignment has sought to be compliant with Rule 7.

6.7.4 Careful consideration has been given to the Holford Rules in defining the preferred alignment from the early stages of developing the graduated swathe, through to defining the preferred alignment. The Holford Rules will be kept under review at the Project continues to evolve.

Localised restriction of the Limits of Deviation

6.7.5 As acknowledged by the Planning Inspectorate's Advice Note Nine[21], a necessary and proportionate degree of flexibility needs to be incorporated into the design of a development so that unforeseen issues encountered after a development has been consented can be addressed. To allow for this proportionate degree of flexibility, limits of deviation (LoD) have been developed for the Project components which will be detailed in the DCO. The LoDs will provide a maximum distance or measurement of variation within which every component of the Project would be located.

6.7.6 LoDs will be applied horizontally and vertically for the Project.

[21] Planning Inspectorate, "Nationally Significant Infrastructure Projects – Advice Note Nine: Rochdale Envelope" Published 1 July 2018. https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope

6.7.7 The horizontal LoD is in general 100m (50m either side of the centre line). In certain locations this has decreased to less than 100m to avoid a particular receptor and, in some locations, the LoD is wider to allow for additional flexibility at this stage. Where the LoD is 100m the extent of movement of any pylon is limited by the span length and conductor swing. At a maximum span length, the centre of the pylon could move approximately 20m either side of the centreline subject to topography and local conditions. There is no limit placed on the movement of a pylon along the centreline (longitudinal LoD).

6.7.8 The upwards vertical LoD for a typical standard lattice pylon is approximately 6m which would allow for two extension panels (typically 3m per extension panel).

6.7.9 There are certain locations where bespoke pylons are required such as at the River Ouse crossing, the crossings of a Distribution Network Operators (DNO) assets or where there are topographical constraints. In these specific locations the vertical LoD would be greater than 6m.

6.7.10 There is no limit placed on the maximum depth of below ground works. Whilst a standard below ground LoD is not proposed, the Project would never go deeper than necessary for technical or environmental reasons as this would add engineering operational complexity and cost.

Pylon Siting

6.7.11 Micro-siting of individual pylons and access routes to avoid direct and indirect impacts on protected habitats, as the design is refined. Micro-siting of pylons would take into account swing of the overhead lines to avoid or minimise loss of woodland and trees as far as practicable.

Restrictions to pylon working areas extents

6.7.12 The pylon working area extents have been designed to only cover the extent required to undertake the works.

6.7.13 Pylon working areas would typically be 60m by 60m for a suspension pylon and 70m by 70m for a tension pylon. They would either be stone laid on geotextile, or formed of interlocking panels, depending on ground conditions and the duration and type of use. Soil stabilisation techniques could be considered subject to local conditions. Further detail on pylon working areas and construction methodology can be found in **PEIR Chapter 4 (Project Description).**

Access Strategy (Construction and Maintenance)

6.7.14 The access strategy for the scheme has been carefully designed and assessed and is included within the draft DCO Order Limits. Details of the access strategy and its technical assessment is included in **PEIR Chapter 14 (Traffic and Transport)**.

6.7.15 In terms of construction access, the linear nature of the Project and characteristics of the Strategic Road Network within which it is routed present constraints to materials and equipment movement. Following an assessment of the route and the local road network, the most appropriate construction access solution is to identify a series of Primary Access Routes (PAR) connecting to the trunk road network connected along the Project corridor by new site access points (bellmouths) leading to off highway haul roads. The purpose of this approach is to reduce the effects of construction traffic movements on the local public highway network during construction. Further detail on

the proposed construction access strategy is detailed in **PEIR Chapter 4 (Project Description)** and **PEIR Chapter 14 (Traffic and Transport)**.

6.7.16 The overhead line would be subject to annual inspection from the ground by foot patrol, small van, or by air using drone/helicopter to check for visible faults or signs of wear. Access will also be required for vegetation management and telecommunications and fibre optic maintenance (where an overhead line is supporting telecommunications equipment). Access for these activities would be located along operation and maintenance access routes as details in **PEIR Chapter 4 (Project Description)**. Temporary interlocking track mat panels may be required along these routes during maintenance activities.

Essential Mitigation Measures

6.7.17 Essential mitigation measures are measures which are required to comply with relevant planning policy and regulatory requirements, and therefore have been included within the draft DCO Order Limits.

6.7.18 Essential mitigation measures will continue to be developed and will be detailed in full within the Environmental Statement.

Drainage areas

6.7.19 Temporary drainage will be required during construction to manage rainfall and alleviate any potential reduction in natural drainage in key areas that will be subject to reduced natural drainage as a result of the installation of stone working areas. The drainage design will include a variety of potential measures to address silt runoff. Construction of sustainable drainage systems (SuDS) will be used if necessary and where appropriate.

New passing places on public highways

6.7.20 In addition to the construction access strategy set out in paragraph 6.7.15, at some areas localised road widening or passing places will be required in order to facilitate the movement of construction HGVs associated with the Project. This work is currently ongoing and further details will be discussed and agreed with the relevant Local Highway Authority so that a final design can be presented within the draft DCO Order Limits.

Habitat restoration

6.7.21 Areas of temporary habitats loss would be reinstated, wherever practicable, following the completion of construction in each area. Wherever possible, reinstatement would return to the type of habitat affected where possible.

6.7.22 Areas of permanent habitat loss would be calculated and considered during the Biodiversity Net Gain (BNG) assessment (see Biodiversity Net Gain subheading below). The Project would deliver 10% BNG.

Biodiversity Net Gain

6.7.23 National Grid is committed to deliver the mitigation measures identified to avoid and reduce the likely significant effects that would be experienced during implementation of the Project. These measures are described in the PEIR.

6.7.24 In addition to this essential mitigation, we will look to implement habitat enhancement and creation through delivery of Biodiversity Net Gain (BNG).

6.7.25 BNG is a way of making sure the habitat for wildlife is in a measurably better state than it was before development. It requires a minimum 10% gain calculated using the government's Biodiversity Metric. BNG must be managed, monitored and reported on to the Local Planning Authority for 30 years. From November 2025, BNG will become mandatory for NSIP projects consented under the Planning Act 2008.

6.7.26 Where possible National Grid will deliver BNG through partnerships and seek to provide value-added BNG with wider benefits to communities, including access to nature, and help deliver national and local policies on health and wellbeing, environmental awareness, education, skills and jobs to ensure best value for money from consumer-funded BNG.

6.7.27 National Grid has begun talking to landowners within several areas, where habitat enhancement and creation might be most beneficial, to explore what opportunities there might be. We are in early discussions with national conservation and environmental organisations to create partnerships to deliver BNG in ways that provide enduring benefit to communities

Birkhill Wood Substation Siting Study

6.7.28 An extensive site selection process was undertaken in order to identify the most appropriate site for the Birkhill Wood substation. Seven potential sites were identified through mapping potential environmental and land use factors that could constrain siting in the "study area". Following further desk top review of the potential sites, three sites were then shortlisted and subject to detailed Strategic Options Appraisals (a structured process by which the environmental, socio-economic, technical and cost implications of options are identified, reported and compared).

6.7.29 An initial identification and appraisal of a 'long list' of site options within the study area was undertaken using GIS mapping which identified areas of potential environmental and land use constraints within the siting study area.

6.7.30 The following parameters were adopted to identify a 'long list' of sites for further consideration:

- A site of sufficient size to accommodate an AIS substation with an indicative footprint of 480m x 150m was required.
- Proximity to the existing 400kV 4ZR overhead line;
- Exclusion of Flood Zones 2 and 3 (areas at medium risk of flood risk, and high risk of flood risk from rivers respectively).
- Options which avoid or minimise as far as reasonably possible effects on environmental and socio economic constraints including ecological constraints (for example designated Natura sites, presence of sensitive habitats, Ancient Woodland, presence of water bodies), historic environment (including World Heritage Sites, Scheduled Monuments, other known heritage assets or archaeological remains), landscape and visual (including designated landscape areas, existing infrastructure, locally designated Special Landscape Areas etc).
- The presence of any rights of way, access routes or other recreational receptors such as local caravan and holiday parks

- The proximity to i) settlements and more rural isolated dwellings, and the degree to which existing features contribute to visual containment and ii) existing industrial and/or energy infrastructures and local landscapes which would have a lower sensitivity to the introduction of a substation;
- Ease of access and proximity of access routes to residential properties which have the potential to be affected by traffic-related impacts.

6.7.31 Following the initial review of the environmental and land use mapping exercise overlain onto the siting study area, a total of seven potential sites were considered for accommodating the Birkhill Wood substation. The seven potential sites identified within the search area, are shown on Figure 6-4 below:

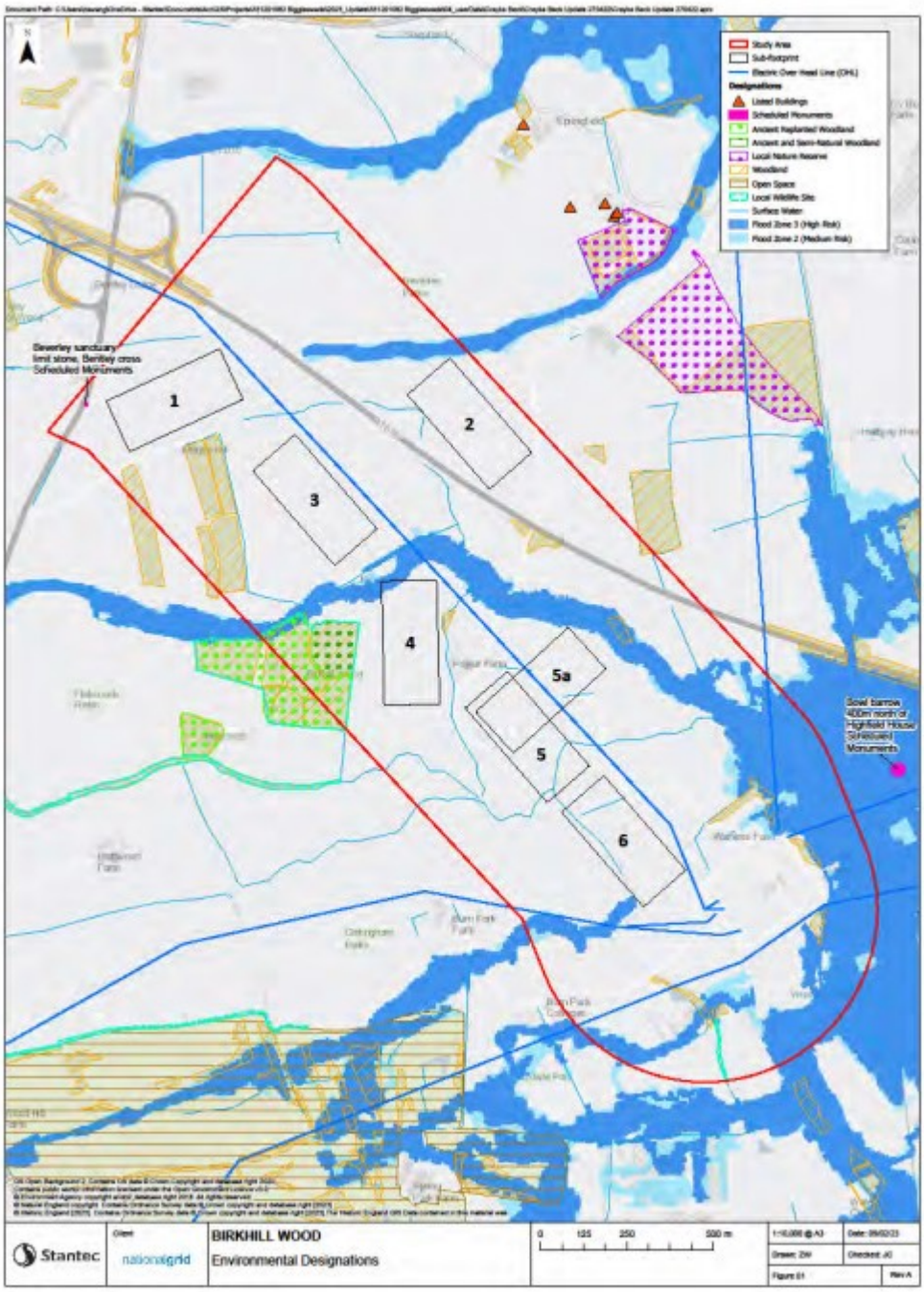


Figure 6-4 Birkhill Wood substation siting study search area

6.7.32 The seven potential sites identified were assessed against environmental, socio-economic, technical, and cost factors. Site 3, Site 5 and Site 5A were taken forward to shortlist stage and were subject to further detailed and desk-based assessment and site visits undertaken to 'ground truth' the desk based assessment.

6.7.33 All three short listed sites were physically constrained due to the presence of utilities and a bridleway / private road.

6.7.34 Site 3 was discounted due to the presence of an Ethylene pipe dissecting the site as it was considered to carry increased cost risk to manage and mitigate such a constraint.

6.7.35 The remaining two sites (5 and 5A) overlapped, however an AIS solution on 5A (which provides for a horizontality aligned site) would require building over a section of Park Lane, a designated bridleway and private road, which would trigger the need for a significant bridleway diversion and extinguishing multiple third-party private rights of access. The existing overhead line would also need to be permanently diverted around the substation; and an AIS solution on Site 5 (which provides for a vertically aligned site) would require a high-pressure gas main to be diverted. Both options would incur significant time, cost and complexity and an AIS solution was not considered feasible.

6.7.36 The decision was therefore taken to change the substation design from an AIS solution to a GIS solution; a GIS substation would require a smaller operational footprint and so enable both the Park Lane bridleway / private road and the high-pressure gas main to be avoided.

6.7.37 The preferred site is the section of Site 5 and 5A that overlapped as this site provided sufficient space to accommodate a vertically aligned GIS substation while also avoiding the physical constraints identified in paragraph 3.7.16. The selection of a vertically aligned GIS substation within Site 5 as the overall preferred site would also benefit from increasing the space available for the GIS hall and would simplify the configuration of overhead line turn-ins when compared to a horizontally aligned GIS substation on the overlapping areas of Site 5 and 5A, which would have presented technical challenges to turn in the existing overhead lines to the new substation.

6.7.38 In summary, the selected Birkhill Wood substation site (Site 5) was supported following detailed environmental, socio-economic, technical and cost appraisals, and it was considered that any residual environmental impacts could be suitably mitigated through detailed design choices.

High Marnham Substation Siting Study

6.7.39 An extensive site selection process was undertaken in order to identify the most appropriate site for the High Marnham substation within the identified study area. Nineteen potential sites were identified through mapping potential environmental and land use factors that could constrain siting in the "study area". Following further analysis of the potential sites, four sites were then shortlisted and subject to detailed Strategic Options Appraisals.

6.7.40 An initial identification and appraisal of a 'long list' of site options within the study area was undertaken using GIS mapping which identified areas of potential environmental and land use constraints within the siting study area.

6.7.41 The following parameters has been adopted to identify a 'long list' of sites for further consideration:

- A minimum required area of 18ha to accommodate both temporary and permanent works for an AIS Substation (a 10ha site size was initially identified which would be able to accommodate a GIS Substation but could not accommodate AIS).
- Within close proximity to the local road network to avoid the need to construct new long access roads.
- Exclusion of Flood Zones 2 and 3 (areas at medium risk of flood risk, and high risk of flood risk from rivers respectively).
- Options which avoid or minimise as far as reasonably possible effects on environmental and socio-economic constraints, including environmental designated statutory and non-statutory sites (e.g., Scheduled Monuments, SSSIs), strategic allocated land in local planning documents (including Green Belt and other land where a substation would not be in accordance with the allocated land use), land identified in planning applications, commons and recreational areas, Crown land, National Trust land, and CRoW land.
- Options that minimise landowner disturbance as far as practicable when considered alongside other constraints.
- Options that follow the principles of the Horlock Rules and that are in accordance with the NPPF and local policy / allocations were preferable.

6.7.42 A total of nineteen sites were identified which could accommodate either a GIS substation based on a minimum 10ha site size or an AIS substation based on a minimum 18ha site size.

6.7.43 The geographical location of the nineteen longlisted sites (numbered 1 to 8 with sub options for 3 and 5 and an additional options known as ‘Skegby’ is shown at Figure 6-5.

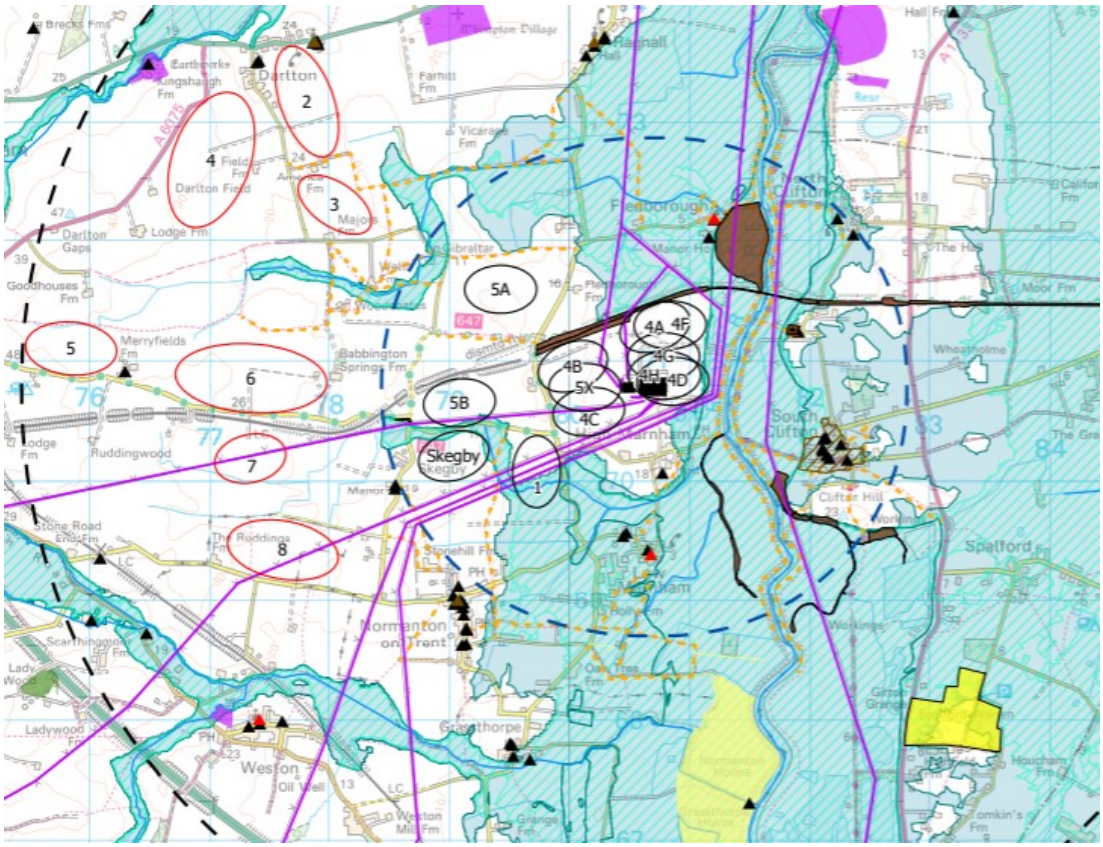


Figure 6-5 Locations of the 19 potential High Marnham substation sites

6.7.44 Each of the short-listed sites (referred to as sites 4F, 5A, 5B and 5X) was subject to a Strategic Options Appraisal which considered the environmental, socio-economic, technical and cost implications of options are identified, reported and compared.

6.7.45 The output of this assessment was to identify Option 5X as the preferred location. Site Option 5X is equivalent or preferable to the other shortlisted sites on all technical aspects, optimising and minimising overhead line and cable lengths and providing opportunities to utilise existing infrastructure at the existing substation, balancing technical benefits and capital cost requirements for new developments against the consequential environmental effects (Horlock Rule 1).

6.7.46 Site Option 5X is located in close proximity to the existing substation, with the shortest new line entry reconfigurations and associated lengths of all site options (1km). This reduce potential impacts on areas of local amenity value, important existing habitats and landscape features (Horlock Rule 3), avoid a confusing appearance (Horlock Rules 4, 7 and 10) and may minimise changes to the existing views from main viewpoints (Horlock Rule 11).

6.7.47 Site Option 5A and Site Option 5B are located at a further distance from the existing substation and would, therefore, require more infrastructure for the additional pylons and overhead lines connections. This would likely result in greater residual adverse visual effects upon landscape and visual receptors than Site Option 5X and to a lesser extent Site Option 4F.

6.7.48 All site options have the potential to impact LWSs due to the possible need to reconfigure existing overhead lines within the LWSs. Options may be able to avoid the need for new overhead lines and pylons through the LWSs, or utilise the existing OHL pylons within the LWSs. This would minimise disturbance to the habitats and species within the designation during construction. Site Option 4F may require multiple new overhead lines entering the substation from the north of the option due to the overlap with the LWSs along the northern boundary of the option, which has the potential to disturb habitats and species.

6.7.49 The engineering requirements are anticipated to be the least complex for Site Option 5X, likely resulting in a shorter construction programme and reduced construction cost for delivery.

7. Development of the Preferred Draft Alignment

nationalgrid

7. Development of the Preferred Alignment

7.1 Introduction

7.1.1 This chapter describes the preferred alignment which forms the subject of the statutory consultation in 2025. The preferred alignment has been developed in response to feedback collected at the non-statutory consultations, further environmental and technical assessments, and a review of work undertaken to date.

7.1.2 This chapter describes design considerations and decisions made to inform the preferred alignment. All proposed changes to the preferred corridor and graduated swathe (otherwise known as “design changes”) identified during the non-statutory consultation phase were considered, however not all design changes were accepted and taken forward to inform the preferred alignment. This chapter describes the design changes that were accepted and taken forward to inform the preferred alignment. The **Non-Statutory Consultation Feedback Report 2025** provides details on all the non-statutory consultation feedback which requested design changes (both those accepted as well as those not taken forward).

7.1.3 The figures within this chapter show the preferred alignment for the Project between Birkhill Wood and High Marnham substations, which is described in this chapter. The figures have been produced to aid viewers understanding of the development of the preferred alignment and are not intended to show all of the Project design elements and constraints associated with the Project, to ensure the figures are legible. The figures are also included in **Appendix D** of this report.

7.1.4 This chapter also provides commentary on the siting studies and design considerations made in relation to the new Birkhill Wood and High Marnham substations.

7.2 Route Sections 1 and 2: Creyke Beck to A63 (Yorkshire Wolds)

Overview

7.2.1 Route Sections 1 and 2 of the preferred alignment run from the new Birkhill Wood substation near Creyke Beck (where the new overhead line would connect to the transmission system), to the A63 dual carriageway, which is located on the western edge of the Yorkshire Wolds Important Landscape Area (ILA). The preferred alignment runs south-west out of the new Birkhill Wood substation and routes between the villages of Little Weighton and Skidby. From this point the preferred alignment is largely routed in close parallel with the existing 4ZQ overhead line, continuing south-west towards the A63, to the north of the village of Brantingham.

7.2.2 This section of the report describes the preferred alignment at Route Sections 1 and 2.

Preferred Alignment and Siting

Birkhill Wood substation to south of Little Weighton

7.2.3 The area in the vicinity of the proposed new Birkhill wood substation has a number of environmental features which constrain routeing alongside a number of new energy infrastructure proposals. These features are discussed below and illustrated on Figure 7-1.

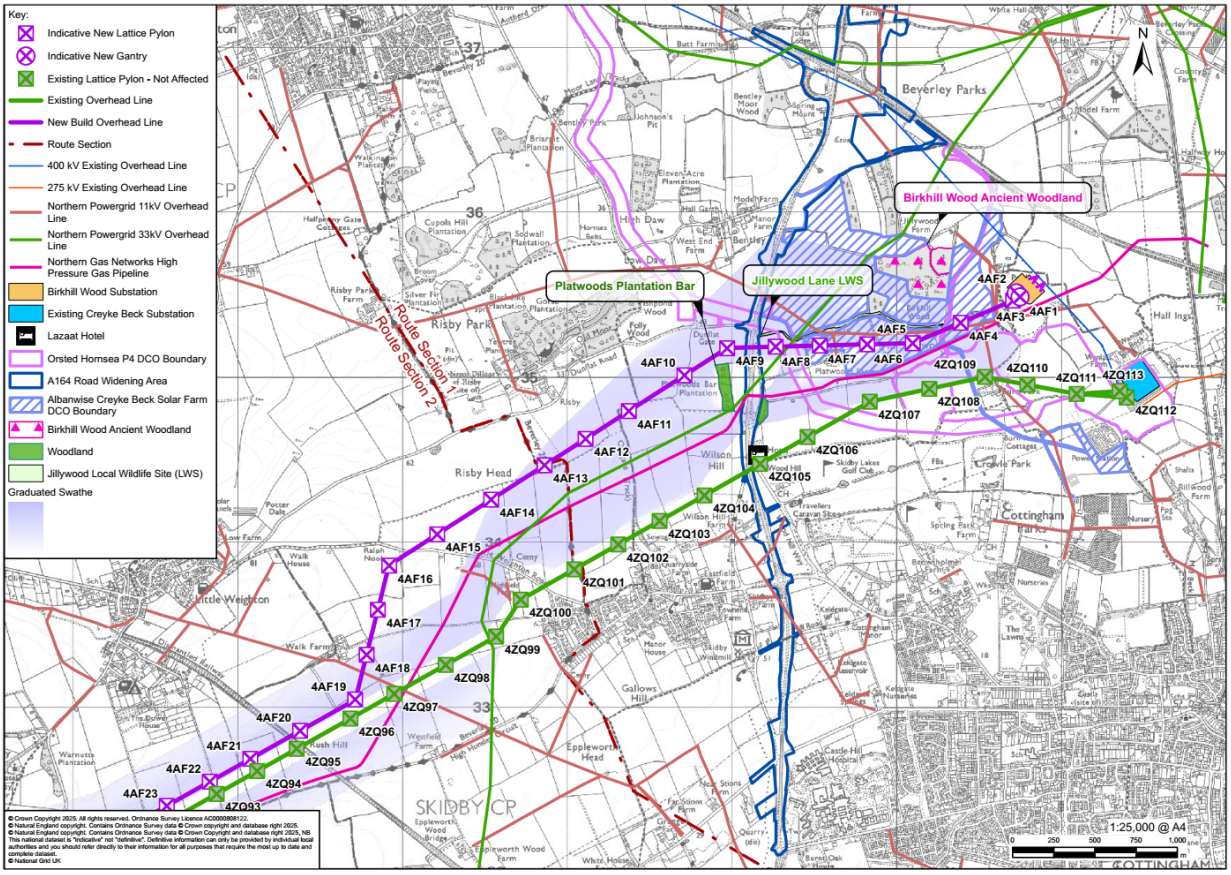


Figure 7-1 Preferred alignment at Birkhill Wood substation

7.2.4 The proposed new Birkhill Wood Substation is located to the south of Poplar Farm and to the north-west of the existing Creyke Beck Substation. The new overhead line would connect to the national transmission system at the new substation. The emerging preferred corridor presented during the non-statutory consultation in 2023 is located to the west of the substation and north of the existing 4ZQ overhead line to avoid sites and features to the north and south as explained in the **CPRSS**.

7.2.5 The area west of the proposed new Birkhill Wood Substation also has several environmental sites and features that act to constrain the routeing of the new overhead line. These include the Ancient Woodlands of Birkhill Wood and Jillywood and the Local Wildlife Site at Jillywood Lane. The farmstead at Platwoods Farm is located within the consultation corridor. The Lazaat Hotel, whilst just beyond the consultation corridor, is located immediately north of the existing 4ZQ overhead line.

7.2.6 Existing infrastructure constrains route options in this area; most notably a high-pressure gas pipeline, located to the north of, and broadly parallel to, the existing 4ZQ overhead line. The presence of lower voltage overhead lines which need to be crossed by the proposed new line add further technical complexity.

7.2.7 In addition, there are several energy-related infrastructure projects proposed in this area. These include the Creyke Beck Solar Farm and the convertor station and underground cable route for the Hornsea 4 Offshore Windfarm, both are consented projects. The recently submitted Dogger Bank South DCO and the Dogger Bank D DCO project which is currently at consultation stage are also in close proximity to new Birkhill Wood substation site and interact with the Project's preferred alignment. National Grid will seek to coordinate with these projects as the design progresses.

7.2.8 These features and constraints to routeing helped define the three possible paths for the proposed new line which were illustrated by the graduated swathe presented within the emerging preferred corridor during non-statutory consultation 2023.These three paths within the swathe route a northern path between Birkhill Wood and Jillywood (avoiding both); a central path between Jillywood and Platwoods Farm and; a southern path between Platwoods Farm and the existing 4ZQ line. These three paths from the proposed Birkhill Wood Substation site lead into two paths to the west of the A164: defined by avoiding the woodland at Platwoods Bar Plantation; either to the north or the south.

7.2.9 Following more detailed assessments, survey and the review of consultation feedback, the preferred alignment routes within the central path of the graduated swathe between Jillywood and Platwoods Farm. It then passes to the north of Platwoods Bar Plantation to the east of the A164. The preferred alignment avoids routeing in close proximity to the Birkhill Wood Ancient Woodland and minimises changes in route direction.

7.2.10 The preferred alignment routes through the planned Creyke Beck Solar Farm for approximately 1.2km between proposed pylons 4AF3-4AF8 and to the south of the Jillywood Lane local wildlife site. Coordination will be required with Creyke Beck Solar Farm as the preferred alignment will require some reconfiguration of the approved layout.

7.2.11 In this area there would also be interactions with the Hornsea P4 project, as the preferred alignment crosses the proposed convertor station access road between 4AF4-4AF5 as well as the proposed cable route between 4AF7-8, although no proposed pylons have been sited in the Hornsea P4 development area.

7.2.12 The preferred alignment is approximately 40m to the north of Platwoods Farm. The A164 road widening area is crossed between proposed pylons 4AF8-4AF9 to the north of Platwoods Bar Plantation, with pylons sited outside the proposed road widening area. Several Northern Powergrid (NPG) wood pole overhead lines are crossed in short sections, which will require coordinating with NPG and other projects in the area. It is likely that these wood pole lines will need to be placed underground for short sections.

7.2.13 A more northerly alignment in the area east of the A164 is not preferred. Such an alignment would have required sharper changes in route direction, would have crossed a greater length of the Creyke Beck Solar Farm development site and would have routed closer to the settlement of Bentley to the north of the route.

7.2.14 Routeing within the more southerly path of the graduated swathe was not preferred as it would have passed close to the north of the Lazaat Hotel, impacting the outlook from the hotel and, whilst being closer to the existing 4ZQ overhead line, could not have achieved a synchronised close-parallel design with the existing overhead line without oversailing the hotel itself. In addition, the length of new line routed in close proximity to the high-pressure gas pipeline would have increased substantially, increasing the technical challenges associated with constructing and operating pylons close to the pipeline.

7.2.15 East of the A164 the preferred alignment routes north of Platwoods Bar Plantation, increasing the distance from Skidby Conservation Area and the Grade II* listed Church of Saint Michael, though these must be considered in the context of the existing overhead line. The preferred alignment also increases stand-off distance to the high-pressure gas pipeline, reducing construction and operational challenges.

7.2.16 The preferred alignment is a little over 300m south of Risby Hall Registered Park and Garden and related Scheduled Monument and Listed Building at its closest point.

7.2.17 To the west of Skidby the preferred alignment routes outside of the graduated swathe for approximately 1.4km. This increases the distance to two residential properties on Little Weighton Road and avoids sections of existing 11kV and 33kV wood pole overhead lines near Little Weighton Road, whilst increasing stand off to the NGN high pressure gas pipeline and minimising construction and operational challenges with siting pylons and 400kV overhead cables in close proximity to the high-pressure gas pipeline. The preferred alignment is located approximately 1km away from Little Weighton.

7.2.18 The preferred alignment approaches the existing 4ZQ at a point south of Little Weighton and Walk Farm, before routeing west on a close parallel alignment from proposed pylon 4AF19.

7.2.19 Consideration was given to routeing to the west rather than east of Walk Farm, but this would have brought the proposed line closer to Little Weighton, would have reduced the extent of the close parallel alignment through the Yorkshire Wolds and may also have resulted in greater visual effects when viewed from local residential properties. This alternative local alignment is not preferred.

South of Little Weighton to Ellerker North Wold

7.2.20 During the non-statutory consultation two paths were presented within the graduated swathe for siting the new overhead line in the area south of the village of Little Weighton. The northern path was broadly parallel to and north of the existing 4ZQ overhead line. The southern path was to the south of, but also broadly parallel with, the existing 4ZQ line. The path to the south of the 4ZQ line ended south of Riplingham, due to the presence of the Brantingham Dale SSSI immediately to the west and the position of the existing 4ZQ line on the edge of the Dale (which would have necessitated the construction of any new line in the woodland on the northern slope of the Dale).

7.2.21 Following more detailed assessments, surveys and the review of consultation feedback, the preferred alignment is routed within the northern path, to the south of Little Weighton. From proposed pylon 4AF19 the preferred alignment routes in close parallel with and to the north of the existing 4ZQ overhead line towards Riplingham. The preferred alignment does pass through Socken Wood near proposed pylon 4AF25, requiring the removal of a number of established trees. However, a substantial area of mitigation planting to the south, approximately 4.5 hectares in extent, has been proposed for the establishment of a new woodland to replace the far smaller area of established woodland trees that would be lost.

7.2.22 South of Riplingham the preferred alignment moves away from a close parallel alignment from proposed pylon 4AF30 before coming back into a close parallel alignment for two spans at proposed pylon 4AF36 at Ellerker North Wold. This is illustrated in **Figure 7-2**.

7.2.23 The preferred alignment moves away from a close-parallel alignment south of Riplingham in order to avoid crossing the Brantingham Dale SSSI and the need to either construct specially designed heavier pylons (to achieve a long span) or construct one or more pylons within this nationally designated conservation site.

7.2.24 The preferred alignment throughout this part of the route is largely close-parallel to the existing line, with a separation distance of approximately 85 metres. This close-parallel alignment would route the new line further from properties at Riplingham and Great Wold and help to minimise any impact upon flying operations from Mount Airey Airstrip (an unlicenced grass airstrip) to the west of Riplingham.

7.2.25 The proposed new and existing pylon positions are largely synchronised. Where pylon positions aren't synchronised, they have been adjusted so as to avoid constructing pylons within or close to existing sites and features, including the long-established woodland at Socken Wood, the dismantled railway south of Little Weighton and the Rowley Road junction at Riplingham.

7.2.26 Following the alternative southern path in this Route Section of the graduated swathe would involve the line swap-over of the new and existing lines at both ends, introducing between two and four heavier tension pylons compared with the northern path and increasing effects upon views through this section of the Wolds. It would also add to the technical complexity and level of construction activity involved.

7.2.27 A high pressure gas pipeline is also located within the eastern half of the southern path within the graduated swathe, representing a significant technical constraint to the construction and operation of any new overhead line in this area. Avoiding the pipeline would mean that any benefit from adopting the southern path would be limited to the western extent of this path only, a distance of less than 2.5km.

7.2.28 In addition, any parallel alignment on the southern path within the graduated swathe would need to be further from the existing line than an equivalent northern close-parallel alignment in order to avoid a residential and commercial property on Riplingham Road. Even then, a route within the southern path would result in there being overhead lines to both the north and south of the property.

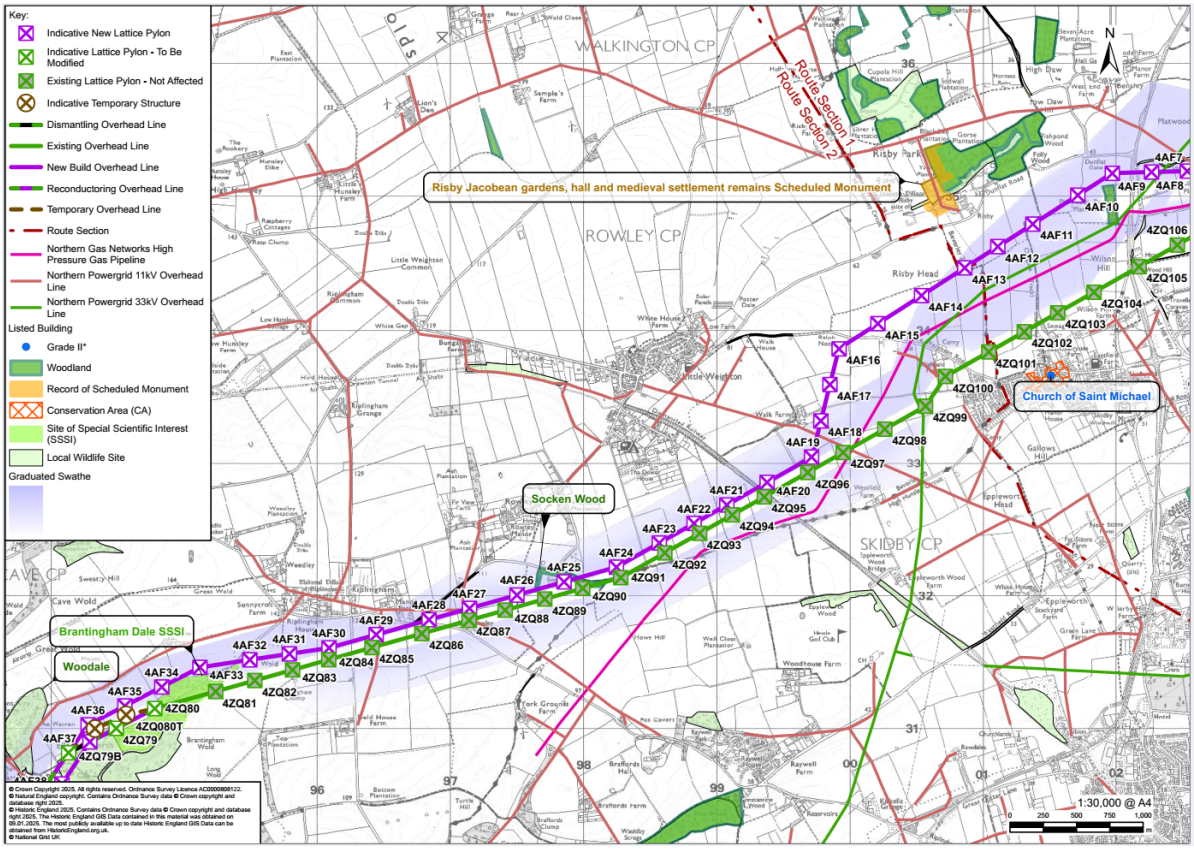


Figure 7-2 Close paralleling north of Skidby

Ellerker North Wold to A63

7.2.29 From Ellerker North Wold a single path for the proposed new overhead line was presented at the non-statutory consultation. This was located to the north of the existing 4ZQ overhead line, running through Woodale down the steeper scarp slope that marks the western edge of the Yorkshire Wolds. At the foot of the Wolds two possible paths for the new line were proposed: one to the north and one to the south of the village of Ellerker. The position of the existing 4ZQ overhead line in relation to the southern edge of the village means that there is insufficient space to route the proposed new overhead line to the north of the existing overhead line within this path. The southern path of the graduated swathe was therefore shown to the south of the existing 4ZQ overhead line in this location.

7.2.30 Feedback from non-statutory consultation indicated some consultees would prefer the southern path in this location to keep the new and existing overhead lines together and south of the village.

7.2.31 With the preferred route being to the north of the existing 4ZQ overhead line on Great Wold adopting the southern path at Ellerker would require the new and existing lines to swap-over somewhere between the Wolds and the eastern edge of the village.

7.2.32 Within this area there are a number of sites and features that influenced the selection of the preferred alignment. The scarp slope is a prominent landscape feature, especially when viewed from the Humberhead Levels to the west. The edge of the Wolds also offers extensive views over the Levels. The Yorkshire Wolds Way National Trail also follows the edge of the Wolds in this locality, providing a succession of significant viewpoints. The National Trail would need to be crossed by the proposed new overhead line regardless of path the alignment would take in this location.

7.2.33 Brantingham Dale and the smaller Woodale, both of which cut into Great Wold, are extensively wooded, with Woodale and large parts of Brantingham Dale being designated as Local Wildlife Sites. There is also plantation woodland of varying ages over the higher ground of Bilks Hill between Woodale and Brantingham Dale. Although this woodland is not designated there is a rectangular block of long-established woodland at Bilkshill Plantation within the more recent plantation areas. There are a small number of residential properties in the bottom of Woodale.

7.2.34 The A63 dual carriageway is located at the foot of the scarp slope and would add technical complexity to the construction of the proposed new line, especially if a line swap-over were to be constructed across the road.

7.2.35 The village of Ellerker is a designated Conservation Area. The path to the north of the village is highly constrained by residential properties on the northern edge of the village, industrial units at Hunsdale Business Park and horticultural glasshouses on Cave Lane. A number of residential properties on Stonepit Road and Cave Lane would also experience close views of a new line in this location.

7.2.36 Whilst a new line built to the south of the village would also be seen in views from properties on Howden Croft Hill, the effect upon these views would be significantly reduced if the proposed new line were built on the far (southern) side of the existing 4ZQ overhead line. A close parallel alignment in this locality would also reduce the scale of impacts upon the surrounding landscape. In comparison, a new line remote from the existing would result in overhead lines on both sides of the village, materially affecting its setting.

7.2.37 However, the preferred alignment at Ellerker could not be determined without also having regard to the implications of the associated line swap over that would be required in order to adopt the southern alignment.

7.2.38 Having undertaken more detailed assessments, surveys and the given careful consideration to consultation feedback, the preferred new overhead line route includes a line swap over and passes to the south of Ellerker.

7.2.39 Following review of consultation feedback an alternative swap-over design is now being proposed, where the swap over between the new and existing lines would occur at the top of Ellerker North Wold rather than at the foot of the scarp slope as per the graduated swathe presented at non-statutory consultation. This swap over position would allow more of the new line to be routed in close parallel to the existing 4ZQ line, where the two lines descend the scarp slope from the Wolds. Despite the resultant removal of a strip of plantation woodland at Bilks Hill it is considered that this close parallel alignment would help reduce the scale of landscape impacts in this sensitive section of the Yorkshire Wolds Important Landscape Area. A formalised photomontage of the new overhead line route as now preferred is included at **Appendix C**.

7.2.40 Whilst the preferred alignment comprises a southern close parallel alignment crossing the Brantingham Dale Local Wildlife Site, no pylons would be constructed within the site and the topography here should help reduce the extent of any tree removal. Similar impacts to the Woodale LWS would have applied had a route within the alternative northern path been preferred.

7.2.41 The preferred alignment in this area (southern close parallel option) should also help reduce effects upon views experienced by users of the Yorkshire Wolds Way, especially at the viewpoint west of Brantingham Dale. The preferred alignment will also significantly reduce impacts upon views from the residential properties and users of the local public footpath located within Woodale.

7.2.42 Constructing the line swap over at Ellerker North Wold also allows the existing tension pylon in this location to be re-used to form part of the line swap over, improving the visual coherence of the design and reducing material use. Nevertheless, two temporary pylons would be needed to temporarily divert the existing line at Ellerker North Wold, thereby keeping the transmission route in service whilst the swap-over was constructed.

7.2.43 The Project includes three areas of environmental mitigation land around the scarp slope of the Wolds, which in total extend to approximately seven hectares, for the establishment of new woodland to mitigate for the loss of the woodland trees at Bilks Hill which would be required to construct the proposed overhead line.

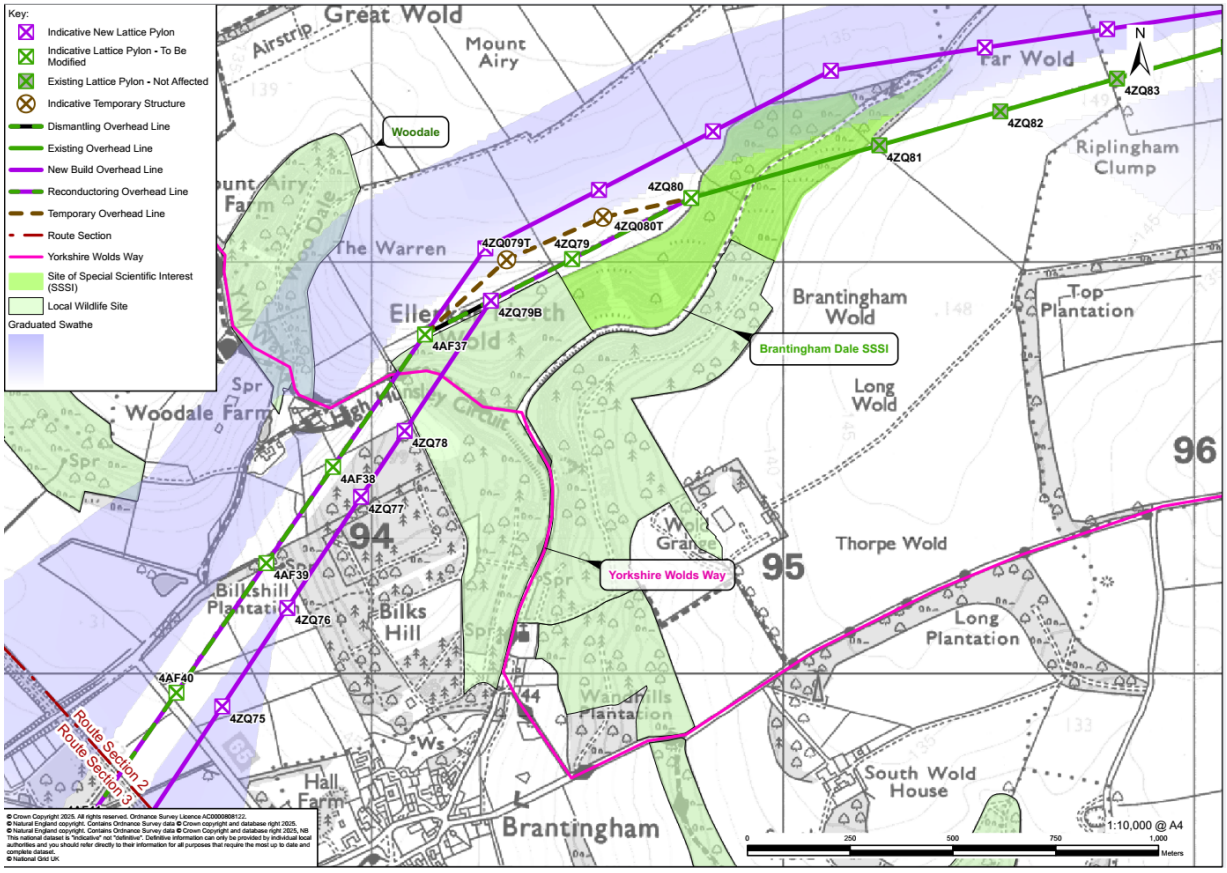


Figure 7-3 View of line swap-over at Ellerker North Wolds

7.3 Route Sections 3, 4 and 5: A63 to Luddington (Humberhead Levels and River Ouse Crossing)

Overview

7.3.1 Route Section 3 of the preferred alignment begins at the A63 dual carriageway and routes in a south-westerly direction along the western edge of the Yorkshire Wolds ILA to Blacktoft Lane, a road in close proximity to the northern bank of the River Ouse. The preferred alignment then crosses the River Ouse in Route Section 4 to the west of Ousefleet, running south towards Adlingfleet. The preferred alignment continues south into Route Section 5 towards the B1392 Meredyke Lane, which is located between the village of Luddington and the River Trent.

7.3.2 This section of the report describes the preferred alignment at Route Sections 3, 4 and 5.

Route Section 3 – A63 dual carriage way to River Ouse Crossing

7.3.3 South of Ellerker the preferred alignment routes closely parallel to the south side of the existing 4ZQ overhead line. This close parallel alignment continues to a point midway between Ellerker and the village of Broomfleet to the west. This area has relatively few constraints to routeing and the positions of the proposed new and existing pylons are therefore well synchronised.

7.3.4 In the vicinity of Broomfleet three discrete paths within the graduated swathe were presented during the non-statutory consultation. One path was sited to the south of the village. A second path followed a parallel route on the northern side of the existing overhead line north of the village, crossing an area of active mineral extraction. The third and northern-most path diverged from a parallel alignment to the north of Broomfleet and passed between the Broomfleet Tile Works site and Oxmardyke Washlands (located north of the main rail line to Hull). Adopting either of the two paths north of Broomfleet would necessitate a line swap over of the proposed new and existing overhead lines if the proposed new overhead line were to be routed to the south of Ellerker.

7.3.5 Some consultation feedback from non-statutory consultation indicated a preference for a route to the north of Broomfleet, to keep the new overhead line north of the village and the existing overhead line.

7.3.6 Design considerations in this area include the potential impacts of the Project on bird species associated with the nearby nationally and internationally nature conservation sites on the Humber Estuary to the south, views from Broomfleet and isolated residential properties in this part of the Humberhead Levels and the impact upon extraction and manufacturing operations at the Tile Works.

7.3.7 Having undertaken more detailed assessments, surveys and given careful consideration to consultation feedback, the preferred alignment follows a central path of the graduated swathe, on the northern side and closely parallels to the existing 4ZQ line north of Broomfleet (see **Figure 7-4**).

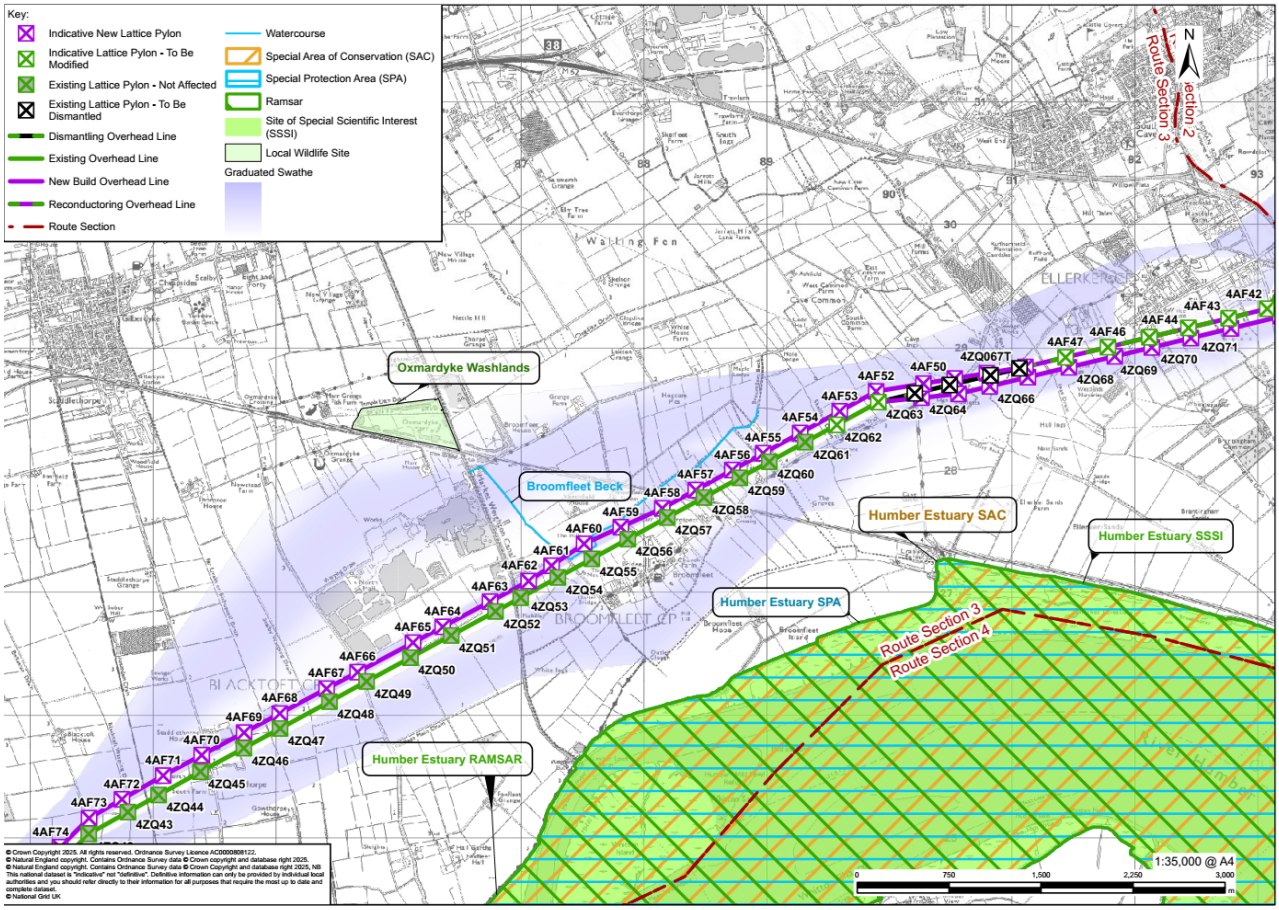


Figure 7-4 Preferred alignment and close paralleling at Broomfleet

7.3.8 The preferred alignment reduces the spread of transmission infrastructure across the Humberhead Levels, reducing effects upon the local landscape. It also avoids introducing an overhead line into currently unaffected views southwards from Broomfleet.

7.3.9 In comparison with the alternative paths within the graduated swathe to the north and south, the preferred alignment avoids introducing a discrete new barrier to bird movements across the Levels, instead reinforcing the presence of the existing overhead line. In this way any additional risk to birds associated with the Humber Estuary has been minimised. In addition, a route within the southern path would have introduced overhead lines far closer to the Estuary and intertidal areas of the Estuary. A route within the northern path would have introduced a new line between the extraction areas at the Tile Works and Oxmardyke Washlands; both areas where surveys have confirmed the presence of significant bird numbers associated with the Estuary.

7.3.10 The preferred alignment is the most technically complex of the three paths considered and demonstrates design mitigation to minimise adverse environmental effects at the design stage of the Project. The preferred alignment introduces significant construction and maintenance challenges due to the ongoing clay extraction works. Inevitably some clay reserves would be sterilised as a result. Discussions with the landowner and operator of the Tile Works regarding the extraction works are ongoing.

7.3.11 As explained previously, adopting a northern alignment at Broomfleet and a southern alignment at Ellerker necessitates a line swap-over somewhere between the two villages. In this Route Section there is one existing tension pylon which could be re-used as part of a new line swap-over. This pylon is located immediately to the north of

Ings Lane. The swap over would be achieved in the area either side of Ings Lane, such that the proposed new line would run to the north of the existing line from the north of Ings Lane westwards. The preferred swap-over design involves the removal of approximately 1.2km of the existing line comprising four pylons, which would become redundant, being replaced by a section of two parallel, newly constructed lines of a similar length.

7.3.12 In this way the preferred design has achieved a closely parallel alignment with the existing line across the Humberhead Levels from the A63 to a point east of the village of Yokefleet on the north bank of the River Ouse. One exception is immediately north-west of Broomfleet where a slight diversion away from a truly parallel alignment is proposed, to avoid constructing a pylon over Broomfleet Beck, a drain maintained by the Internal Drainage Board (IDB).

7.3.13 Where possible existing and proposed pylon positions are proposed to be synchronised, but a number of local constraints to pylon construction have precluded this in some locations. Such constraints include: the active extraction areas at Broomfleet Tile Works anda required 10 metre stand-off from multiple watercourses (most IDB-maintained drains).

7.3.14 It is acknowledged that the preferred alignment is closer to a small number of residential properties than the existing overhead line. In some cases, existing intervening vegetation would help to reduce the magnitude of change experienced in views towards the new overhead line. In one instance, at Staddlethorpe, the preferred alignment runs on the opposite side of a property from the existing line. In this location the alignment again moves around 30 metres further from the existing overhead line so as to avoid direct impacts upon the residential curtilage of the property.

7.3.15 The preferred alignment and the end-to-end two line swap-overs at Ellerker Wold North and Ings Lane are illustrated below.

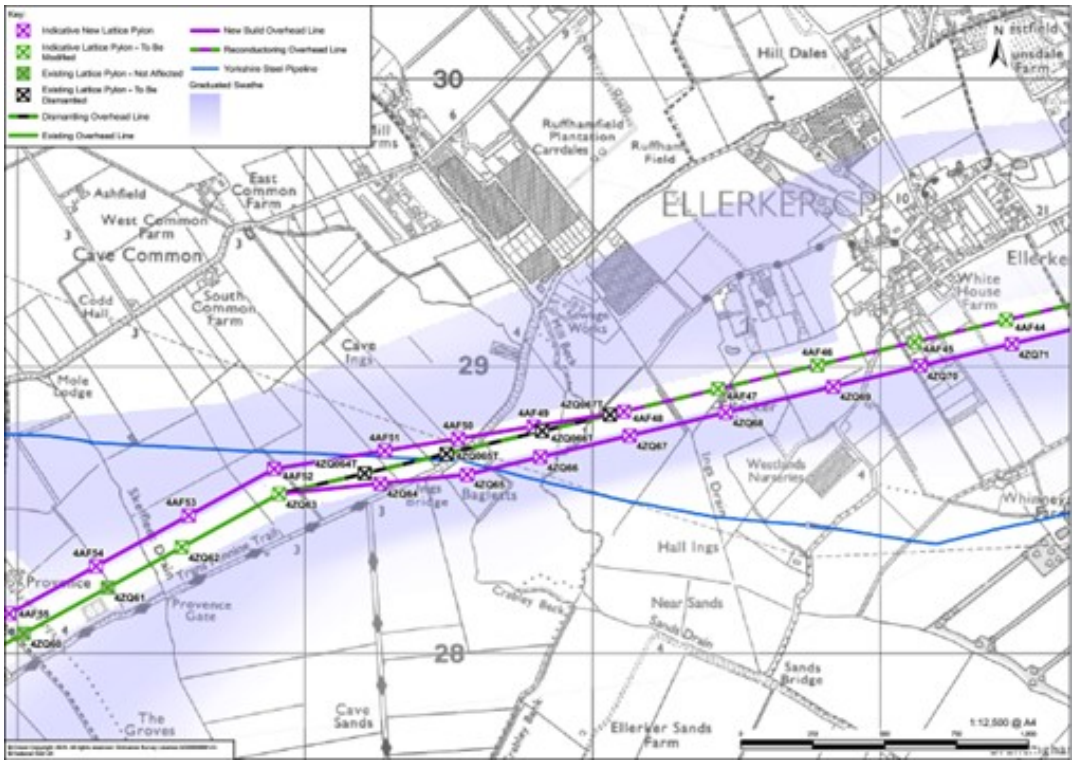


Figure 7-5 View of line swap over at Ings Lane

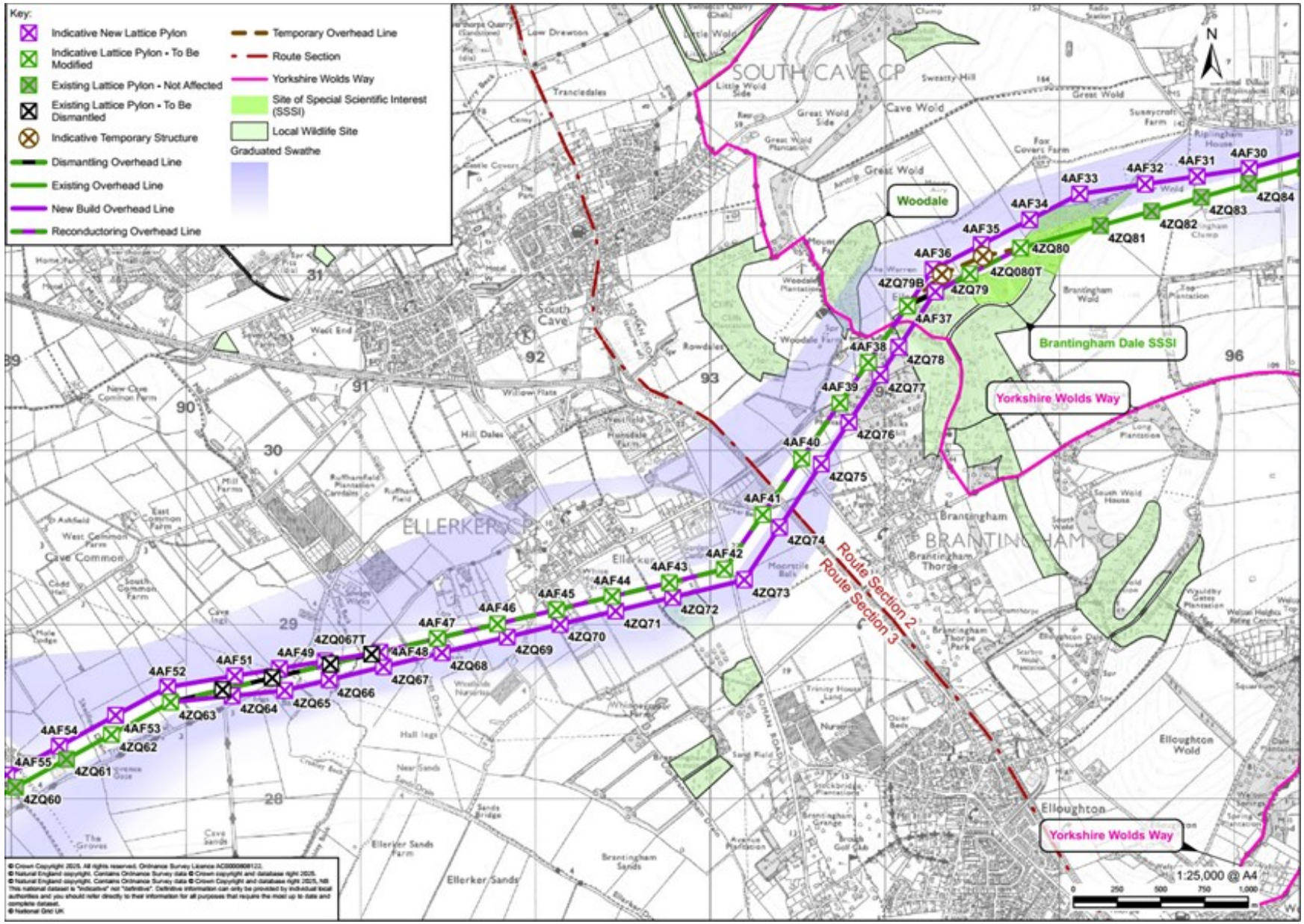


Figure 7-6 Two line swapovers at Ellerker Wold North and Ings Lane

Route Section 4 – River Ouse crossing and routeing west of Ousefleet

7.3.16 The new overhead line is proposed to cross the River Ouse at a point east of Yokefleet. During non-statutory consultation two alternative paths were presented within the graduated swathe: one to the east and one to the west of the existing overhead line crossing (see Figure 7-7).

7.3.17 This is a significantly constrained section of the route. Notable constraints include the nationally and internationally designated nature conservation sites of the Humber Estuary, the dispersed linear settlement of Ousefleet on the south bank of the river and the Hall Garth Moated Site; a Scheduled Monument, located in Ousefleet. The Blacktoft Sands Nature Reserve is an important conservation site on the Humber Estuary, managed by the RSPB, which supports large numbers of protected bird species, most of which are qualifying species for the Humber Estuary designated sites. Bird usage of the Reserve is particularly concentrated in the central section. Ongoing bird surveys indicate that bird activity is more concentrated to the east of the existing overhead line. In addition, local listed buildings include Yokefleet Hall on the north bank of the river, Whitgift Lighthouse on the south bank and Ross Farmhouse in Ousefleet; all Grade II listed.

7.3.18 Whilst the River Ouse at this point forms part of the nationally and internationally nature conservation sites of the Humber Estuary, the designated site boundaries are generally defined by the flood banks and therefore don't extend far from the riverbank. Therefore, it would be possible to avoid having to site pylons within the designated sites themselves, avoiding permanent habitat loss.

7.3.19 Subject to the final construction methodology adopted it may be necessary to access the water edge to pass ropes from shore to a waiting boat, for the ropes to then be drawn across the river and passed onto the far bank. For this reason, the draft DCO Order Limits proposed extend into the designated nature conservation sites. However, National Grid will endeavour not to construct any permanent or temporary structure within the sites and any interactions with the designated sites will be considered in detail.

7.3.20 Any alignment option would require the use of tall pylons to cross the river and maintain safe clearance to large sea-going vessels travelling to the Port of Goole and Howdendyke Port. Whilst these two tall pylons would increase the extent of adverse landscape and visual impact, the presence of the existing 4ZQ overhead line reduces the sensitivity of the landscape to the proposals in this area.

7.3.21 An alignment to the most westerly edge of the graduated swathes western path is proposed. The preferred alignment increases the distance between the existing overhead line and the proposed new overhead line as the route crosses the River Ouse. This is primarily to allow the line to be routed through a larger gap in the linear settlement, between the villages of Ousefleet and Whitgift. The preferred alignment also moves away from the main part of the RSPB Blacktoft Sands Reserve and the main areas of bird activity, helping to reduce any potential adverse impacts upon bird movements. Whilst it is recognised that this preferred alignment would adversely affect the setting of the Hall Garth Moated site, works within the designated site boundary have been restricted to the removal of an existing wood pole electricity line, owned by Northern PowerGrid, which is proposed to be cabled underground beyond the site boundary.

7.3.22 A route within the eastern path of the graduated swathe, whilst offering the opportunity to route in parallel with the existing overhead line across the river, would have been routed across a wider part of the RSPB Reserve and in an area known to be more heavily used by bird species associated with the Humber Estuary. Such a route would also have passed through a narrow gap between residential properties in Ousefleet and close to a Grade II Listed building. The eastern path was therefore not preferred.

7.3.23 A more easterly route within the western path of the graduated swathe was also considered and would have followed closely in parallel to the existing overhead line, then routeing through a narrow gap in the built development of Ousefleet, immediately east of Narrow Lane, and oversailing or requiring the removal of a number of agricultural buildings. Whilst potentially having some minor advantages in relation to bird flight movements it is considered that this option would likely have resulted in significant impacts upon the immediate residential properties. These arise as a result of both proximity and the local changes in route direction. This would also have been sited close to Ousefleet Village Hall and playing field which is a valued community resource. As a result, a more easterly route within the western path of the graduated swathe was not preferred. Regard was also had to the relationship to the route alignment to the north of the river. Had an alignment to the east of the existing overhead line been preferred for the crossing of the River Ouse then a further line swap over would have been required in the Staddlethorpe/Yokefleet area. This would have been needed to allow the close parallel alignment at Broomfleet to move from the north (west) side of the existing overhead line to the eastern side. This would have increased technical complexity and introduced additional tension pylons. Preferring a western alignment for the proposed new overhead line across the River Ouse also has the benefit of avoiding the need for this line swap over.

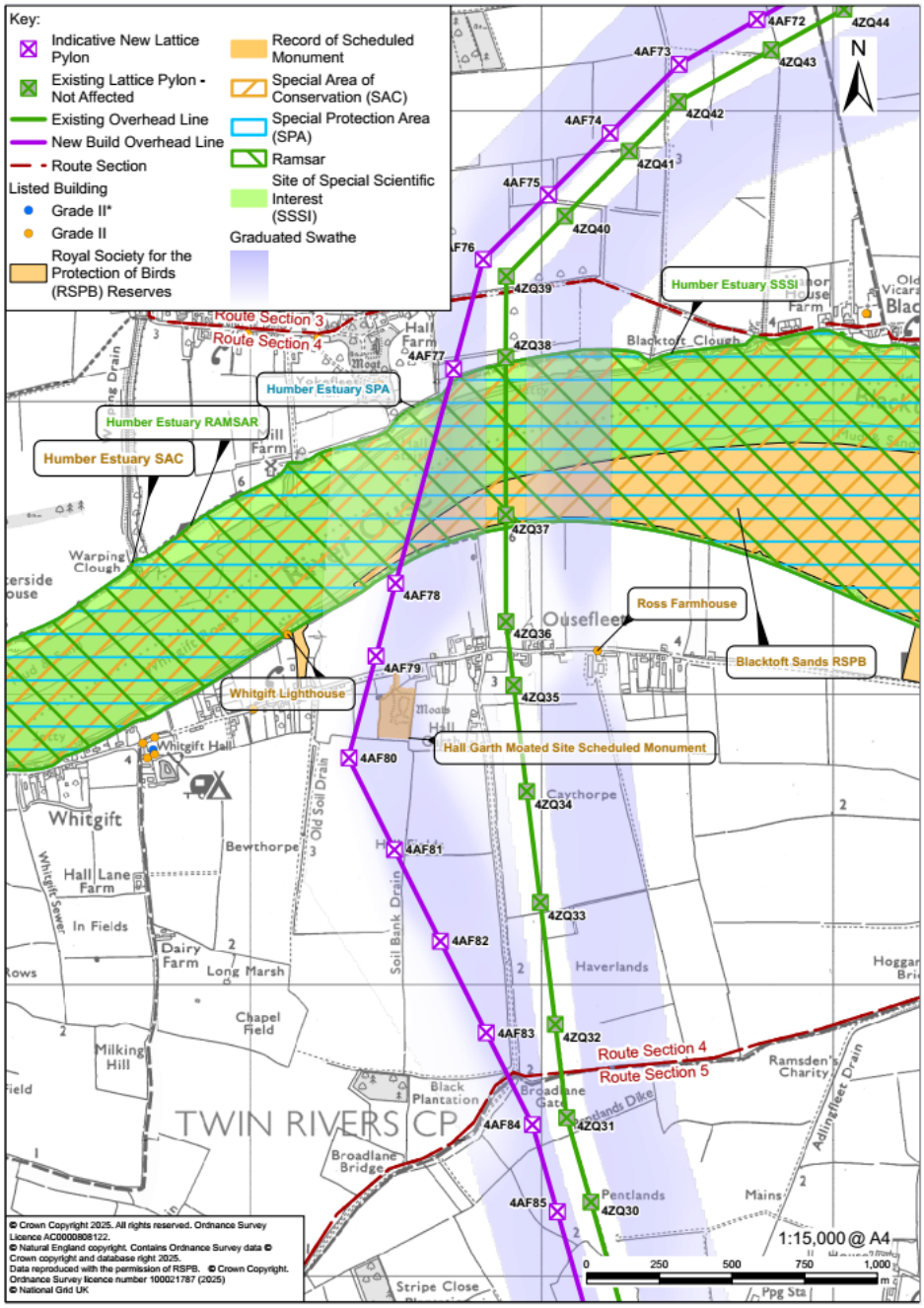


Figure 7-7 Preferred alignment at River Ouse crossing and at Ousefleet

Route Section 5 – River Ouse crossing to Luddington

7.3.24 South of Ousefleet two alternative paths within the graduated swathe were presented for the proposed new overhead line during our non-statutory consultation. Both paths were parallel to the existing 4ZQ overhead line: one to the east and one to the west of the existing overhead line, with the eastern path ending in the area west of the village of Garthorpe (thereby avoiding the need to route beneath a second existing overhead line that connects with the 4ZQ overhead line south of Garthorpe).

7.3.25 Some feedback from non-statutory consultation supported proposals to keep the new overhead line in close parallel with the existing overhead line in this location to keep transmission infrastructure closer together where possible. This part of the route has relatively few environmental sites and features that would influence or constrain the routeing of the proposed new overhead line.

7.3.26 Having undertaken more detailed assessments, surveys and given careful consideration to consultation feedback, the preferred new overhead line route follows the western path in the area south of Ousefleet. Therefore, from proposed pylon 4AF84, the preferred alignment runs in a south-easterly direction in close parallel with the existing 4ZQ overhead line for approximately 5.3km to the B1392 Meredyke Road at the end of Route Section 5. The location of proposed pylon 4AF84 is approximately 1.5km south of Ousefleet.

7.3.27 Whilst it would be possible to move to a close parallel alignment closer to the village of Ousefleet, increasing the length of closely parallel alignment by a maximum of around 1km, such an alignment would have introduced an additional tension pylon and resulted in a greater adverse effect upon views south from the village.

7.3.28 Both the eastern and western paths presented south of Ousefleet offered opportunities to develop a close parallel alignment, with the positions of the new and existing pylons closely synchronised to reduce adverse effects upon views by presenting a more coherent design solution. In this respect views from the villages of Garthorpe and Adlingfleet to the east of the existing line are most notable. Adlingfleet is also a designated Conservation Area and contains a Schedule Monument and number of listed buildings, including the Grade I Listed Church of All Saints.

7.3.29 If adopting a route within the eastern path south of Ousefleet then two line swap overs would be needed to connect to a western path across the River Ouse. This would add substantial technical complexity, increase the amount of construction activity and introduce at least five tension pylons.

7.3.30 If an eastern crossing of the River Ouse were preferred then only a single line crossover would be needed in the areas west of Garthorpe. (However, it should be noted that, as described above, this would introduce the need for an additional line crossover to the north of river if a northern path (as proposed) were adopted at Broomfleet).

7.3.31 This added complexity and consideration of effects upon the remote villages of Adlingfleet and Garthorpe mean that the eastern path within the graduated swathe in this Route Section is not preferred and the preferred alignment routes within the western path, in close parallel with the existing overhead line once south of Ousefleet from proposed pylon 4AF84 to 4AF98.

7.4 Route Section 6: Luddington to M180 (Humberhead Levels South)

Overview

7.4.1 Route Section 6 of the preferred alignment begins at the B1392 Meredyke Road routeing south-westerly for approximately 4.9km from pylons 4AF100 to 4AF114 routeing around Keadby wind farm and crossing Ox Pasture Lane and Carr Lane. The preferred alignment then routes broadly south for 6.4km crossing Outgate, the Sheffield and South Yorkshire Navigation Canal and the A18 where this Route Section ends at the M180.

7.4.2 This section of the report describes the preferred alignment at Route Section 6.

South of Luddington to east of Crowle Routeing

7.4.3 Pylon 4AF100 is synchronised with the existing 4ZQ overhead line. From this point the preferred alignment at pylon 4AF100 deviates west, away from the existing 4ZQ overhead line. From 4AF100 to 4AF114 the preferred alignment has been routed in a straight line to minimise changes of direction and thus additional tension pylons, with pylons sited to optimise stand-off to existing watercourses in the area and increase distance from isolated properties near Eastoft and Luddington, where practicable. The preferred alignment crosses over where Ox Pasture Lane and Carr Lane meet, to the east of Eastoft. Pylon 4AF114 has been sited sensitively on the edge of the proposed Humber Carbon Capture Pipeline[22] (HCCP) corridor, optimising stand off to local drains and a National Gas high pressure gas pipeline. Avoiding siting of pylons within the proposed HCCP corridor is not feasible without significantly increasing the distance between pylons, which would lead to significantly taller pylons. This has led to 4AF114 and 4AF115 being sited within the HCCP corridor. Siting of pylon 4AF114 has also been orientated in respect of the required existing ZDA overhead line crossing. Coordination with HCCP and National Gas will be required as the Project progresses.

7.4.4 From 4AF114, the preferred alignment continues in the eastern path of the graduated swathe, in parallel with the National Gas Transmission high pressure gas pipeline and approximately 270m away from Crowle Grange to the overhead line centreline. Routeing in the eastern path, rather than the western path allows for routeing in a straight line from 4AF114 to 4AF128, minimising changes of direction and thus requiring fewer tension pylons in close proximity to the settlements of Crowle and Ealand. This increases the distance from the settlements of Crowle and Ealand including a number of designated heritage assets to the west and optimises the distance from the proposed HCCP corridor to the east and the existing National Gas Transmission high pressure gas pipelines.

7.4.5 The preferred alignment optimises the crossing location of the existing ZDA overhead line, keeping the proposed works within one field, which minimises impacts on local drains. The ZDA crossing has not been located further east due to the gas pipelines and the proposed HCCP corridor and has not been located further west as it brings it closer to Ealand and would impact more on localised drainage systems. South of the existing ZDA overhead line, the alignment continues south, with pylons located sensitively to avoid drains and cross roads, South Humberside Main Line railway and navigable waterways as perpendicular as possible.

7.4.6 Routeing in the western path of the graduated swathe would result in a more oblique crossing of the existing ZDA overhead line, routeing in closer proximity to Ealand and Outgate, and in closer proximity to an Exolum fuel pipeline when compared to the current preferred alignment. This western path is also closer to the designated heritage assets with the Crowle Conservation Area.

7.4.7 The preferred alignment at this location is shown at Figure 7-8 below.

[22] Formerly known as the Humber Low Carbon Pipeline (HLCP) Project

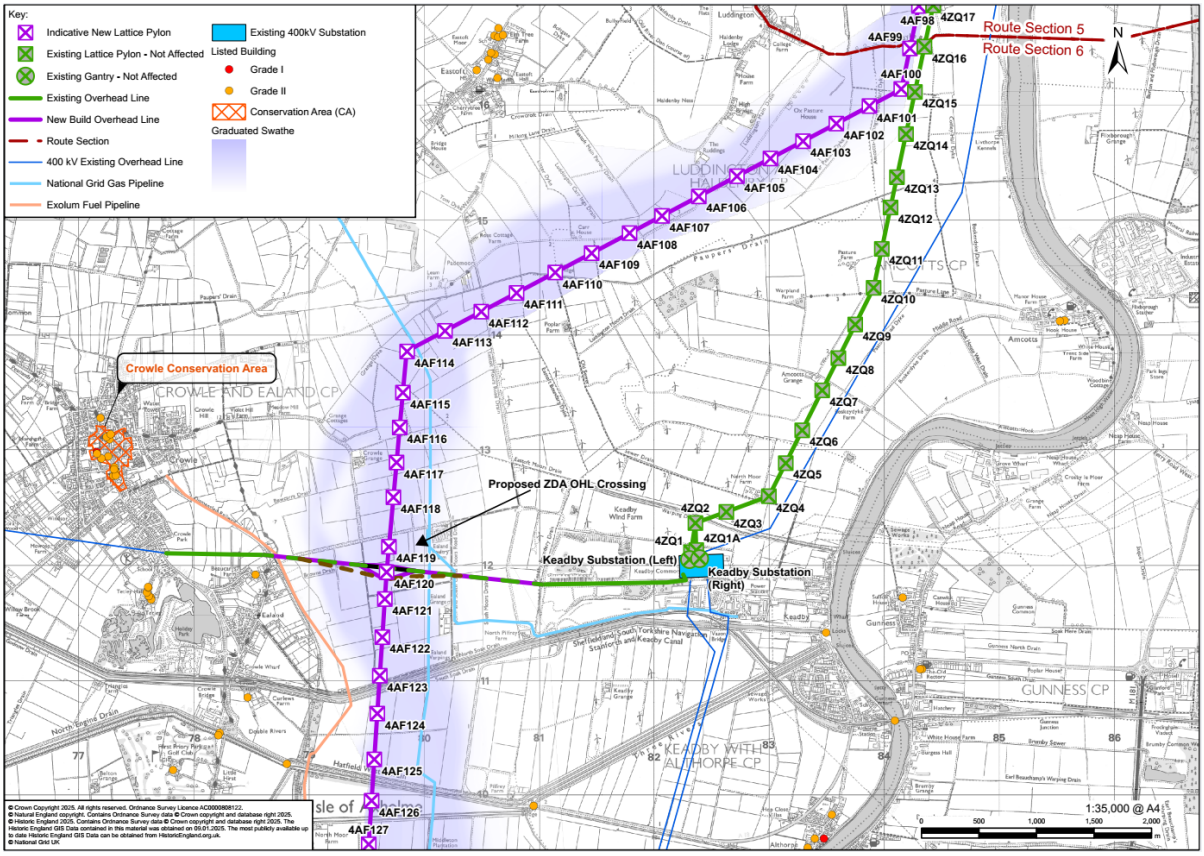


Figure 7-8 Preferred alignment south of Luddington to east of Crowle

Crossing the existing ZDA overhead line to the west of Keadby

7.4.8 As the preferred alignment routes south-east of Crowle, it approaches the existing ZDA overhead line to the west of Keadby which runs in an east-west orientation.

7.4.9 The preferred alignment crosses the existing 400kV ZDA overhead line between 4AF119 and 4AF121. The design includes for modification of the existing ZDA overhead line to a 'diamond duck-under' arrangement, whereby the existing ZDA overhead line will be modified by replacing two existing pylons with two sets of lower height structures, each set carrying an individual electrical circuit, to ensure the proposed new overhead line can maintain sufficient electrical safety clearance to the ZDA overhead line.

7.4.10 In addition, modifications will be required to the ZDA overhead line between ZDA116 – ZDA123, including replacement of existing conductors and diversion of the existing fibre optic cable, which is required for signalling and electrical protection purposes. Structural modifications to the pylons and foundations may be required subject to surveys and detailed design. Outages on the electricity transmission network and specialist personnel will be required to ensure these works can be undertaken safely. A temporary diversion may be required to ensure continuity of electricity supply, which will involve construction of two additional temporary structures to temporarily re-route conductors. The temporary structures will be removed following completion of the works.

7.4.11 Siting of pylons in this area has been undertaken with regard to watercourses, public bridleways south of Outgate, two existing National Gas Transmission high pressure pipelines, a Yorkshire Water pipeline, an Exolum fuel pipeline, in addition to ensuring sufficient electrical clearance can be achieved to the modified ZDA overhead line route. Coordination will be required with the relevant asset owners and authorities as the Project progresses.

7.4.12 An illustrative design of the ZDA overhead line duck-under is illustrated in Figure **7-9** and Figure **7-10** below.

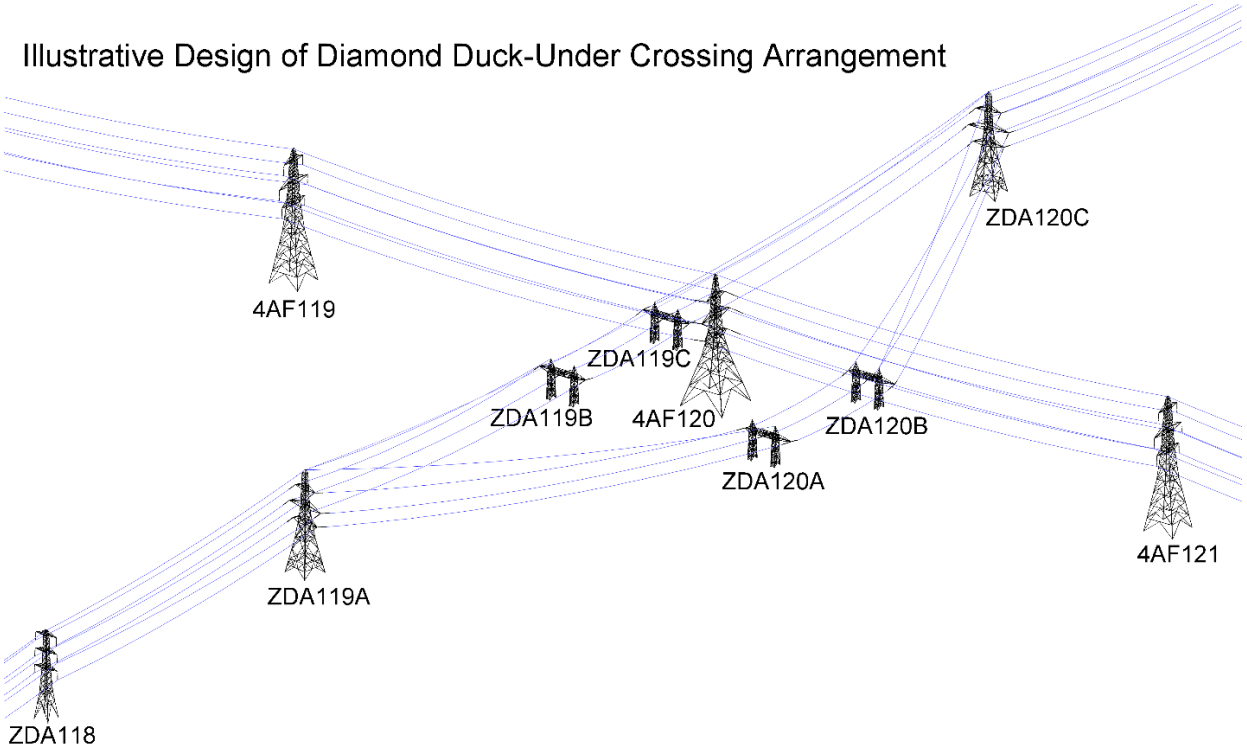


Figure 7-9 Illustrative design of diamond duck-under crossing arrangement

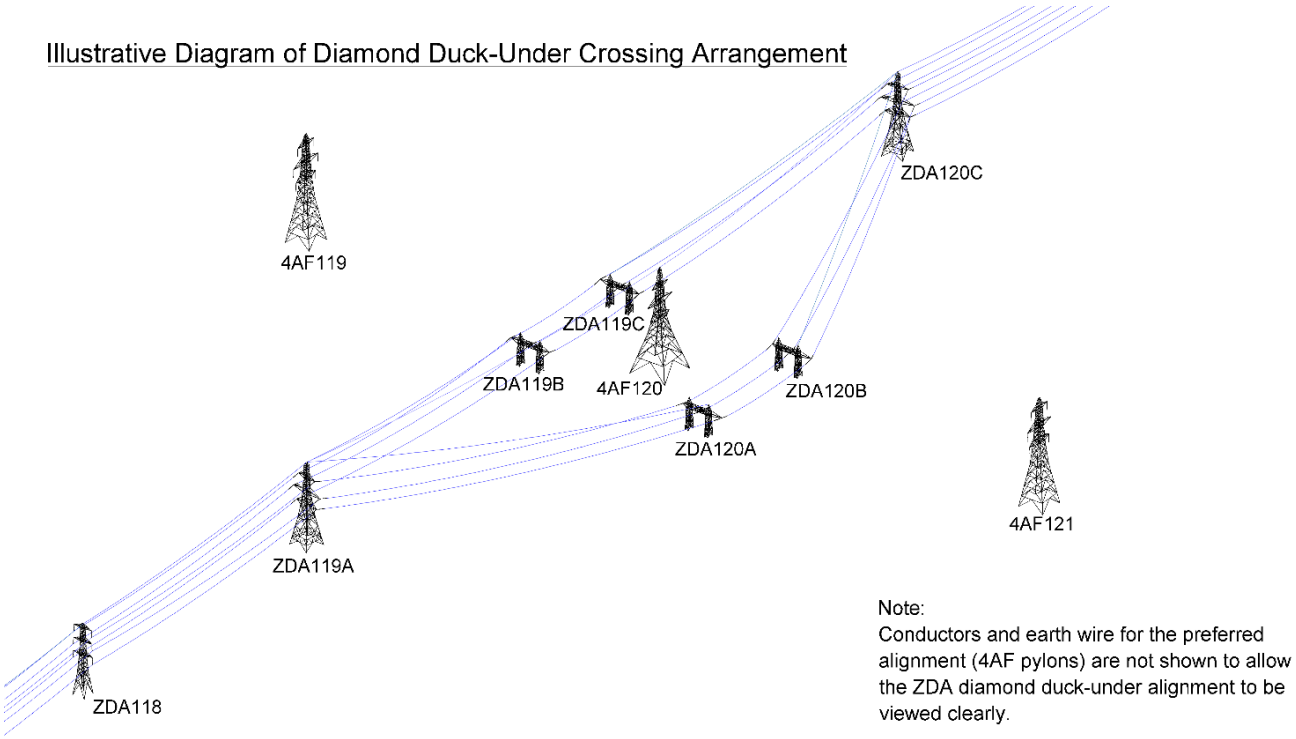


Figure 7-10 Illustrative design of diamond duck-under crossing arrangement (without conductors and earth wire shown for the preferred alignment)

South of the ZDA Crossing to M180

7.4.13 Following the duck under crossing of the ZDA overhead line, the preferred alignment continues in a southerly direction, crossing over Bonnyhale Road and the South Humberside Mainline railway. The preferred alignment continues into the Isle of Axholme Area of Historic Landscape Interest south of the A18. Pylon locations have sought to avoid localised features including drainage channels, Sheffield and South Yorkshire Navigation Canal and the A18, while continuing in a broadly straight route for approximately 2.7km, until pylon 4AF128, west of the North Moor Farm anaerobic digestion plant.

7.4.14 Multiple pipelines are located in this area, including a National Gas Transmission high pressure gas pipeline, Cadent medium pressure gas pipeline and Exolum fuel pipeline. The preferred alignment avoids direct impact on these pipelines, however further coordination will be required with the asset owners as the Project progresses.

7.4.15 Now south-west of the existing Keadby windfarm the preferred alignment routes broadly south-east towards the two existing 400kV overhead lines, avoiding woodlands to the north-west of Belwood Farm and to the west of Dixon Wood, before crossing the M180 where Route Section 6 ends.

7.5 Route Section 7: M180 to Graizelound

Overview

7.5.1 Route Section 7 of the preferred alignment begins at the M180 routeing broadly south to the east of Belton and the west of Beltoft. The preferred alignment then routes closer to the existing 4TM and ZDA overhead lines to the east Epworth. Following this, the preferred alignment routes south in between Haxey and Owston Ferry, avoiding local constraints, before this Route Section ends to the east of Graizelound.

7.5.2 This section of the report describes the preferred alignment at Route Section 7.

Preferred Alignment and Siting

M180, east of Belton to east of Graizelound

7.5.3 The preferred alignment crosses the M180 motorway and continues routeing broadly south-east past Mill Hill Wood and crossing Belton Road to the west of Beltoft. The preferred alignment seeks to maximise stand-off distance from Beltoft while continuing to gradually route back toward the existing 400kV overhead lines, and also avoiding isolated properties west of Beltoft Road and west of the 4TM overhead line. The alignment also avoids a woodland block to the south-west of Beltoft.

7.5.4 At pylon 4AF142, the preferred alignment runs in triple parallel with the existing 4TM and ZDA overhead lines to the east of Epworth. Between pylons 4AF142 and 4AF152, the pylons are synchronised with the pylons of the existing 4TM and ZDA overhead lines. The preferred alignment has a stand-off distance ranging from 175m – 190m from the existing 4TM overhead line in this area, to ensure appropriate stand-off distance from the existing overhead line and to reduce proximity to scattered residential properties. Routeing in triple parallel in this area keeps the new and existing overhead line infrastructure in the same location through this part of the Isle of Axholme Area of Historic Landscape Interest and on lower ground, limiting the spread of landscape and

visual effects while also increasing distance from the villages of Epworth and East Lound to the west.

7.5.5 Routeing in close parallel does result in the introduction of a new overhead line to the west of isolated rural properties which already have the existing overhead lines to their east. Pylon locations have been proposed with consideration to such properties and other local features including Melwood Upper Quarry LWS which is oversailed by the proposed alignment, though no pylons are proposed within the LWS.

7.5.6 The preferred alignment deviates away from parallel routeing (south of pylon 4AF152) near Low Hall Farm as oversailing of the property and curtilage would be unavoidable while maintaining parallel routeing. Pylon 4AF156 is sited closer to the existing 400kV overhead lines again and avoids Sedge Hole Close Lincolnshire Wildlife Trust Reserve to the west. This area of woodland further aids screening to views from East Lound. A further deviation away from the existing overhead lines occurs south pylon 4AF156 to route west of Owston Grange. If the preferred alignment had continued in close parallel with the necessary 150m stand-off from the existing overhead lines this would bring the new overhead line in close proximity to the residential property. Consideration was given to potential visual effects and views from the properties affected by routeing in parallel in this area. Consideration was also given to minimising the crossing angle of Ferry Drain and Warping Drain and Gunthorpe Road, in addition to optimising stand-off distances of pylons from the watercourses.

7.5.7 Figure 7-11 illustrates this routeing option at this location.

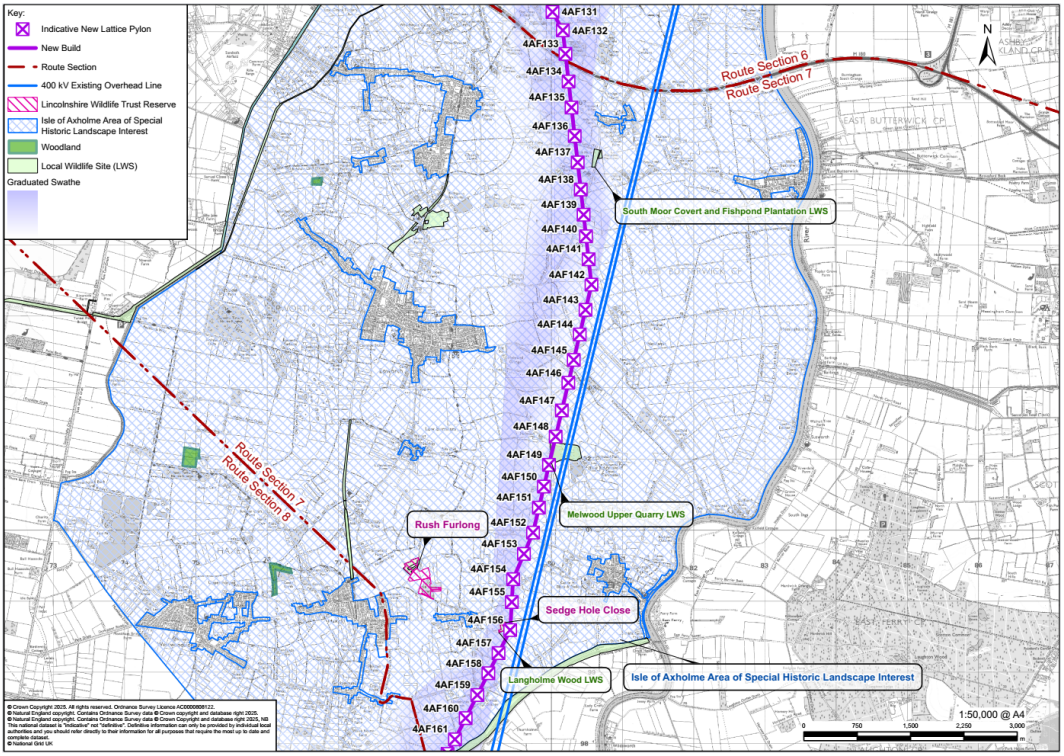


Figure 7-11 Close paralleling east of Epworth

7.5.8 South of Owston Grange consideration was given to siting pylons to avoid a number of drains, including Ferry Drain and Warping Drain. This siting of pylons 4AF162 and 4AF163 also avoid and facilitate the crossing of the Warping Drain LWS and Gunthorpe Road to the south-east of Graizelound where Route Section 7 ends.

7.6 Route Sections 8 and 9: Graizelound to South Wheatley

Overview

7.6.1 Route Section 8 of the preferred alignment begins east of Graizelound where the preferred alignment crosses Stockwith Road before it routes broadly south-west for approximately 3km crossing The Spalding and Doncaster Railway Line, the A161 (Haxey Gate Road) and Tindale Bank Road. The preferred alignment then routes southwards crossing the River Idle, Misterton Golf Club, Cornley Road and Cattle Road to pass to the west of Misterton where it meets Chesterfield Canal.

7.6.2 Following the crossing of the Chesterfield Canal and moving into Route Section 9 the preferred alignment routes in a south-easterly direction for approximately 6km to the west of Walkeringham and Beckingham, and crossing the B1403 (Walkeringham Road) with Gringley on the Hill to the west. The preferred alignment continues south crossing the A631 to the east of Clayworth and the west of Saundby, meeting the A620 (Gainsborough Road).

7.6.3 This section of the report describes the preferred alignment at Route Sections 8 and 9.

Preferred Alignment and Siting

South of Graizelound to the Chesterfield Canal (Route Section 8)

7.6.4 The preferred alignment, after crossing Warping Drain, routes further west within the northern path of the graduated swathe, away from the existing 4TM and ZDA overhead lines at pylon 4AF163 to avoid the settlement of Misterton to the south and an area of higher ground to the north-west of Misterton. The route crosses the Spalding and Doncaster Line railway, the A161 and Tindale Bank Road which influence the siting of pylons in this location. Consideration has also been given to isolated properties along the A161 near the level railway crossing and the Grade II listed Langholme Manor Farmhouse on Tindale Bank Road. The preferred alignment continues to pass to the north of Misterton Driving Range the tension pylon 4AF172.This avoids a crossing of the A161 in close proximity to Haxey Quays Caravan Park, The Haxey Gate Inn and the Grade II Listed Haxey Gate Bridge, as well as the Tindale Drain LWS, Mother Drain LWS, River Idle and Banks LWS in the southern path of the graduated swathe.

7.6.5 From 4AF172 the preferred alignment routes in a south-westerly direction along the western edge of the graduated swathe, crossing the Misterton golf course (which is assumed to no longer be operational). Some consultation feedback indicated a preference to route along the western edge of the graduated swathe at this location. By routeing in the western extent of the graduated swathe there is greater distance from residential and commercial receptors to the west of both Misterton and Walkeringham, however, routeing to the west of the swathe brings the preferred alignment in closer proximity to the settlement of Gringley on the Hill.

7.6.6 From pylon 4AF183 the preferred alignment routes in a south-easterly direction towards the north-east of Gringley on the Hill where it crosses the Trent Valley Way and Chesterfield Canal SSSI, routeing within the preferred corridor but moving outside of the graduated swathe. Figure 7-12 illustrates the preferred alignment at this location. Further detail on the decision to route the corridor outside of the graduated swathe is detailed in Chapter 5.5. Routeing and pylon locations in this area have had

consideration for the isolated properties to the west of Walkeringham, the Wooden Beck Hill Verges LWS and a number of Grade II listed buildings.

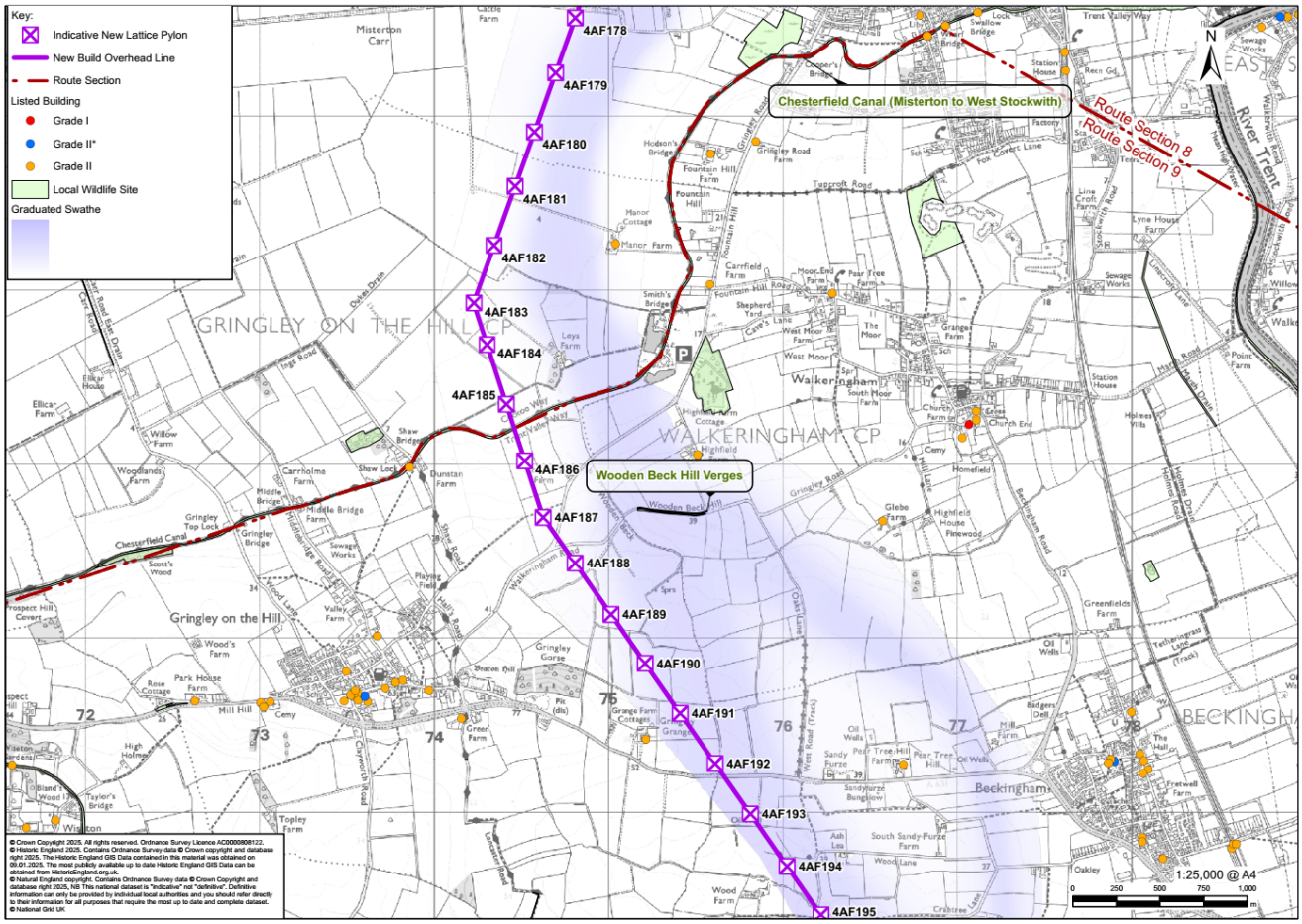


Figure 7-12 Preferred alignment west of Misterton and Walkeringham and north-east of Gringley on the Hill

7.6.7 An alternative corridor (corridor 3) following the existing overhead lines in triple parallel through the Trent Valley was considered in the **CPRSS 2023**. As explained in the **CPRSS**, from East Stockwith, routeing to the west of the existing 400kV ZDA and 4TM overhead lines is unlikely to be feasible as the corridor narrows substantially due to the surrounding residential areas of Misterton, Beckingham and Saundby to the west, and Beckingham Marshes RSPB Nature Reserve on the east. Sufficient stand-off from the existing overhead lines to enable future maintenance works is unlikely to be achievable without oversailing residential properties and curtilage. South of Beckingham Marshes RSPB Nature Reserve, West Burton Power Station, various underground assets and multiple planning applications occupy the corridor to the west of the existing 400kV ZDA overhead line and consequently close parallel routeing on the western side is also unlikely to be feasible at this down towards West Burton. Further information on the assessment of Corridor 3 can be found in Chapter 8 of the **CPRSS 2023**.

Chesterfield Canal to A620 (Route Section 9)

7.6.8 The preferred alignment immediately crosses the Chesterfield Canal SSSI. Routeing and pylon locations in this area have had consideration for the isolated properties to the west of Walkeringham the Wooden Beck Hill Verges LWS, in addition to a number of Grade II listed buildings.

7.6.9 Once across the Chesterfield Canal SSSI the preferred alignment continues to route in a south-easterly direction to the east of Gringley on the Hill and west of Beckingham moving back within the western path of the graduated swathe as it crosses the A631. The preferred alignment avoids routeing on areas of higher ground towards Gringley on the Hill, an isolated residential property on Walkeringham Road and the consented Bumble Bee Solar Farm and proposed Oaks Lane Solar Farm. Routeing in this area has also sought to avoid areas of ancient woodland and several LWS including Beckingham Wood LWS, Tongs and Dogholes Woods LWS, Wheatley Wood LWS and Saundby Park Wood LWS. An alternative route within the eastern path of the graduated swathe within Route Section 9 would have resulted in the new overhead line being routed closer to Beckingham and Saundby.

7.6.10 Between 4AF193 and 4AF194 the LoD of the preferred alignment oversails part of the existing Gainsborough-Beckingham oil field area. Further coordination with the owner, IGas Energy, will be required.

7.6.11 At pylon 4AF196 the preferred alignment routes broadly south to the west of Saundby crossing the A620 (Gainsborough Road) at which point Route Section 9 ends.

7.7 Route Sections 10 and 11: South Wheatley to High Marnham

Overview

7.7.1 Route Section 10 runs from the A620 in a south-easterly direction crossing the Sheffiled to Lincoln Railway Line at Sturton le Steeple, before continuing in a broadly southerly direction towards the existing 400kV substation at High Marnham in Route Section 11. The preferred alignment is routed to the west of the settlements of Sturton le Steeple, North Leverton with Habblesthorpe, South Leverton, Treswell, Stokeham, East Drayton and Ragnall. The preferred alignment continues in a south-easterly direction through Route Section 11 for 1km before connecting into the proposed new 400kV substation at High Marnham.

7.7.2 A potential alternative eastern corridor was identified and consulted on during a localised non-statutory consultation in 2024. This was subsequently discounted with the preferred corridor routeing predominantly within the emerging preferred corridor presented at non-statutory consultation in 2023. More information about the corridor decision and ‘eastern corridor’ can be found in Chapter 5.3 of this report. The alignment of the western corridor is shown at Figure 7-13 below.

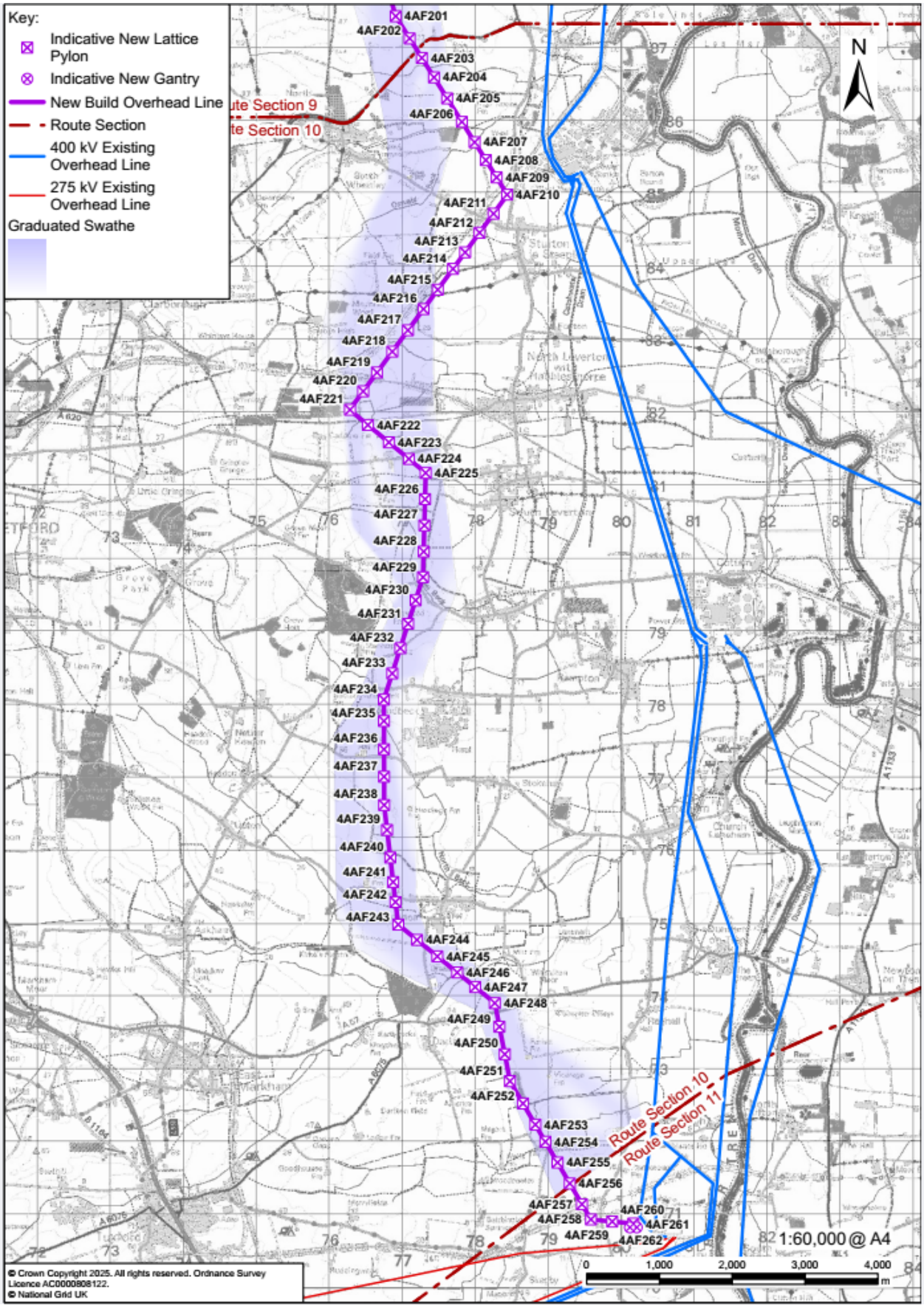


Figure 7-13 Preferred alignment between South Wheatley and High Marnham

Preferred alignment between A620 and west of North Leverton with Habblesthorpe

7.7.3 The preferred alignment in Route Section 10 extends in a south-easterly direction from the A620 at North Wheatley towards the Sheffield to Lincoln Line railway west of Sturton le Steeple crossing Wheatley Beck and the West Burton unlicenced grass airstrip. As the preferred alignment directly crosses this airstrip, existing operation as an airstrip would need to cease. National Grid have and will continue to engage with the landowner.

7.7.4 At pylon 4AF206 the preferred alignment extends outside of the western corridor graduated swathe presented during the 2023 non-statutory consultation, though stays within the eastern corridor graduated swathe consulted on in 2024. Once across the railway line, the preferred alignment routes in a south-westerly direction in parallel to the Sheffield to Lincoln Line railway transitioning between the eastern corridor graduated swathe and western corridor graduated swathe at pylon 4AF215. Figure 7-14 shows the preferred alignment at this location.

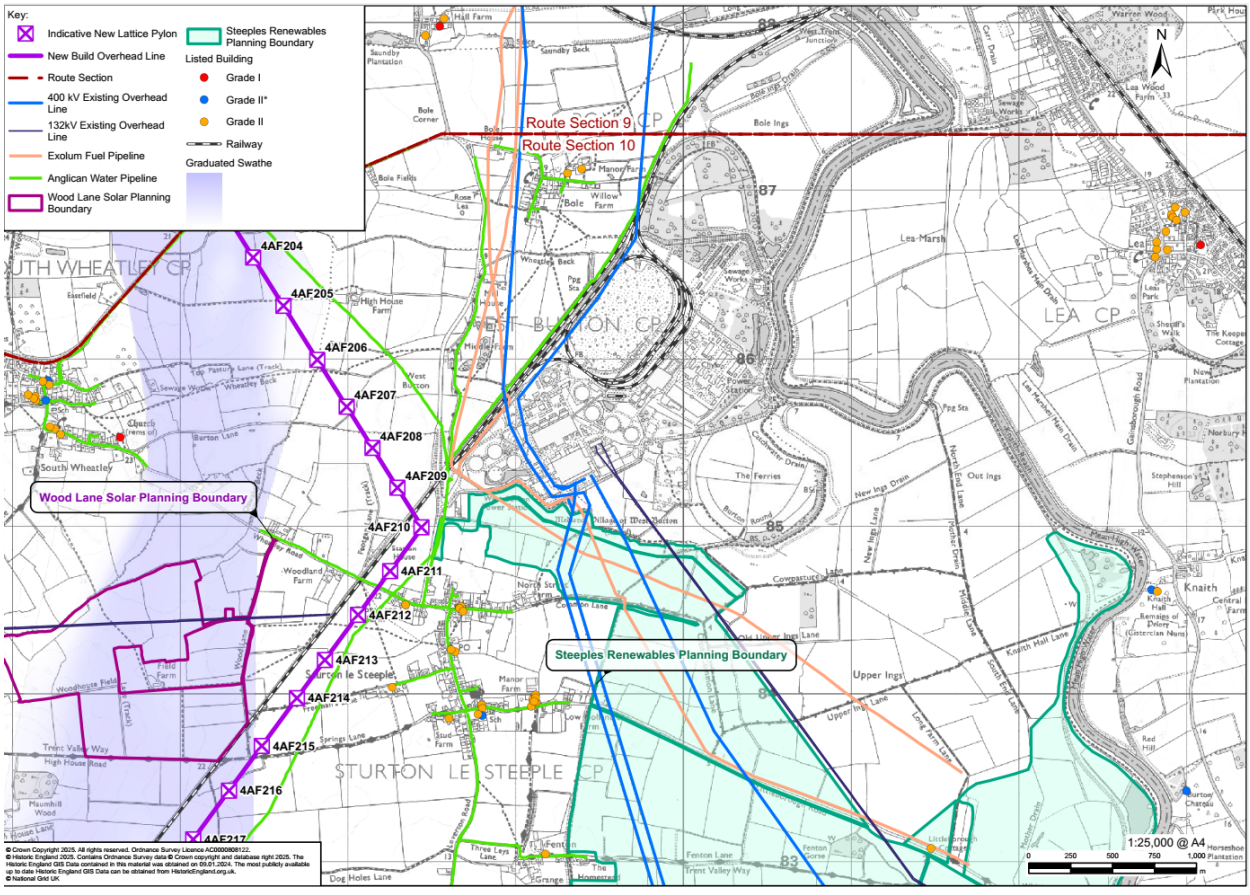


Figure 7-14 Preferred alignment between South Wheatley and North Leverton

7.7.5 The preferred alignment avoids the consented Wood Lane Solar Farm and existing NGED 132kV steel lattice overhead line section, which if crossed would result in increased technical complexity and would likely require replacement of the existing overhead line with a section of 132kV underground cable and associated terminal pylons with cable sealing platforms, which could increase impacts on the consented solar farm compared to the preferred alignment. The preferred alignment also seeks to cross the Sheffield to Lincoln Line railway as close as possible to a 90-degree angle as

preferred by Network Rail. Regardless of path chosen, coordination will be required with the developer of Wood Lane Solar Farm, Steeples Renewables.

7.7.6 The preferred alignment moves away from South Wheatley to minimise potential effects on the setting of the Remains of the Church of St Helens (Grade I listed building) while seeking to take the most direct route possible to minimise potential landscape and visual impacts.

7.7.7 As mentioned above, the preferred alignment routes in a south-westerly direction from the north of Sturton le Steeple, routeing in parallel to the railway track between pylons 4AF210 and 4AF221. At pylon 4AF221, the preferred alignment changes direction to route in a south-easterly direction towards South Leverton at pylon 4AF225, as shown in Figure 7-15 below.

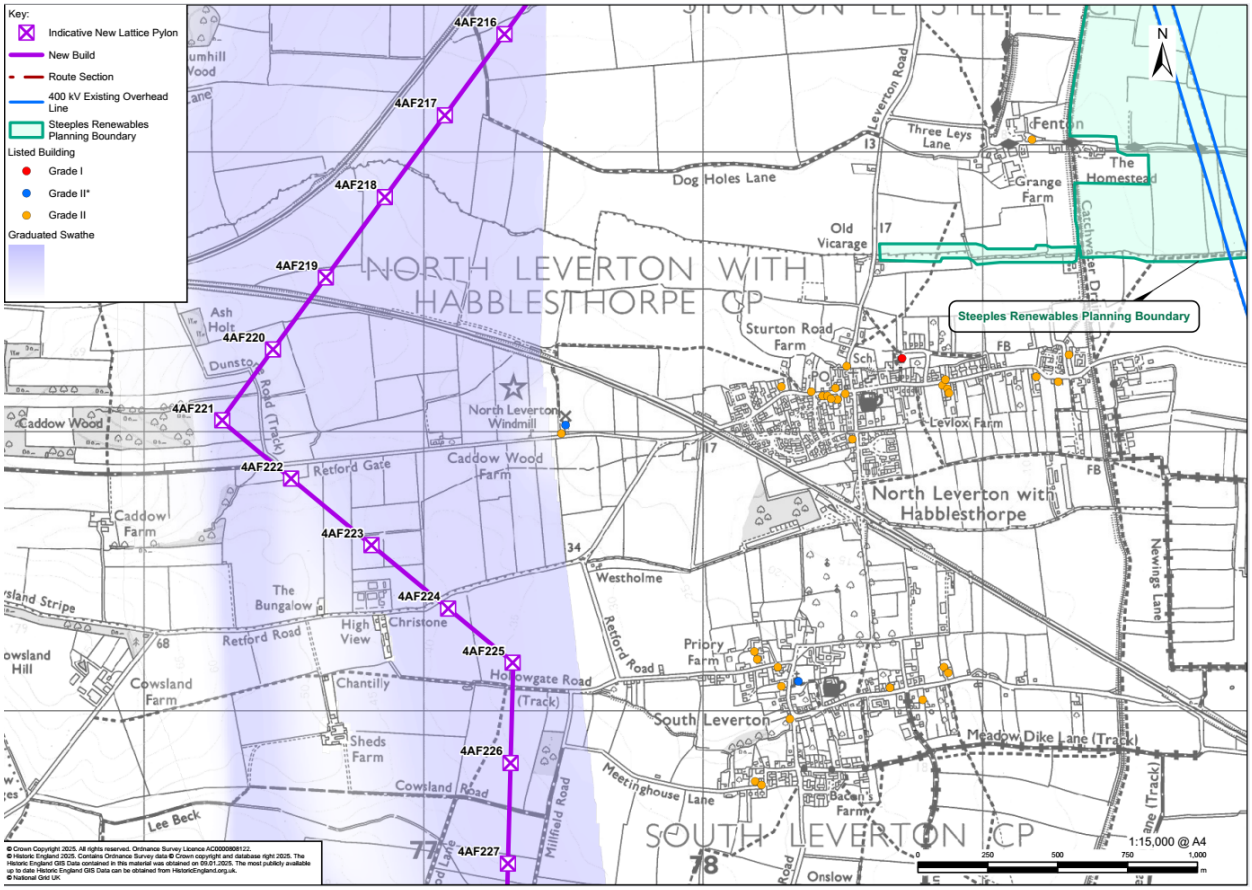


Figure 7-15 Avoidance of North Leverton Windmill

7.7.8 The purpose of the preferred alignment configuration between pylons 4AF216 and 4AF225 is to minimise potential impacts on the setting of the Grade II* listed North Leverton Windmill by maximising distance between the preferred alignment and the windmill, located on Mill Lane to the west of North Leverton and Habblesthorpe. In addition to being a listed heritage asset, feedback gathered from the non-statutory consultation 2023 and the localised non-statutory consultation 2024 identified the asset to be of local importance. Routeing the preferred alignment further west of the asset is considered to be preferable.

Preferred alignment West of South Leverton to East Drayton

7.7.9 The preferred alignment moves back into the eastern path of the graduated swathe south of North Leverton Windmill to avoid the area of slightly elevated ground between Retford Road and Wood Lane in the western path of the graduated swathe. This increases the distance of the preferred alignment from the Grove Farm Airfield and Forewood Farm Airfield when compared to the western path of the graduated swathe between Retford Road and Forewood Lane. Both Grove Farm Airfield and Forewood Farm Airfield are unlicenced grass airstrips. National Grid has engaged and will continue to engage with the owners and operators of these airstrips as we continue to refine our proposals.

7.7.10 Nearby to Treswell, the preferred alignment routes directly between the existing solar farm at Ashley Lane to the west and the Treswell Woods SSSI and Forwood Farm Airfield to the east. The preferred alignment then routes to the west of the settlement of Woodbeck and Rampton Hospital, routeing towards the west of East Drayton within the eastern path of the graduated swathe south of Main Street. Consideration has been given to a number of isolated properties along Main Street and Retford Road as well as scattered trees and blocks of woodland when siting pylons in the section between 4AF234 and 4AF243 while seeking to take the most direct route and minimise tension pylons. Routeing the preferred alignment within the eastern path of the graduated swathe also increases the distance from the unlicenced Headon Airfield located to the west of the graduated swathe.

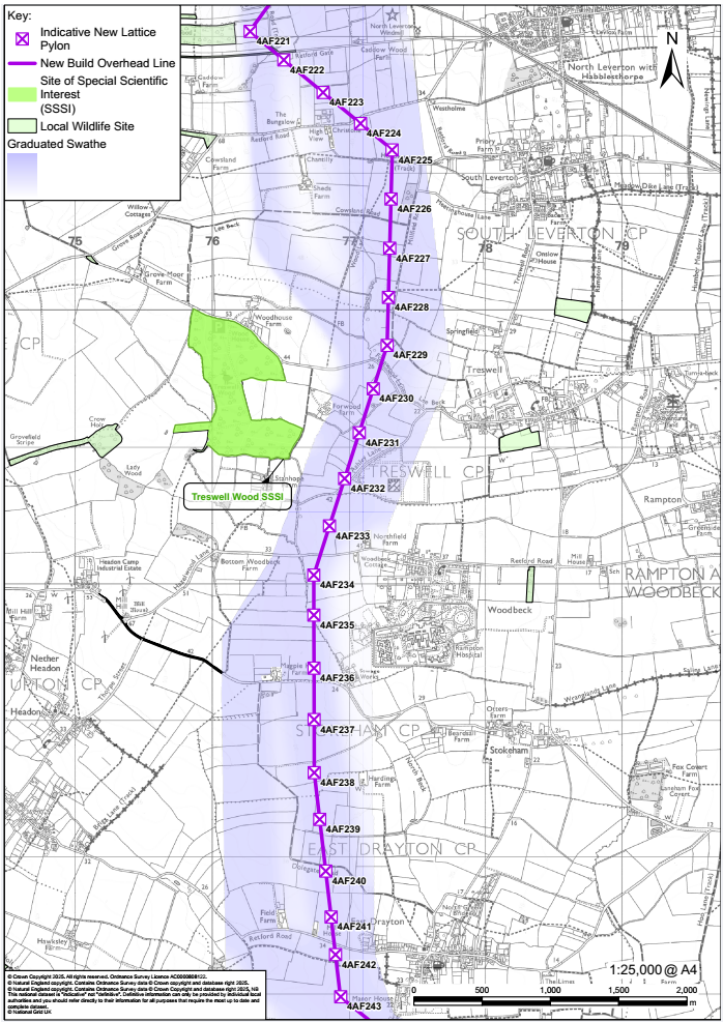


Figure 7-16 Preferred alignment West of South Leverton to East Drayton

Preferred alignment from East Drayton to High Marnham substation

7.7.11 At pylon 4AF243, located to the west of East Drayton, the preferred alignment routes in a south-easterly direction before crossing the A57 between the settlement of Darlton and the Whimpton Moor Scheduled Monument. At pylon 4AF248, the preferred alignment routes south towards High Marnham substation following the most western edge of the graduated swathe to minimise interactions with the proposed One Earth Solar Farm. The preferred alignment between pylons 4AF243 and 4AF248 routes at an eastwards angle in order to maximise the stand-off distance from Darlton and the Grade II* listed St. Giles Church. The unlicenced grass airstrip at Darlton Gliding Club is located over 1.5 km to the west of the preferred alignment. National Grid has engaged and will continue to engage with the owners and operators of all aviation interests along the route as we continue to refine our proposals.

7.7.12 As we move into Route Section 11, the preferred alignment continues in a south-easterly direction before turning into the new High Marnham Substation from the west avoiding interactions with the proposed reconfigurations of the existing overhead lines as part of the new High Marnham substation, as shown in **Figure 7-17**.This proposed alignment also avoids routeing through two Nottinghamshire Local Wildlife Sites[23] along the northern edge of the High Marnham Substation.

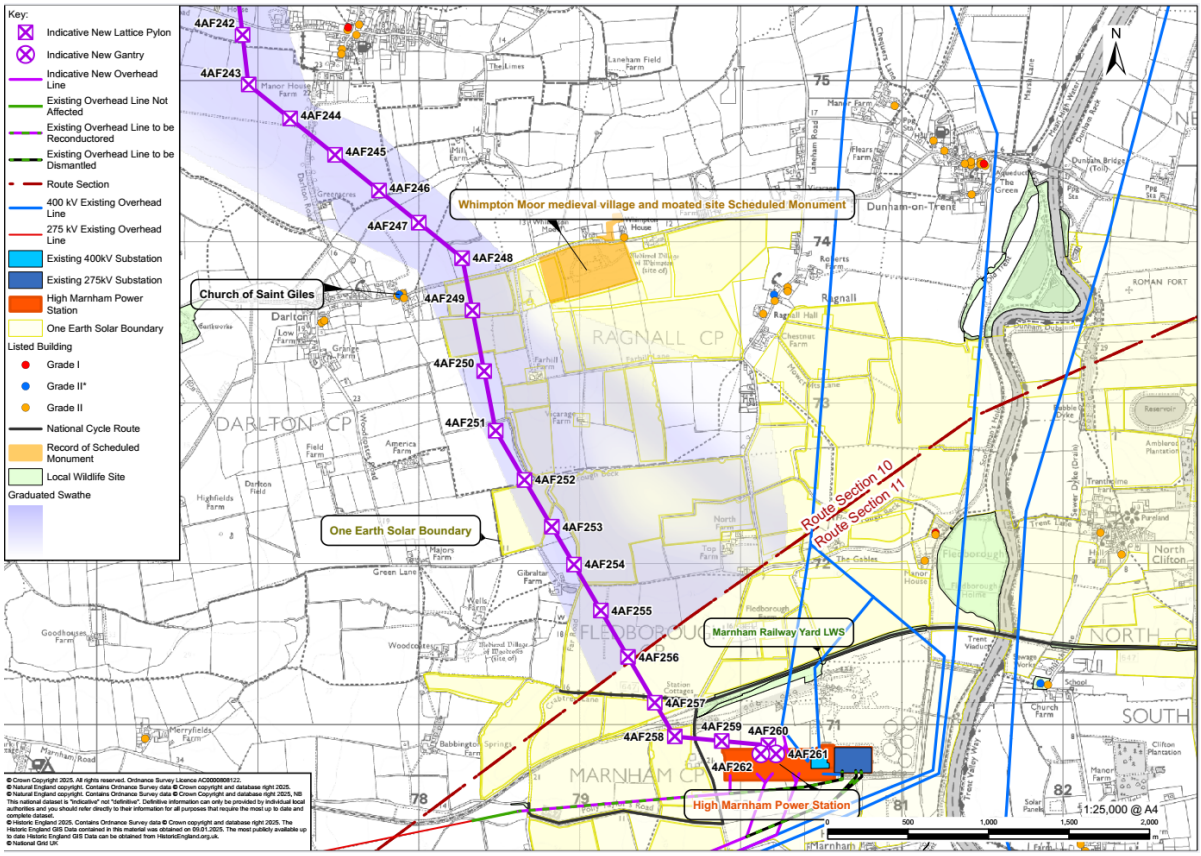


Figure 7-17 Preferred alignment and line entry into the new High Marnham substation

[23] Nottinghamshire Local Wildlife sites Fledborough to Harby Dismantled Railway Local Wildlife Site (5/133) and Marnham Railway Yard Local Wildlife Site (5/3437)

7.8 Birkhill Wood Substation

Overview

7.8.1 The existing Creyke Beck 400kV substation does not have sufficient capacity to accommodate new customers requiring a connection to the electricity network. National Grid has therefore identified the need for a new substation close to the existing Creyke Beck substation to connect a number of new customers. The new substation will also serve as the connection point for the Project.

7.8.2 The proposed development would comprise a new 400kV gas insulated substation (GIS) and associated works, comprising:

- A new 400kV GIS substation (operational footprint of 2.5ha) containing:
  - 400kV GIS equipment building/switch house with attached annex to house protection and control, ancillary equipment and welfare facilities;
  - Customer protection and control rooms;
  - Gas insulated and air insulated switchgear;
  - Gantries to interface between overhead line and substation;
  - Backup generator;
  - Water tank (for emergency fire-fighting purposes);
  - Ground deployed solar array to support the substation building services power supply;
  - Foul water cess pit;
  - Lighting columns and CCTV equipment;
  - Electrified fence around the perimeter;
  - Carparking;
  - 11kV/415V Utility Distribution Equipment enclosure;
  - Ground treatment comprising loose stone and gravel substrata with hardstanding buildings and transmission assets.
- A new vehicular access off the A1079 and approximately 1.2km of new permanent access road to serve the new and existing substation, including new culvert crossings over ditches. (Note: The vehicular access and the first 0.7km of the access road has already been consented through the Hornsea Four DCO);
- Temporary haul road, construction compounds and laydown areas;
- Drainage, landscaping and areas for biodiversity net gain provision;
- Removal of the existing wind turbine southwest of the proposed Birkhill Wood substation site to facilitate the substation development.

7.8.3 Due to the number of developments and customers connecting in the Creyke Beck area and the given constraints, there is not an area large enough to accommodate an AIS substation. A GIS substation is therefore proposed.

7.8.4 Overhead line works are also proposed, including the erection of two new pylons along the existing overhead line alignment which are required to turn-in the existing 400kV 4ZR overhead line into the new substation. These works benefit from permitted development rights under Part 15 Class B (a) of the General Permitted Development Order (GPDO) 2015 (as amended) and therefore will not form part of the planning application submission.

Substation Site and Design

7.8.5 The substation site is located to the north-west of the existing Creyke Beck 400kV substation and approximately 3km north of the town of Cottingham. The substation site is located within a relatively flat open landscape with agricultural land making up most of the land use. The site is located approximately 1.4km east of the Yorkshire Wolds Important Landscape Area. The existing 4ZR overhead line is closely located to the north of the site, and the existing 4ZQ overhead line is located in close proximity to the south.

7.8.6 The substation has an operational footprint of approximately 2.5ha and comprises GIS substation equipment contained within a single switchroom building. The substation building has a slanted roof, which at its highest point measures approximately 12.8m. The switchroom building measures approximately 1,982.4m^2. A smaller lean-to structure adjoins the GIS switchroom, containing all control rooms and welfare facilities. This structure measures a height of approximately 4m, and has a footprint of approximately 885m^2. Within the substation compound lies external intermediate support structures and ancillary infrastructure.

7.8.7 The security perimeter for the substation site will include a physical barrier. The physical barrier will consist of a National Protective Security Authority (NPSA) rated perimeter fence, fitted with an Electric Perimeter Intruder Detection (EPID) System, up to 4m from the ground.

7.8.8 Exterior and interior lighting will be provided at the substation site to allow for safe movement of vehicles (using their headlights) and pedestrians, and the operation of plant and equipment. For inspection and maintenance activities at night or low levels of daylight, additional portable lighting equipment may be used in localised areas. Light pollution will be kept to a minimum via the use of directable light output. Individual Passive Infrared (PIR) motion sensor “instant on” lights will be used at each access gate to facilitate safe entry at night or low levels of daylight.

7.8.9 Specific security lighting will be installed at the substation site, to complement the security equipment, such as CCTV cameras. The security lighting will provide flat and even illumination under alarm conditions.

7.9 High Marnham Substation

Overview

7.9.1 The High Marnham substation, and associated modifications to overhead lines, will form part of a wider project to reinforce the network between South Yorkshire and the North Midlands area known as the Brinsworth to High Marnham Project. The new High Marnham substation will also connect a number of new customers playing an important role in building a more secure and resilient future energy system.

7.9.2 The new substation would be connected via the transfer of the circuits from the existing 275kV substation and 400kV compound (including High Marnham – West Burton, High Marnham – Stoke Bardolph, High Marnham- Thurcroft-West Melton circuit) as well as turn-in of the Cottam- Staythorpe 1 circuit. These circuits will instead need to be connected into a 400kV substation. However, the existing 400kV substation cannot easily be extended to accommodate the new overhead line. It is therefore proposed that a new 400kV substation would be developed in the vicinity of the former High Marnham Power Station site, in order to connect the uprated circuits and facilitate the connection of future electricity transmission network projects and new customers.

7.9.3 The site is located directly adjacent to the existing High Marnham 400/275kV substation and would comprise:

- A new 400kV air insulated switchgear (AIS) substation, containing:
  - Approximately 22 bays.
  - Approximately 10 overhead line gantries.
  - Standard substation plant, inclusive of two new super grid transformers; 1 x 400/275kV, and 1 x 400/33kV transformers.
  - A new substation control building, and relay rooms.
  - Security fencing.
  - Lighting columns.
  - CCTV surveillance.
  - A new vehicular permanent access route off an existing private road to serve the new substation.
  - Temporary access route during construction.
  - Temporary construction compounds, welfare and laydown areas.
  - Landscaping, drainage features and BNG areas.

7.9.4 The new High Marnham substation is proposed to be served by a new access road off an existing private road from Fledborough Road, which is configured similarly to the current existing access.

7.9.5 The construction works will involve the reconfiguration of the existing overhead electricity lines currently connecting to the 275kV substation and 400kV compound as well as the turn-in of the Cottam-Staythorpe 1 circuit, to be connected into the new High Marnham substation.

Substation Site and Design

7.9.6 The substation site is located to the south-west of the existing substation within agricultural land which could be accessed from Fledborough Road to the west of the site, and Hollowgate Lane to the south of the site.

7.9.7 The substation has an approximate footprint of 155,000m^2. The substation equipment would consist of a variety of vertical structures supporting overhead busbars with ancillary equipment. The maximum height of the equipment would be approximately 15m.

7.9.8 A metalled internal access road of approximately 5.5m wide with adjacent hard standing is located within the substation compounds.

7.9.9 The security perimeter for the substation site will include a physical barrier. The physical barrier will consist of a National Protective Security Authority (NPSA) rated perimeter fence, fitted with an Electric Perimeter Intruder Detection (EPID) System, up to 4m from the ground.

7.9.10 Exterior and interior lighting will be provided at the substation site to allow for safe movement of vehicles (using their headlights) and pedestrians, and the operation of plant and equipment. For inspection and maintenance activities at night or low levels of daylight, additional portable lighting equipment may be used in localised areas. Light pollution will be kept to a minimum via the use of directable light output. Individual Passive Infrared (PIR) motion sensor “instant on” lights will be used at each access gate to facilitate safe entry at night or low levels of daylight.

7.9.11 Specific security lighting will be installed at the substation site, to complement the security equipment, such as CCTV cameras. The security lighting will provide flat and even illumination under alarm conditions.

8. Temporary Works

nationalgrid

8. Temporary Works

8.1 Overview

8.1.1 This chapter sets out National Grid's strategies and considerations towards the associated temporary works when constructing the Project.

8.2 Overall Transport Strategy

8.2.1 The Transport Strategy for the Project will be informed by the need for the movement of construction materials such as stone, concrete, steelwork, conductors, cables, equipment and construction personnel. The strategy will also be influenced by the nature and location of existing transport infrastructure, ports, offloading facilities and rail paths. Construction programmes may modify requirements if material can be re-used between Project Route Sections. Full detail and assessment of the proposed Transport Strategy is set out in **Chapter 14 (Traffic and Transport) of the PEIR**.

8.2.2 Locally, the deliveries and movements to site are expected to be by Heavy Goods Vehicles (HGV), Light Goods Vehicles (LGV) and private vehicles for site personnel. These local deliveries and movements, between the Strategic Road Network and site access points, are the focus of the Project design and assessment with the movement requirements and nature of the road network informing the strategy.

8.2.3 Multi-modal considerations are relevant to the long-distance movement of material from source to the Strategic Road Network and are influenced by commercial considerations in the context of a potentially global supply chain and to some extent by contractor preference.

8.2.4 The specific sitings of, and accesses to, different elements facilitating local access have been informed by highway safety, environmental and socio-economic considerations. The avoidance of adverse transport effects forms an inherent part of the Project's design development approach.

8.2.5 Initial discussions on the strategic access points throughout the route have been held with the relevant highway authorities.

8.2.6 National Grid are investigating the potential use of existing aggregate handling facilities. These have the potential to provide import locations to meet the needs of the Project and details will be presented within the DCO.

8.3 Access strategies for construction and maintenance

Construction Haul Road

8.3.1 The linear nature of the Project and characteristics of the Strategic Road Network within which it is routed present constraints to materials and equipment movement. The Project is crossed by a number of roads suitable for HGV traffic and a number of roads not suitable for potential two-way HGV movements.

8.3.2 Following an assessment of the route and the local road network the most appropriate transport solution is to identify a series of Primary Access Routes (PAR) connecting to the trunk road network connected along the Project corridor by new site access points (bellmouths) leading to off highway haul roads.

8.3.3 Maintenance works for the haul road and its accesses will be carried out in order to ensure safety and efficiency as set out in their designs.

Interlocking Panels

8.3.4 Some temporary construction accesses are likely to require panels to be laid in order to be used by HGVs and LGVs. Temporary panels are formed of interlocking metallic, plastic or rubber panels that would be laid to National Grid standard specifications.

Bellmouths and the creation of visibility splays

8.3.5 The proposed new access points and widened existing access points from the PAR will require bellmouths to be installed. The Project's proposed bellmouths may require a realignment, protection and/or diversion of existing underground services and the creation of visibility splays to create a line of sight for the safe use of the bellmouth.

8.3.6 Within the visibility splays, vegetation may need to be cut to a specified height and obstacles removed depending on local conditions, the speed rating of the road and whether traffic management was in place. Proposed design and location of bellmouths may also require the removal and relocation of street furniture.

8.3.7 Where the local highway network is not appropriate for the use of HGVs, crossover points (with associated bellmouths) will be developed to allow access to and from the haul road. The haul road would be expected to be used by LGVs and private vehicles of site personnel who can also utilise highway network to minimise overall distance travelled through more direct routes.

8.3.8 The intention of siting the proposed bellmouths is to locate them as close to the proposed works as possible in order to minimise overall distance of each vehicle movement. Sitings have been informed by highway safety, environmental considerations, and socio-economic effects to reduce effects on other existing (or proposed in planning) land use activities.

8.3.9 Similar considerations have influenced the proposed alignment of the haul road connecting the bellmouths and work locations. Where possible and practical, haul roads will follow alongside the proposed alignment, to avoid areas of woodland and minimise wider effects. In terms of constructability, a number of considerations have influenced the haul road alignment including but not limited to:

- Use of existing field boundary entrances;
- Use of existing watercourse crossing points;
- Topographical constraints;
- Limiting sharp bends in the route; and
- Limiting multi-crossing of the overhead lines.

8.3.10 Some environmentally sensitive locations have been avoided and effects on commercial businesses reduced by longer diversions to reduce the potential Project impacts.

Crossing Protection Scaffolding

8.3.11 Temporary scaffolding netting would be installed during construction where required as a safety measure to protect crossing assets such as roads, railways, and existing distribution network overhead lines (where not already moved underground) and could include hedgerows which would be crossed by the proposed 400kV overhead line.

8.3.12 During conductor stringing this netting will protect against accidental dropping of conductors and any of the associated equipment. Temporary closures of some affected asset, such as roads, may be required during these works to install the protective netting, or indeed may be used instead of installing scaffolding.

8.3.13 Alternative methods are available where the use of scaffold towers is not technically viable or where their use would give rise to particularly significant effects, such as catenary support systems, where feasible.

Pulling Positions

8.3.14 In order to keep construction disturbance to a minimum and ensure that all conductors are installed in a clean condition, conductors are not laid out on the ground before being winched up onto the pylon cross arms. Instead, a thinner wire is laid out and lifted into place in pulleys attached to the pylon arms.

8.3.15 This wire is attached to the conductors delivered to site on large drums. The wire is then pulled by a winch located at the far end of a length of the line, from the drum located at the other end, through the pulleys on each pylon until it reaches the final pylon in that line length.

8.3.16 The conductor is then attached to the strings of insulators hanging from each cross arm on the start and end pylons. The winches pull the conductor through a gentle slope from the cross arms, and therefore need to be sited some distance back from the tension pylon itself. Once the conductors are installed and connected so as to achieve the correct sag between each pylon, the position of the drums and winches are reset to continue installing conductors on the next length of the route.

8.3.17 This continues until conductors have been installed throughout the route. At this point the individual conductor lengths are connected together by clamping a short length of conductor between each, hanging below the cross arms of each of the tension pylons.

Substation Access

New Birkhill Wood Substation

8.3.18 Access to the new Birkhill Wood 400kV substation comprises a new vehicular access off the A1079 and approximately 1.2km of new permanent access road to serve the new and existing substation, including new culvert crossings over ditches.

8.3.19 It should be noted that the new vehicular access and the first 0.7km of the access road has already been consented through the Hornsea Four DCO.

8.3.20 Construction access to the new Birkhill Wood 400kV substation would be via the new access road leading from the A1079, which will be constructed prior to the commencement of the construction of the substation. Park Lane will used for a limited time for pre-commencement activities and site set up.

New High Marnham Substation

8.3.21 The new High Marnham 400kV substation is proposed to be served by a new access road off an existing private road from Fledborough Road.

8.3.22 Temporary construction accesses will be taken off the newly built permanent access to access the pylon locations.

Temporary Public Right of Way Management

8.3.23 There are several Public Rights of Way (PRoWs) that have been identified as being directly impacted by the construction phase of the Project. The identified PRoWs are set out in **PEIR Chapter 14 (Traffic and Transport)** and **Chapter 17 (Socio-economics)**.

8.3.24 Prior to commencement of construction, all designated PRoWs will be identified, and any potential temporary closures applied for/detailed in the DCO. All designated PRoWs crossing the working area will be managed with potential for access only closures for short periods while construction activities occur. Any required temporary diversions will be clearly marked at both ends with signage explaining the diversion and the duration of the diversion. A comprehensive list of management measures for each identified PRoW is set out in **PEIR Chapter 14 (Traffic and Transport)**.

8.4 Temporary Compounds

8.4.1 The Project's temporary construction compounds will be required to support the construction phase. These compounds will have a variety of uses which include but are not limited to:

- security gate house;
- plant and construction vehicle parking;
- site office, parking area and welfare facilities;
- fencing and lighting;
- laydown and storage area;
- wheel wash;
- collection, storage and disposal of surface water, in addition to water from within the compound including grey and foul water (where feasible and practicable connecting to the local sewer network);
- soil bund;
- spoil storage area;
- power supplies (where feasible to do so alternatively fuelled generators or other generation sources will be used and/or a local grid connection); and
- fuel and lubricants storage.

8.4.2 The siting of the temporary compounds has been informed by the location of project elements and the specific construction service that each required compound provides. The locations proposed for each compound seek to reduce the potential for environmental and socio-economic effects. It is National Grid's logistical preference for the locations to be close to bellmouth accesses and preferably the primary access

route. The latter reduces travel distances for greater efficiency and reduced construction effects.

8.4.3 The size of the Project's proposed temporary compounds vary depending on purpose. Indicative temporary compound layouts are shown in the following plans:

- NHHM-NG-ENG-DWG-0016 Illustrative Construction Compound (Satellite)
- NHHM-NG-ENG-DWG-0017 Illustrative Construction Compound (Main)

8.5 Work by Third Parties

8.5.1 When undertaking temporary works, National Grid has considered all relevant live planning applications that were available on the planning register as of 6 November 2024 in line with the latest Project design cut off (31 October 2024). Any subsequent submission of further development proposals will be considered following Statutory Consultation.

8.5.2 National Grid is aware of Distribution Network Operator (DNO) utilities and customer connections that will require future works, these projects are considered within **PEIR Chapter 21 (Cumulative Effects)**.

9. Next Steps

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9. Next Steps

9.1 Introduction

9.1.1 As the earlier chapters have discussed, the Project has evolved as a result of the non-statutory consultation held in 2023, the localised non-statutory consultation held in 2024, and the ongoing assessment of environmental, socio-economic and technical considerations. This work has led to the development of the preferred alignment which will be the subject of the statutory consultation.

9.2 Statutory Consultation, review of consultation feedback and ongoing survey and assessment work

9.2.1 National Grid will be undertaking the statutory consultation on the Project's current proposals and the preferred alignment between 18 February and 15 April 2025. Following the close of statutory consultation all feedback will be reviewed and considered. Further detailed assessments and studies will continue to inform the preferred alignment. These will include environmental assessments and surveys. These assessments and surveys, together with feedback received during the statutory consultation period will inform and refine the location and design of the substations, compounds, pylon positions and temporary construction locations of the Project.

9.3 Substations Consenting Strategy

9.3.1 The Project would need to connect to two new substations – one at Creyke Beck, Cottingham, (known as Birkhill Wood Substation) in the East Riding of Yorkshire and a new substation at High Marnham in Nottinghamshire (part of a project called 'Brinsworth to High Marnham'). National Grid intends to apply for planning permission for the two new 400kV substations from the relevant local planning authorities under the Town and Country Planning Act.

9.3.2 In 2025, a planning application is intended to be submitted to East Riding of Yorkshire Council for the new Birkhill Wood substation. In 2025, a planning application is intended to be submitted to Bassetlaw District Council for the new High Marnham substation. Separate pre-application public consultations have been undertaken for the substation applications ahead of these planning applications being submitted.

9.3.3 While the new substations did not form part of our proposals for North Humber to High Marnham during non-statutory consultation, we have made the decision to include both substations within the stage 2 (statutory) consultation for the Project. This approach allows National Grid to demonstrate that the Project can be delivered and that it can connect into the national transmission network.

9.3.4 National Grid is obligated to meet certain timescales for the delivery of the network reinforcement through the proposed new 400kV overhead line, and the substations are integral to this. The inclusion of the substations within the Project does not change our intention to continue to progress with the separate planning applications for each substation, and it does not affect our continuing discussions and negotiations with relevant landowners and interested parties. We are committed to, and fully intend to

pursue and deliver, the substations pursuant to those permissions and land agreements.

9.3.5 National Grid will continue to keep this approach under review as the Project progresses. The new proposed substations will play an important role in building a more secure and resilient future energy system.

9.4 Mitigation Measures

9.4.1 As discussed throughout this report there will be a need for some mitigation measures to be incorporated into the Project to reduce its potential effects. These mitigation measures are to be informed by ongoing assessments, field surveys and feedback. These measures will be taken forward into the Project's DCO application submission.

9.5 Environmental Impact Assessment

9.5.1 The Project continues to be the subject of Environmental Impact Assessments (EIA), and National Grid will continue engagement with stakeholders, interested parties and members of the public. The EIA will continue to be developed and inform Project decisions, this progress and assessment will be presented in the Environmental Statement which will form part of the DCO application submission.

9.6 The DCO application timeline

9.6.1 Following the upcoming statutory consultation period, which will take place between 18 February and 15 April 2025, the obtained consultation feedback in combination with continuing technical and environmental considerations will inform the development of the DCO application documents. Once finalised, the DCO application will be submitted to the Planning Inspectorate. According to the current programme, DCO submission is targeted for 2026. Once submitted, the Planning Inspectorate will assess whether the application will be accepted within the statutory determination period of 28 days. If accepted the pre-examination phase will commence in which members of the public[24], local authorities and others can continue to take part in each stage of the NSIP process.

[24] Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: The stages of the NSIP process and how you can have you say. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-the-stages-of-the-nsip-process-and-how-you-can-have-your-say

Appendix A
Local Design Policies

Local Policy Document	Policy Reference	Policy Context
East Riding Local Plan – Local Design Policies		
East Riding Local Plan 2012 – 2029 (Adopted 2016)	Policy EC4 – Enhancing sustainable transport	Policy EC4 states that: C. The number of parking spaces for all new development should reflect: 1. The level of public transport accessibility; 2. The expected car usage on the site; and 3. The most efficient use of space available and promotion of good design.
	Policy ENV1 – Integrating high quality design	Policy S2 on addressing climate change states the strategy of encouraging 'high standards of sustainable design and construction which ENV1 involve the prudent and efficient use of natural resources and built-in resilience to the impacts of climate change' Policy ENV1 states that: A. All development proposals will: 1. Contribute to safeguarding and respecting the diverse character and appearance of the area through their design, layout, construction and use; and 2. Seek to reduce carbon emissions and make prudent and efficient use of natural resources, particularly land, energy and water. B. Development will be supported where it achieves a high quality of design that optimises the potential of the site and contributes to a sense of place. This will be accomplished by: 1. Having regard to the specific characteristics of the site's wider context and the character of the surrounding area;

Local Policy Document	Policy Reference	Policy Context
		2. Incorporating an appropriate mix of uses on the site; 3. Having an appropriate scale, density, massing, height and material; 4. Having regard to the amenity of existing or proposed properties; 5. Having an adaptable layout for sites and/or buildings that takes into account the needs of future users; 6. Having regard to healthy lifestyles; 7. Incorporating energy efficient design and arrangements to manage waste; 8. Incorporating hard and/or soft landscaping, alongside boundary treatment of an appropriate scale and size, to enhance the setting of buildings, public space and views; 9. Promoting equality of safe access, movement and use; 10. Having regard to features that minimise crime and the perception of crime; 11. Considering the use of public art, where the sense of place and public access or view would justify it; 12. Ensuring infrastructure, including green infrastructure and flood mitigation, are well integrated into the development; 13. Incorporating, where possible, nature conservation and biodiversity enhancement into the development; 14. Paying attention to the use of local materials, architectural styles and features that have a strong association with the area's landscape, geology and built form, with particular attention to heritage assets; and 15. Safeguarding the views and setting of outstanding built and natural features and skylines within and adjoining the East Riding, including those features identified in Policies A1-A6. C. Innovative design incorporating new materials and technologies will be supported where the local context and sub areas, with their diverse landscapes, geologies, historical background and built form, have been fully considered as part of the design process.

Local Policy Document	Policy Reference	Policy Context
		D. Where possible, the design of development that maximises the use of decentralised and renewable or very low carbon technologies will be supported. This includes expecting that: 1. Chosen technology(ies) will be operationally suitable for the development, visually acceptable and not unduly harm amenity; and 2. Larger developments will consider how to contribute/share technologies to meet part of their energy needs, and/or increase the sustainability of existing or new development nearby, and be capable of being adapted over time to further upgrade energy efficiency and allow alternative occupancy and/or use.
	Policy ENV5 – Strengthening green infrastructure	Policy ENV5 states that: A. Development proposals should: 1. Incorporate existing and/or new green infrastructure features within their design; and 2. Capitalise on opportunities to enhance and/or create links between green infrastructure features such as those listed in Table 10. Links should be created both on-site and, where possible, with nearby green infrastructure features. B. Development proposals within, or in close proximity to, a green infrastructure corridor should enhance the functionality and connectivity of the corridor.
East Riding Local Plan Strategy Documents Update – Draft (May 2021)	Policy S2 – Addressing climate change	Policy S2 states that: Development proposals will be supported where they contribute to a reduction in greenhouse gas emissions and incorporate adaptation to the expected impacts of climate change. This will be accomplished by: ... G. Incorporating high standards of sustainable design and construction which involve the prudent and efficient use of natural resources and built-in resilience to the impacts of climate change (e.g. overheating, flood risk).

Local Policy Document	Policy Reference	Policy Context
	Policy ENV1 – Integrating high quality design	A. All development proposals will: 1. Contribute to safeguarding and respecting the diverse character and appearance of the area through their design, layout, construction and use; and 2. Seek to reduce carbon emissions and make prudent and efficient use of natural resources, particularly land, energy and water. B. Development will be supported where it achieves a high quality of design that optimises the potential of the site and contributes to a sense of place. This will be accomplished by: 1. Having regard to the specific characteristics of the site's wider context and the character of the surrounding area; 2. Incorporating an appropriate mix of uses on the site; 3. Having an appropriate scale, density, massing, height and material; 4. Having regard to the amenity of existing or proposed properties; 5. Having regard to the potential impact of a proposal on existing uses in the surrounding area; 6. Having an adaptable layout for sites and/or buildings that takes into account the needs of future users; 7. Having regard to healthy lifestyles; 8. Incorporating energy efficient design and arrangements to manage waste; 9. Incorporating hard and/or soft landscaping, alongside boundary treatment of an appropriate scale and size, to enhance the setting of buildings, public space and views; 10. Promoting equality of safe access, movement and use, including minimising highway safety risks; 11. Having regard to features that minimise crime and the perception of crime; 12. Considering the use of public art, where the sense of place and public access or view would justify it;

Local Policy Document	Policy Reference	Policy Context
		13. Ensuring infrastructure, including green infrastructure and flood mitigation, are well integrated into the development; 14. Incorporating, where possible, nature conservation and biodiversity enhancement into the development; 15. Incorporating, where possible, a reduction in the vulnerability and increase in resilience to climate change; 16. Paying attention to the use of local materials, architectural styles and features that have a strong association with the area's landscape, geology and built form, with particular attention to heritage assets; and 17. Safeguarding the views and setting of outstanding built and natural features and skylines within and adjoining the East Riding, including those features identified in Policies A1-A6. C. Innovative design incorporating new materials and technologies will be supported where the local context and sub areas, with their diverse landscapes, geologies, historical background and built form, have been fully considered as part of the design process. D. Where possible, the design of development that minimises the demand for energy and maximises the use of decentralised and renewable or very low carbon technologies will be supported. This includes expecting that: 1. Chosen technology(ies) will be operationally suitable for the development, visually acceptable and not unduly harm amenity; and 2. Larger developments will consider how to contribute/share technologies to meet part of their energy needs, and/or increase the sustainability of existing or new development nearby, and be capable of being adapted over time to further upgrade energy efficiency and allow alternative occupancy and/or use.
	Policy ENV5 – Strengthening blue/green infrastructure	A. Development proposals will:

Local Policy Document	Policy Reference	Policy Context
		1. Incorporate a comprehensive design that is underpinned by its consideration of existing and new blue/green infrastructure features, including those features required by policies ENV1, 2, 3, 4, 6 and C3; 2. Capitalise on opportunities to: i. Enhance and/or create links between blue/green infrastructure features such as those listed in Table 14. Links should be created both on-site and, where possible, with nearby blue/green infrastructure features; and ii. Utilise potential multifunctional benefits of blue/green infrastructure features.
Draft East Riding Design Code (October 2024)	Guidance G1 – Green Infrastructure	Designing green infrastructure to perform multiple functions will deliver schemes that make efficient use of land and are cost effective. Combining recreation, movement, drainage and enhancing biodiversity in the same space will maximise benefits and make the best use of space available. A well-connected and multifunctional green infrastructure system should be integrated holistically into the landscape design. This should incorporate: • public open spaces (see Chapter 5); • movement network (see Chapter 4 and Chapter 7); • SuD's network (see 3.4 Sustainable Drainage); • wildlife habitat network (see 3.2 Biodiversity), and; • development edges, to blend seamlessly with green infrastructure outside of the site (for a more comprehensive list see table 10 of the East Riding Local Plan). Green infrastructure should be designed to integrate existing neighbouring areas and future developments. Public open spaces and streets should include new trees and landscaping elements that complement and enhance existing features while mitigating any negative impacts caused by the new development.

Local Policy Document	Policy Reference	Policy Context
		Connecting green infrastructure will maximise benefits, create resilience and provide continuous corridors for wildlife and movement of people. The green infrastructure system should connect existing and proposed natural and semi-natural spaces, including: • open spaces; • wooded areas, • tree belts and hedgerows; • wildlife habitats; • green corridors; • SuDS and water bodies. The National Urban Greening Factor should be met as follows: • 0.3 for commercial development, • 0.4 for residential development and • 0.5 for residential greenfield development Guidance on using the urban greening factor is set out in Natural England's Green Infrastructure Framework. For the urban greening factor, the evidence of calculations should be submitted with applications
	Guidance G2 – Biodiversity	To improve biodiversity on site, a network should be created, that connects existing and proposed wildlife habitats. These should be integrated into the green and blue infrastructure network. Throughout the whole site, including public and private spaces, development should: • retain, protect and enhance existing natural features such as trees, hedgerows, wildflower meadows and water courses; • protect and create wildlife habitats and corridors through whole sites, connecting to green infrastructure outside of the site boundary (see 3.1 Green Infrastructure); • use existing hedgerows, amending any gaps, to define boundaries and create wildlife corridors linking these to other wildlife habitats;

Local Policy Document	Policy Reference	Policy Context
		• include native trees and plants in landscaping schemes; • enhance resilience by including climate-resistant trees and plants in landscaping schemes; • use retained trees and include additional trees in car parking, communal areas inside blocks and into streets; • integrate sustainable drainage plans with landscaping and use the SuDS solutions designed into the site to promote biodiversity; • integrate green walls and green roofs; • use brown roofs; • include locally appropriate wildflower and species-rich planting; • include integrated bat and swift bricks supplemented with species specific nest boxes where appropriate. The use of generic bird boxes is discouraged.
	Guidance G3, Codes C1 to C3 - Trees and Hedgerows	Guidance G3 states that: Trees and hedgerows should be retained and their provision should be increased wherever possible, for their holistic benefits to the function and performance of both the built and natural environment, as well as physical and mental wellbeing. Tree planting should reflect native and climate resistant species (see The Trees and Design Action Group, TDAG, for further information). Code C1 states that: Existing category A and B trees within the development site must be retained. Code C2 states that: When there is the need to remove existing trees (of any category) they must be replaced on-site on a 1:2 ratio. Code C3 states that: A minimum of 75% of new trees planted as part of landscaping proposals must be within the public realm.

Local Policy Document	Policy Reference	Policy Context
	Code C5 – Sustainable Drainage	Code C5 states that: Sustainable Drainage Systems (SuDS) must be embedded in the site layout and be fully integrated within the green infrastructure system.
	Code C6 – Renewable energy	Code C6 states that: At least one form of on-site renewable energy must be delivered where development includes new buildings.
North Lincolnshire Council – Local Design Policies		
The North Lincolnshire Local Plan – Saved 2003 Local Plan Policies (October 2024)	DS1 – General Requirements	A high standard of design is expected in all developments in both built-up areas and the countryside and proposals for poorly designed development will be refused. All proposals will be considered against the criteria set out below: Quality of Design A. The design and external appearance of the proposal should reflect or enhance the character, appearance and setting of the immediate area; and i. the design and layout should respect and where possible retain and/or enhance the existing landform of the site Amenity i. No unacceptable loss of amenity to neighbouring land uses should result in terms of noise, smell, fumes, dust or other nuisance, or through the effects of overlooking or overshadowing; and ii. amenity open space in the area should be retained, wherever possible; and iii. no pollution of water, air or land should result which poses a danger or creates detrimental environmental conditions. Where appropriate, conditions will be imposed requiring the provision of landscaping to enhance new development. Conservation i. There should not be an adverse effect on features of acknowledged importance, on or surrounding, the site, including species of plants and animals of nature conservation value (particularly species protected by Schedules 1, 5 and 8 of the

Local Policy Document	Policy Reference	Policy Context
		Wildlife and Countryside Act 1981), Scheduled Ancient Monuments, archaeological remains, listed buildings and Conservation Areas or trees and woodland covered by Tree Preservation Orders; and ii. the development must ensure the retention of those existing site features that make an important contribution to the character or amenity of the site or the surrounding area; and iii. development proposals should include the results of archaeological assessment, where appropriate, and adequate measures to ensure that there would be no unacceptable impacts on archaeological remains. Conditions will be imposed to secure suitable mitigation at the appropriate time in the development process. Resources i. There should be no conflict with an allocated or approved land-use proposal in the locality nor should the reasonable potential for development of a neighbouring site be prejudiced; and ii. the location and design of developments on the urban fringe (sites adjoining settlement development limits) should take into account the need to minimise the impact of the development on adjoining agricultural land or other countryside interests; and iii. measures to conserve energy will be expected in: A. the design, orientation and layout of buildings; and B. the location of development; and C. improvements to the transport network and in the management of traffic. Utilities and Services i. There should be no reliance on public finances being available to provide infrastructure and services; and

Local Policy Document	Policy Reference	Policy Context
		ii. suitable on-site drainage should be provided and where there are off-site drainage problems the developer will be expected to overcome them
	DS3 – Planning Out Crime	New development should take into account personal safety and the security of people and property by: i. ensuring that paths, play areas and open spaces are overlooked by inhabited buildings while maintaining the privacy of inhabitants; and ii. avoiding the creation of spaces with ill-defined ownership and ensure there is a clear distinction between public open space and private open space; and iii. ensuring the development is well integrated into the existing pattern of pedestrian and vehicular movement; and iv. ensuring that dark or secluded areas are not created by landscaping, planting or building; and v. ensuring that streets and paths are adequately lit.
	DS12 – Light Pollution	Planning applications which involve light generating development including floodlighting will only be permitted where it can be demonstrated that there would be no adverse impact on local amenities.
	DS17 – Overhead Power Lines and High Powered Electrical Installations	The Council will seek to minimise the environmental effects of proposals for overhead power lines of 132kv or over, and high-powered electrical installations. The Council will not support such development within or in locations where the development would have a detrimental impact upon the following areas: i. Special Protection Areas, Special Areas of Conservation and Ramsar sites; ii. SSSIs or other statutory nature conservation sites; iii. Conservation Areas and sites and buildings of historic or archaeological interest, including listed buildings and scheduled monuments;

Local Policy Document	Policy Reference	Policy Context
		iv. existing committed or allocated housing areas. In view of the substantial practical, technical and cost disadvantages involved, it is only in exceptional circumstances that the Council will seek to have lines placed underground, where this is not damaging to sites of nature conservation value or archaeological importance. Careful line routing will usually be the most appropriate way to minimise the visual impact of high voltage power lines. To ensure a satisfactory built environment the Council will have regard to the amenity of potential future occupiers in determining applications for development close to overhead power lines.
	DS21 – Renewable Energy	Proposals for the generation of energy from renewable resources will be permitted provided that: i. any detrimental effect on features and interests of acknowledged importance, including local character and amenity, is outweighed by environmental benefits; and ii. proposals include details of associated developments including access roads and other ancillary buildings and their likely impact upon the environment. Where appropriate, conditions will be imposed requiring the restoration of the site to its original condition or the implementation of an agreed scheme of after-use and restoration.
North Lincolnshire Council *Design in the Countryside SPG* – May 2003	Landscaping Planting	The immediate setting for development in the countryside is defined by the boundaries of the site. Where boundaries are to be created or replaced it is appropriate to use native hedging protected from stock and wildlife as appropriate to the situation, by post and rail fencing and tree guards. In some cases native standard trees may be included as part of the hedge. In order to maintain local habitats and conserve the distinctive natural heritage of the countryside it is important that new tree and shrub planting should be of native, predominantly deciduous species. Certain trees relate to specific locations and, if

Local Policy Document	Policy Reference	Policy Context
		there is any doubt about the most appropriate choice of tree or shrub for a locality, North Lincolnshire Council's Environment Team will be able to provide advice. Tree planting may be inappropriate on or near to a Site of Special Scientific Interest (SSSI) or Site of Importance for Nature Conservation (SINC), or where archaeological remains are likely to be encountered. For advice and/or guidance contact North Lincolnshire Council. It is of most value to wildlife if planting is undertaken in substantial belts or groups of trees linked to existing hedgerows or copses to provide wildlife corridors. Planting within existing hedgerows and new hedge planting is also important and, if space permits, woodland planting of native species will be encouraged though the design of planting should be in keeping with the local landscape character. The following species will be welcomed for their wildlife value.
Bassetlaw District Council – Local Design Policies		
Bassetlaw Local Plan 2020-2038 (Adopted May 2024	Policy ST33 – Design Quality	1. All development must be of a high quality design that: a) has a clear function, character and identity based upon a robust understanding of local context, constraints and distinctiveness, while reflecting the principles of relevant national and local design guidance, including Sport England's Active Design principles, the Bassetlaw Design Quality SPD and the Bassetlaw Design Code; b) uses land efficiently and ensures density reflects local character: i. within the Main Towns of Worksop, Retford and Harworth & Bircotes the density on sites in and adjoining town centres and transport hubs should be maximised, whilst densities elsewhere within the development boundary should be a minimum of 30 dwellings per hectare (net) unless it would result in an adverse effect on the character of the area, including the setting of a heritage asset and/or the integrity of a natural asset;

Local Policy Document	Policy Reference	Policy Context
		ii. within the Large Rural Settlements and Small Rural Settlements densities should reflect the character of the settlement and local housing needs, unless otherwise promoted through a neighbourhood plan; iii. HS1: Peaks Hill Farm and HS13: Ordsall South will be expected to deliver a range of housing densities across each site informed by the site's masterplan framework, design code and density plan; c) where appropriate, positively preserves, enhances and integrates landscape and townscape features, and natural and heritage assets; d) respects the local context and complements the landform, layout, building orientation, scale, height, massing, type, materials, details and landscaping of the surrounding areas; e) maximises opportunities to create mixed-use developments which support the function and vitality of the area in which they are located; f) for housing, provides a high standard of accommodation, and does not differentiate between the design quality of market and affordable housing; g) integrates well with surrounding streets and open spaces, provides a clear and legible hierarchy of streets, routes and spaces that prioritises safe, easy and direct pedestrian, cycle and public transport movement, while ensuring the safe, convenient movement of all highway users; h) ensures that all the community, including those with disabilities, can easily and safely access buildings and spaces and move around; i) creates safe communities and reduces the likelihood of crime and the fear of crime through maximising natural surveillance and where appropriate use of active ground floor frontages and lighting; j) incorporates and/or links to a well-defined green/blue infrastructure network of well-managed and maintained public and open spaces; k) secures a high quality public realm that is attractive and aesthetically pleasing, that clearly distinguishes between public and private spaces; l) enhances the value of the District's Nature Recovery Network such as through the use of street trees;

Local Policy Document	Policy Reference	Policy Context
		m) incorporates high quality landscape design and maximises opportunities for greening, particularly where a development site adjoins the countryside; n) is sustainable in design and construction, and utilises modern construction methods and durable materials, where practicable; o) minimises energy consumption by maximising opportunities for passive solar energy and integrating renewable and low carbon technologies where practicable in accordance with Policy ST49; p) mitigates flood risk and water run-off utilising the drainage hierarchy in accordance with Policy ST50, and integrates water management appropriate to place; q) ensures an appropriate level of well-integrated, convenient and visually attractive areas for motor vehicle and cycle parking informed by the most up-to-date Nottinghamshire Parking Standards unless it can be demonstrated that it is not viable or feasible to do so; and provides for external storage including waste disposal; 2. Where neighbouring or functionally linked sites come forward together, applicants will be expected to work together to ensure that proposals are, or can be, properly integrated.
	Policy ST48 – Reducing Carbon Emissions, Climate Change Mitigation and Adaptation	1. All proposals, including the change of use of existing buildings and spaces, should be designed to improve resilience to the anticipated effects of climate change taking into account the design principles in the Bassetlaw Design Quality SPD and the Bassetlaw Design Code. Proposals should incorporate, where appropriate, the following measures that address issues of climate change mitigation and adaptation through: a) ensuring no unacceptable adverse impact on local air quality; b) designing layouts so that the orientation of buildings and spaces maximise opportunities for solar gain; c) providing space for habitats and species to move through the landscape and for the operation of natural processes to occur;

Local Policy Document	Policy Reference	Policy Context
		d) where possible, minimising the use of natural resources over the development's lifetime, such as minerals and consumable products, by reuse or recycling of materials in construction, and by making the best use of existing buildings and infrastructure; e) adapting surface materials and drainage design to reduce the risk of flooding to land, property and people as a result of more extreme rainfall in accordance with Policy ST50; f) using integrated water management systems to manage runoff and provide a non-potable water supply; g) providing green/blue infrastructure, and where possible, retaining existing trees and woodlands to reduce the 'urban heating effect' during warmer summers; h) using urban greening methods within the design of new buildings. 2. All new non residential development of 1000sqm floorspace or more will be required to meet the BREEAM very good-excellent standards or equivalent. 3. All new residential development in the District should promote water efficiency by meeting the tighter Building Regulations optional requirement of 110 litres/person/day. 4. All major development will be required to make provision for 5 trees per dwelling or per 1,000 sqm of non-residential floorspace on site, or if on site provision is not practicable then an equivalent financial contribution will be sought to enable provision of new native trees and/or the protection and enhancement of ancient and veteran woodland within the District.
Bassetlaw Design Quality Supplementary Planning Document (SPD) (Non-adopted and unpublished)		The Bassetlaw Design Quality SPD referenced in Policy ST33 of the Local Plan will set out additional detailed guidance to developers, housebuilders and the community on the Council's approach to delivering high quality design in new development. This will include residential and non-residential development, the built environment and green infrastructure. The Bassetlaw Design Code referenced in Policy ST33 will also be published as part of the Design Quality SPD following adoption of the Local Plan. As of October 2024, a draft of the SPD is not available for consultation for formal adoption. The SPD thus has not had materiality in the determination of planning

Local Policy Document	Policy Reference	Policy Context
		applications. Paragraph 8.1.9 of the Local Plan states that the principles of the National Design Guide 2019 will take effect in the meantime.
Newark and Sherwood District Council – Local Design Policies		
Newark and Sherwood Amended Core Strategy (Adopted March 2019)	Core Policy 9 – Sustainable Design	The District Council will expect new development proposals to demonstrate a high standard of sustainable design that both protects and enhances the natural environment and contributes to and sustains the rich local distinctiveness of the District. Therefore, all new development should: • Achieve a high standard of sustainable design and layout that is capable of being accessible to all and of an appropriate form and scale to its context complementing the existing built and landscape environments; • Through its design, pro-actively manage surface water including, where feasible, the use of Sustainable Drainage Systems; • Minimise the production of waste and maximise its re-use and recycling; • Demonstrate an effective and efficient use of land that, where appropriate, promotes the re-use of previously developed land and that optimises site potential at a level suitable to local character; • Contribute to a compatible mix of uses, particularly in the town and village centres; • Provide for development that proves to be resilient in the long-term. Taking into account the potential impacts of climate change and the varying needs of the community; and • Take account of the need to reduce the opportunities for crime and the fear of crime, disorder and anti-social behaviour, and promote safe living environments.
	Core Policy 10 – Climate Change	The District Council is committed to tackling the causes and impacts of climate change and to delivering a reduction in the Districts carbon footprint. The District Council will work with partners and developers to: • Promote energy generation from renewable and low-carbon sources, including community-led schemes, through supporting new development where it is able to demonstrate that its adverse impacts have been satisfactorily addressed. Policy

Local Policy Document	Policy Reference	Policy Context

		DM4 'Renewable and Low Carbon Energy Generation' provides the framework against which the appropriateness of proposals will be assessed;
		• Ensure that development proposals maximise, where appropriate and viable, the use of available local opportunities for district heating and decentralised energy;
		• Mitigate the impacts of climate change through ensuring that new development proposals minimise their potential adverse environmental impacts during their 63 construction and eventual operation. New proposals for development should therefore:
		  ○ Ensure that the impacts on natural resources are minimised and the use of renewable resources encouraged; and
		  ○ Be efficient in the consumption of energy, water and other resources.
		• Steer new development away from those areas at highest risk of flooding, applying the sequential approach to its location detailed in Policy DM5 'Design'. Where appropriate the Authority will seek to secure strategic flood mitigation measures as part of new development;
		• Where appropriate having applied the Sequential Test move on to apply the Exceptions Test, in line with national guidance. In those circumstances where the wider Exceptions Test is not required proposals for new development in flood risk areas will still need to demonstrate that the safety of the development and future occupants from flood risk can be provided for, over the lifetime of the development; and
		• Ensure that new development positively manages its surface water run-off through the design and layout of development to ensure that there is no unacceptable impact in run-off into surrounding areas or the existing drainage regime

Newark and Sherwood Plan Review Amended Allocations and Development Management DPD	Policy DM4 – Renewable and Low Carbon Energy Generation	In order to achieve the commitment to carbon reduction set out in Core Policy 10, planning permission will be granted for renewable and low carbon energy generation development, as both standalone projects and part of other development, its associated infrastructure (including battery storage) and the retro-fitting of existing development, where its benefits are not outweighed by detrimental impact from the

Local Policy Document	Policy Reference	Policy Context
(Published November 2022 and non-adopted)		operation and maintenance of the development and through the installation process upon: 1. The landscape character or urban form of the district or the purposes of including land within the Green Belt arising from the individual or cumulative impact of proposals; 2. Southwell Views as defined in Policy So/PV or the setting of the Thurgarton Hundred Workhouse, as defined in Policy So/Wh; 3. Heritage Assets and or their settings; 4. Amenity, including noise pollution, shadow flicker and electro-magnetic interference; 5. Highway safety; 6. The ecology of the local or wider area; or 7. Aviation interests of local or national importance. Applications to develop new wind energy schemes involving turbines of sufficient size to require planning permission will only be considered acceptable: • In areas identified set away from sensitive receptors and identified as suitable for wind energy development in the Development Plan; • Where it is demonstrated that the local community has been consulted and are supportive; and • Where the planning impacts identified by the affected local community have been fully addressed.
	Policy DM5(a) – The Design Process	The District Council will expect the following design process to be adopted for all proposed development (with the exception of householder development). Such development proposals shall be informed by, and respond to, a robust site and contextual appraisal that will involve identifying constraints and opportunities. New residential development will also need to perform positively against Building for a Healthy Life (or any successor version of the tool) and the National Design Guide. The Design Process

Local Policy Document	Policy Reference	Policy Context
		Design Stage 1: Understanding the site and its context; identifying and responding to opportunities and constraints. Design Stage 2: Creating a vision for the development. Design Stage 3: Exploring ideas and options. Design Stage 4: Developing detailed designs. Development will be supported where the application material demonstrates that the site and its context has been understood and respected; with opportunities and constraints identified, considered and responded to appropriately. Applications should provide evidence of each stage from the outset (where appropriate) and whilst there is flexibility for schemes to evolve as part of this process, it is important that design and layout is not retrofitted. For all developments (with the exception of householder developments and those otherwise identified by the Council), opportunities and constraints will be encouraged to be validated through robust and meaningful engagement with the local planning authority (pre-application discussion). Developers are strongly encouraged to engage with local communities and other stakeholders at any early stage of the process, enabling them the opportunity to shape development proposals. The information required in support of applications is set out in the Council's Planning Application Local Validation Checklist.
	Polic DM5(b) – Design	In accordance with the Requirements of Core Policy 9 of the Amended Core Strategy, all proposals for new development shall be assessed against the following criteria: 1. Access Provision should be made for safe and inclusive access to new development. Integration of sustainable and active modes of travel is encouraged and, where practicable, developments should include dedicated walking and cycling corridors, connecting to existing defined routes in the surrounding area, making use of multifunctional Green Infrastructure. 3. Amenity

Local Policy Document	Policy Reference	Policy Context
		The layout of development within sites and separation distances from neighbouring development should be sufficient to ensure that neither suffers from an unacceptable reduction in amenity including overbearing impacts, loss of light and privacy. All proposals for new housing developments should demonstrate that they provide adequate internal and external space in order to ensure an appropriate living environment for future occupiers. Development proposals should have regard to their impact on the amenity or operation of surrounding land uses and where necessary mitigate for any detrimental impact. Proposals resulting in the loss of amenity space will require justification. The presence of existing development which has the potential for a detrimental impact on new development should also be taken into account and mitigated for in proposals. New development that cannot be afforded an adequate standard of amenity or creates an unacceptable standard of amenity will be resisted. 4. Local Distinctiveness and Character The rich local distinctiveness of the District's landscape and character of built form should be reflected in the scale, form, mass, layout, design, materials and detailing of proposals for new development. In accordance with Core Policy 13 of the Amended Core Strategy, all development proposals will be considered against the assessments contained in the Landscape Character Assessment Supplementary Planning Document. Proposals creating backland development will only be approved where they would be in-keeping with the general character and density of existing development in the area, and would not set a precedent for similar forms of development, the cumulative effect of which would be to harm the established character and appearance of the area. Inappropriate backland and other uncharacteristic forms of development will be resisted. Where local distinctiveness derives from the presence of heritage assets, proposals will also need to satisfy Policy DM9. 5. Public Realm New development should create new or strengthen existing street and public space networks; where appropriate assisting in the delivery of the Council's Open Space Assessment & Strategy. New development shall contribute positively towards creating

Local Policy Document	Policy Reference	Policy Context
		a well-defined, well-used, safe and attractive public realm, including tree lined streets where possible. The interface between buildings and the public realm is of critical importance and should have strong boundary treatments or well resolved threshold spaces with opportunities for natural surveillance required. The quality of the public realm will be negatively affected where threshold design (and in particular, the storage of recycling and waste containers) has been poorly considered. The District Council will seek to ensure that the quality of the public realm is safeguarded through carefully considered solutions relating to: • boundary demarcations • changes in level • utility boxes and flues • recycling and waste storage, and • car parking. Development proposals which affect, or add to, the public realm should create a well-defined, easily navigable and accessible network of streets and spaces and ensure that convenient access is provided for all users whilst prioritising the needs of pedestrians, cyclists, public transport users, and people with a range of disabilities, and emergency and service vehicles. 6. Trees, Woodland, Biodiversity and Green and Blue Infrastructure In accordance with Core Policy 12 of the Amended Core Strategy, all natural features within or adjacent to development sites should not be unnecessarily adversely impacted and development should first seek to respect existing features before the Council will consider removal of such features. The starting point should be through integration and connectivity of Green Infrastructure to deliver multi-functional benefits and should be incorporated into a landscaping scheme that mitigates any loss and / or the effects of the development on the local landscape. A holistic approach shall be adopted with respect to the design and integration of green and blue infrastructure into new development, creating

Local Policy Document	Policy Reference	Policy Context
		opportunities for habitat creation, water management and attractive and memorable places. 7. Ecology Where it is apparent that a site may provide a habitat for protected species, development proposals should be supported by an up-to-date ecological assessment, including a Habitat Survey and a survey for species listed in the Nottinghamshire Biodiversity Action Plan. Significantly harmful ecological impacts should be avoided through the design, layout and detailing of the development with mitigation, and as a last resort, compensation (including off-site measures), provided where significant impacts cannot be avoided. New Development should deliver an evidenced net gain in biodiversity appropriately integrated into design and layout in accordance with Policy DM7. 9. Unstable Land Development proposals within the current and historic coal mining areas of the District should take account of ground conditions, land stability and mine gas, and where necessary include mitigation measures to ensure they can be safely implemented. 10. Flood Risk and Water Management The Council will, in line with Policy DM5(c)aim to steer new development away from areas at highest risk of flooding. Development proposals within Environment Agency Flood Zones 2 and 3 and areas with critical drainage problems will only be considered where it constitutes appropriate development and it can be demonstrated, by application of the Sequential Test, that there are no reasonably available site in lower risk Flood Zones. Where development is necessary within areas at risk of flooding it will also need to satisfy the Exception Test by demonstrating it would be safe for the intended users without increasing flood risk elsewhere and where possible, pursue opportunities to reduce flood risk overall. All application for new development shall demonstrate that all surface water discharges have been carried out in accordance with the principles laid out within the

Local Policy Document	Policy Reference	Policy Context
		drainage hierarchy, in such that a discharge to the public sewerage systems are avoided, where possible. All major developments shall ensure that Sustainable Drainage Systems (SuDS) for the management of surface water run-off are put in place unless demonstrated to be inappropriate. All schemes for the inclusions of SuDS should demonstrate they have considered all four aspects of good SuDS design, Quantity, Quality, Amenity and Biodiversity, and the SuDS and development will fit into the existing landscape. The completed SuDS schemes should be accompanied by a maintenance schedule detailing maintenance boundaries, responsible parties and arrangements to ensure that the SuDS are maintained in perpetuity. Where possible, all non-major development should look to incorporate these same SuDS principles into their designs. 14. Design SPD Further guidance will be set out within a SPD to be prepared by the Council in accordance with the NPPF and the National Model Design Code Requirement.

Appendix B
Indicative wireline visualisations

The following illustrative views were used to help inform professional judgment when considering the appropriateness of alternative pylon forms from a landscape and visual perspective.

The first image in each view illustrates an overhead line constructed using the standard lattice pylon form, the second illustrates the same line using ‘low height’ lattice pylons and the third image illustrates the same line using T-pylons.

The alignment and pylon positions assumed at the time differ in detail from those now proposed. **As such these views are not intended to illustrate the current proposed Project design, as presented in February 2025.**

Illustrative views of the proposed Project design have been produced to support statutory consultation.

View 1 - Route Section 2 (looking from Risby Hall Registered Park and Garden)

Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using 'low height' lattice pylons

Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 2 - Route Section 3

Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using ‘low height’ lattice pylons

Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 3 - Route Section 5 (looking from Fockerby)

Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using 'low height' lattice pylons

Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 4 - Route Section 5 (looking from Luddington Church)

Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using 'low height' lattice pylons

Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 5 - Route Section 7

Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using ‘low height’ lattice pylons

Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 6 - Route Section 8 (looking west from the Chesterfield Canal)

Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using 'low height' lattice pylons

Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 7 - Route Section 9 (looking from Beacon Hill, Gringley on the Hill)

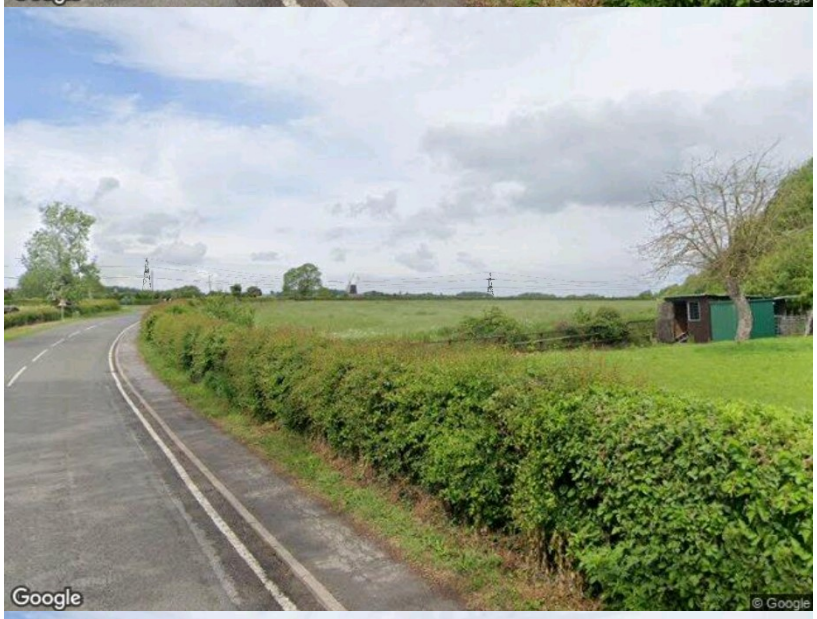
Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using ‘low height’ lattice pylons

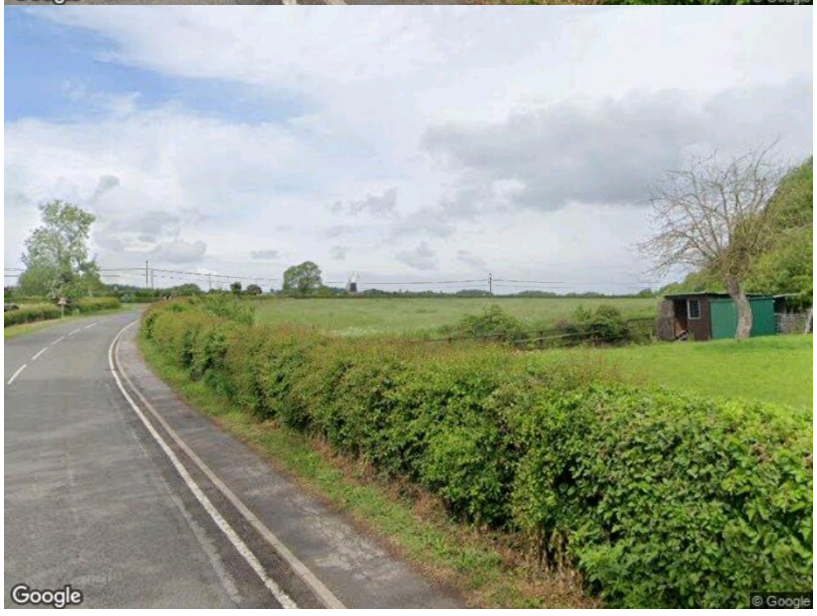
Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 8 - Route Section 10 (looking west towards the North Leverton Windmill)

Illustrative wireline image of an overhead line constructed using the standard lattice pylon



Illustrative wireline image of an overhead line constructed using 'low height' lattice pylons



Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 9 - Route Section 10 (looking east from Treswell Woods)

Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using 'low height' lattice pylons

Illustrative wireline image of an overhead line constructed using T-pylon style pylons

View 10 - Route Section 10 (looking east from Darlton)

Illustrative wireline image of an overhead line constructed using the standard lattice pylon

Illustrative wireline image of an overhead line constructed using 'low height' lattice pylons

Illustrative wireline image of an overhead line constructed using T-pylon style pylons

Appendix C
Wireline Visualisations at Ellerker

The following illustrative views were used to help inform professional judgment when considering the appropriateness of the preferred alignment from a landscape and visual perspective at Ellerker.

The alignment and pylon positions assumed at the time differ in detail from those now proposed. **As such these views are not intended to illustrate the current proposed Project design, as presented in February 2025.**

Illustrative views of the proposed Project design have been produced to support statutory consultation.

Ellerker North – Existing

Wireline – Indicative Alignment within Graduated Swathe

Visualisation of Indicative Alignment within Graduated Swathe

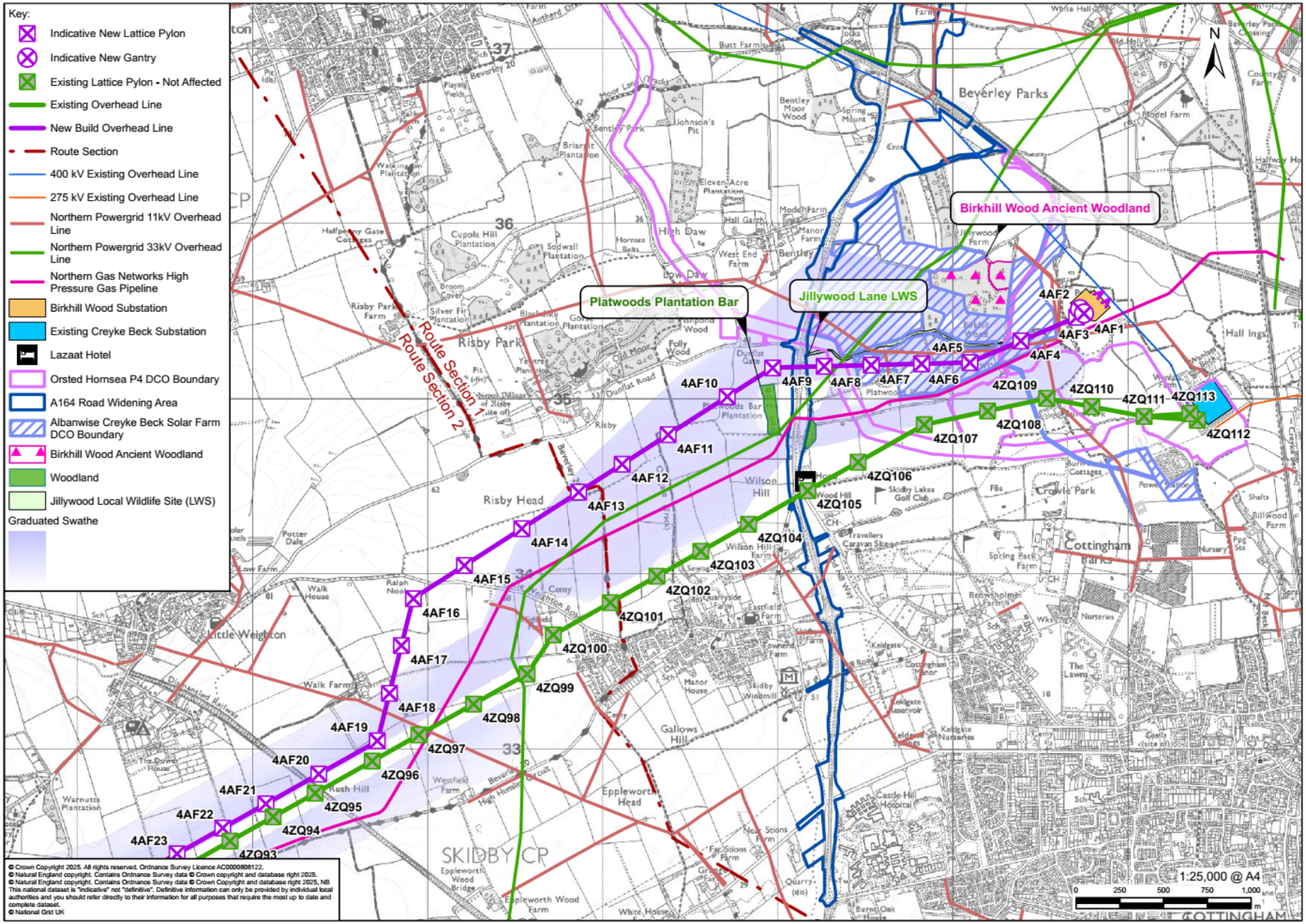
Ellerker North – Existing

Wireline – Indicative South Parallel Alignment identified and considered following feedback from non-statutory consultation

Visualisation of Indicative South Parallel Alignment identified and considered following feedback from non-statutory consultation

Appendix D
Chapter 7 (Development of the Preferred Alignment) Inset Figures

The following figure insets are larger versions of preferred alignment Route Sections referenced in Chapter 7 of this report and include: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Northern Powergrid 11kV Overhead Line
Northern Powergrid 33kV Overhead Line
Northern Gas Networks High Pressure Gas Pipeline
Birkhill Wood Substation
Existing Creyke Beck Substation
Lazaat Hotel
Orsted Hornsea P4 DCO Boundary
A164 Road Widening Area
Albanwise Creyke Beck Solar Farm DCO Boundary
Birkhill Wood Ancient Woodland
Woodland
Jillywood Local Wildlife Site (LWS)
Graduated Swathe
Birkhill Wood Ancient Woodland
Platwoods Plantation Bar
Jillywood Lane LWS
Route Section 1
Route Section 2
4AF1
4AF2
4AF3
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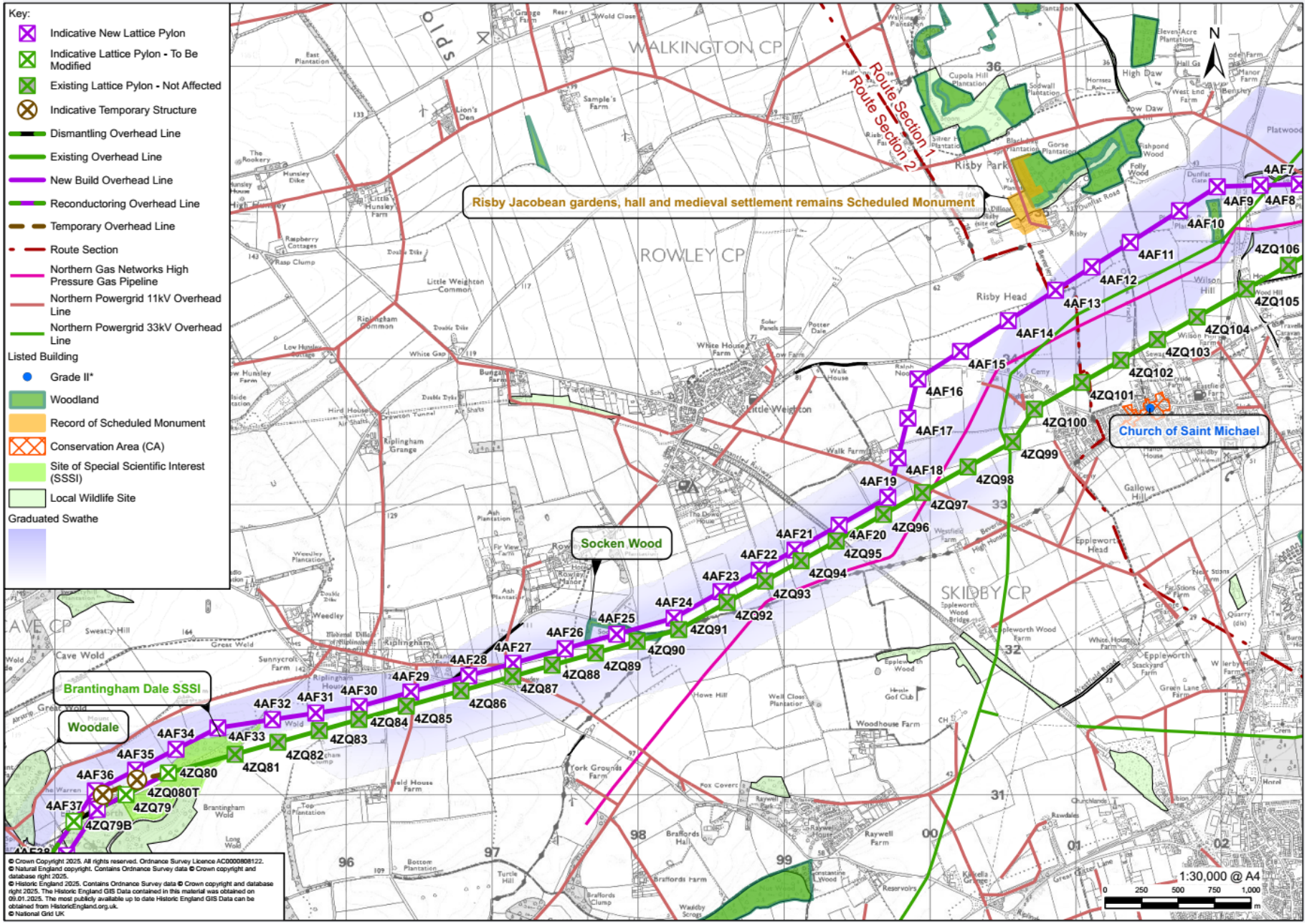
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Reconductoring Overhead Line
Temporary Overhead Line
Route Section
Northern Gas Networks High Pressure Gas Pipeline
Northern Powergrid 11kV Overhead Line
Northern Powergrid 33kV Overhead Line
Listed Building
Grade II*
Woodland
Record of Scheduled Monument
Conservation Area (CA)
Site of Special Scientific Interest (SSSI)
Local Wildlife Site
Graduated Swathe
WALKINGTON CP
ROWLEY CP
SKIDBY CP
Route Section 1
Route Section 2
Risby Jacobean gardens, hall and medieval settlement remains Scheduled Monument
Church of Saint Michael
Socken Wood
Brantingham Dale SSSI
Woodale
4AF7
4AF8
4AF9
4AF10
4AF11
4AF12
4AF13
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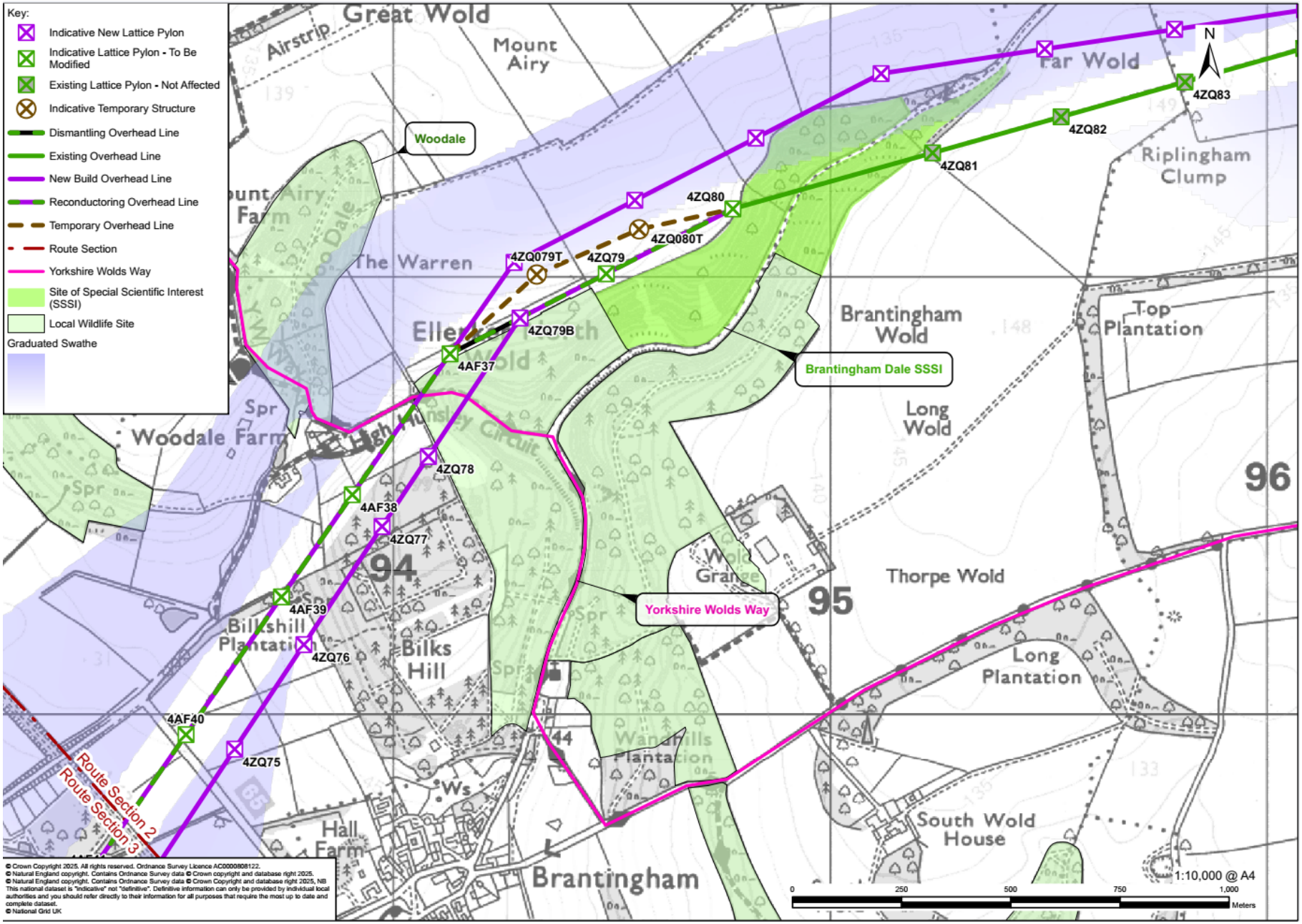
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Local Wildlife Site
Graduated Swathe
Great Wold
Airstrip
Mount Airy
Far Wold
Riplingham Clump
Woodale
Woodale Farm
The Warren
Brantingham Wold
Brantingham Dale SSSI
Top Plantation
Long Wold
Thorpe Wold
Long Plantation
Billshill Plantation
Bilks Hill
Wandrills Plantation
South Wold House
Hall Farm
Brantingham
4ZQ83
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4ZQ80
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4ZQ79
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Route Section 2
Route Section 3
Yorkshire Wolds Way
94
95
96
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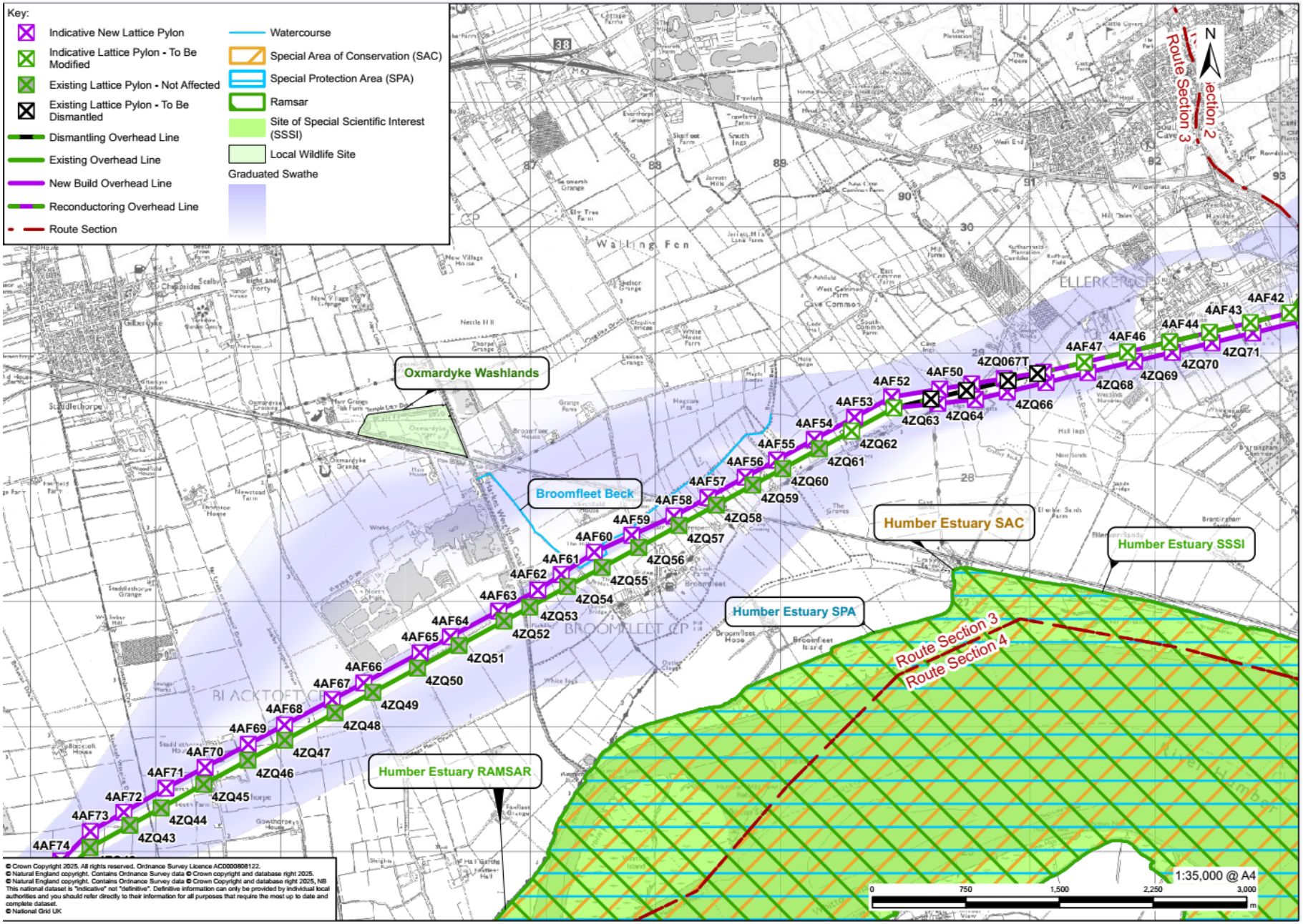

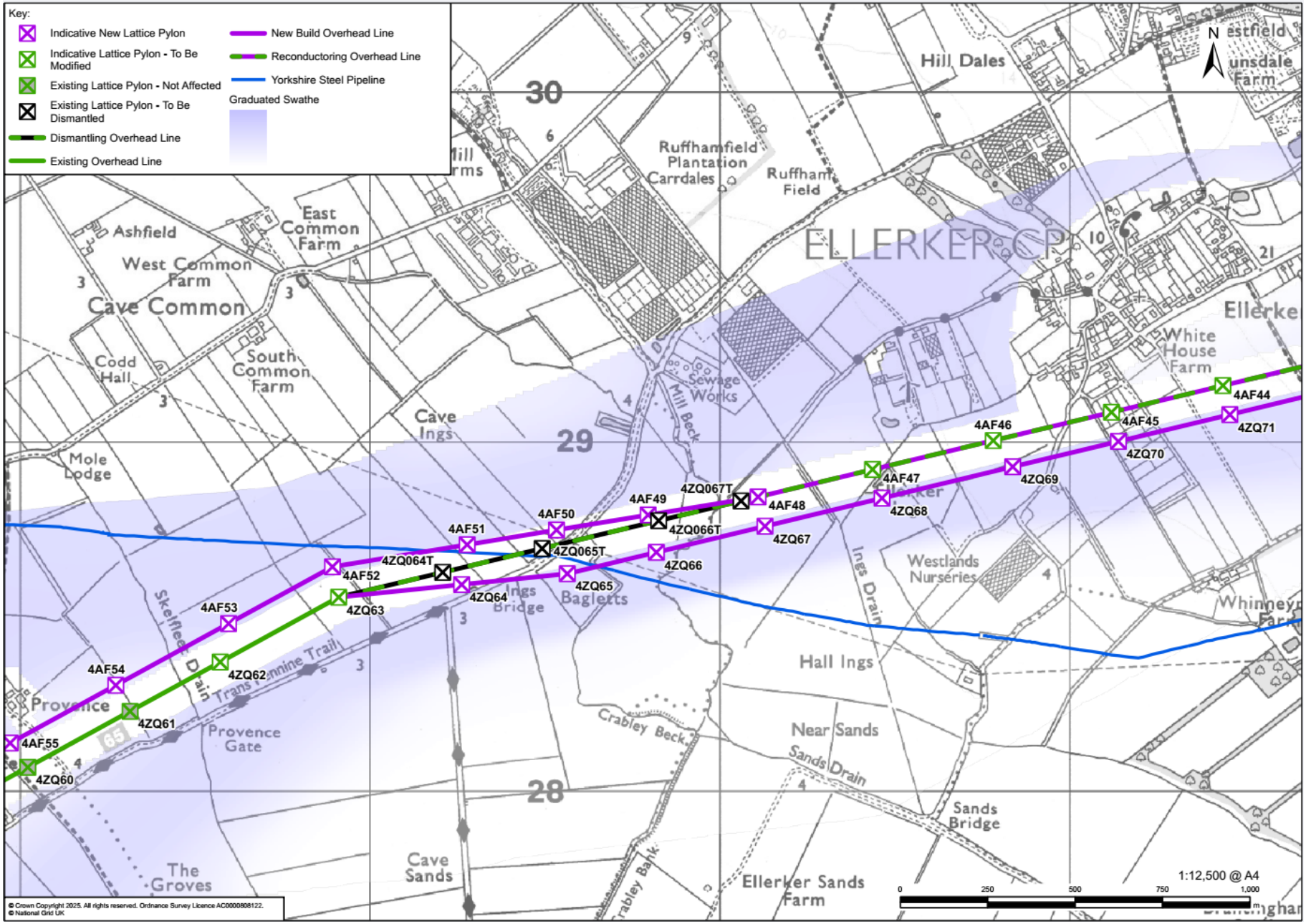
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ELLERKER CP
Hill Dales
Ruffhamfield Plantation
Carrdales
Ruffham Field
Ashfield
East Common Farm
West Common Farm
Cave Common
Codd Hall
South Common Farm
Cave Ings
Mill Beck
Sewage Works
Mole Lodge
White House Farm
Ellerker
Westlands Nurseries
Ings Drain
Ings Bridge
Bagletts
Skeffling Dain
Trans Pennine Trail
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Hall Ings
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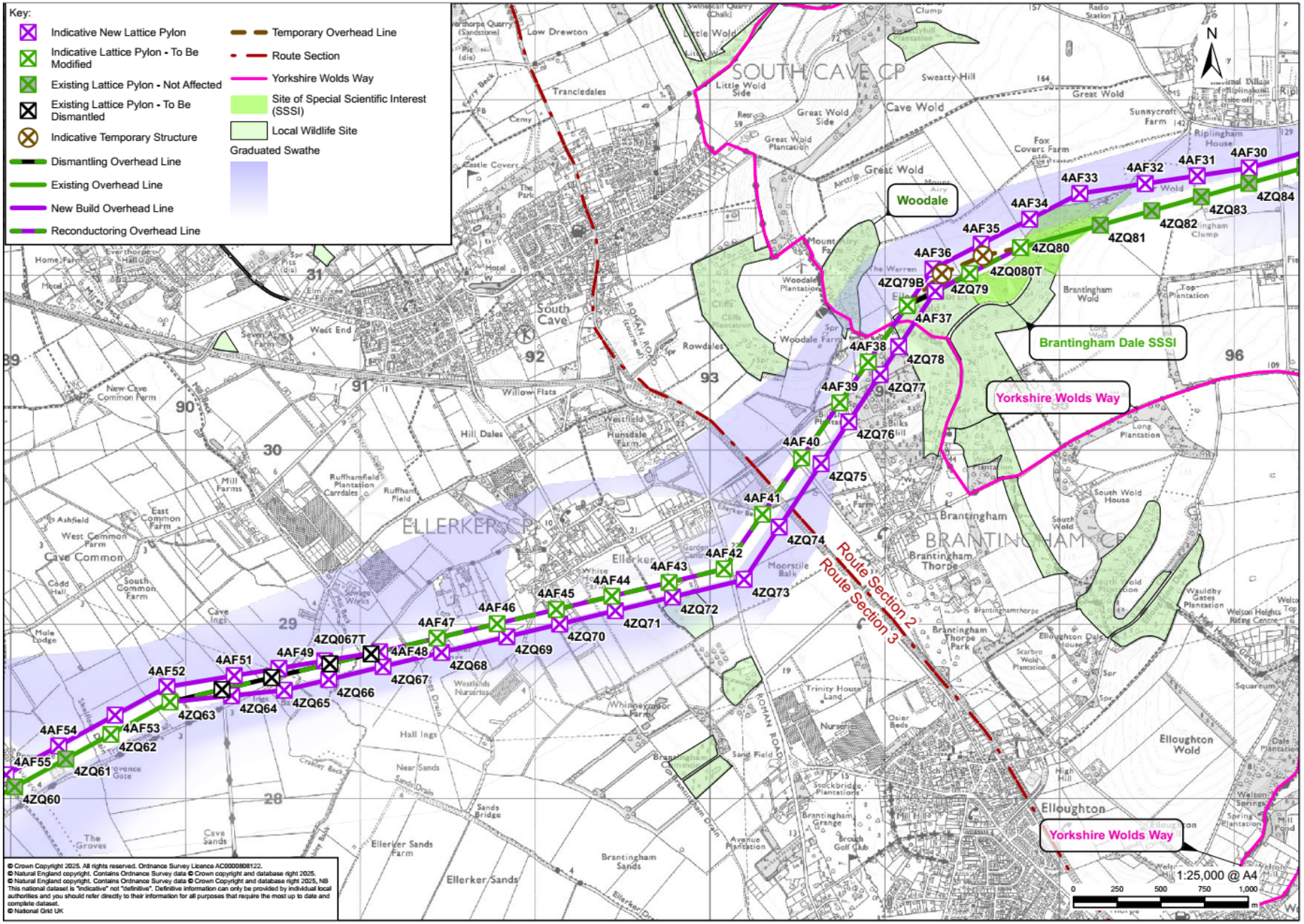
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Local Wildlife Site
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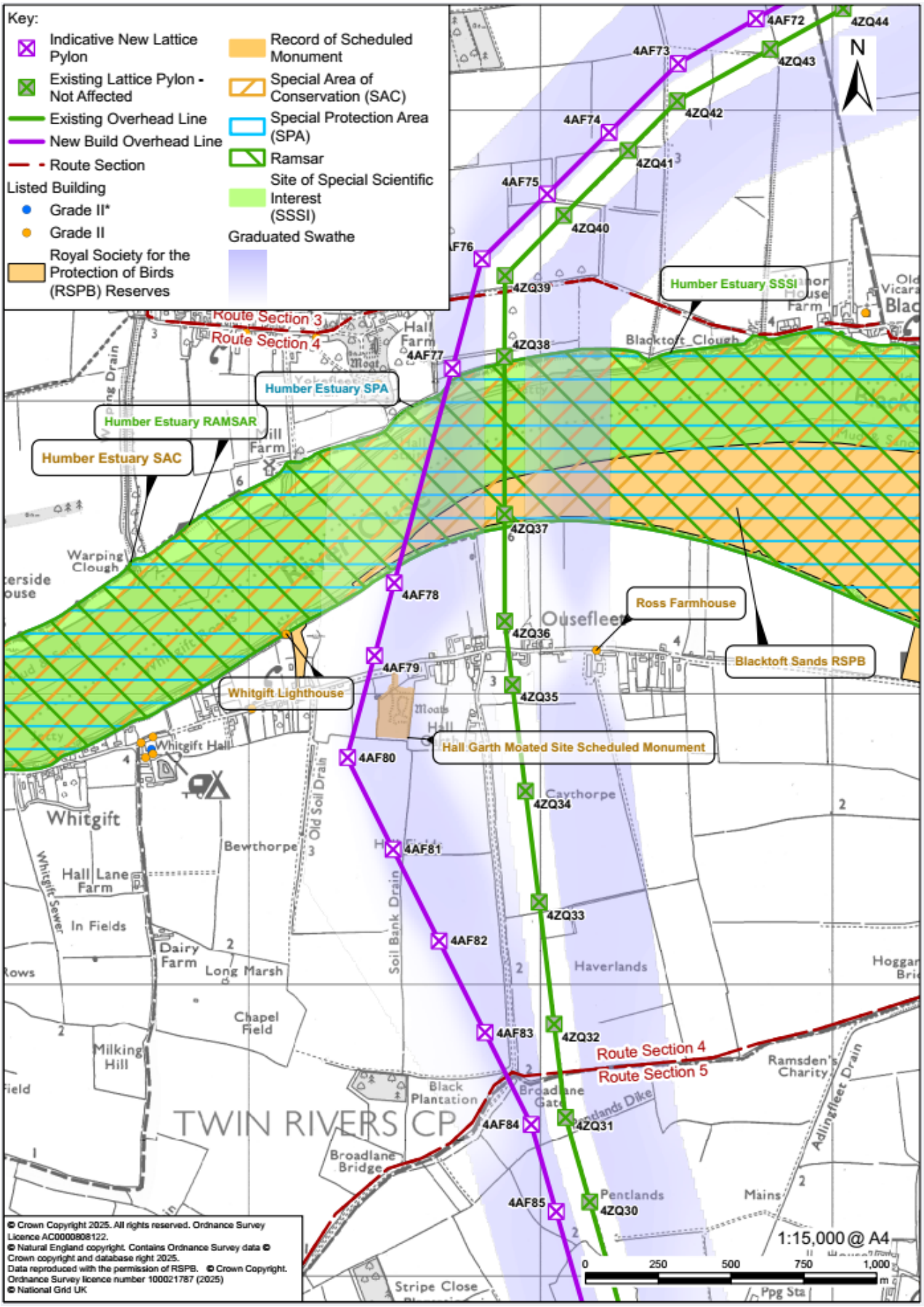
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Route Section 4
Route Section 5
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Humber Estuary RAMSAR
Humber Estuary SAC
Ross Farmhouse
Blacktoft Sands RSPB
Whitgift Lighthouse
Hall Garth Moated Site Scheduled Monument
Blacktoft Clough
Ousefleet
Caythorpe
Whitgift
Whitgift Hall
Bewthorpe
Hall Lane Farm
Dairy Farm
Long Marsh
Haverlands
Chapel Field
Milking Hill
Black Plantation
Broadlane Bridge
Pentlands
Mains
Stripe Close
TWIN RIVERS CP
Old Soil Drain
Soil Bank Drain
Whitgift Sewer
Adlingfleet Drain
Ramsden's Charity
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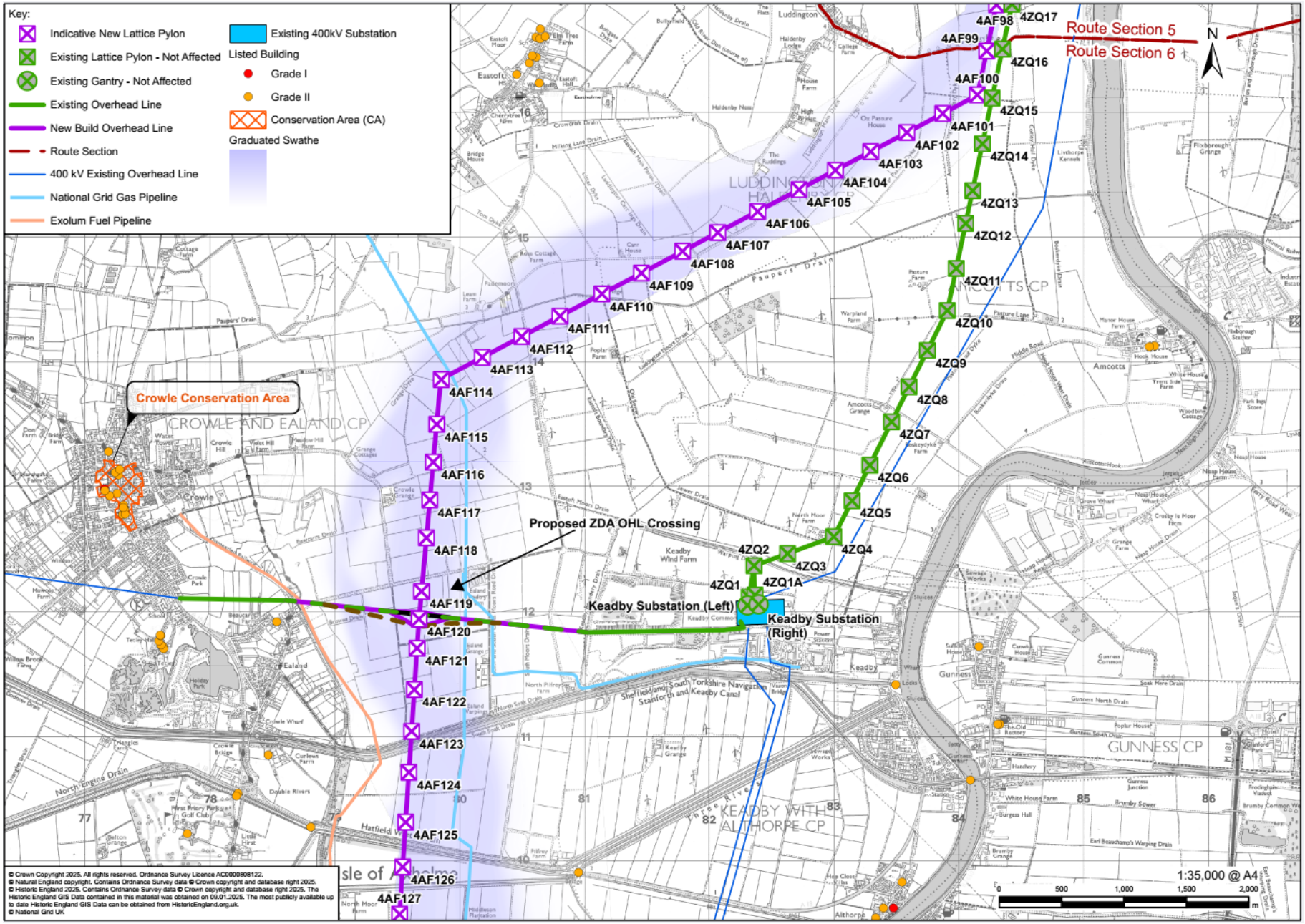

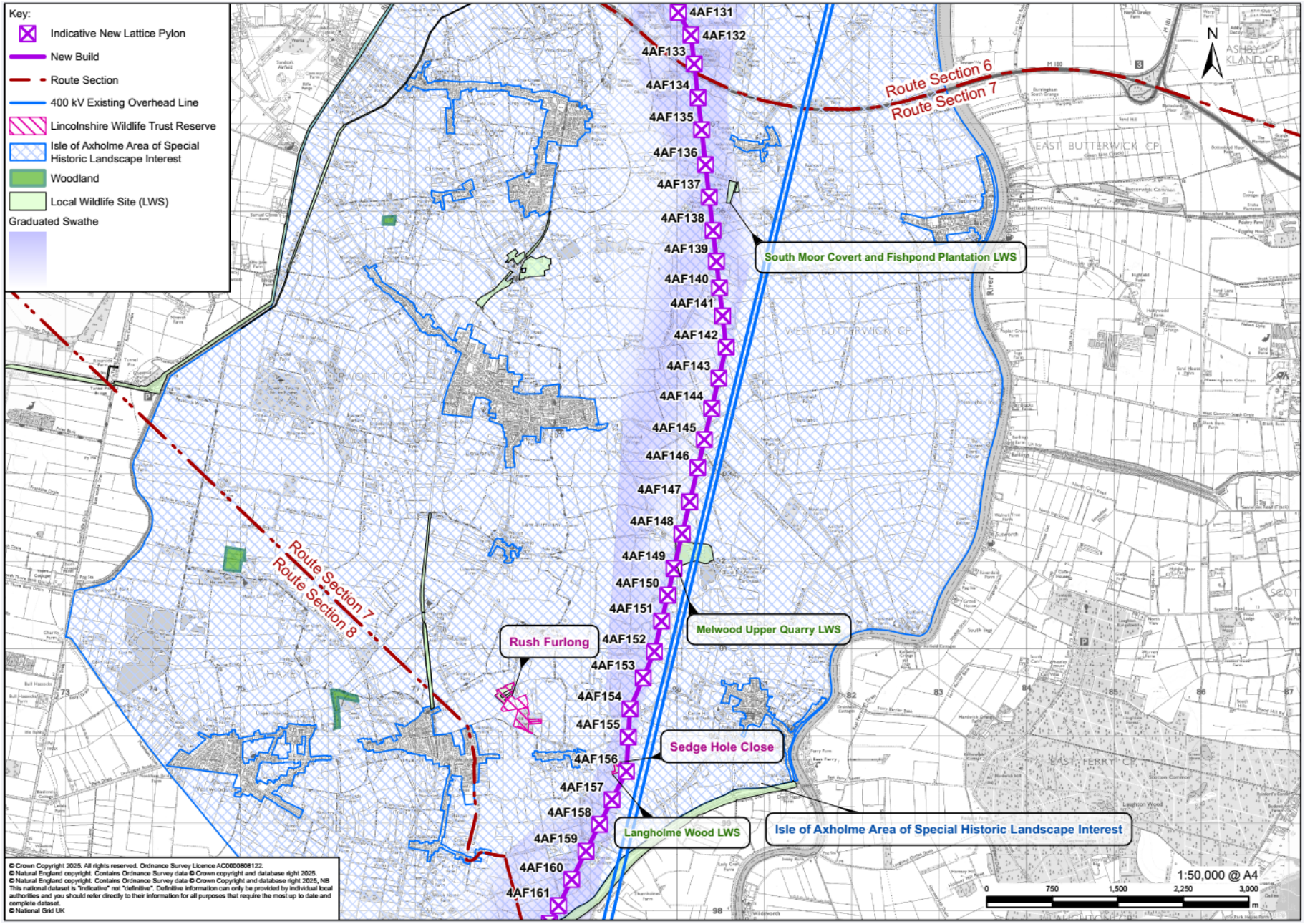
Key:
Indicative New Lattice Pylon
New Build
Route Section
400 kV Existing Overhead Line
Lincolnshire Wildlife Trust Reserve
Isle of Axholme Area of Special Historic Landscape Interest
Woodland
Local Wildlife Site (LWS)
Graduated Swathe
4AF131
4AF132
4AF133
4AF134
4AF135
4AF136
4AF137
4AF138
4AF139
4AF140
4AF141
4AF142
4AF143
4AF144
4AF145
4AF146
4AF147
4AF148
4AF149
4AF150
4AF151
4AF152
4AF153
4AF154
4AF155
4AF156
4AF157
4AF158
4AF159
4AF160
4AF161
Route Section 6
Route Section 7
Route Section 7
Route Section 8
South Moor Covert and Fishpond Plantation LWS
Melwood Upper Quarry LWS
Rush Furlong
Sedge Hole Close
Langholme Wood LWS
Isle of Axholme Area of Special Historic Landscape Interest
N
1:50,000 @ A4
0
750
1,500
2,250
3,000
m
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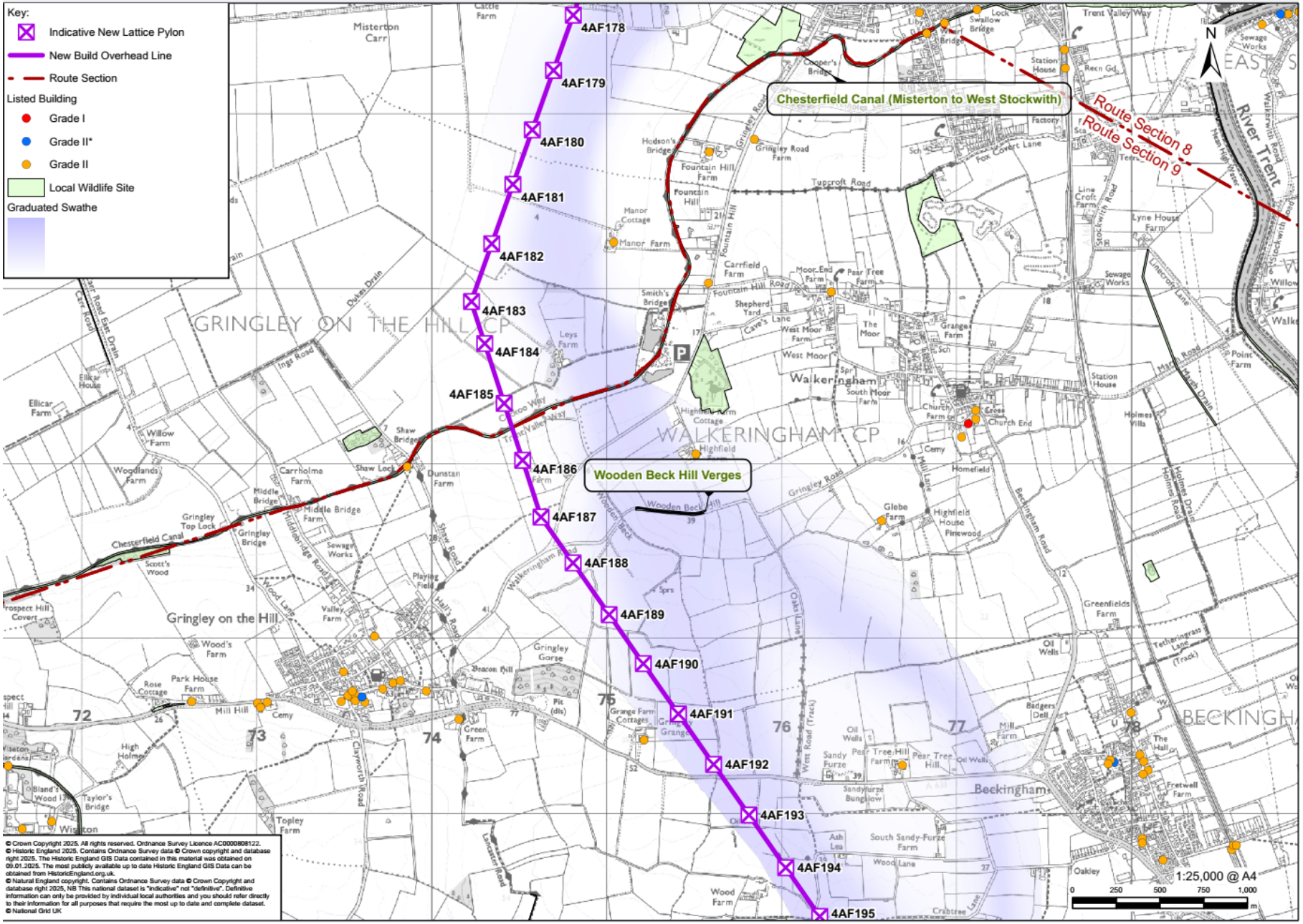

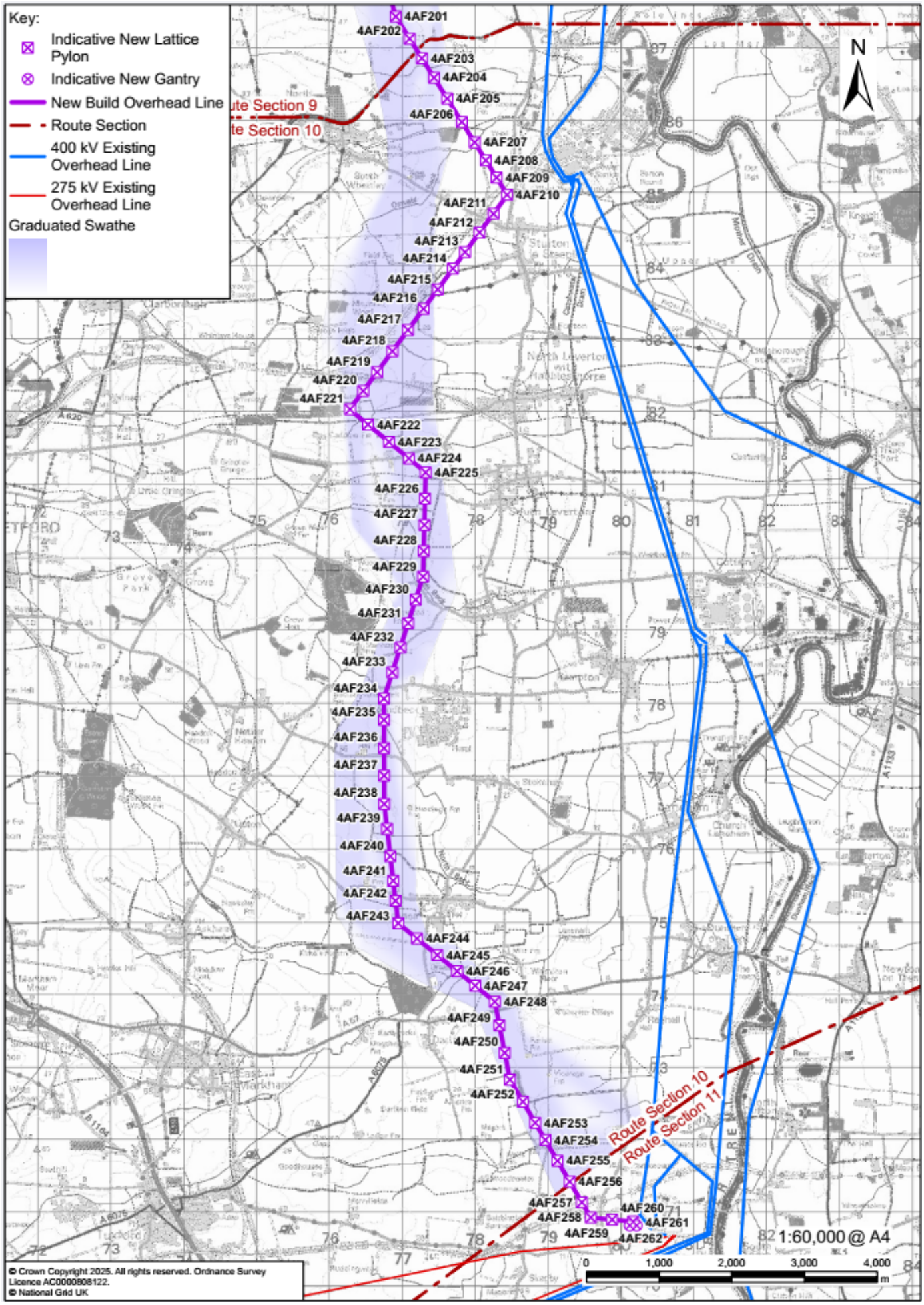
Key:
Indicative New Lattice Pylon
Indicative New Gantry
New Build Overhead Line
Route Section
400 kV Existing Overhead Line
275 kV Existing Overhead Line
Graduated Swathe
4AF201
4AF202
4AF203
4AF204
4AF205
4AF206
4AF207
4AF208
4AF209
4AF210
4AF211
4AF212
4AF213
4AF214
4AF215
4AF216
4AF217
4AF218
4AF219
4AF220
4AF221
4AF222
4AF223
4AF224
4AF225
4AF226
4AF227
4AF228
4AF229
4AF230
4AF231
4AF232
4AF233
4AF234
4AF235
4AF236
4AF237
4AF238
4AF239
4AF240
4AF241
4AF242
4AF243
4AF244
4AF245
4AF246
4AF247
4AF248
4AF249
4AF250
4AF251
4AF252
4AF253
4AF254
4AF255
4AF256
4AF257
4AF258
4AF259
4AF260
4AF261
4AF262
Route Section 10
Route Section 11
N
1:60,000 @ A4
0
1,000
2,000
3,000
4,000
m
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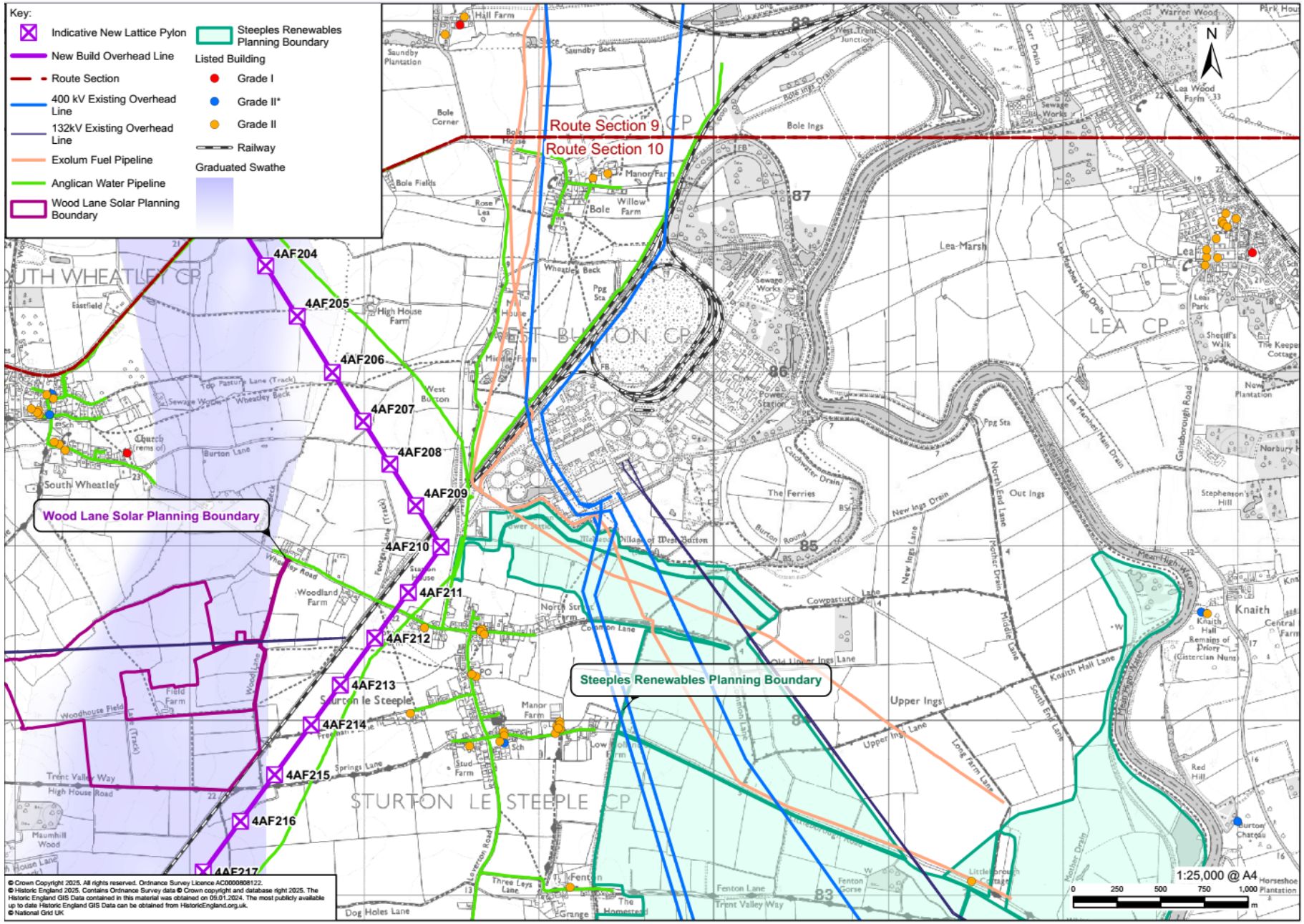
Key:
Indicative New Lattice Pylon
New Build Overhead Line
Route Section
400 kV Existing Overhead Line
132kV Existing Overhead Line
Exolum Fuel Pipeline
Anglican Water Pipeline
Wood Lane Solar Planning Boundary
Steeples Renewables Planning Boundary
Listed Building
Grade I
Grade II*
Grade II
Railway
Graduated Swathe
Route Section 9
Route Section 10
4AF204
4AF205
4AF206
4AF207
4AF208
4AF209
4AF210
4AF211
4AF212
4AF213
4AF214
4AF215
4AF216
4AF217
Wood Lane Solar Planning Boundary
Steeples Renewables Planning Boundary
SOUTH WHEATLEY CP
WEST BURTON CP
LEA CP
STURTON LE STEEPLE CP
N
1:25,000 @ A4
0 250 500 750 1,000 m
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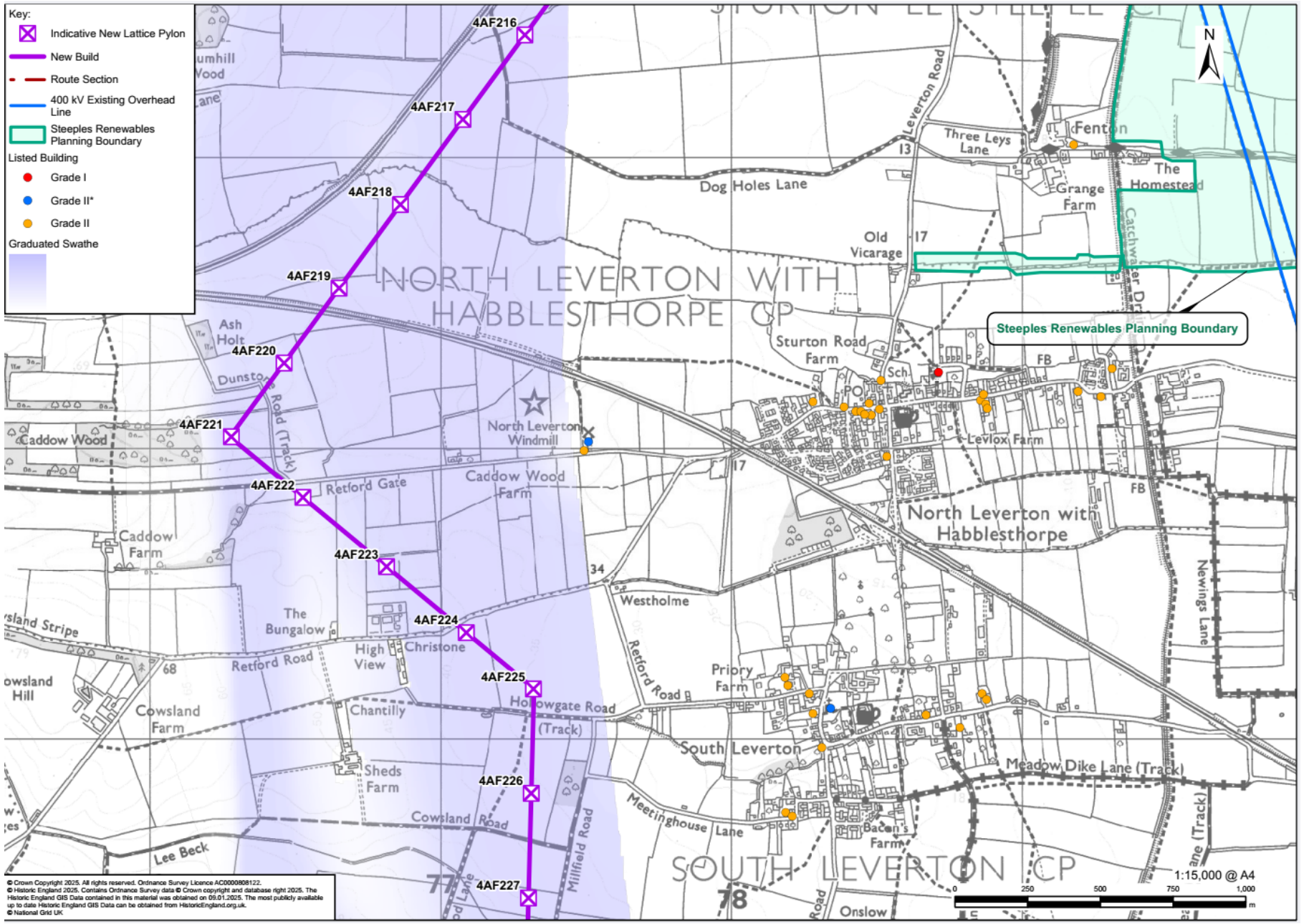
Key:
Indicative New Lattice Pylon
New Build
Route Section
400 kV Existing Overhead Line
Steeples Renewables Planning Boundary
Listed Building
Grade I
Grade II*
Grade II
Graduated Swathe
4AF216
4AF217
4AF218
4AF219
4AF220
4AF221
4AF222
4AF223
4AF224
4AF225
4AF226
4AF227
NORTH LEVERTON WITH HABBLESTHORPE CP
SOUTH LEVERTON CP
Steeples Renewables Planning Boundary
Leverton Road
Three Leys Lane
Fenton
The Homestead
Grange Farm
Dog Holes Lane
Old Vicarage
Sturton Road Farm
Levlox Farm
North Leverton with Habblesthorpe
Ash Holt
Dunstone Road (Track)
Caddow Wood
North Leverton Windmill
Retford Gate
Caddow Wood Farm
Caddow Farm
The Bungalow
High View
Christone
Retford Road
Cowsland Hill
Cowsland Farm
Chantilly
Sheds Farm
Cowsland Road
Lee Beck
Hollowgate Road (Track)
Millfield Road
Meetinghouse Lane
Westholme
Priory Farm
South Leverton
Meadow Dike Lane (Track)
Bacon's Farm
Onslow
Newings Lane
N
1:15,000 @ A4
0 250 500 750 1,000 m
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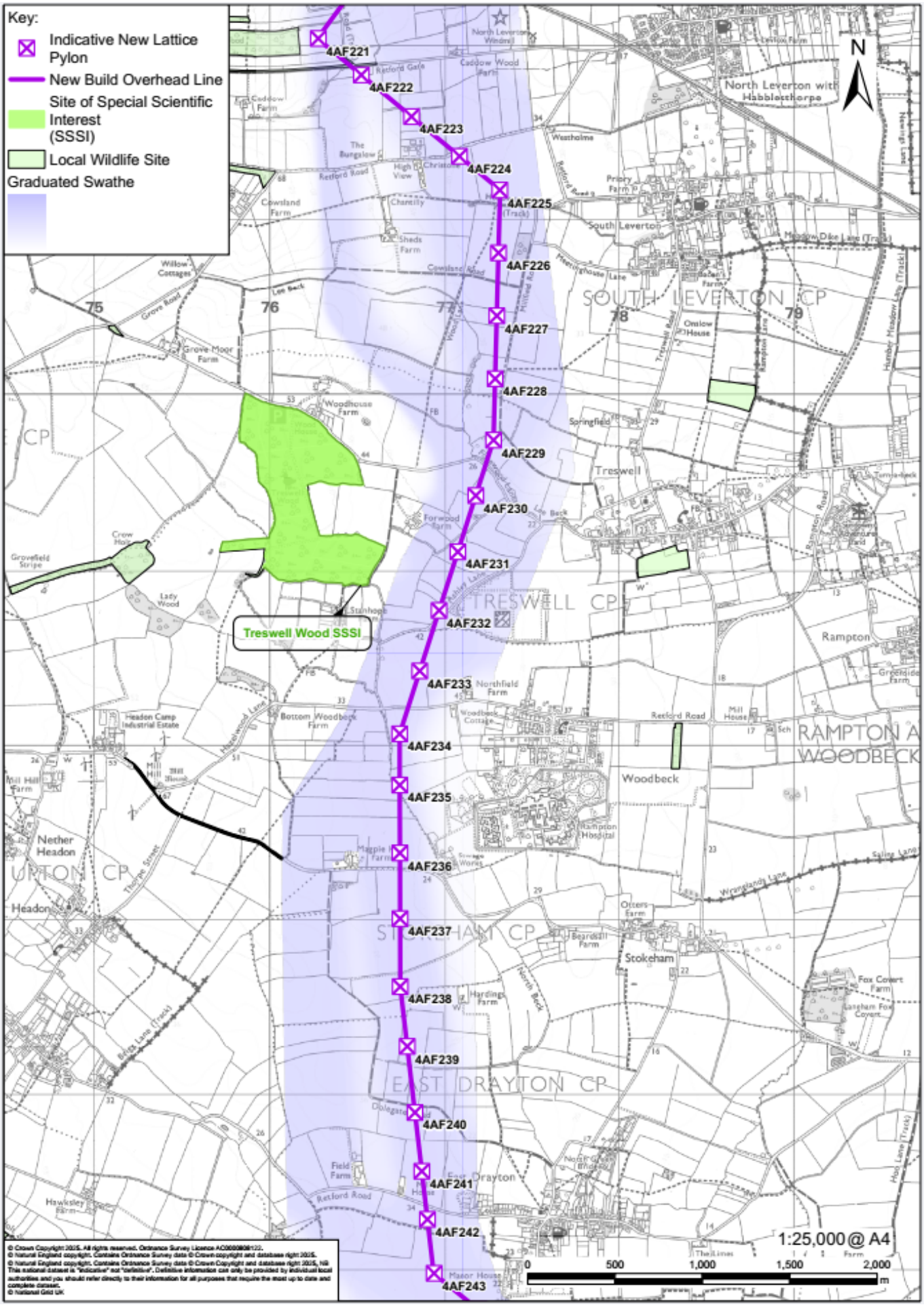
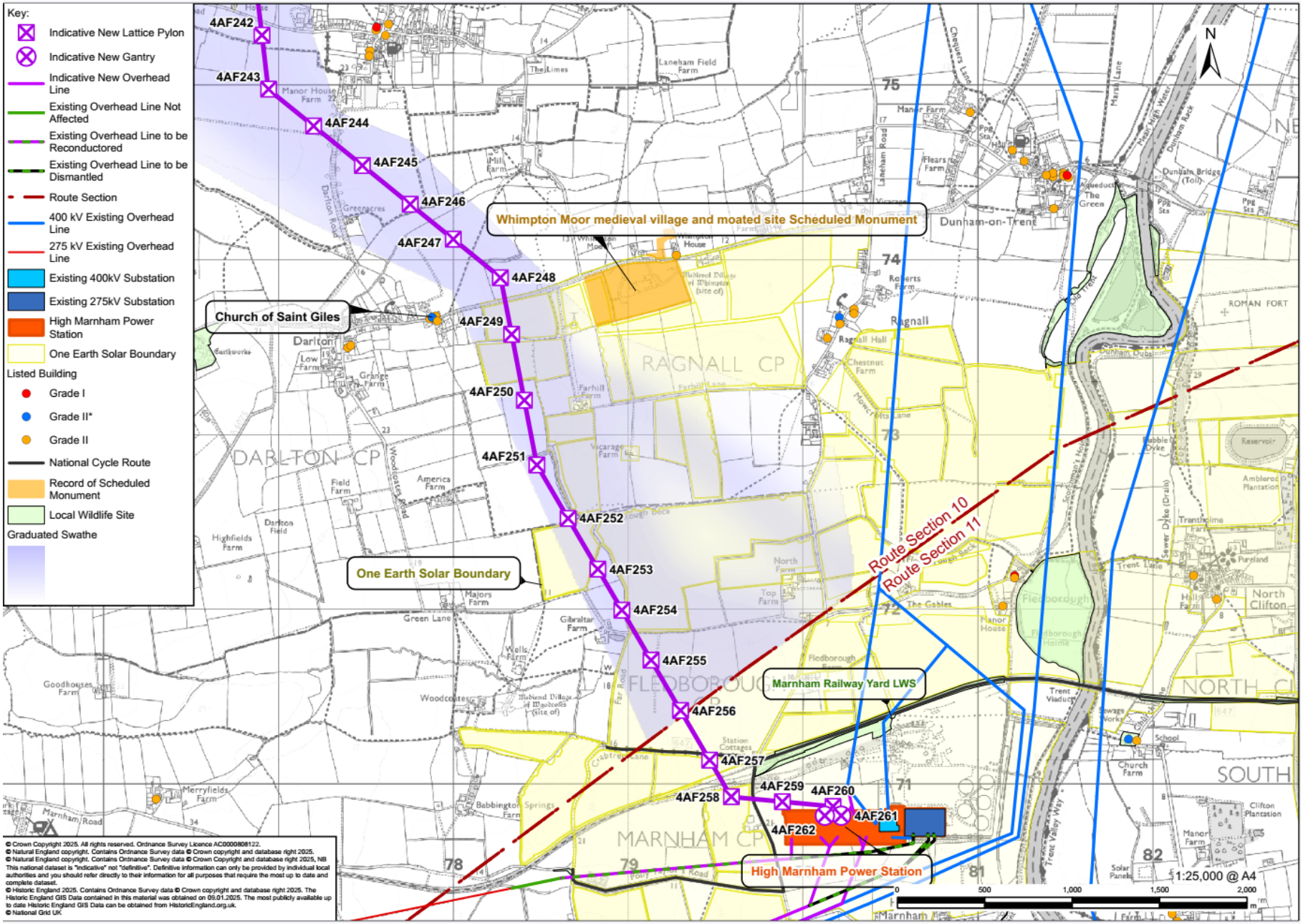

Key:
Indicative New Lattice Pylon
New Build Overhead Line
Site of Special Scientific Interest (SSSI)
Local Wildlife Site
Graduated Swathe
4AF221
4AF222
4AF223
4AF224
4AF225
4AF226
4AF227
4AF228
4AF229
4AF230
4AF231
4AF232
4AF233
4AF234
4AF235
4AF236
4AF237
4AF238
4AF239
4AF240
4AF241
4AF242
4AF243
Treswell Wood SSSI
N
1:25,000 @ A4
0
500
1,000
1,500
2,000
m



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