The Great Grid Upgrade

North Humber to High Marnham

NHHM-AEC-CNS-CPR-0004

North Humber to High Marnham

Volume 6: Environmental Statement

Document 6.3 Environmental Statement Chapter 3 - Main Alternatives Considered

Final Issue A

October 2026

Planning Inspectorate Reference: EN020034

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(a)

nationalgrid

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3. Main Alternatives Considered

3.1 Introduction

Reasonable Alternatives

3.1.1 This chapter presents details of the main alternatives that have been considered during the development of the North Humber to High Marnham Project (the Project).

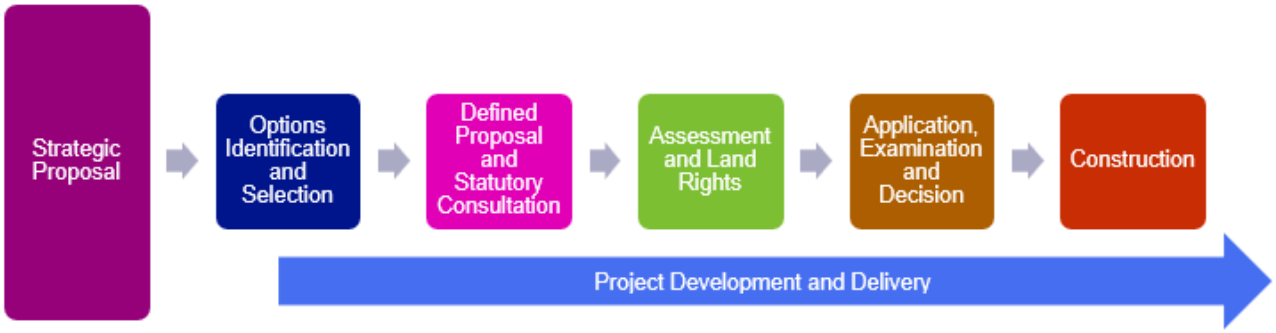
3.1.2 Alternatives is a term used to describe aspects of a proposal considered during its development. These can comprise different designs, technologies, locations, approaches, sizes, and methods. Options that can genuinely meet an identified need for, and objectives of, a proposal are considered to represent reasonable alternatives (i.e. options that are proportionate, realistic, commercially feasible, deliverable and relevant to the proposal).

3.1.3 National Grid Electricity Transmission plc (National Grid) undertakes a staged approach to options appraisal as there are often several different ways that its proposals can be developed. As each proposal requires professional judgement and decisions to be made about the most appropriate way to achieve the required outcome, this options appraisal process is applied to provide the necessary information to help inform those decisions.

3.1.4 Options appraisal is a robust and transparent process that is used to compare different options and record the positive and negative effects each may have in meeting the defined need. A range of criteria incorporating environmental, socio-economic, technical and cost considerations are applied to the options so that each can be appraised and evaluated on its own merits, the objective being to achieve a balanced solution that meets the identified need case while meeting National Grid's statutory duties (as set out in the Electricity Act 1989 (HM Government, 1989)).

3.1.5 The design of the Project has followed a structured project development process that has integrated technical and environmental assessment with consultation feedback and stakeholder engagement. Further detail can be found in Our Approach to Consenting (National Grid, 2022). The key stages of project development are set out in Image 3.1.

Image 3.1 – National Grid's approach to project development and delivery



3.1.6 Alternative options are considered and appraised throughout the evolution of the Project. The approach to options appraisal is a robust and transparent process that is used to compare options and to record the positive and negative effects they may have in meeting the identified need, across a wide range of criteria including environmental, socio-economic, technical, and cost factors. Feedback received through consultation also informs this process. The aim is to find a balanced outcome to meet the identified need while meeting National Grid's statutory duties.

3.1.7 **Application Document 5.10 Design Approach Document** outlines the Project's design options and process.

3.1.8 The appraisal and evaluation of reasonable alternatives for the Project have been undertaken by National Grid through Stages 1 to 4 of this framework as outlined in Image 3.1 above, commencing in 2021 with the identification of strategic proposals. Subsequently, the design of the Project was advanced through corridor optioneering and routeing studies to achieve a design that could be consulted upon in 2023 and 2024 (non-statutory consultation), and a defined proposal and design in 2025 (statutory consultation). Following consultation, further design development and evaluation was undertaken to achieve the design which forms the basis of the Development Consent Order (DCO) application. (**Application Document 5.9 Design Development Report**).

3.1.9 Stage 5 of the process comprises the submission of the application for development consent National Grid, its subsequent examination by the Planning Inspectorate, and decision-making by the Secretary of State (SoS). Assuming development consent is granted by the SoS, Stage 6 would involve construction of the Project.

3.1.10 The remainder of this chapter is structured as follows:

- Section 3.2 describes the relevant legislation and policy concerning the identification and reporting of reasonable alternatives, and how these have been accounted for within the design development and environmental assessment of the Project.
- Section 3.3 describes National Grid's approach to options appraisal in detail.
- Section 3.4 describes the studies undertaken to develop a strategic proposal for the Project (Stage 1).
- Section 3.5 describes the studies undertaken to identify, evaluate and select options for the Project (Stage 2).
- Section 3.6 describes the Project design assessed and consulted upon as part of statutory consultation (Stage 3).
- Section 3.7 describes how feedback from statutory consultation shaped and influenced the design development of the Project, including continued post-consultation design evaluation (Stage 4).

3.1.11 This chapter should be read in conjunction within the following chapters:

- **Application Document 6.1 Chapter 1 Introduction**;
- **Application Document 6.2 Chapter 2 Legislation and Policy Context**;
- **Application Document 6.4 Chapter 4 Description of the Project**; and
- **Application Document 6.5 Chapter 5 Environmental Impact Assessment Approach and Methodology**.

3.1.12 Details of the options appraisal process and associated evaluation criteria that National Grid applies to its projects are presented in National Grid's Our Approach to Options Appraisal (National Grid, 2012); and Our Approach to Consenting (National Grid, 2022).

Scoping Opinion Comments

3.1.13 As set out in **Application Document 6.1 Chapter 1 Introduction**, this Environmental Statement (ES) has been informed by **Application Document 6.5.A2 Appendix 5.2 Scoping Opinion** published by the SoS in September 2023. The comments received on the description of the Project in **Application Document 6.5.A2 Appendix 5.2 Scoping Opinion** have been taken into account in the production of this chapter.

3.1.14 An explanation of how and where these comments have been addressed in the ES are set out in Table 3.1.

Table 3.1 – Comments raised in the Scoping Opinion relating to the consideration of alternatives

ID	Inspectorate's comments	Response
2.1.3	**Limits of Deviation/flexibility** The Scoping Report notes that the ES will include Limits of Deviation to allow flexibility in the development of the design. Alternative pylon designs, line swap overs, and methods for installation of the overhead line and cabling are not yet confirmed and the Inspectorate considers that these options have potential for very different environmental effects.	The proposed Limits of Deviation and the proposed materials used (such as pylon types) and the methods used for construction of the Project are set out within **Application Document 6.4 Chapter 4 Description of the Project**.
2.2.1	**Description of alternatives** The Scoping Report describes the approach taken so far to develop the route corridor and how environmental matters have been taken into account in the refinement of the scoping boundary. The Inspectorate notes the proximity to local settlements and that designated sites remain within the scoping boundary. The Inspectorate also directs the Applicant to the Environment Agency's consultation response (Appendix 2 of this Opinion) in relation to the presence of land in Flood Zones 2 and 3, and the Canal and River Trust's response in relation to navigable waterways (namely Chesterfield Canal and Stainforth & Keadby Canal) within the scoping boundary. The ES should describe how the presence of these, and other environmental constraints, has continued to inform subsequent design choices, such as siting of	Sections 3.4, 3.5, 3.6 and 3.7 of this chapter provide the information on the iterative design process that National Grid has undertaken from an emerging preferred corridor through to the production of a preliminary design for a preferred route alignment. This iterative design process has been underpinned by s9 of the Electricity Act 1989, '*to develop and maintain an efficient, co-ordinated and economical system of electricity*

ID	Inspectorate's comments	Response
	particular elements of the infrastructure or the use of particular construction technologies. With reference to the iterative design process in Image 5.1 of the Scoping Report, the ES should demonstrate how these choices have been influenced by environmental factors.	*transmission*' (HM Government, 1989), whilst also taking due consideration of environmental constraints. **Application Document 6.4 Chapter 4 Description of the Project** **Application Document 6.11 Chapter 11 Water Environment**
2.2.3	**Choice of route corridor option technology** The Inspectorate notes the Applicant's proposal to place the new line parallel to the existing 400kV line, on the basis it is considered to concentrate the impact in one place rather than creating new impacts elsewhere. The ES should expand on the reasons for the choice of route and method for installation, taking into account environmental considerations.	The reasoning for the route choice is detailed within this chapter, which is based on the applicable appraisals undertaken during the routeing design process. The method of installation for infrastructure associated with the Project is explained within **Application Document 6.4 Chapter 4 Description of the Project**.
3.10.3	**Noise impact at NSRs from the overhead line – Operation** The Applicant proposes to scope out this matter for the phase identified on the basis that operational noise from the overhead line is not likely to be significant at nearby NSRs under any weather conditions owing to the proposed 'triple Araucaria' conductor bundle (Section 15.5 of the Scoping Report). The Applicant also proposes that, should the iterative design process result in alternative conductor types being used, consideration for this would be assessed within the noise and vibration assessment and technical information would be submitted as part of the application for development consent to support scoping out noise associated with overhead lines from the noise and vibration assessment.	Following further design work, it is now considered that conductor flexibility is required at the crossing of the River Ouse between proposed pylons 4AF76 and 4AF80. The reason this flexibility is required is set out in **Application Document 6.4 Chapter 4 Description of the Project**. Operational noise has therefore been scoped into the assessment at

ID	Inspectorate's comments	Response
	The Inspectorate is content with this approach, however, should alternative conductor types be proposed, the Applicant should submit further technical information as part of the development consent to support scoping out this matter from the noise and vibration assessment.	this location on the basis of a twin conductor system potentially being used. The assessment of which is presented within **Application Document 6.16 Chapter 16 Noise and Vibration**.

3.2 Legislative and Policy Context

Background

3.2.1 This section summarises the legal and policy framework governing the identification and assessment of reasonable alternatives. It also sets out:

- The statutory duties of National Grid as a transmission licence holder; and
- The established rules for overhead transmission line routeing.

3.2.2 As the design development of the Project has spanned a number of years, references to policy requirements and considerations noted in Stages 1 and 2 of the options appraisal process reflect the (now superseded) versions that were in place at the time of undertaking the studies.

3.2.3 Full details of legislation and policy directly relevant to the consideration of alternatives, and how National Grid has given regard to them, are presented in **Application Document 6.2 Chapter 2 Legislation and Policy Context** and **Application Document 5.5 Planning Statement**.

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

3.2.4 Section 14(2)(d) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (HM Government, 2017) requires the ES to include '*a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment*'.

3.2.5 This chapter meets this legal requirement by presenting the reasonable alternatives considered for the Project. National Grid's determination of what constituted a reasonable alternative (and the level of assessment undertaken of each) directly related to its practicality and deliverability, and the benefits it would provide compared to other feasible solutions.

3.2.6 In evaluating their relative advantages and disadvantages, not all Project alternatives have been explored to an equal level of detail by National Grid. For example, some options were appraised and eliminated from further consideration in the early stages of the design development process, whereas other options have been retained to a

much later stage of the process, having been subject to repeated analysis and refinement.

National Policy Statements

Overview

3.2.7 National Policy Statements (NPSs) relevant to the Project are:

- Overarching National Policy Statement for Energy (EN-1) (NPS EN-1) (Department for Energy Security and Net Zero, 2025); and
- National Policy Statement for Electricity Networks Infrastructure (EN-5) (NPS EN-5) (Department for Energy Security and Net Zero, 2025).

3.2.8 Where a relevant NPS has effect in relation to a Nationally Significant Infrastructure Project (NSIP), the SoS must have regard to that NPS and must determine the application for development consent in accordance with the relevant NPS unless certain exceptions apply as set out in S104 of the Planning Act 2008 (HM Government, 2008).

3.2.9 At the time of undertaking development of its strategic proposal and corridor routeing studies, National Grid had regard to the then-current versions of NPS EN-1 and NPS EN-5 when making decisions on which options to carry forwards or discount. At that time, draft updates to these policy documents had been published for consultation in late 2021 but had not been adopted. In response, National Grid's Corridor and Preliminary Routeing and Siting Study (CPRSS) (National Grid, 2023) acknowledged this evolving policy landscape while basing its analysis on current policy.

3.2.10 Both NPSs were updated subsequent to the studies reported in the CPRSS (National Grid, 2023), and introduced elements relating to the consideration of alternatives that were not included in the superseded versions. The NPSs were again updated in 2026 and have been considered in the drafting of the ES. This chapter accordingly references current policies in the updated versions of these NPSs, while acknowledging the policy context that informed the earlier development stages of the Project.

Overarching National Policy Statement for Energy (EN-1)

3.2.11 National Policy Statement EN-1 (Department for Energy Security and Net Zero, 2025) provides the overarching policy framework for nationally significant energy infrastructure and recognises the urgent need for substantial new energy and electricity network infrastructure to support energy security, Clean Power 2030 and net zero objectives. It establishes that this need is a fundamental consideration in project development and decision making.

3.2.12 In relation to alternatives, NPS EN-1 (Department for Energy Security and Net Zero, 2025) recognises that the ES should include information on the reasonable alternatives for the Project that are relevant to the development proposed and capable of meeting the project's objectives. The SoS's consideration is primarily directed towards the acceptability of the application before them, rather than identifying whether another option might be preferable in principle.

3.2.13 This policy document also promotes the application of the mitigation hierarchy through the project development process, whereby potential adverse effects should,

wherever possible, be avoided through site selection, routeing and design before relying on mitigation or compensation measures. Consequently, the consideration of alternatives forms part of an iterative process of proposal evolution rather than a separate exercise undertaken solely for the purposes of Environmental Impact Assessment (EIA).

3.2.14 The approach of identifying and refining reasonable alternatives for the Project, as described within this chapter accords with the requirements of NPS EN-1 (Department for Energy Security and Net Zero, 2025).

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

3.2.15 EN-5 recognises that electricity network infrastructure must be developed in accordance with strategic network planning and system requirements, with projects brought forward to connect defined points within the transmission network and support a secure, coordinated and efficient electricity system ((Department for Energy Security and Net Zero, 2025) paragraphs. 1.1.7-1.1.9). The NPS also notes that safety, security and functional requirements can constrain infrastructure design choices (paragraph 2.4.3) (Department for Energy Security and Net Zero, 2025). The policy emphasises the importance of avoiding and reducing environmental effects through routeing and design, having regard to established industry guidance, including the Holford Rules (described below).

3.2.16 For overhead line proposals, NPS EN-5 (Department for Energy Security and Net Zero, 2025) requires applicants to demonstrate that they have considered feasible alternatives where significant landscape and visual effects may arise. This may include consideration of route variations, undergrounding and other technology options, taking account of environmental, engineering, operational and cost considerations. The ES should explain the alternatives considered and the reasons for the preferred option.

3.2.17 This policy document does not require every conceivable alternative to be assessed; rather, it supports a proportionate approach focused on feasible alternatives capable of meeting the identified network need, while applying the mitigation hierarchy and seeking to minimise environmental and community effects through project design and route refinement.

3.2.18 This policy framework established by NPS EN-5 (Department for Energy Security and Net Zero, 2025) has guided the Project's assessment of reasonable alternatives for overhead line technology, routeing options, and undergrounding considerations.

Holford Rules

3.2.19 The Holford Rules (National Grid, 1959) are guidelines which form the basis for decisions of siting overhead transmission lines. Originally set out in 1959 but later updated in the 1990s, these remain a valuable tool in selecting and assessing potential route options as part of the environmental assessment process.

3.2.20 Further information regarding the Holford Rules (National Grid, 1959) is presented in **Application Document 6.2 Chapter 2 Legislation and Policy Context** and **Application Document 5.5 Planning Statement**.

Planning Inspectorate Advice

Nationally Significant Infrastructure Projects: Pre-Application Advice on Environmental Impact Assessment

3.2.21 The Planning Inspectorate's publication Nationally Significant Infrastructure Projects: Pre-Application Advice on Environmental Impact Assessment (Planning Inspectorate, 2026), recognises that the consideration of alternatives is an iterative process undertaken during development of a proposal.

3.2.22 It reinforces that alternatives should be considered as part of the iterative development of a proposal and clarifies that the purpose of the ES is to explain the reasonable alternatives considered by the applicant and the reasons for the selected option, including environmental considerations, rather than identify or assess every conceivable alternative.

3.2.23 Accordingly, the alternatives reported in this chapter comprise those options that were considered sufficiently practicable to warrant assessment, together with the reasons for their acceptance or rejection.

Nationally Significant Infrastructure Projects: Advice on Preparing Applications for Linear Projects

3.2.24 The Planning Inspectorate's publication Nationally Significant Infrastructure Projects: Advice on Preparing Applications for Linear Projects (Planning Inspectorate, 2026), recognises that consideration of alternatives is an integral part of the iterative design process. Applicants are expected to provide a clear and transparent explanation of the evolution of their proposals, including the alternatives considered, the factors influencing route selection and design decisions, and the reasons for identifying their preferred design option.

3.2.25 This chapter provides a proportionate account of the alternatives considered during the iterative development of the Project, and explains how environmental, technical, operational and other relevant factors informed the development and selection of the design for which development consent is sought.

Limits of Deviation and Design Flexibility

3.2.26 Flexibility has been built into the design of the Project through the definition of Limits of Deviation (LoD). These allow for certain lateral and vertical adjustments to be made during the detailed design and construction phases of the Project

3.2.27 Accordingly, minor variations that may be implemented through the use of LoD (such as precise pylon positioning) have not been treated as alternatives; this is because the EIA has considered a worst-case scenario within established parameters that account for any possible deviation.

3.3 National Grid's Approach to Options Appraisal

Overview of the Options Appraisal Process

3.3.1 National Grid undertakes a process of options appraisal as there are often several different ways that its projects can be developed; these can involve different locations, technologies or designs.

3.3.2 As each project requires decisions to be made regarding the best way to achieve the required outcome, undertaking option appraisals provides the necessary information to help inform those judgements.

3.3.3 Options appraisal is a robust and transparent process that is undertaken by National Grid in line with a staged approach. The process compares options and records the beneficial (positive) and adverse (negative) effects these may have in meeting the defined need of a project, with each option tested and evaluated against defined criteria relating to environmental, socio-economic, technical, and cost factors.

3.3.4 The aim of the process is to achieve a balanced outcome, taking account of the range of National Grid's statutory duties under the Electricity Act 1989 (HM Government, 1989).

3.3.5 The options appraisal process is presented in Our Approach to Options Appraisal (National Grid, 2012); and the appraisal criteria adopted in the process are detailed in Our Approach to Consenting (National Grid, 2022).

Approach to the Development of the Project

3.3.6 Project alternatives were identified, appraised and evaluated as part of a structured design development process undertaken over several years. Key stages as shown in Image 3.1, and the steps taken in the process comprised the following:

Approach to Consenting Stage 1

- 2021/2022: The Strategic Options Report (National Grid, 2023) identified the preferred strategic proposal to meet the defined need and corridor options.
- June 2023: **Application Document 7.18 Corridor and Preliminary Routeing and Siting Study**.

Approach to Consenting Stage 2

- June to July 2023: Non-statutory consultation on the emerging preferred corridor and graduated swathe for the Project
- July 2024: **Application Document 7.19 Supplementary Corridor and Routeing Report**, which set out the potential alternative eastern corridor
- July to August 2024: Localised non statutory consultation on the potential alternative eastern corridor.
- 2024: A back check and review of the strategic proposal and Corridor and Preliminary Routeing and Siting Study was undertaken. The conclusions of this review are presented in **Application Document 7.20 Design Development Report - 2025** which was published at Statutory consultation in 2025. The

backcheck and review validated the strategic approach and considered the overall preferred corridor following localised non-statutory consultation.

- 2025: The Strategic Options Report Update (National Grid, 2025) was published in February 2025.

Approach to Consenting Stage 3

- February to April 2025: Statutory consultation on the preferred draft alignment and publication of the Preliminary Environmental Information Report (National Grid, 2025).
- June 2025 to September 2026: Targeted statutory consultation on proposed changes identified through statutory consultation, iterative design refinement and/or further environmental survey information or knowledge (see Chapter 9 of **Application Document 5.1 Consultation Report**).
- 2026: **Application Document 5.9 Design Development Report** documents the design refinements and reasonable alternatives considered following 2025 consultation feedback. **Application Document 5.10 Design Approach Document** explains the overarching design approach, key principles that have guided the development of the Project, and how the design has evolved.
- 2026: **Application Document 7.17 Strategic Options Report Including Needs Case**.

3.3.7 At each stage of the options appraisal process, transparent methods were used to inform decision-making. The process has been informed by a number of inputs including technical design information from engineers, and data and evidence collected by environmental consultants through desk-based and site-based surveys.

3.3.8 Consultation and engagement feedback provided by prescribed bodies and local communities has been taken into account and appraisals were subjected to challenge and review to ensure the robustness of the decisions made in light of any changing circumstances.

Supporting Documents

3.3.9 Decisions and assumptions made during the development of the Project have been subject to periodic challenge and review as part of iterative design development and engagement.

3.3.10 Accordingly, a number of documents have been prepared by National Grid to:

- Record the need for the Project and the strategic options considered to meet that need;
- Record the process by which different corridors, alignments and sites were established, appraised and selected;
- Provide environmental and design information to inform consultation and engagement with stakeholders and the general public; and
- Explain how the Project design evolved and how consultee feedback shaped and influenced its development.

3.3.11 The alternatives considered in reaching the design for the Project are listed below; these should be referred to for more detailed information on the approach to, and evolution of, the Project:

- **Application Document 5.9 Design Development Report**;
- **Application Document 5.10 Design Approach Document**;
- **Application Document 7.17 Strategic Options Report Including Needs Case**;
- **Application Document 7.18 Corridor and Preliminary Routeing and Siting Study**;
- **Application Document 7.19 Supplementary Corridor and Routeing Report**; and
- **Application Document 7.20 Design Development Report - 2025**.

3.4 Strategic Proposal

Overview

3.4.1 A range of strategic options that might address the network reinforcement needs were identified and appraised at a high level. These appraisals considered the likely environmental and socio-economic effects, technical issues and costs that would be associated with each strategic option.

3.4.2 The network performance of each strategic option was modelled and appraised to determine their benefits, the outcomes of which informed judgements regarding the relative merits of the options. This ensured that the final strategic proposal would meet National Grid's statutory duties under the Electricity Act 1989 (HM Government, 1989), including the requirement to bring forward proposals that are efficient, coordinated and economical, and which have regard to the desirability of preserving amenity and which would balance all relevant considerations including compliance with the relevant planning policies.

Stage 1: Strategic Proposal Options

Identifying the need for the Project

3.4.3 With growing renewables integration into the National Electricity Transmission System, such as offshore wind and interconnectors[1], an anticipated tripling of wind generation connected across the Scottish networks by 2030 and the government's increased ambition to connect 50 GW of offshore wind by 2030, north–south power flows are set to increase.

3.4.4 The existing electricity transmission network in the Yorkshire and Humber region was initially developed in the 1960s and has historically been able to meet demand. It was designed to connect the in-land large coal fired power stations in the region, with changes occurring in the later parts of the century in order to connect gas fired power stations and offshore wind.

[1] Interconnectors are high voltage cables that are often used to connect the electricity systems of neighbouring countries.

3.4.5 However, due to the changes noted above in terms of delivering net zero emissions, the existing network in this area does not have the capability to reliably and securely transport all the energy that will be connected by 2030, whilst operating to the standards it is required to.

3.4.6 The existing transmission infrastructure in this area requires reinforcement for the following main reasons:

- The existing transmission network was not designed to transport electricity from where it is increasingly being generated (largely offshore).
- The growth in offshore wind, interconnectors and onshore generation such as battery and solar means that more electricity will be generated in the years ahead than the current network is able to securely and reliably transport.
- In the UK, electricity demand is forecasted to at least double by 2050, increasing the amount of energy we need to transport to homes and businesses.
- Upgrading the existing network as it is today (such as through replacing cables to carry more power) will not be enough to carry the amount of future power whilst operating to required standards.
- The need to increase boundary transfer capability in order to reduce wider network generator constraint costs.

3.4.7 The Project would support the UK's net zero target by reinforcing the electricity transmission network between the North of England and the Midlands and facilitate the connection of planned renewable energy projects such as offshore wind generation and interconnectors and increase boundary transfer capability. The Project would help meet future energy requirements.

3.4.8 For further information please refer to the 'Needs Case' section contained within **Application Document 7.17 Strategic Options Report Including Needs Case**.

Alternatives considered at the Strategic Proposal stage

3.4.9 National Grid undertook a strategic options appraisal at the Strategic Proposal stage (Stage 1) in 2021/22. This identified the most appropriate strategic solution to bring forward, considering a wide range of options for providing the necessary north–south power flows. The strategic options appraisal is reported in the Strategic Options Report Update **Application Document 7.17 Strategic Options Report Including Needs Case)** which describes the future network requirements, and the options appraised to meet these requirements.

3.4.10 The consideration of strategic options was part of an iterative process in response to interactions with a range of emerging energy projects and customer requirements. As described in the need case (**Application Document 7.17 Strategic Options Report Including Needs Case**), the connection of additional generation requires the transmission system to be reinforced. Transmission boundary B8 (see Image 3.2) runs east to west separating the northern generation zones, including Scotland, Northern England and North Wales, from the Midlands and Southern demand centres. The B8 boundary will require two 400 kV alternating current (AC) double circuits or six high voltage direct current (HVDC) connections of transmission capacity circuits to deliver >10 GW boundary capability.

3.4.11 Providing no infrastructure would mean the National Electricity Transmission System in the area would not be compliant with the National Electricity Transmission System

Security and Quality of Supply Standard (NETS SQSS), and National Grid would not be complying with its transmission licence. Therefore, the provision of infrastructure is a requirement and a key necessity for delivering government net zero targets.

3.4.12 The need above identified a requirement for two AC 400 kV transmission circuits or multiple HVDC connections to resolve the NETS SQSS compliance and two distinct issues:

- Issue (a): a circuit is required to ensure compliance from the Creyke Beck generation group whilst also providing >6 GW of boundary capacity across the B8 boundary.
- Issue (b): a circuit is required to provide capacity to the East Coast generation group whilst increasing the boundary capacity across B8 by an additional >6 GW (giving 12 GW capacity) and providing >6 GW of capacity across the B9 boundary.

3.4.13 Strategic options were identified to resolve these distinct issues while complying with the NETS SQSS. Although strategic options were considered in parallel for the two issues identified above, National Grid has progressed both as separate development consent applications for reinforcement works (the other is The Grimsby to Walpole Project[2]). The Project represents the preferred strategic proposal for Issue (a) only, and accordingly Issue (b) is not discussed further within this chapter or the wider ES. For further information refer to the Strategic Options Report Update (**Application Document 7.17 Strategic Options Report Including Needs Case**).

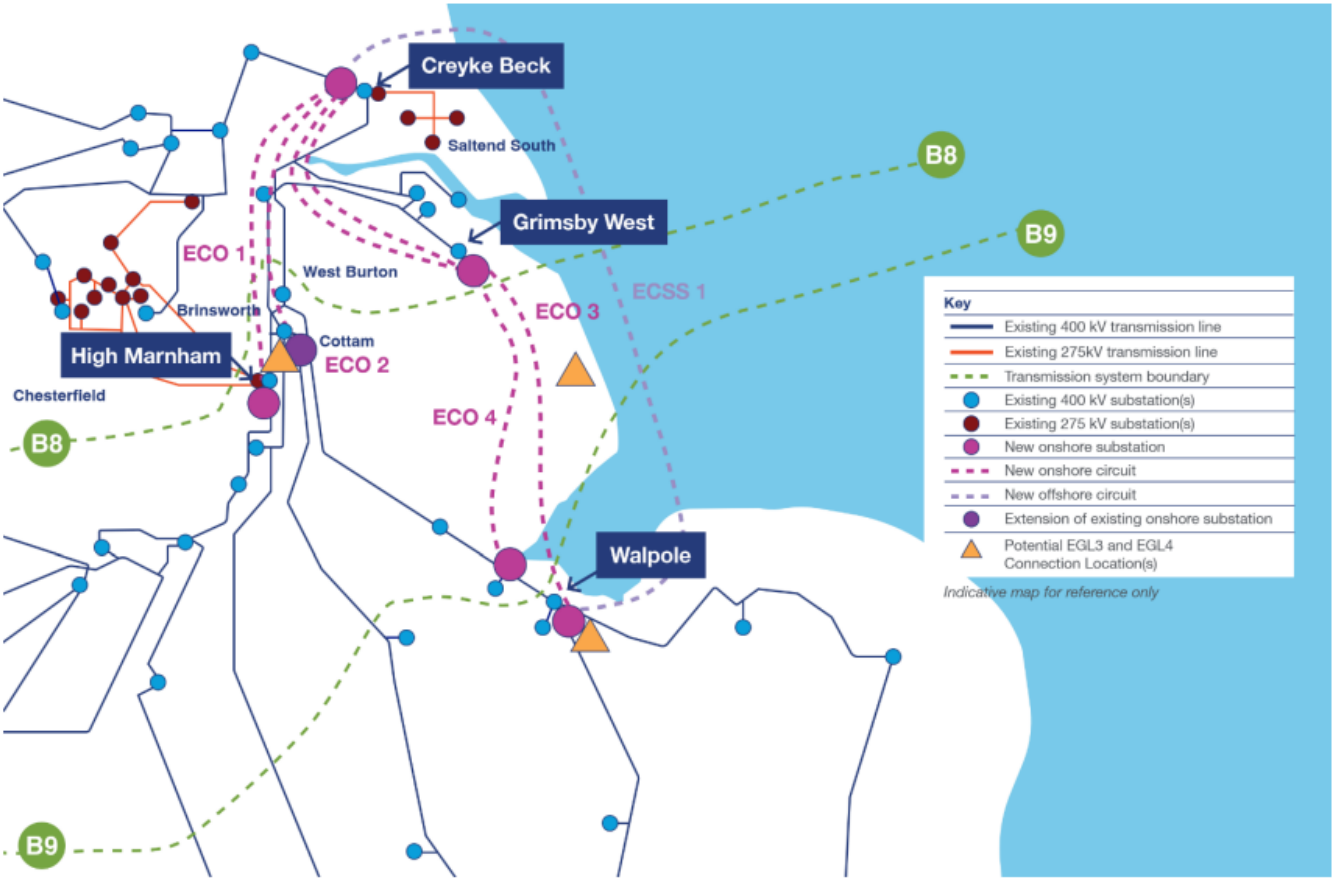
3.4.14 The strategic options considered to resolve Issue (a) Creyke Beck generation group connections and >6 GW capacity across B8 were:

- ECO 1 – New Creyke Beck to new High Marnham 85 km;
- ECO 2 – New Creyke Beck to Cottam 75 km;
- ECO 3 – New Creyke Beck to new Grimsby West, new Grimsby West to new Walpole 225 km;
- ECO 4 – New Creyke Beck to new Grimsby West, new Grimsby West to new Weston Marsh 200 km; and
- ECSS 1 – Subsea from new Creyke Beck – new Walpole 195 km.

3.4.15 Image 3.2 illustrates the strategic options considered to resolve Issue (a) Creyke Beck generation group connections and >6 GW capacity across B8.

[2] https://www.nationalgrid.com/the-great-grid-upgrade/grimsby-to-walpole

Image 3.2 – Indicative map of strategic options considered to resolve Issue (a) Creyke Beck generation group connections and >6 GW capacity across B8



3.4.16 For those onshore options with a connection at Creyke Beck (ECO 1, ECO 2, ECO 3 and ECO 4), both western and eastern sub-options were considered:

- The western sub-options (located to the west of Hull) assumed an overhead line crossing of the Humber Estuary Special Protection Area (SPA) and Special Area of Conservation (SAC). These options would also need to cross the Yorkshire Wolds, a locally important landscape.
- The eastern sub-options (located to the east of Hull) assumed a requirement for tunnelling for around 6 km beneath the Humber, due to the extent of the estuary in this area.

3.4.17 A full strategic options evaluation and comparative analysis of ECO 1 to ECO 4 and ECSS 1 (subsea option) was undertaken, with each strategic option appraised in accordance with Our Approach to Consenting (National Grid, 2022).

3.4.18 Each strategic option was appraised to establish its environmental and socio-economic impacts; this involved establishing a 20 km study area around each strategic option to identify its likely significant effects and enable comparison with other options, the objective being to identify an initial preferred option. The high-level options appraisal had particular regard for internationally or nationally important sites and other features that are of a sufficient scale and importance to inform decision-making at a regional level.

3.4.19 A technical appraisal was also undertaken to ensure each option would satisfy the NETS SQSS and resolve the requirements set out in the need case, along with a cost evaluation of the option transmission works.

3.4.20 For further information please see the Strategic Options Report Update (**Application Document 7.17 Strategic Options Report Including Needs Case**)

3.4.21 For ECSS 1 (the offshore option), overall, technical, environmental and socio-economic factors were not considered to differentiate between ECSS 1 and the onshore options for the purposes of option selection. However, ECSS 1 was substantially more expensive than any of the onshore options. This meant that onshore options were preferred and this option was accordingly discounted and not considered further.

3.4.22 ECO 1 performed better in terms of boundary capacity (i.e., the ability of the national network to transport power around regions, particularly the South Yorkshire conurbation), while also being less constrained in terms of routeing due to the proposed connection to a new substation at High Marnham rather than Cottam. A comparison of the Cottam and High Marnham sites indicated that High Marnham offered substantial cost savings, as well as reduced constructability risks.

3.4.23 Overall, ECO 1 represented the most advantageous of the Creyke Beck generation group options when balancing cost, technical performance, and environmental and socio-economic effects.

3.4.24 Option ECO 1 would involve the construction of a new transmission circuit connection between a new Creyke Beck substation and a new High Marnham substation, following a route to the west of the Humber Estuary. From early calculations it would have had a route length of approximately 85 km.

3.4.25 In summary, ECO 2, ECO 3 and ECO 4 were discounted at this stage for the following reasons:

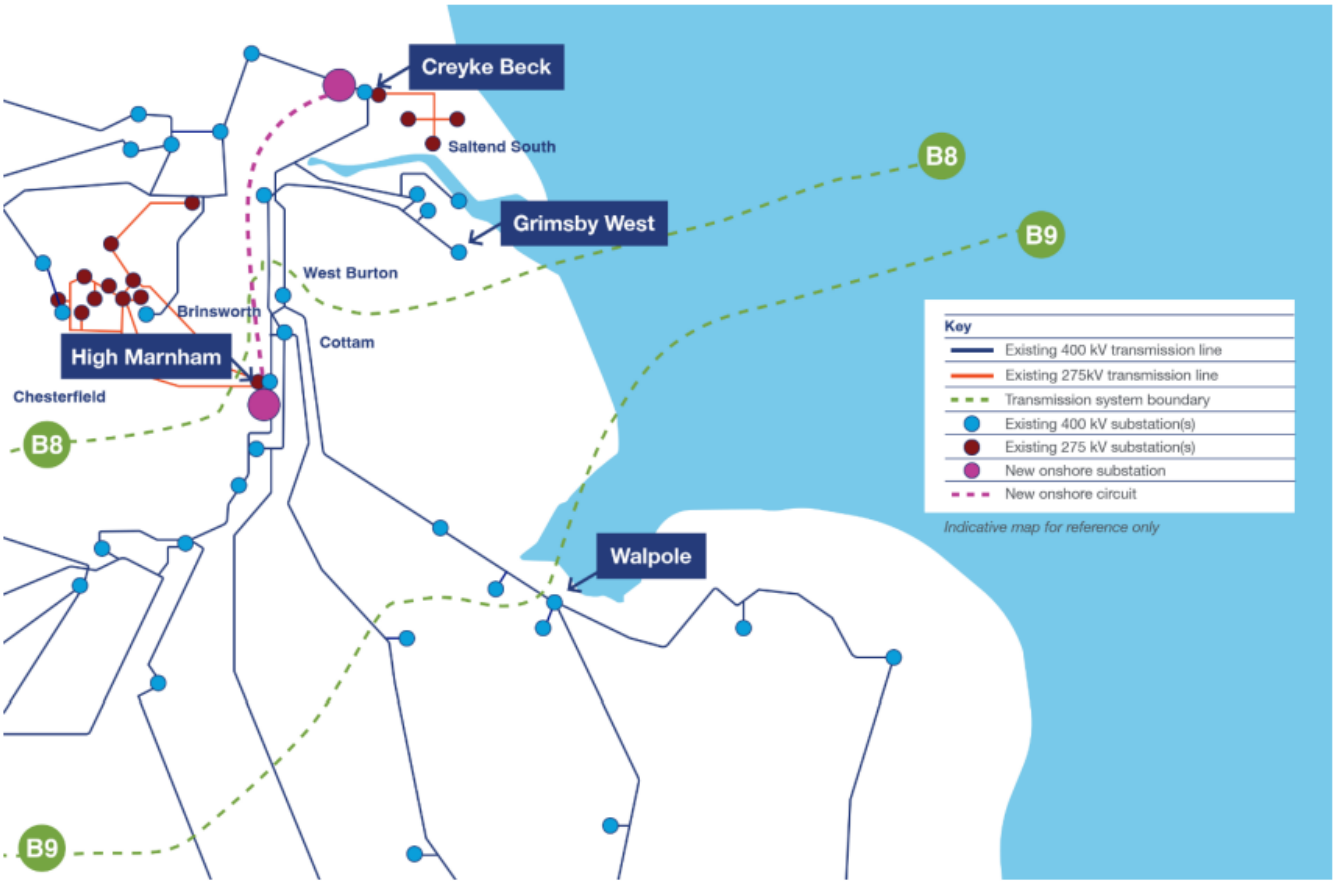
- ECO 3 and ECO 4 would require a longer linear overhead route and would therefore be expected to have greater environmental and socio-economic effects, as well as higher capital and lifetime costs.
- ECO 2, ECO 3 and ECO 4 had lesser technical advantages when compared to ECO 1. ECO 1 would perform better in terms of boundary capacity, while also being less constrained in terms of routeing due to the proposed connection to a new substation at High Marnham, rather than Cottam.
- Both ECO 3 and ECO 4 would have likely resulted in long-term adverse effects from within and into the Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB)[3] and scattered properties and a higher number of settlement fringes.
- The Lincolnshire coast is a popular tourist destination with a number of coastal resorts and extensive areas of holiday accommodation, which both ECO 3 and ECO 4 would have passed close to or within.

[3] At the time of undertaking the Strategic Options Report (2021/22) these landscape designations were known as Areas of Outstanding Natural Beauty (AONBs). However, these were renamed in 2023 to National Landscapes, to highlight the importance of these natural sites and their role in conservation and public enjoyment.

- ECO 3 and ECO 4 would also have resulted in likely adverse effects on The Wash SPA and The Wash and North Norfolk Coast SAC, in addition to the Humber Estuary SPA and SAC.

3.4.26 The preferred strategic proposal, ECO 1, is illustrated in Image 3.3.

Image 3.3 – Preferred strategic proposal: ECO 1 – new Creyke Beck to new High Marnham



3.5 Alternatives Considered at the Options Identification and Selection Stage

3.5.1 Following the selection of Option ECO 1 as the preferred strategic proposal, a Corridor and Preliminary Routeing and Siting Study (the CPRSS 2023) (**Application Document 7.18 Corridor and Preliminary Routeing and Siting Study**) was undertaken in 2022/23 (and published in 2023) to further define the location of the proposed Project infrastructure within a defined study area.

3.5.2 The CPRSS 2023 reported the process undertaken as part of the Options Identification and Selection stage to identify an emerging preferred corridor within which the required infrastructure for the Project may be located.

3.5.3 The CPRSS 2023 set out the routeing and siting activities undertaken as part of the identification, refinement and assessment of options for preliminary corridors between the proposed new substation in the Creyke Beck area, and the proposed new substation at High Marnham, and explains the emerging preferred corridor National Grid consulted on in 2023 at non statutory consultation.

3.5.4 As outlined in the CPRSS 2023, consideration was given to the use of underground cables throughout geographical areas where known constraints were present. This was focused on the River Ouse crossing and the Yorkshire Wolds area.

3.5.5 The starting assumption (in accordance with National Grid's guidance and National Policy Statement for Electricity Networks Infrastructure (EN-5 (Department for Energy Security and Net Zero, 2025)) is that transmission connections are constructed as overhead lines, except in nationally designated landscapes. Consideration was given to the use of underground cables throughout, including through the Yorkshire Wolds on the assumption that the area could be designated as an AONB. Underground cable options were considered across the Yorkshire Wolds because the initial 'Area of Search' for the AONB covered the entirety of the Wolds within the study area. When the provisional 'Candidate Area' for the proposed AONB was announced, indicating that designation within the study area was unlikely, it was considered that a policy compliant overhead line could be developed within the study area through the Yorkshire Wolds and an underground cable option was not taken forward.

3.5.6 With regards to the River Ouse crossing, undergrounding would have required the installation of long ducts or the construction of one or more tunnels to accommodate the 18 transmission cables likely to be required, as these could not be laid securely on the riverbed. The use of underground cables would have also increased the amount of permanent loss of flood zone and functionally linked land associated with the River Ouse Site of Special Scientific Interest (SSSI), due to the operational need for Cable Sealing End Compounds and tunnel head housing to allow for maintenance. Due to this, in addition to the much higher construction and programme costs, it was concluded that undergrounding for the Project in this location was not a viable solution and was accordingly not progressed further.

Study Area

3.5.7 The study area defined the area within which the Project infrastructure could be located and represented the extents within which detailed environmental and socio-economic data was gathered to inform the CPRSS 2023.

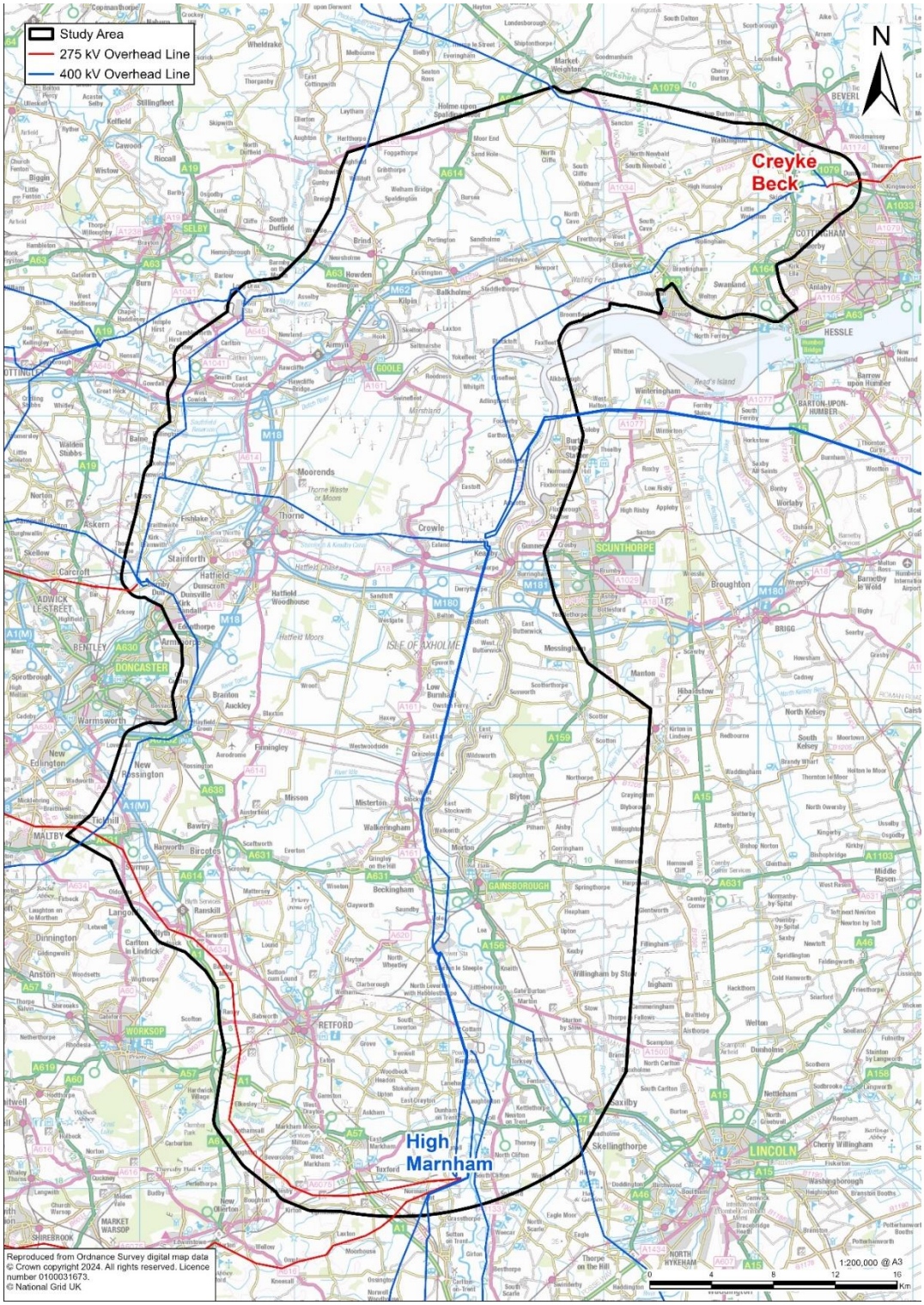
3.5.8 The study area developed for the Project was informed by:

- The connection points (start/end points) identified in the Strategic Proposal stage (Stage 1).
- The distribution of extensive areas of the highest amenity value or environmental constraint (for example, internationally designated sites).
- The nature of the physical and human geography. The presence of major geographical features such as estuaries or hills, or major settlements may represent a natural boundary to the study area or dictate a need for the area to extend to support routes around such features.
- Consideration of the likely balance of environmental impacts between direct and indirect routes.
- Consideration of the Holford Rules (National Grid, 1959) (for routeing of an overhead line) and the Horlock Rules (National Grid, 2003) (for siting of Cable Sealing End Compounds should any be required).

3.5.9 The study area for the Project is shown in Image 3.4. The study area encompasses the maximum extent within which a Project design that satisfies the statutory duties

and obligations of National Grid and meets the Project objectives is likely to be located. Areas were excluded which were considered unlikely to be feasible to accommodate the Project. The study area was defined by Holford Rule 1[4] and allows for the application of the principles of the Holford Rules (National Grid, 1959) and Horlock Rules (National Grid, 2003).

Image 3.4 – Study area for the Project



[4] Holford Rule 1 is to '*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*'.

Corridor Routeing

3.5.10 Following the establishment of the strategic proposal described in section 3.4 and defining the study area as described above, the next phase was to develop the specific Project through detailed corridor routeing and siting studies.

3.5.11 The identification of preliminary routeing and siting options within the study area was led by landscape and environmental specialists, with due regard given to environmental and socio-economic considerations alongside the Project's required technical parameters.

3.5.12 To start, heat maps were produced to undertake a Geographic Information System (GIS) 'corridor analysis'. This is a GIS tool that takes the weight applied to each cell (a 10 m by 10 m square based on the Ordnance Survey (OS) grid) and applies a weighted score of 1 (very low) to 5 (very high) against known features (such as listed buildings and priority habitats). This GIS tool then calculates the perceived 'cost' by adding up the weighted potential impacts/interactions with features from infrastructure passing through that 10 m x 10 m grid. This tool calculates the total cost of every possible path between the defined start and end points. From this, it is possible to identify potential corridors that minimise the environmental 'cost', where the environmental 'cost' is determined by the combination of distance of a feature away from possible infrastructure and the sensitivity weighting applied by the heat map.

3.5.13 The GIS tool therefore helps identify potential corridors with the least likely potential for adverse impacts on those aspects of the environment that can be mapped, by finding routes across the heat map surface to connect the start and end points of the Project which have the least environmental 'cost' (i.e. the least interaction with mapped environmental constraints).

3.5.14 The corridors generated through the GIS analysis then provided a starting point for the Project landscape and environmental specialists, working with the wider Project team as appropriate, and employing professional judgement and their understanding of routeing considerations, to identify and generate technically feasible preliminary corridors based upon the start and end points and heat maps.

3.5.15 The preliminary corridors identified were then subject to review by National Grid, to confirm technical feasibility and ensure that key issues and the interaction of constraints had been appropriately considered. Professional judgement applied during the review led to modifications being recommended to the corridors (i.e., to park, refine or expand the corridors). These recommendations were reviewed and implemented by the landscape and environmental specialists to ensure that changes were made in a manner consistent with landscape and environmental considerations.

3.5.16 Following identification of preliminary corridors, links and loops[5], site visits were undertaken by landscape, heritage and ecology specialists, along with the Front-End Engineering Design (FEED) contractor and National Grid. Following these site visits, further refinements were made to the corridors, links and loops before progressing to options appraisal.

3.5.17 For the Project, four preliminary overhead line corridors were identified following the process described above, as illustrated in Image 3.5 and summarised below.

[5] A link is a connection between two corridors and a loop is where a corridor splits into an eastern or western section to loop around a feature, like a settlement.

Corridor 1

3.5.18 Corridor 1 began to the north of Cottingham in the area around the existing Creyke Beck Substation and then routed in a north westerly direction to the south of Market Weighton. From here, it routed in a southeasterly direction towards Barmby on the Marsh where it crossed the River Ouse. From the River Ouse, the corridor continued south passing the towns of Thorne, Bawtry and Retford before ending at the area around the existing High Marnham Power Station.

3.5.19 Corridor 1 was located furthest west and was the longest corridor of the options appraised. Constraints to note for this corridor included the Yorkshire Wolds Important Landscape Area (ILA); River Ouse crossing; Thorne and Hatfield Moors designated sites; local plan allocations and proximity to Doncaster Sheffield Airport and Retford (Gamston) Airport.

3.5.20 The corridor was progressed primarily due to it providing an option to avoid crossing the sections of the River Ouse that are internationally designated for their bird interest (Humber Estuary designated sites). It was also recognised as potentially providing opportunities to close parallel[6] existing overhead lines, which is beneficial in terms of landscape, visual and ecological reasons, by reducing infrastructure corridors, wirescape clutter and reducing ecological habitat disturbance. The corridor provided three close parallel opportunities. The first was between Creyke Beck and Market Weighton alongside the existing 4ZR 400 kV overhead line for approximately 17.5 km; the second was between Spaldington and Barmby on the Marsh alongside the existing 4VC 400 kV overhead line for approximately 8.5 km; and the third was between Blyth and Retford alongside the existing XE 275 kV overhead line for approximately 8 km.

Corridor 2

3.5.21 Corridor 2 began with a northern and southern option. The northern option began to the west of South Cliffe, using Corridor 1 to route between Creyke Beck and Link 1, and the southern option began to the west of South Cave, using Corridor 3 to route between Creyke Beck and South Cave. From Link 1, the corridor routed south and west around Gilberdyke, and from Corridor 3, the corridor routed in a westerly direction to the north of Broomfleet. Both the northern and southern options merged at Bellasize and the corridor then routed southwest towards the River Ouse. Corridor 2 provided three separate crossing opportunities for the River Ouse to the east and west of Swinefleet and Saltmarshe. South of the River Ouse, Corridor 2 continued south passing settlements such as Crowle, Epworth and Sturton le Steeple before ending at the area around the existing High Marnham Power Station.

3.5.22 Key constraints associated with this corridor included the Yorkshire Wolds ILA; River Ouse crossing; River Ouse and Thorne and Hatfield Moors designated sites; Isle of Axholme Area of Special Historic Landscape Interest; and proximity to several wind farms.

Corridor 3

3.5.23 Corridor 3 began to the north of Cottingham in the area around the existing Creyke Beck Substation and then routed in a southwesterly direction to Ellerker, passing to

[6] Close parallel is where two overhead lines run alongside each other at the closest distance achievable whilst maintaining a safe operating distance for maintenance between them. For close parallel lines, this equates to approximately 150 m.

the north of Skidby and Brantingham. From Ellerker, the corridor continued in a south westerly direction to the north of Yokefleet and Blacktoft, crossing the River Ouse in between these settlements. From the River Ouse, the corridor continued south, passing the settlements of Garthorpe, Althorpe, Epworth, Misterton and Gainsborough before ending at the area around the existing High Marnham Power Station.

3.5.24 Key constraints associated with this corridor included the Yorkshire Wolds ILA; River Ouse crossing; Humber Estuary designated sites and Blacktoft Sands Royal Society for the Protection of Birds (RSPB) Reserve; Keadby Windfarm; and existing transmission infrastructure.

3.5.25 The corridor was identified primarily to close parallel existing electricity transmission infrastructure, including the existing 4ZQ 400 kV overhead line between Creyke Beck and Keadby, and several existing 400 kV routes south of Keadby to High Marnham.

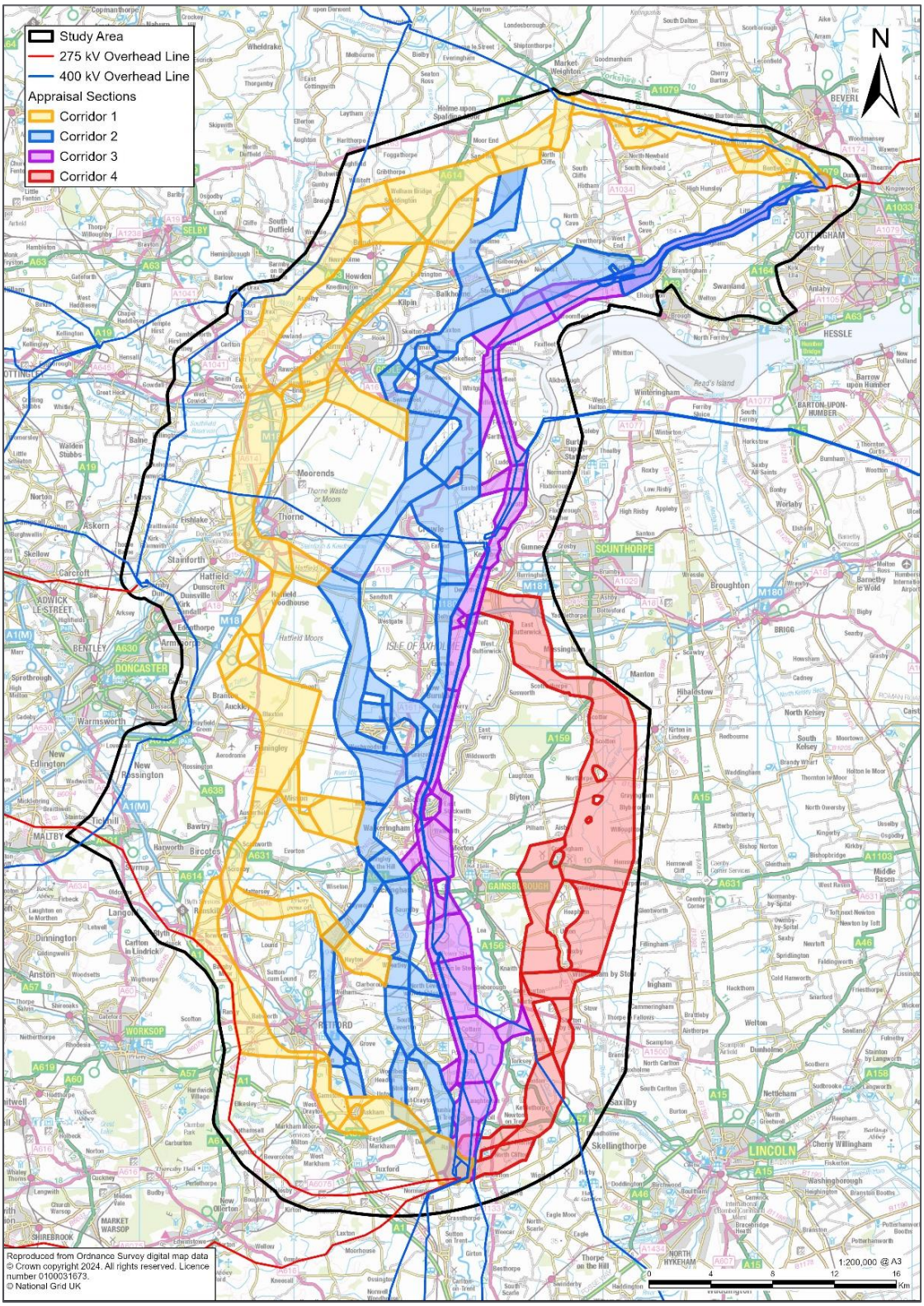
Corridor 4

3.5.26 Corridor 4 branched from Corridor 3 and began with a crossing of the River Trent to the southwest of Scunthorpe and south of Burringham. The corridor then routed southeast through agricultural fields crossing the M180, M181 and A159 to the west and south of Scunthorpe, before routeing southeast to avoid Scotter and Laughton Forest. From Scotter, the corridor continued south past Scotton, Kirton in Lindsey and Northorpe before crossing the A631 at Corringham, and continuing south passing settlements including Upton, Willingham by Stow, and Stow. The corridor then routed south crossing the A1500, A156, A57 and A1133 before routeing in a southwest direction ending at the area around the existing High Marnham Power Station.

3.5.27 Corridor 4 was the furthest east corridor option and was the shortest as it did not connect to Creyke Beck; instead, it connected to the northern section of Corridors 2 or 3 at a point southwest of Scunthorpe to complete the route. Key constraints associated with this corridor included five existing 400 kV overhead lines which would need to be crossed, the River Trent, and the road and rail network.

3.5.28 The corridor was progressed primarily to avoid the Trent Valley and route away from the existing electricity transmission infrastructure in this area through a relatively open and unconstrained landscape within west Lincolnshire. Corridor 4 was the only corridor to predominantly route to the east of the River Trent and the only corridor to route into High Marnham from the northeast.

Image 3.5 – Preliminary overhead line corridors



Potential route corridor links and loops

3.5.29 As part of the CPRSS 2023, the four preliminary overhead line corridors were divided into sections, links and loops for appraisal (in isolation and end-to end solution) to inform identification and selection of an emerging preferred corridor. Due to the length of each corridor, the appraisals involved five steps: four steps covering geographical extents, and a fifth step comprising an end-to-end review.

3.5.30 This stepped approach was adopted as each preliminary corridor contained localised constraints which could be avoided through alternative routeing opportunities and could maximise routeing opportunities and wider corridor synergies (i.e., use of links and loops between sections of preliminary corridors). Therefore, it was likely that a combination of sections of preliminary corridors, links and loops, rather than a single corridor, would be used to route between Creyke Beck and High Marnham.

3.5.31 The defined components considered under each step are summarised below from the CPRSS 2023 report. The defined components were considered in isolation and broadly approached in a sequential manner routeing north to south:

- **Step 1** – Consider the preliminary corridors across the Yorkshire Wolds.
- **Step 2** – Consider how to link the optimum preliminary corridor from Step 1 between the Yorkshire Wolds and the River Ouse.
- **Step 3** – Consider the best performing preliminary corridor across the River Ouse.
- **Step 4** – Consider options from the River Ouse crossing point to High Marnham. Step 4 comprises several sub-steps (Step 4a – 4e).
- **Step 5** – Consider all evaluation components as end-to-end solutions to ensure that there were no circumstances where an accumulation of smaller constraints in a 'parked' option might justify reconsidering decisions in identification of the components.

3.5.32 The CPRSS 2023 considered each progressed section, link or loop of the preliminary corridor in the context of the wider end-to-end solution. This was done to ensure that the reasoning and justification for progressing one part of the emerging preferred corridor did not incorrectly impact on the decision made for the next section, link or loop of the corridor.

3.5.33 The emerging preferred corridor from the CPRSS 2023 consisted of the following:

- A new overhead line closely parallel to the existing 4ZQ 400 kV overhead line from the edge of the Yorkshire Wolds to near Luddington (Lincolnshire) including crossing the River Ouse alongside the existing overhead line river crossing;
- A new overhead line from Luddington to near Beltoft, looping west around Keadby Windfarm to pass east of Ealand and then parallel or close parallel to the two existing 400 kV overhead lines south to near the crossing of the Warping Drain, southeast of Haxey; and
- A new overhead line from there looping west to pass west of Misterton, then south, passing west of the line of villages along the edge of the Trent Valley (Walkeringham, Beckingham, Sturton le Steeple, North and South Leverton, Treswell and Woodbeck) to pass west of East Drayton then approach High Marnham from the northeast.

3.5.34 Overall, the conclusion was drawn that routeing the new overhead line closely parallel to existing 400 kV network would minimise the overall environmental impacts, concentrating impacts in areas already impacted rather than spreading them more widely. The alternative corridors would have introduced infrastructure in areas where it is currently not located and would have resulted in likely adverse effects to the

Yorkshire Wolds AONB candidate site[7] and encircled a larger proportion of settlements.

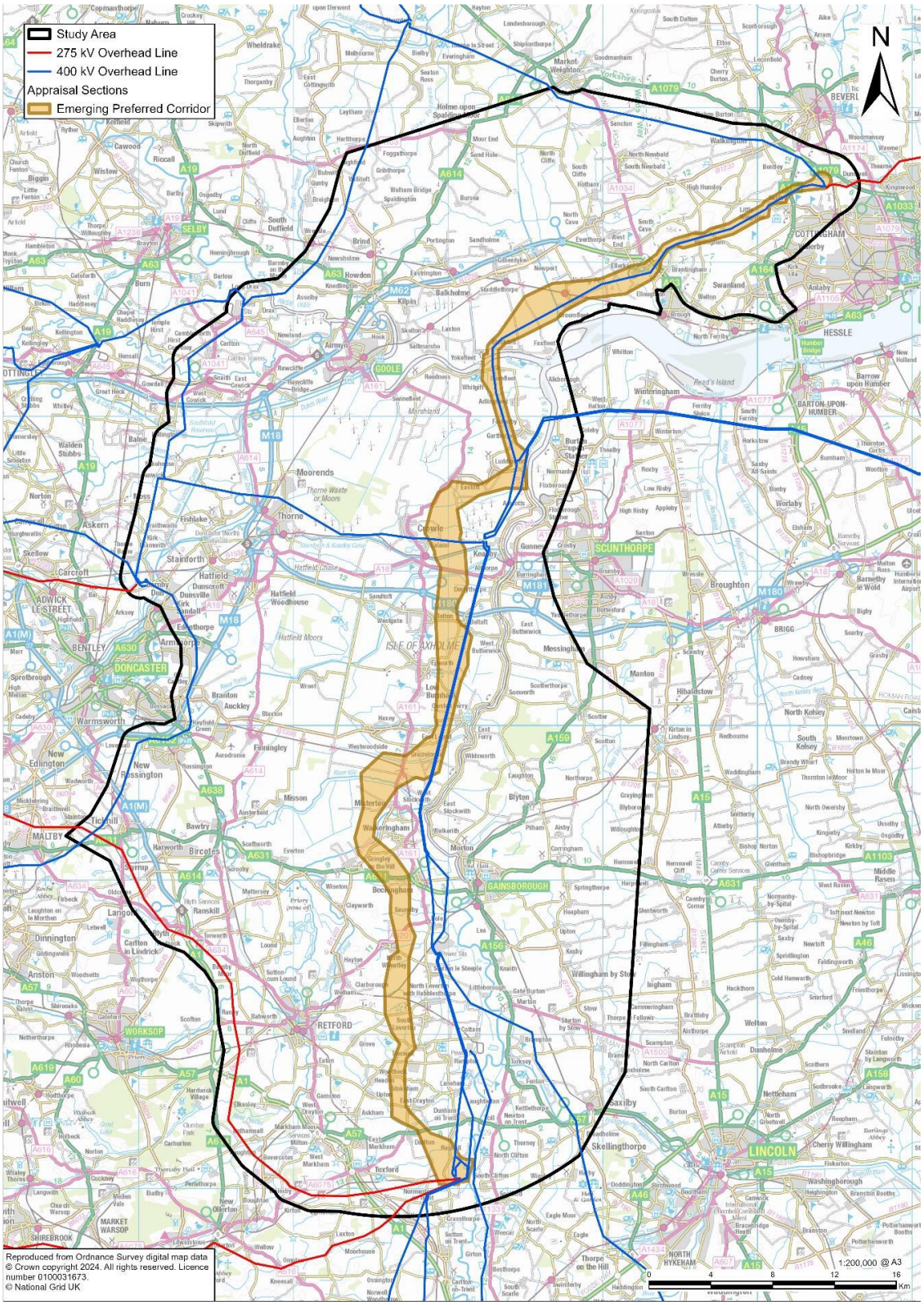
3.5.35 The main exceptions to this were at Keadby, with the technical constraints around Keadby Windfarm and south of Haxey. It was considered that south of Haxey, a new corridor three to four kilometres west of the existing 400 kV overhead lines in the Trent Valley adhered to Holford Rule 6 by preventing a third close parallel to the existing overhead lines and avoiding further wirescape[8] in the landscape.

3.5.36 The emerging preferred corridor is shown in Image 3.6.

[7] At the time of the CPRSS 2023 and emerging corridors being developed, the Yorkshire Wolds Candidate site boundary would have interacted with the northern extent of the Project. However, following statutory consultation by Natural England in 2024/25, the boundary was refined and any interaction between the Project and Candidate site was removed.

[8] The collective visual presence of National Grid overhead transmission lines, pylons and associated infrastructure within a landscape, and their effect on landscape character and visual amenity.

Image 3.6 – Emerging preferred corridor – CPRSS 2023



The Graduated Swathe

3.5.37 A graduated swathe was then produced within the emerging preferred corridor that illustrated the geographical areas and extents where it might be more appropriate to route the new transmission line. This graduated swathe took into consideration designated ecological sites, heritage features, residential settlements and isolated properties, existing and consented infrastructure, and professional judgement.

3.5.38 The emerging preferred corridor and graduated swathe within it were taken forward and consulted upon as part of the non-statutory consultation in 2023.

Defined Proposal and Non-Statutory Consultation

Non-statutory consultation 2023

3.5.39 The emerging preferred corridor option was presented at non-statutory consultation which took place between 1 June 2023 to 27 July 2023. The feedback has been compiled and presented within **Application Document 5.1 Consultation Report Appendix B Non-Statutory Consultation Feedback Report**.

3.5.40 A total of 585 feedback submissions were received during the non-statutory consultation period from local authorities, stakeholders and other consultees. The summaries below of the feedback received are not exhaustive but have been included to present the range of themed feedback that was considered in further refining the emerging preferred corridor. To the north of the emerging preferred corridor option, feedback included:

- A request to underground and/or move proposed overhead lines to the west of Brantingham/Ellerker area;
- Concerns around landscape, visual and ecological impacts in proximity to the River Ouse;
- Requests for undergrounding across the River Ouse;
- Landscape and visual impacts to local footpaths, residents and North Leverton Windmill; and
- If a route went through the Isle of Axholme, it should be undergrounded.

3.5.41 To the south of the emerging preferred corridor option, feedback included:

- That the new overhead line should be routed further to the east, placing it closer to existing overhead power lines, and further from villages where infrastructure was not present;
- That the new overhead line should be routed in close parallel with the existing overhead lines wherever possible to reduce encirclement of residential areas by the new overhead line to the west, and the existing 400 kV overhead lines to the east; and
- Concerns around the potential negative impacts of routeing the overhead line close to the Treswell Woods SSSI and Nature Reserve, and on North Leverton Windmill, a local Grade II* listed cultural heritage asset in the area.

3.5.42 **Application Document 5.1 Consultation Report Appendix B Non-Statutory Consultation Feedback Report** provides full details on the consultation feedback responses received during non-statutory consultation 2023.

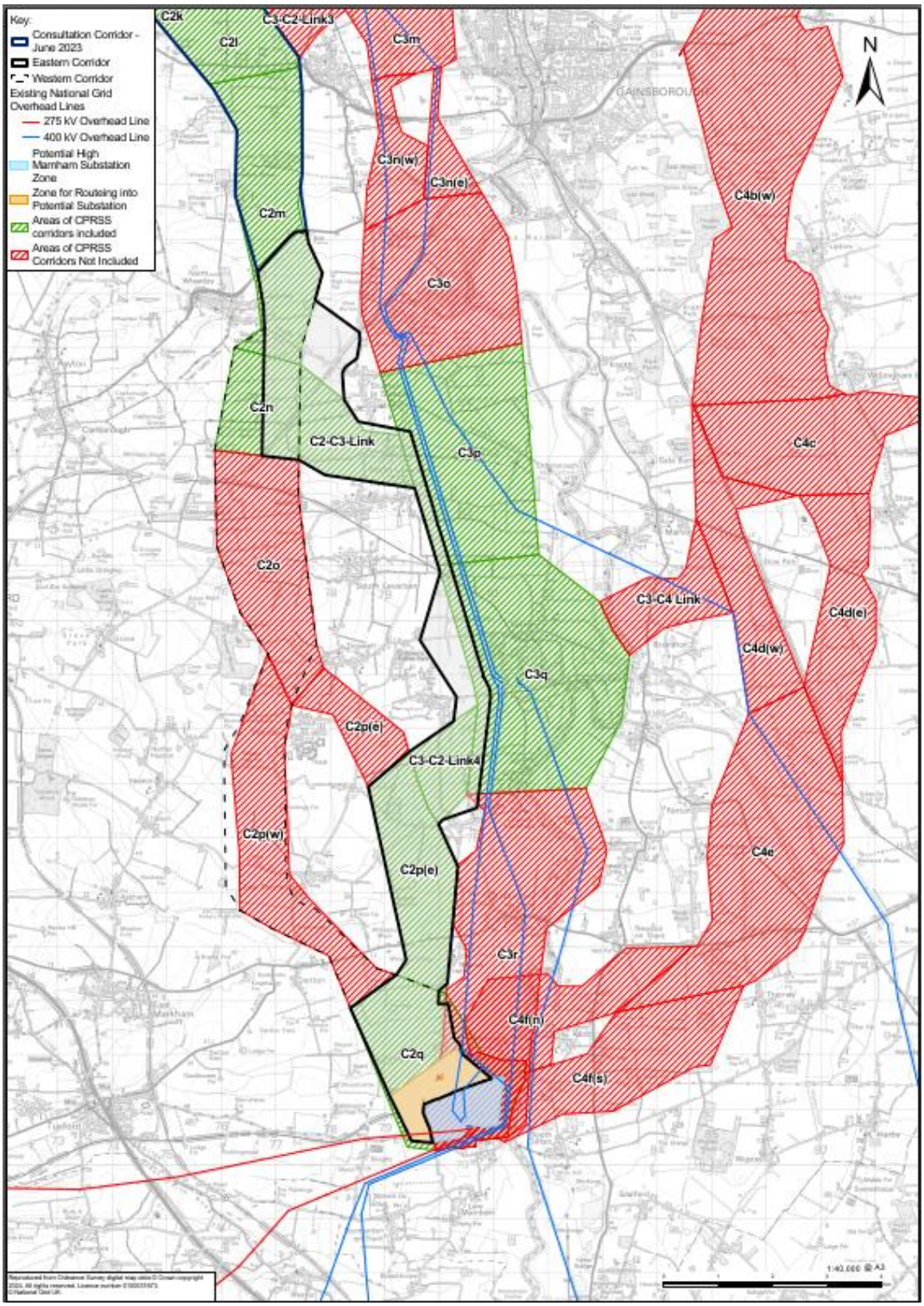
3.5.43 The consultation feedback received by National Grid during the non-statutory consultation 2023 played an important role in developing the Project, as local knowledge and feedback helped shape the evolution of the Project design and routeing. Further information on evolution of the Project design, including identification of the preferred alignment, can be found in **Application Document 7.20 Design Development Report - 2025**.

3.5.44 As a result of consultation feedback, review of new information and a review of the CPRSS 2023 (National Grid, 2023), a potential alternative corridor was considered and a localised non-statutory consultation was held in 2024. Further information on this is set out below.

Localised Non-Statutory Consultation 2024

3.5.45 Following a review of the CPRSS 2023 (National Grid, 2023) which took into account additional information received, and feedback gathered from the non-statutory consultation 2023 (as summarised above), National Grid undertook an exercise to consider a potential alternative corridor between South Wheatley and High Marnham. This potential alternative was referred to as the eastern corridor. National Grid undertook early engagement with stakeholders on this eastern corridor. Image 3.7 shows which sections of Corridors 2 and 3, as defined within the CPRSS 2023 and described above in section 3.5, were used in defining the eastern corridor.

Image 3.7 – Areas of the CPRSS study corridors used in the eastern corridor



3.5.46 To support and inform the localised non-statutory consultation 2024 events, a potential impacts identification appraisal was undertaken on the eastern corridor which covered a range of criteria such as environmental, socio-economic, technical and cost factors. This options appraisal process is reported in **Application Document 7.19 Supplementary Corridor and Routeing Report**. Image 3.8 presents the difference between the eastern and western corridors[9] (and, for

[9] The Western Corridor refers to the section of the Emerging Preferred Corridor presented in the CPRSS 2023 between South Wheatley and High Marnham.

reference, also shows the part of the consultation corridor immediately north of the two corridors) that was taken to non-statutory consultation in 2023.

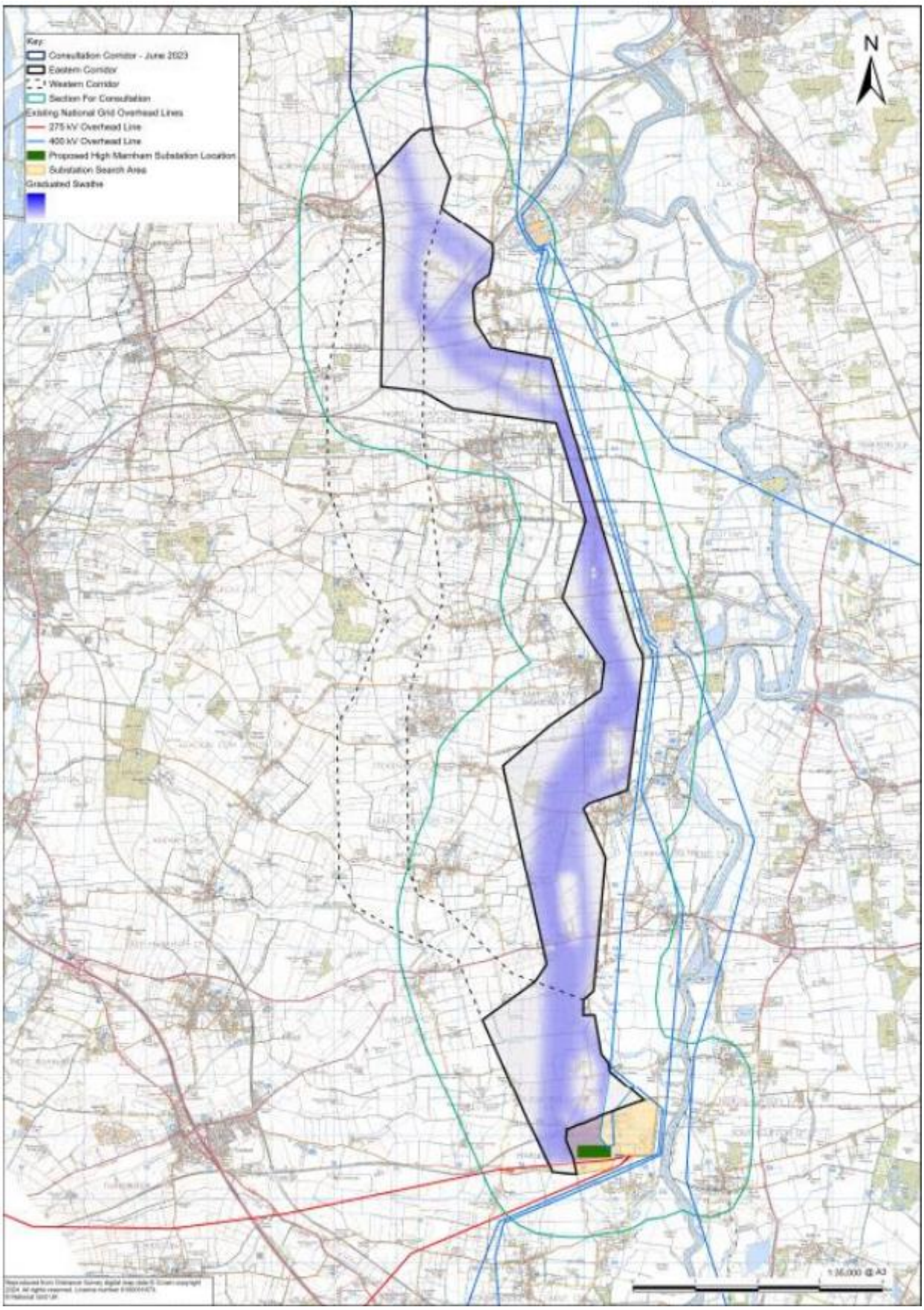
3.5.47 The localised non-statutory consultation was undertaken between 9 July and 6 August 2024. This localised non-statutory consultation focused on the eastern corridor extents to allow stakeholders and consultees to provide feedback on the eastern corridor.

3.5.48 National Grid had made no decision as to which of the two corridors (eastern or western) in this southernmost section of the route should be taken forward at the time of the localised non-statutory consultation.

3.5.49 Following the closure of the localised non-statutory consultation 2024, feedback was collated and reviewed. In total, 152 feedback submissions on the eastern corridor were received by National Grid during the localised non-statutory consultation.

3.5.50 **Application Document 5.1 Consultation Report Appendix B Non-Statutory Consultation Feedback Report** summarises the consultation feedback responses received during the localised non-statutory consultation 2024.

Image 3.8 – Eastern corridor (with graduated swathe) and western corridor



Selection of the End-to-End Preferred Corridor

3.5.51 Feedback from both the non-statutory consultation 2023 and localised non-statutory consultation 2024, as well as further technical assessments, including environmental surveys, were considered when making a decision on the overall end-to-end preferred corridor and identification of the preferred alignment ahead of statutory consultation.

3.5.52 National Grid concluded that the western corridor was the preferred corridor for the southern section of the wider overall end-to-end preferred corridor.

3.5.53 In summary, the appraisal concluded that the eastern corridor was consistent with the principles of the Holford Rules (National Grid, 1959) when these were applied flexibly and supported by appropriate justification. National Grid determined that routeing the proposed overhead line through an area already influenced by existing electricity transmission infrastructure would not significantly alter landscape character, perceptions of tranquillity or rurality. In applying Holford Rule 6, which relates to wirescape, National Grid balanced the effects of concentrating infrastructure within an established transmission corridor against the alternative of spreading visual effects into a wider area of relatively unspoilt countryside.

3.5.54 The assessment identified the potential for adverse visual effects arising from the scale of the proposed infrastructure and its combination with existing overhead lines between Sturton le Steeple and Ragnall. However, it concluded that views across the Trent Valley were already influenced by electricity transmission infrastructure and that the proposed route would largely reinforce an existing pattern of development rather than introduce a new feature into an unaffected landscape. Potential effects on heritage assets and ecological receptors were also identified, although National Grid considered that these could be minimised through careful route alignment and pylon siting during the next stage of the design process.

3.5.55 The appraisal also identified a number of environmental and land use constraints. Much of the eastern corridor was located within the River Trent floodplain and within Flood Zones 2 and 3. Although the assessment concluded that overhead lines could operate safely within areas at risk of flooding, it recognised that construction and maintenance activities could be more challenging due to issues such as waterlogging, restricted access and potential programme delays. Appropriate foundation design, drainage measures and access arrangements were therefore considered necessary. Temporary disruption during construction was also identified as a potential issue for users of the Local Road Network, railway infrastructure, recreational routes, neighbouring farms and other developments within the eastern corridor.

3.5.56 From a technical perspective, the assessment identified several engineering challenges associated with the eastern corridor. These included potential interactions with an existing National Grid Electricity Distribution (NGED) 132 kV overhead line, which would have required diversion, undergrounding or reconfiguration, together with constraints arising from close parallel routeing alongside existing transmission infrastructure. Additional complexity was associated with railway crossings, which could have required additional tension pylons, while access across much of the corridor was considered potentially difficult due to the limited availability of major roads, the presence of railway lines, numerous field drains and watercourses, and the need to accommodate construction and maintenance activities within these constraints. There were also several proposed NSIP developments and associated planning applications in the vicinity of West Burton and Cottam Power Stations that

were partially or fully within the eastern corridor bringing additional design and coordination complexities when determining an overhead line route within this corridor.

3.5.57 As such, it was concluded that the western corridor between South Wheatley and High Marnham was preferred (subject to some amendments in the West Burton area) and the original findings of the CPRSS 2023 remained valid. Further details of the South Wheatley to High Marnham corridor are set out in **Application Document 7.19 Supplementary Corridor and Routeing Report** and the corridor decision is explained in **Application Document 7.20 Design Development Report - 2025**.

3.5.58 As set out above, the western corridor (i.e. the 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 section 5.5 of the **Application Document 7.20 Design Development Report - 2025**.

3.5.59 This end-to-end preferred corridor formed the geographic parameters for which the preliminary alignment for the Project is located.

3.5.60 This preferred alignment formed the basis for the Preliminary Environmental Information Report on which National Grid consulted upon as part of statutory consultation.

The alternative for ZDA overhead line crossing

3.5.61 Within the end-to-end preferred corridor is the need to cross an existing 400 kV ZDA overhead line route between Ealand and the West of Keadby. At the time of non-statutory consultation in 2023, the working assumption was that the crossing of this overhead line would be done through undergrounding any new overhead line associated with the Project.

3.5.62 Further technical, cost, and environmental and socio-economic assessments were undertaken as part of the iterative design process which identified that a solution known as a ‘diamond duck-under’ (see Image 3.16) would be a better solution. This solution would reduce overall land-take, permanent construction works, disturbance to the environment and be less obtrusive to landowners and existing ground conditions. Further information can be found within the **Application Document 7.20 Design Development Report - 2025**.

Consultation with Statutory Bodies

3.5.63 National Grid continued to develop the preferred alignment design and consulted with statutory bodies, such as Natural England, Historic England, Environment Agency, local authorities, other stakeholders and interested parties, as it recognised the importance of developing the design and routeing of the Project through feedback given prior to and during statutory consultation.

3.6 Alternatives Considered at the Defined Proposal and Statutory Consultation Stage

3.6.1 This section describes the preferred alignment which formed the proposals that were shared at statutory consultation in 2025. The images within the section are taken from Application Document 7.20 Design Development Report – 2025, and as such provide a point in time during the iterative design process. As such not all constraints

may be present on the images to allow for improved legibility. Further, some constraints may have been identified during ongoing surveys and discussions with third parties and as such were not known at the time of compilation in 2025. The preferred alignment was developed in response to feedback collected at the non-statutory consultations, further environmental and technical assessments, and a review of work undertaken. Where main routeing decisions were taken to avoid known constraints, these have been summarised where applicable.

3.6.2 The numbered Route Sections detailed below are those adopted for statutory consultation, these were defined by administrative boundary to allow interested parties the ability to navigate the proposed alignment, interrogate information presented and to assist in provided targeted consultation responses. These route sections were refined following statutory consultation and design development, the changes of which are detailed in Table 3.2 below.

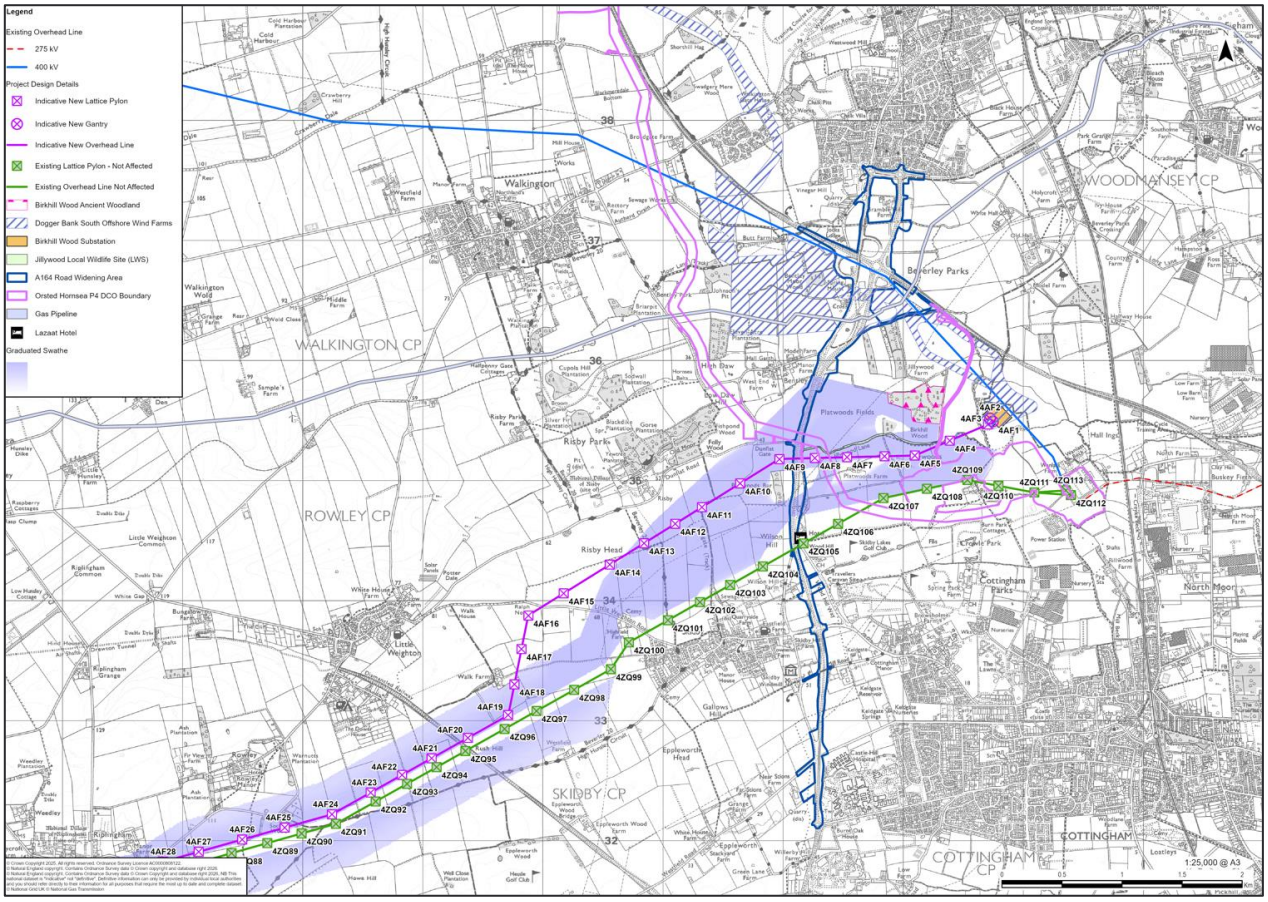
Route Sections 1 and 2: Creyke Beck to A63 (Yorkshire Wolds)

Preferred alignment and siting

Birkhill Wood Substation to south of Little Weighton

3.6.3 The area in the vicinity of the proposed new Birkhill Wood Substation had a number of environmental features which constrained routeing alongside a number of new energy infrastructure proposals. These features are discussed below and illustrated on Image 3.9.

Image 3.9 – Preferred alignment at Birkhill Wood Substation



3.6.4 The proposed new Birkhill Wood Substation would be located to the south of Poplar Farm and to the northwest of the existing Creyke Beck Substation. The overhead line would connect to the national transmission system at the new substation. The emerging preferred corridor that was presented during the non-statutory consultation in 2023 was 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 (National Grid, 2023).

3.6.5 The area west of the proposed new Birkhill Wood Substation also had several environmental sites and features that acted to constrain the routeing of the new overhead line. These included the ancient woodlands of Birkhill Wood and Jillywood and the Local Wildlife Site (LWS) at Jillywood Lane. The farmstead at Plattwood Farm was located within the preferred consultation corridor. The Lazaat Hotel, whilst just beyond the consultation corridor, is located immediately north of the existing 4ZQ overhead line.

3.6.6 Existing infrastructure constrained 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 DNO overhead lines which need to be crossed by the proposed new line added further technical complexity.

3.6.7 In addition, there were several energy-related infrastructure projects proposed in this area. These include the Creyke Beck Solar Farm and a convertor station and underground cable route for the Hornsea 4 Offshore Windfarm; both are consented projects. The recently approved (2026) Dogger Bank South DCO, and the Dogger Bank D DCO project which is currently at pre-application consultation stage, are also close to the new Birkhill Wood Substation site and interact with the Project's preferred alignment (at the time of statutory consultation for the Project).

3.6.8 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 graduated 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.

3.6.9 Following more detailed assessments, survey and the review of consultation feedback, the preferred alignment routed within the central path of the graduated swathe between Jillywood and Platwoods Farm. It then passed to the north of Platwoods Bar Plantation to the east of the A164. The preferred alignment avoided routeing close to the Birkhill Wood Ancient Woodland and minimised changes in route direction.

3.6.10 The preferred alignment routed through the planned Creyke Beck Solar Farm for approximately 1.2 km between proposed pylons 4AF3 and 4AF8 and to the south of the Jillywood Lane LWS. Consultation with the proponents of the Creyke Beck Solar Farm was undertaken as the preferred alignment required some reconfiguration of the approved layout.

3.6.11 In this area there were also interactions with the Hornsea P4 project, as the preferred alignment crossed the proposed convertor station access road between pylons 4AF4

and 4AF5 as well as the proposed cable route between pylons 4AF7 and 4AF8, although no proposed pylons were sited in the Hornsea P4 development area.

3.6.12 The preferred alignment was approximately 40 m to the north of Platwoods Farm. The A164 road widening area was crossed between proposed pylons 4AF8 and 4AF9 to the north of Platwoods Bar Plantation, with pylons sited outside the proposed road widening area. Several Northern Powergrid wood pole overhead lines would have been crossed in short sections, which would have required coordination with Northern Powergrid and other projects in the area. It was likely that these wood pole lines would have needed to be placed underground for short sections.

3.6.13 A more northerly alignment in the area east of the A164 was 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.

3.6.14 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 close to the high pressure gas pipeline would have increased substantially, increasing the technical challenges associated with constructing and operating pylons close to the pipeline.

3.6.15 East of the A164, the preferred alignment routed 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 increased stand-off distance to the high pressure gas pipeline, thus reducing construction and operational challenges.

3.6.16 The preferred alignment was a little over 300 m south of Risby Hall Registered Park and Garden and related scheduled monument and listed building at its closest point. To the west of Skidby, the preferred alignment routed outside the graduated swathe for approximately 1.4 km. This increased the distance to two residential properties on Little Weighton Road and avoided sections of existing 11 kV and 33 kV wood pole overhead lines near Little Weighton Road, whilst it increased stand-off to the Northern Gas Network high pressure gas pipeline and minimised construction and operational challenges with siting pylons and 400 kV overhead lines close to the high pressure gas pipeline. The preferred alignment was located approximately 1 km away from Little Weighton.

3.6.17 The preferred alignment approached 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.

3.6.18 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 was not preferred.

South of Little Weighton to Ellerker North Wold

3.6.19 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).

3.6.20 Following more detailed assessments, surveys and the review of consultation feedback, the preferred alignment was routed within the northern path, to the south of Little Weighton. From proposed pylon 4AF19 the preferred alignment routed in close parallel with and to the north of the existing 4ZQ overhead line towards Riplingham. The preferred alignment did pass through Socken Wood near proposed pylon 4AF25, requiring the removal of a number of established trees. However, an area of mitigation planting has been proposed for the establishment of a new woodland to replace the area of established woodland trees that would be lost (See **Application Document 6.4.F1 Environmental Statement Figure 4.1 - Proposed Project Design**).

3.6.21 South of Riplingham the preferred alignment moved 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 Image 3.10.

3.6.22 The preferred alignment moved away from a close parallel alignment south of Riplingham in order to avoid crossing the Brantingham Dale SSSI and potentially needing to construct pylons within the conservation site due to the large span required to cross the steep topography either side of Dale Road.

3.6.23 The preferred alignment throughout this part of the route was largely close parallel to the existing line, with a separation distance of approximately 85 m. This close parallel alignment would have routed the new line further from properties at Riplingham and Great Wold and helped to minimise any impact upon flying operations from Mount Airey Airstrip (an unlicensed grass airstrip) to the west of Riplingham.

3.6.24 The proposed new and existing pylon positions were largely synchronised. Where pylon positions were not synchronised, they had been adjusted 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.

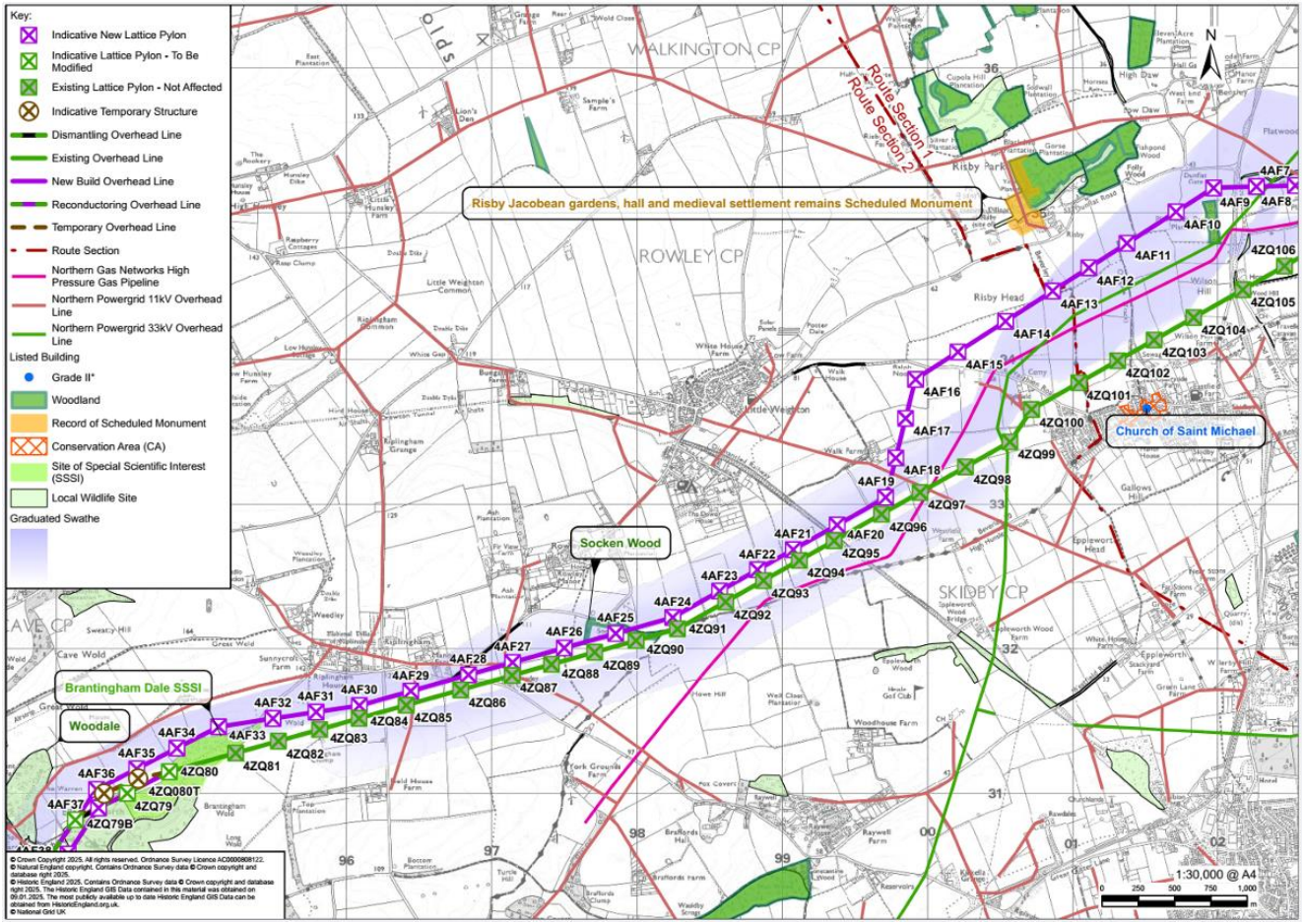
3.6.25 Following the alternative southern path in this Route Section of the graduated swathe would have involved a line swap over of the new and existing lines at both ends, introducing between two and four heavier tension pylons compared with the northern path and increasing effects upon views through this section of the Wolds. It would have also added additional diversions, electrical outages and sequencing constraints in addition to the technical complexity and level of construction activity involved.

3.6.26 A high pressure gas pipeline was also located within the eastern half of the southern path within the graduated swathe, which represented a significant technical constraint to the construction and operation of any new overhead line in this area. Avoiding the pipeline would have meant that any benefit from adopting the southern

path would be limited to the western extent of this path only, a distance of less than 2.5 km.

3.6.27 In addition, any parallel alignment on the southern path within the graduated swathe would have needed 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 have resulted in there being overhead lines to both the north and south of the property.

Image 3.10 – Close paralleling north of Skidby



Ellerker North Wold to A63

3.6.28 From Ellerker North Wold, a single path for the proposed new overhead line was presented at non-statutory consultation. This was located to the north of the existing 4ZQ overhead line, which ran through Woodale down the steeper scarp slope that marked 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 meant that there was 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.

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

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

3.6.31 Within this area there were 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 followed the edge of the Wolds in this locality, providing a succession of significant viewpoints. The National Trail needed to be crossed by the proposed new overhead line regardless of the path the alignment takes in this location.

3.6.32 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 LWSs. 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.

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

3.6.34 The village of Ellerker is a designated Conservation Area. The path to the north of the village was 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 have also experienced close views of a new line in this location.

3.6.35 Whilst a new line built to the south of the village would have also been 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 have reduced the scale of impacts upon the surrounding landscape. In comparison, a new line remote from the existing would have resulted in overhead lines on both sides of the village, affecting its setting.

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

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

3.6.38 Following the review of consultation feedback, an alternative swap over location 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 descended the scarp slope from the Wolds. Despite the resultant removal of a strip of plantation woodland at Bilks Hill, it was considered that

this close parallel alignment would help reduce the scale of landscape impacts in this sensitive section of the Yorkshire Wolds ILA.

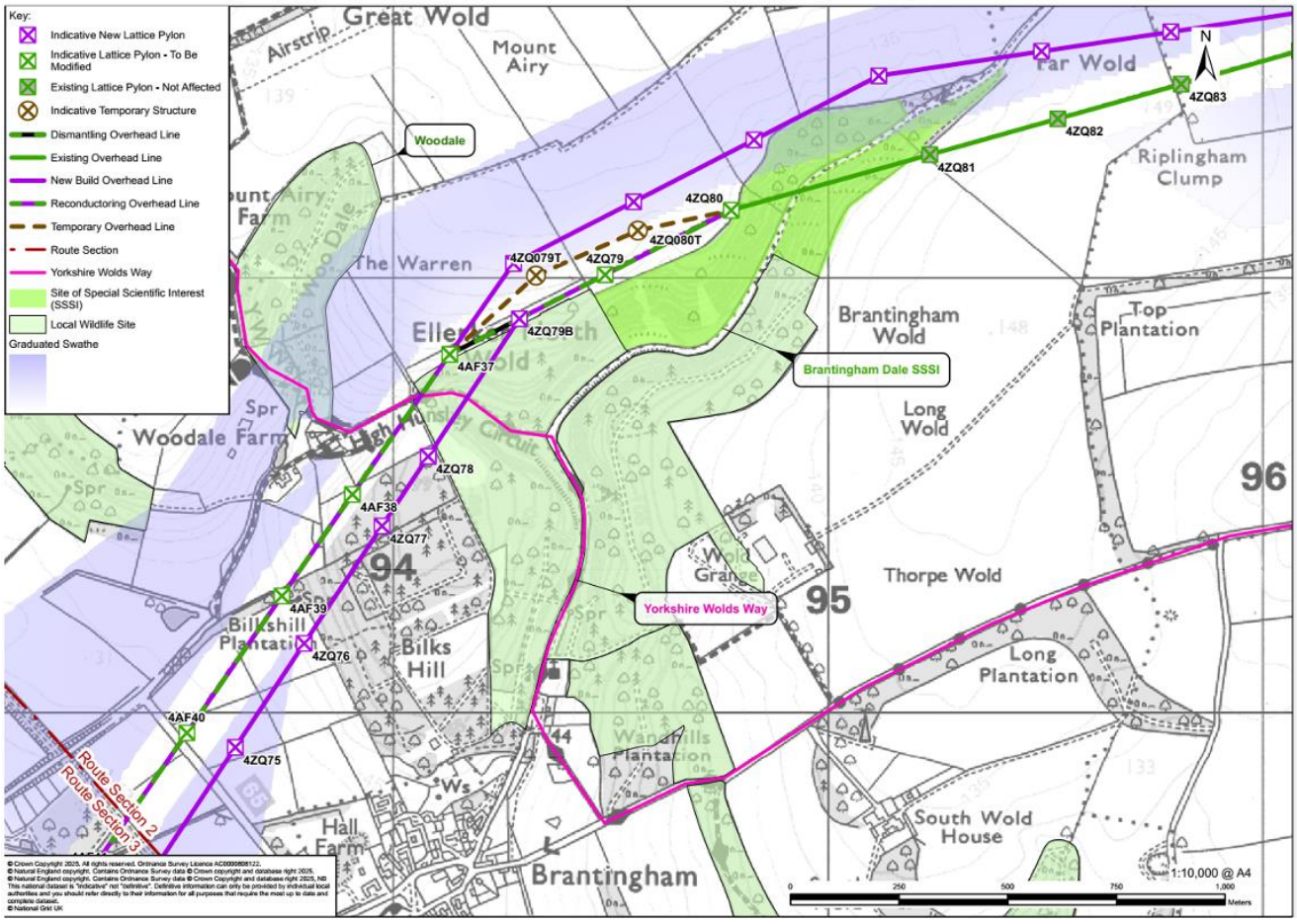
3.6.39 Whilst the preferred alignment comprises a southern close parallel alignment crossing the Brantingham Dale LWS, no pylons would have been constructed within the site and the topography here would have also helped reduce the extent of any tree removal. Similar impacts to the Woodale LWS would have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

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

3.6.41 Constructing the line swap over at Ellerker North Wold also allowed 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.

3.6.42 The Project included three areas of environmental mitigation land around the scarp slope of the Wolds 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.

Image 3.11 – View of line swap over at Ellerker North Wolds



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

Overview

3.6.43 Route Section 3 of the preferred alignment began at the A63 dual carriageway and routed in a southwesterly direction along the western edge of the Yorkshire Wolds ILA to Blacktoft Lane, a road close to the northern bank of the River Ouse. The preferred alignment then crossed the River Ouse in Route Section 4 to the west of Ousefleet, running south towards Adlingfleet. The preferred alignment continued south into Route Section 5 towards the B1392 Meredyke Road, located between the village of Luddington and the River Trent.

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

Preferred alignment and siting

Route Section 3 – A63 dual carriageway to River Ouse Crossing

3.6.45 South of Ellerker the preferred alignment routed closely parallel to the south side of the existing 4ZQ overhead line. This close parallel alignment continued to a point midway between Ellerker and the village of Broomfleet to the west. This area had relatively few constraints to routeing and the positions of the proposed new and existing pylons were therefore well synchronised.

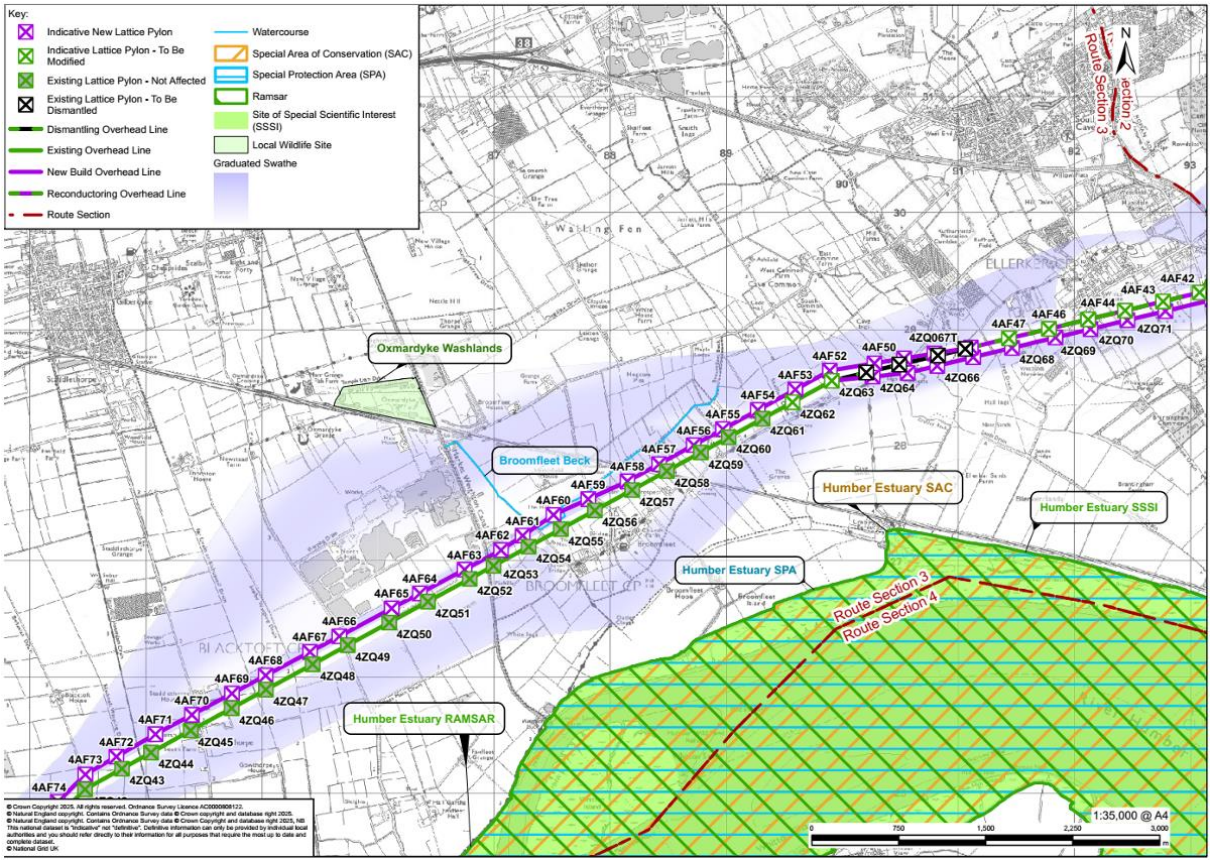
3.6.46 In the vicinity of Broomfleet three discrete paths within the graduated swathe were presented during the non-statutory consultation. One path was sited to the south of the village. A second path followed a parallel route on the northern side of the existing overhead line north of the village, crossing an area of active mineral extraction. The third and northernmost 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 have necessitated a line swap over, the proposed new and existing overhead lines if the proposed new overhead line were to be routed to the south of Ellerker.

3.6.47 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.

3.6.48 Design considerations in this area included the potential impacts of the Project on bird species associated with the nearby nationally and internationally designated 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 Broomfleet Tile Works.

3.6.49 Having undertaken more detailed assessments and surveys, and given careful consideration to consultation feedback, the preferred alignment followed a central path of the graduated swathe on the northern side and closely paralleled the existing 4ZQ line north of Broomfleet (see Image 3.12).

Image 3.12 – Preferred alignment and close paralleling at Broomfleet



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

3.6.51 In comparison with the alternative paths within the graduated swathe to the north and south, the preferred alignment avoided 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 was 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 Broomfleet Tile Works and Oxmardyke Washlands; both areas where surveys have confirmed the presence of significant bird numbers associated with the Estuary.

3.6.52 The preferred alignment was the most technically complex of the three paths considered and demonstrated design mitigation to minimise adverse environmental effects at the design stage of the Project. The preferred alignment introduced construction and maintenance challenges due to the ongoing clay extraction works. Inevitably, some clay reserves would be sterilised as a result.

3.6.53 As explained previously, adopting a northern alignment at Broomfleet and a southern alignment at Ellerker necessitated a line swap over, somewhere between the two villages. In this Route Section there was one existing tension pylon which could be reused as part of a new line swap over. This pylon was 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 involved the removal of approximately 1.2 km 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.

3.6.54 In this way the preferred alignment 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 was immediately northwest of Broomfleet where a slight diversion away from a truly parallel alignment was proposed, to avoid constructing a pylon over Broomfleet Beck, a drain maintained by the Internal Drainage Board (IDB).

3.6.55 Where possible, existing and proposed pylon positions were proposed to be synchronised, but a number of local constraints to pylon construction precluded this in some locations. Such constraints included the active extraction areas at Broomfleet Tile Works and a required 10 m stand-off from multiple watercourses (mostly IDB-maintained drains).

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

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

Image 3.13 – View of line swap over at Ings Lane

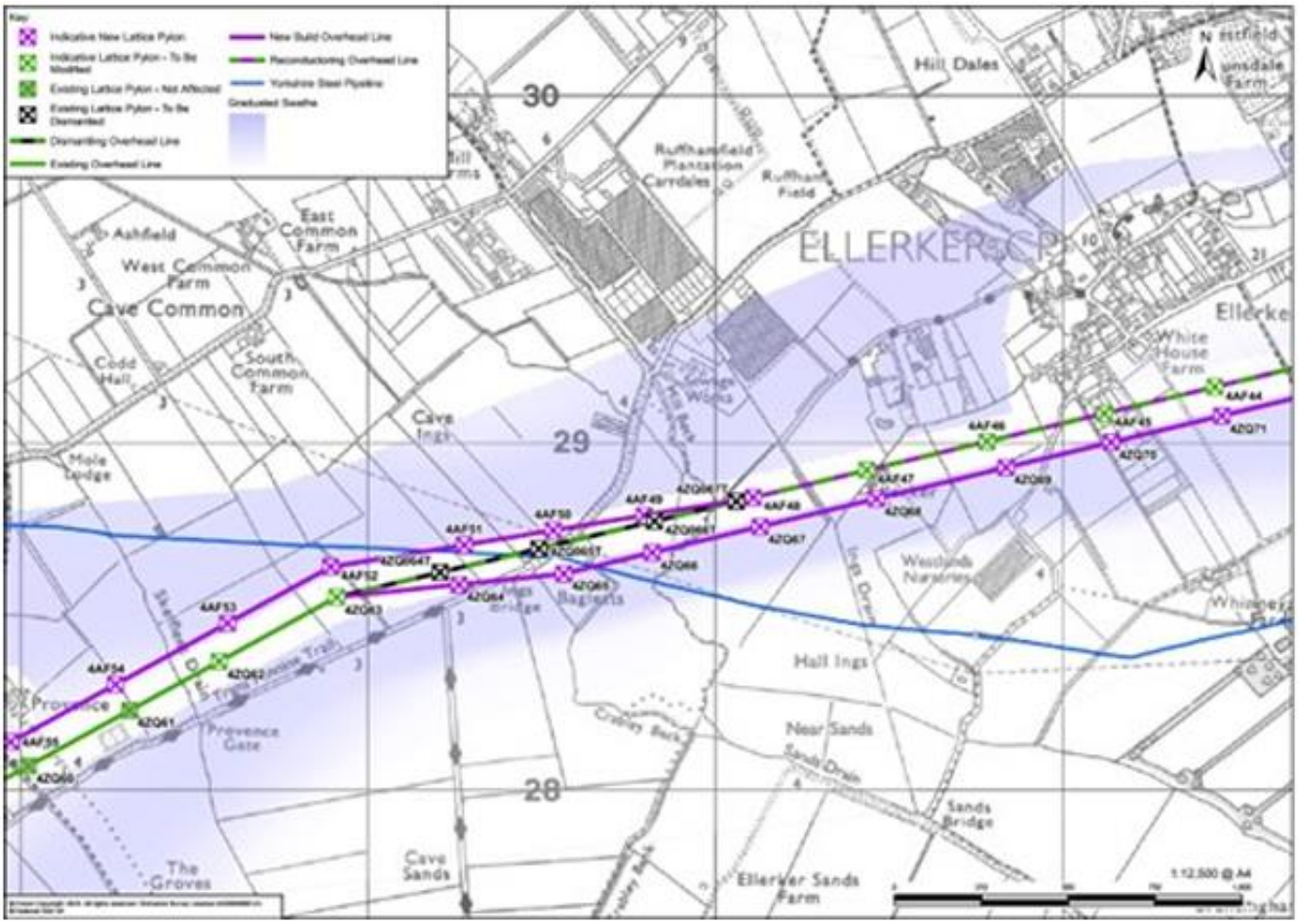
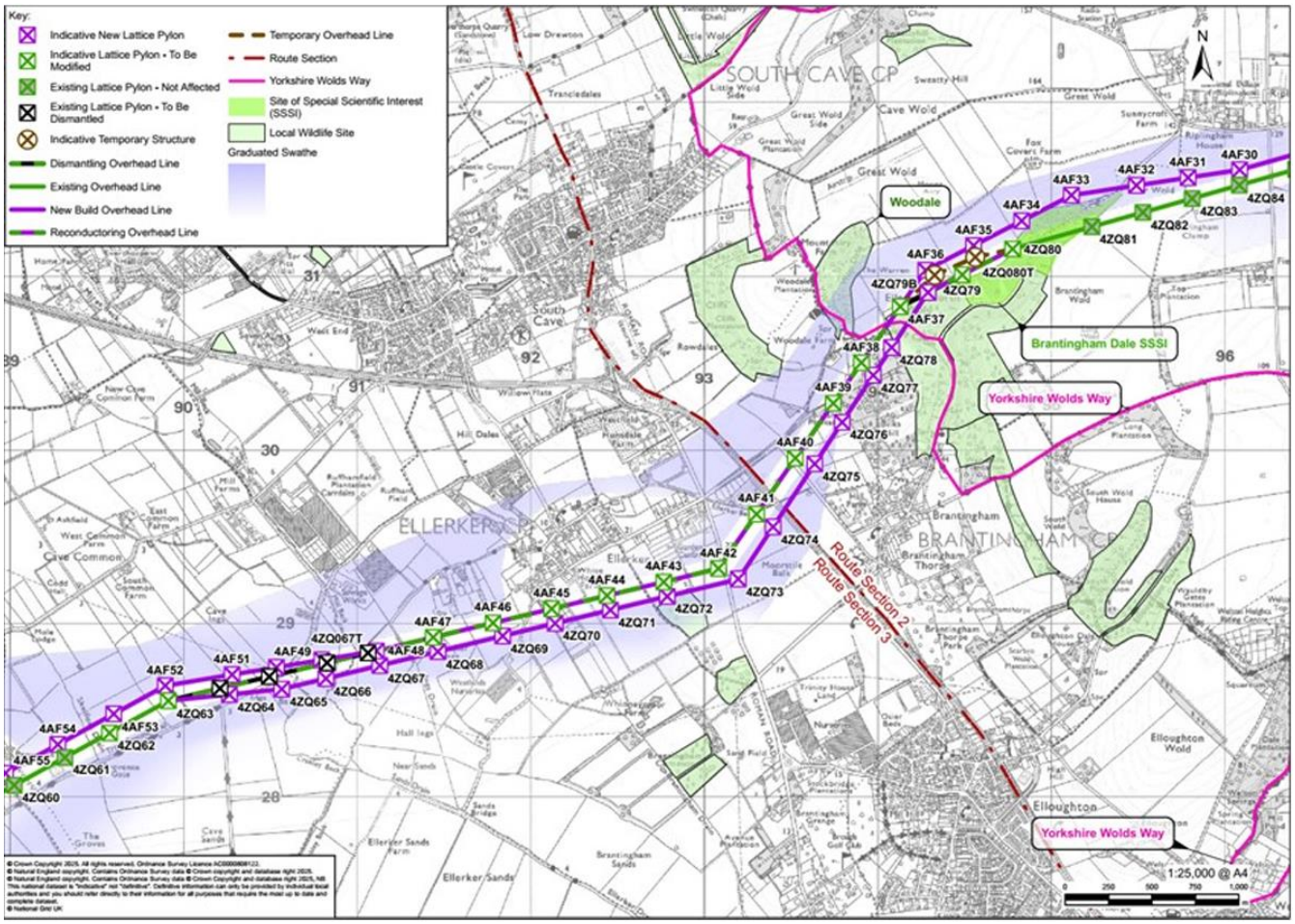


Image 3.14 – Combined view of the two line swap overs at Ellerker North Wold and Ings Lane



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

3.6.58 The new overhead line 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 Image 3.15).

3.6.59 This was a significantly constrained section of the route. Notable constraints included 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. Another constraint is Blacktoft Sands RSPB Reserve, 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 RSPB Reserve is particularly concentrated in the central section.

3.6.60 In addition, local listed buildings included Yokefleet Hall on the north bank of the river, Whitgift Lighthouse on the south bank and Ross Farmhouse in Ousefleet; all Grade II listed.

3.6.61 Whilst the River Ouse at this point forms part of the national and international nature conservation sites of the Humber Estuary, the designated site boundaries are generally defined by the flood banks and therefore do not extend far from the

riverbank. Therefore, it was possible to avoid having to site pylons within the designated sites themselves, avoiding permanent habitat loss.

3.6.62 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. An alignment to the most westerly edge of the graduated swathe's western path was proposed. The preferred alignment increased the distance between the existing overhead line and the proposed overhead line as the route crossed the River Ouse.

3.6.63 This was 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 moved away from the main part of the Blacktoft Sands RSPB Reserve and the main areas of bird activity, helping to reduce any potential adverse impacts upon bird movements. Whilst it was recognised that the preferred alignment would adversely affect the setting of the Hall Garth Moated Site, proposed works within the designated site boundary were restricted.

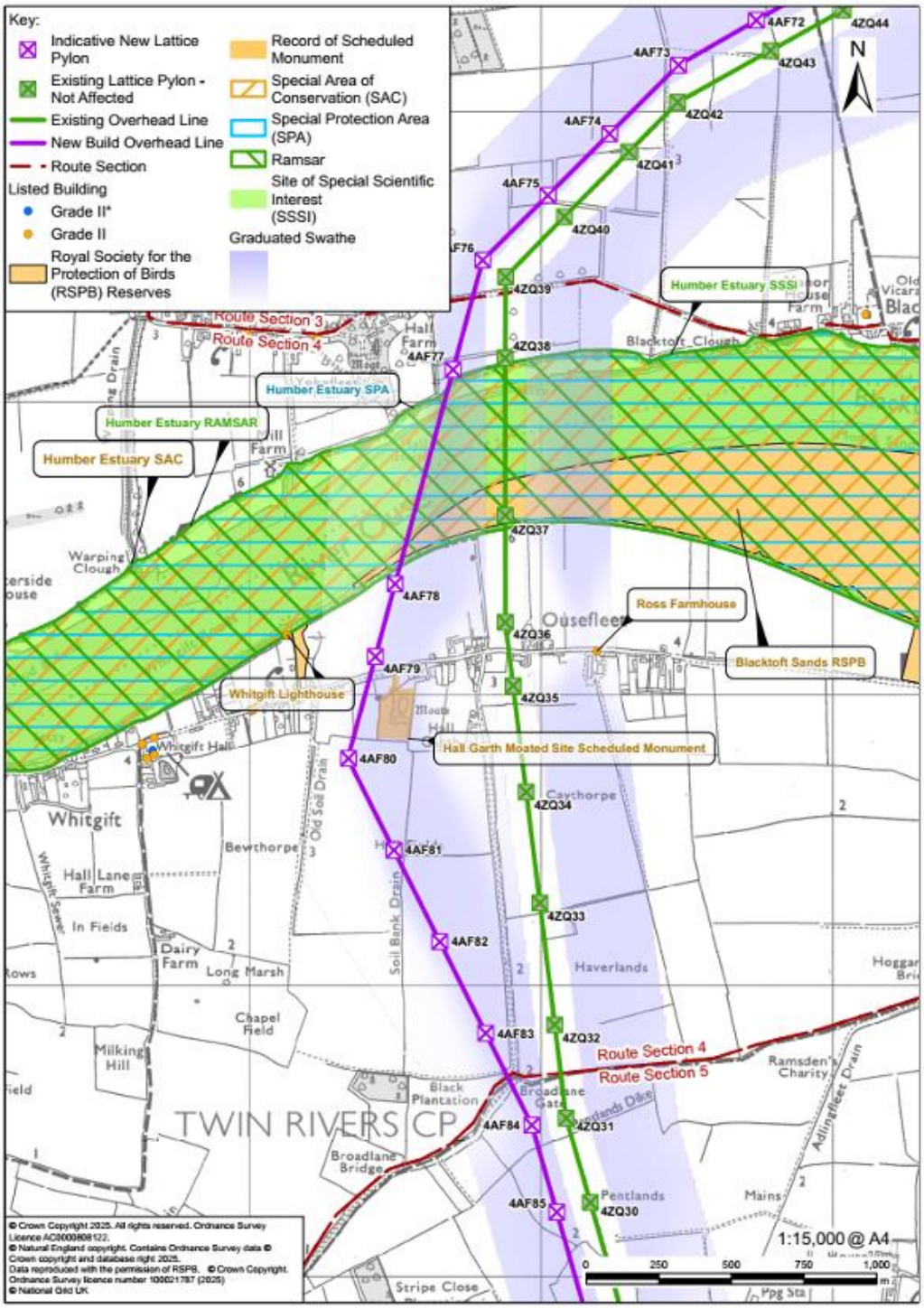
3.6.64 A route within the eastern path of the graduated swathe, whilst offering the opportunity to route in parallel with the existing overhead line across the river, would have been routed across a wider part of the RSPB Reserve and in an area known to be more heavily used by bird species associated 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.

3.6.65 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 was considered that this option would likely have resulted in greater impacts upon the immediate residential properties. These arose as a result of both proximity and the local changes in route direction.

3.6.66 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 context of 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.

3.6.67 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 had the benefit of avoiding the need for this line swap over.

Image 3.15 – Preferred alignment at River Ouse crossing and at Ousefleet



Route Section 5 – River Ouse crossing to Luddington

3.6.68 South of Ousefleet, two alternative paths within the graduated swathe were presented for the proposed new overhead line during non-statutory consultation. Both paths were parallel to the existing 4ZQ overhead line: one to the east and one to the west, 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).

3.6.69 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 had relatively few environmental sites and features that would influence or constrain the routeing of the proposed new overhead line.

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

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

3.6.72 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 were most notable. Adlingfleet is also a designated Conservation Area and contains a scheduled monument and a number of listed buildings, including the Grade I listed Church of All Saints.

3.6.73 If a route within the eastern path south of Ousefleet were adopted, two line swap overs would have been needed to connect to a western path across the River Ouse. This would have added substantial technical complexity, increased the amount of construction activity and introduced at least five tension pylons.

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

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

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

Overview

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

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

Preferred alignment and siting

South of Luddington to east of Crowle Routeing

3.6.78 Pylon 4AF100 was synchronised with the existing 4ZQ overhead line. From this point the preferred alignment at pylon 4AF100 deviated west, away from the existing 4ZQ overhead line. From 4AF100 to 4AF114 the preferred alignment was 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.

3.6.79 The preferred alignment crossed over where Ox Pasture Lane and Carr Lane meet, to the east of Eastoft. Pylon 4AF114 was sited sensitively on the edge of the proposed Humber Carbon Capture Pipeline (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 was not feasible without significantly increasing the distance between pylons, which would have led to significantly taller pylons. This led to 4AF114 and 4AF115 being sited within the HCCP corridor. Siting of pylon 4AF114 was also orientated in respect of the required existing ZDA overhead line crossing.

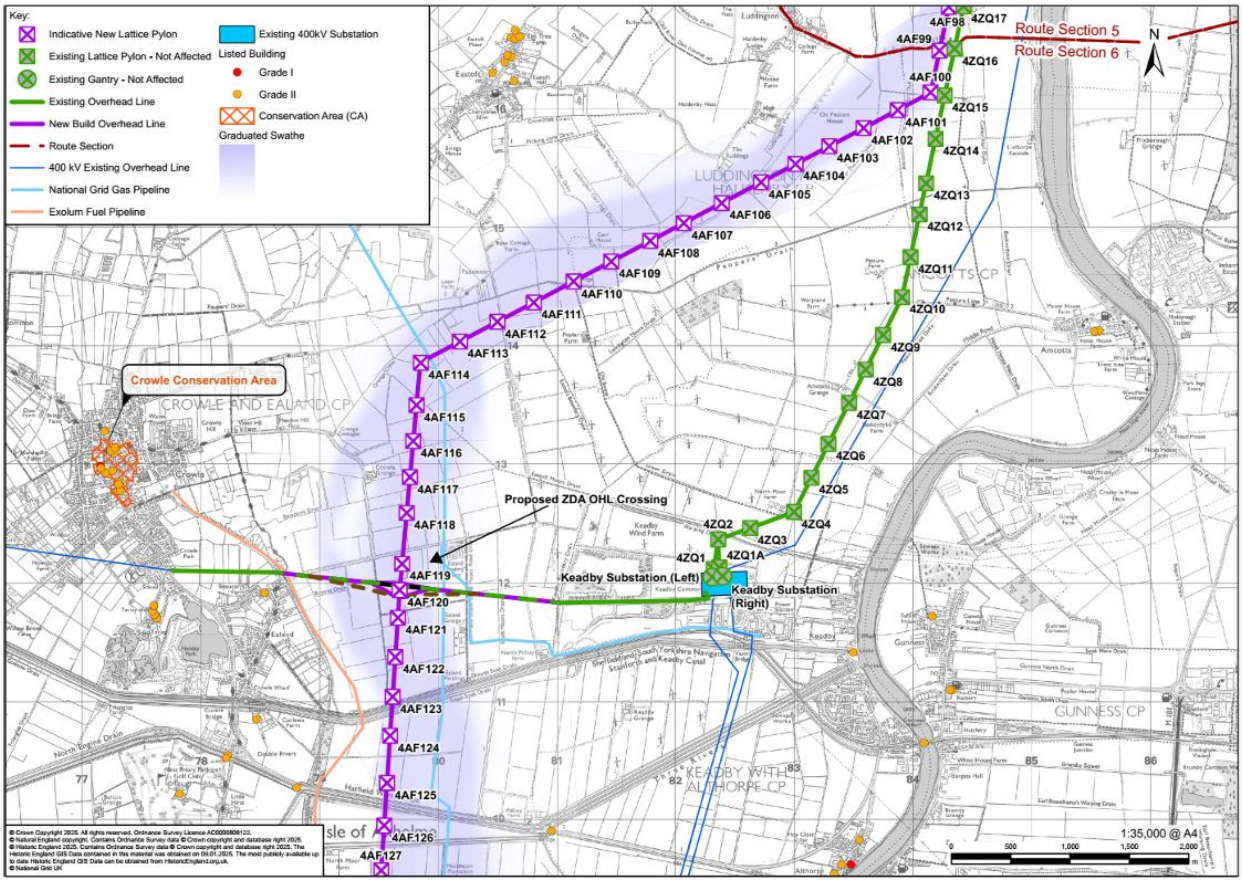
3.6.80 From 4AF114, the preferred alignment continued in the eastern path of the graduated swathe, in parallel with the National Gas Transmission high pressure gas pipeline and approximately 270 m away from Crowle Grange, to the overhead line centreline. Routeing in the eastern path rather than the western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

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

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

3.6.83 The preferred alignment at this location is shown at Image 3.16.

Image 3.16 – Preferred alignment south of Luddington to east of Crowle



Crossing the existing ZDA overhead line to the west of Keadby

3.6.84 As the preferred alignment routed southeast of Crowle, it approached the existing ZDA overhead line to the west of Keadby which ran in an east-west orientation. The preferred alignment crossed the existing 400 kV ZDA overhead line between 4AF119 and 4AF121. The design included modification of the existing ZDA overhead line to a 'diamond duck-under' arrangement. This proposed replacing two existing ZDA pylons with two sets of lower height structures, ensuring the proposed new overhead line could maintain sufficient electrical safety clearance above the ZDA line.

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

3.6.86 Siting of pylons in this area had 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.

3.6.87 An illustrative design of the ZDA overhead line duck-under is illustrated in Image 3.17 and Image 3.18.

Image 3.17 – Illustrative design of diamond duck-under crossing arrangement

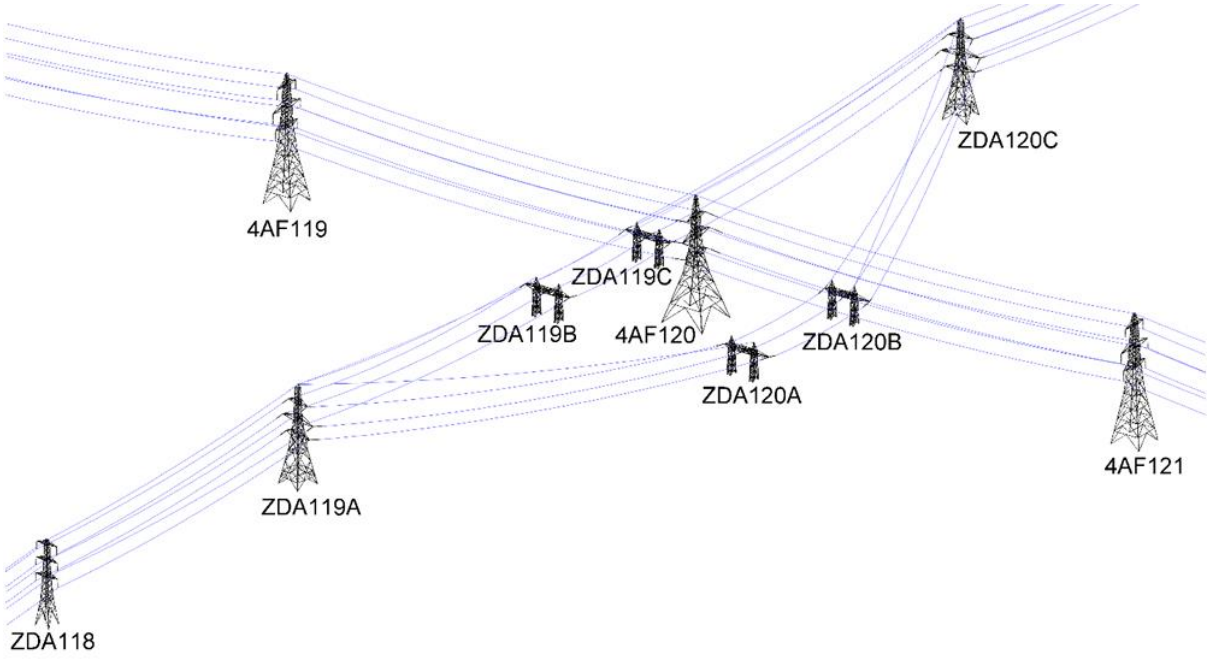
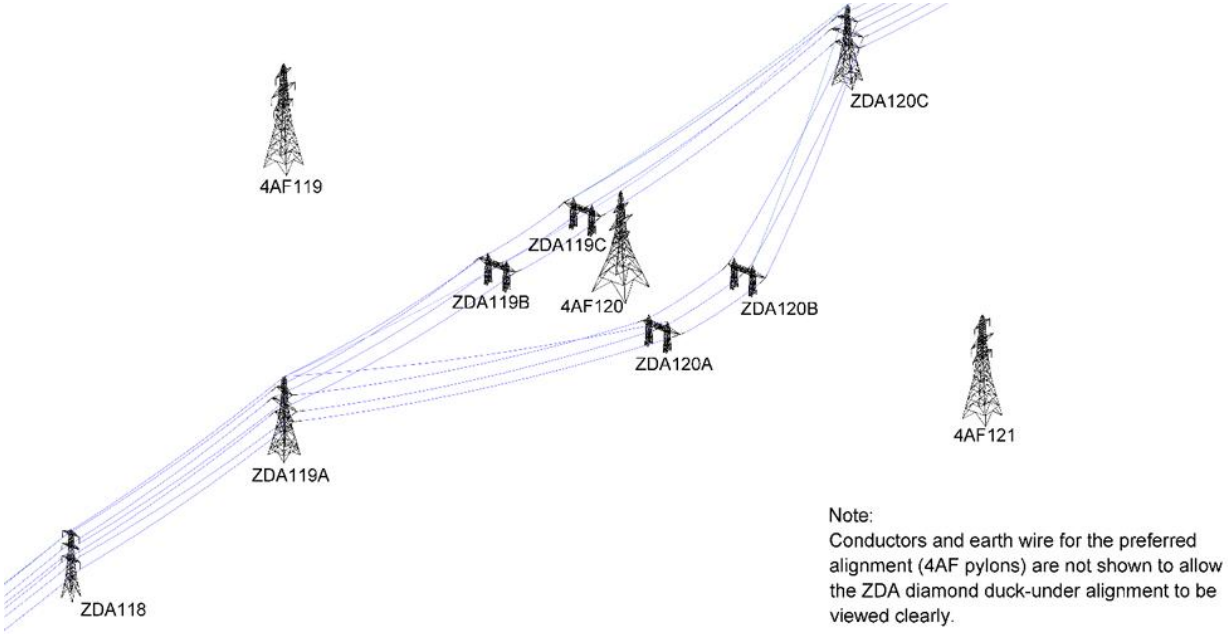


Image 3.18 – Illustrative design of diamond duck-under crossing arrangement (without conductors and earth wire shown for the preferred alignment)



South of the ZDA Crossing to M180

3.6.88 Following the duck-under crossing of the ZDA overhead line, the preferred alignment continued in a southerly direction, crossing over Bonnyhale Road and the South Humberside Mainline railway. The preferred alignment continued into the Isle of Axholme Area of Special Historic Landscape Interest south of the A18. Pylon locations 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 2.7 km, until pylon 4AF128, west of the North Moor Farm anaerobic digestion plant.

3.6.89 Multiple pipelines were 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 avoided direct impact on these pipelines.

3.6.90 Southwest of the existing Keadby windfarm, the preferred alignment routed broadly southeast towards the two existing 400 kV overhead lines, avoiding woodlands to the northwest of Belwood Farm and to the west of Dixon Wood, before crossing the M180 where Route Section 6 ended.

Route Section 7: M180 Motorway to Graizelound

Overview

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

3.6.92 The preferred alignment crossed the M180 motorway, routeing broadly southeast past Mill Hill Wood and crossing Belton Road to the west of Beltoft. The preferred alignment sought to maximise stand-off distance from Beltoft while continuing to gradually route back towards the existing 400 kV overhead lines, and also avoided isolated properties west of Beltoft Road and west of the 4TM overhead line. The alignment also avoided a woodland block to the southwest of Beltoft.

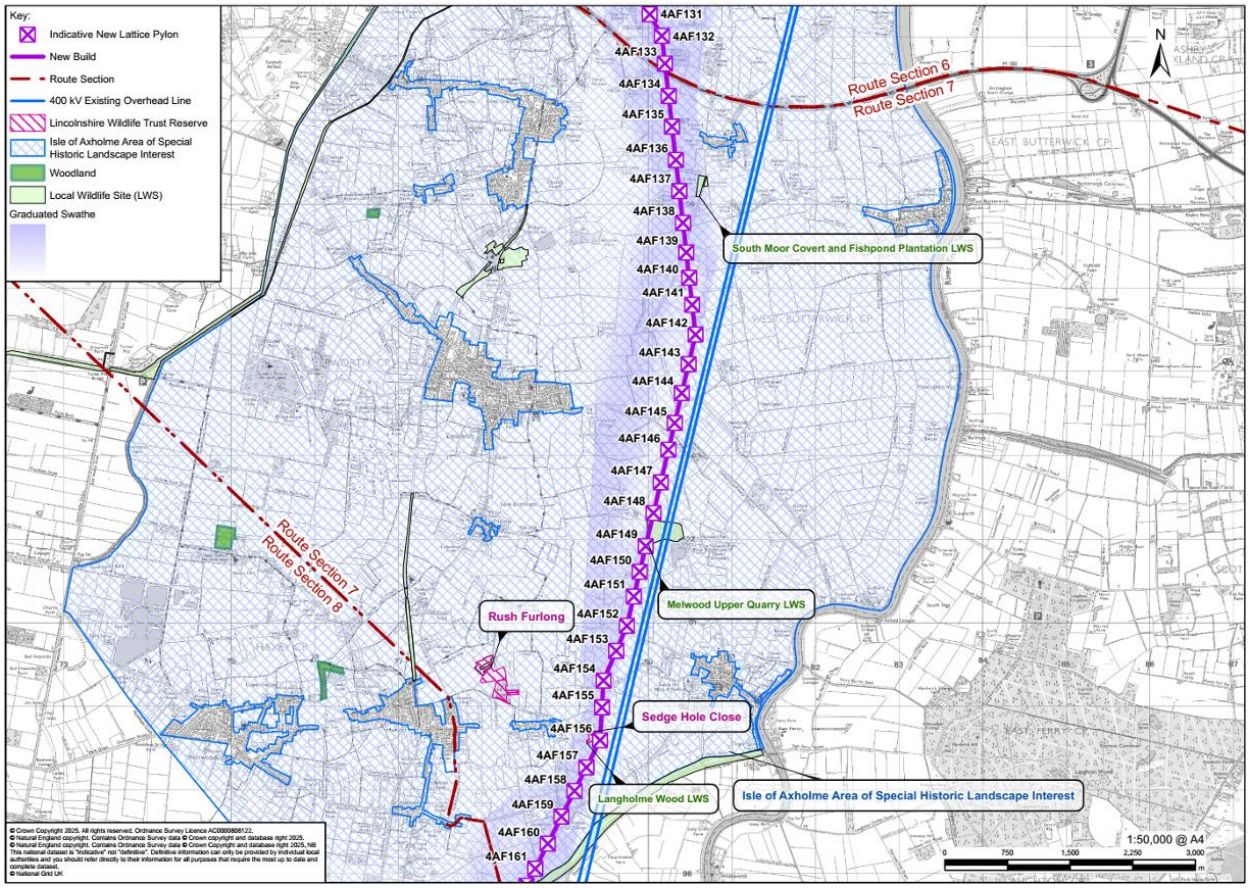
3.6.93 At pylon 4AF142, the preferred alignment ran in triple parallel with the existing 4TM and ZDA overhead lines to the east of Epworth. Between pylons 4AF142 and 4AF152, the pylons were synchronised with the pylons of the existing 4TM and ZDA overhead lines. The preferred alignment had a stand-off distance ranging from 175 m – 190 m 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 kept the new and existing overhead line infrastructure in the same location through this part of the Isle of Axholme Area of Special 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.

3.6.94 Routeing in close parallel did result in the introduction of a new overhead line to the west of isolated rural properties which already had the existing overhead lines to their east. Pylon locations were proposed with consideration to such properties and other local features including Melwood Quarry LGS which was oversailed by the proposed alignment, though no pylons were proposed within the LWS.

3.6.95 The preferred alignment deviated away from parallel routeing (south of pylon 4AF152) near Low Hall Farm as oversailing of the property and curtilage was unavoidable while maintaining parallel routeing. Pylon 4AF156 was sited closer to the existing 400 kV overhead lines again and avoided Sedge Hole Close Lincolnshire Wildlife Trust Reserve to the west. This area of woodland further aided screening to views from East Lound. A further deviation away from the existing overhead lines occurred south of pylon 4AF156 to route west of Owston Grange. If the preferred alignment had continued in close parallel with the necessary 150 m stand-off from the existing overhead lines, this would have brought the new overhead line close 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, Warping Drain and Gunthorpe Road, in addition to optimising stand-off distances of pylons from the watercourses.

3.6.96 Image 3.19 illustrates this routeing option at this location.

Image 3.19 – Close paralleling east of Epworth



3.6.97 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 avoided crossing the Warping Drain LWS and facilitated the crossing of Gunthorpe Road to the southeast of Graizelound where Route Section 7 ended.

Route Sections 8 and 9: Graizelound to South Wheatley

Overview

3.6.98 Route Section 8 of the preferred alignment began east of Graizelound where the preferred alignment crossed Stockwith Road before it routed broadly southwest for approximately 3 km crossing The Spalding and Doncaster Railway Line, the A161 (Haxey Gate Road) and Tindale Bank Road. The preferred alignment then routed southwards crossing the River Idle, Misterton Golf Club, Cornley Road and Cattle Road to pass to the west of Misterton where it met Chesterfield Canal.

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

3.6.100 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)

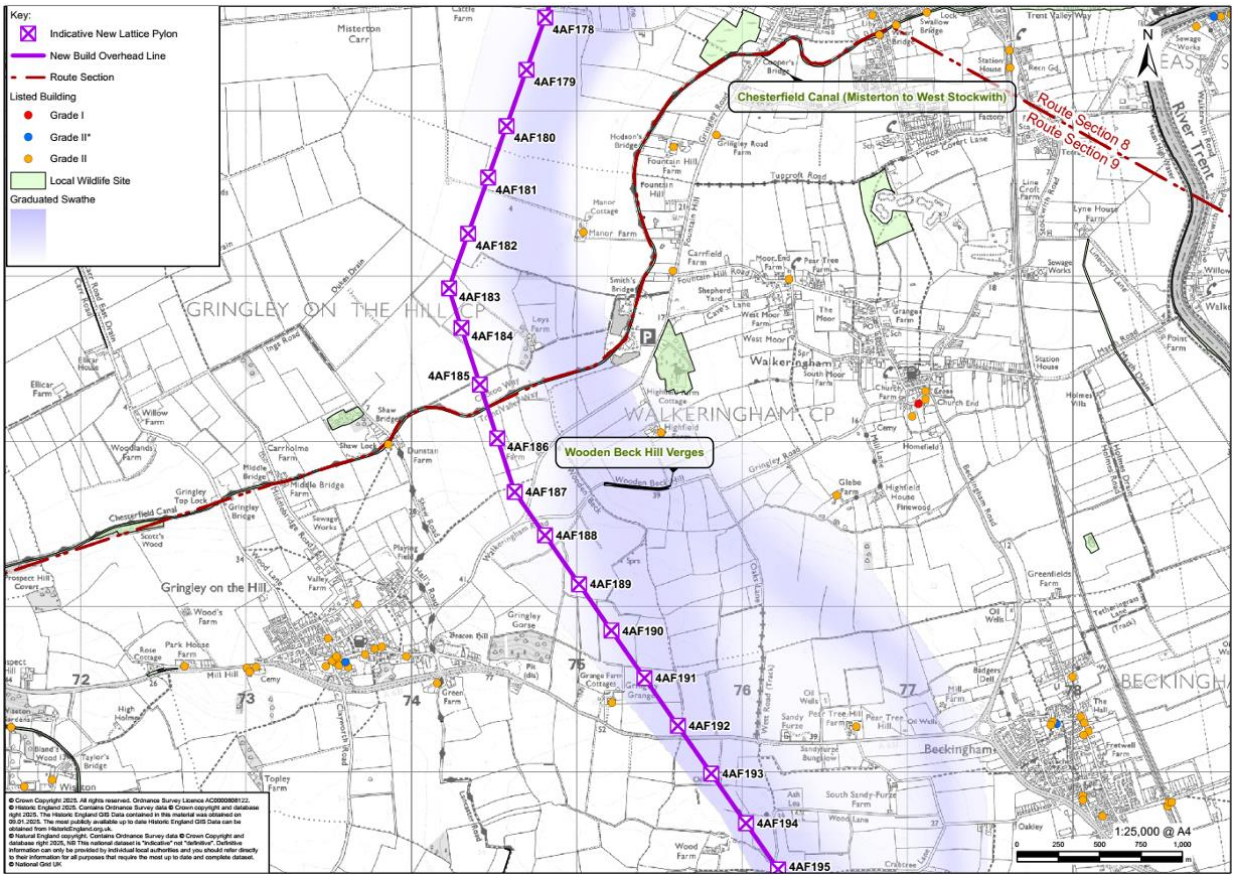
3.6.101 The preferred alignment, after crossing Warping Drain, routed further west within the northern path of the graduated swathe, away from the existing 4TM and ZDA overhead lines at pylon 4AF163 to avoid the settlement of Misterton to the south and an area of higher ground to the northwest of Misterton. The route crossed the Spalding and Doncaster Line railway, the A161 and Tindale Bank Road, which influenced the siting of pylons in this location. Consideration was also given to isolated properties along the A161 near the railway level crossing and the Grade II listed Langholme Manor Farmhouse on Tindale Bank Road. The preferred alignment continued to pass to the north of Misterton Driving Range to the tension pylon 4AF172. This avoided a crossing of the A161 close 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, and the River Idle and Banks LWS in the southern path of the graduated swathe.

3.6.102 From 4AF172 the preferred alignment routed in a southwesterly direction along the western edge of the graduated swathe, crossing the Misterton golf course (no longer 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 would have been a greater distance from residential and commercial receptors to the west of both Misterton and Walkeringham, however, routeing to the west of the graduated swathe brought the preferred alignment closer to the settlement of Gringley on the Hill.

3.6.103 From pylon 4AF183 the preferred alignment routed in a southeasterly direction towards the northeast of Gringley on the Hill, where it crossed the Trent Valley Way and Chesterfield Canal SSSI, routeing within the preferred corridor but moving outside the graduated swathe. Image 3.20 illustrates the preferred alignment at this location. Routeing and pylon locations in this area were considered for the isolated

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

Image 3.20 – Preferred alignment west of Misterton and Walkeringham and northeast of Gringley on the Hill



3.6.104 An alternative corridor (corridor 3), following the existing overhead lines in triple parallel through the Trent Valley was considered in the CPRSS 2023 (National Grid, 2023). As explained in the CPRSS (National Grid, 2023), from East Stockwith, routeing to the west of the existing 400 kV ZDA and 4TM overhead lines was unlikely to be feasible as the corridor narrowed substantially due to the surrounding residential areas of Misterton, Beckingham and Saundby to the west, and Beckingham Marshes RSPB Reserve on the east.

3.6.105 Sufficient stand-off from the existing overhead lines to enable future maintenance works was unlikely to be achievable without oversailing residential properties and curtilage. South of Beckingham Marshes RSPB Reserve, West Burton Power Station, various underground assets and multiple planning applications occupied the corridor to the west of the existing 400 kV ZDA overhead line and consequently, close parallel routeing on the western side was also unlikely to be feasible towards West Burton. Further information on the assessment of Corridor 3 can be found in CPRSS 2023 (National Grid, 2023).

Chesterfield Canal to A620 (Route Section 9)

3.6.106 The preferred alignment immediately crossed the Chesterfield Canal SSSI. Routeing and pylon locations in this area were considered for the isolated properties to the

west of Walkeringham and the Wooden Beck Hill Verges LWS, in addition to a number of Grade II listed buildings. Once across the Chesterfield Canal SSSI the preferred alignment continued to route in a southeasterly 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 crossed the A631.

3.6.107 The preferred alignment avoided 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 also sought to avoid areas of ancient woodland and several LWSs 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.

3.6.108 Between 4AF193 and 4AF194 the LoD of the preferred alignment oversailed part of the existing Gainsborough-Beckingham oil field area.

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

Route Sections 10 and 11: South Wheatley to High Marnham

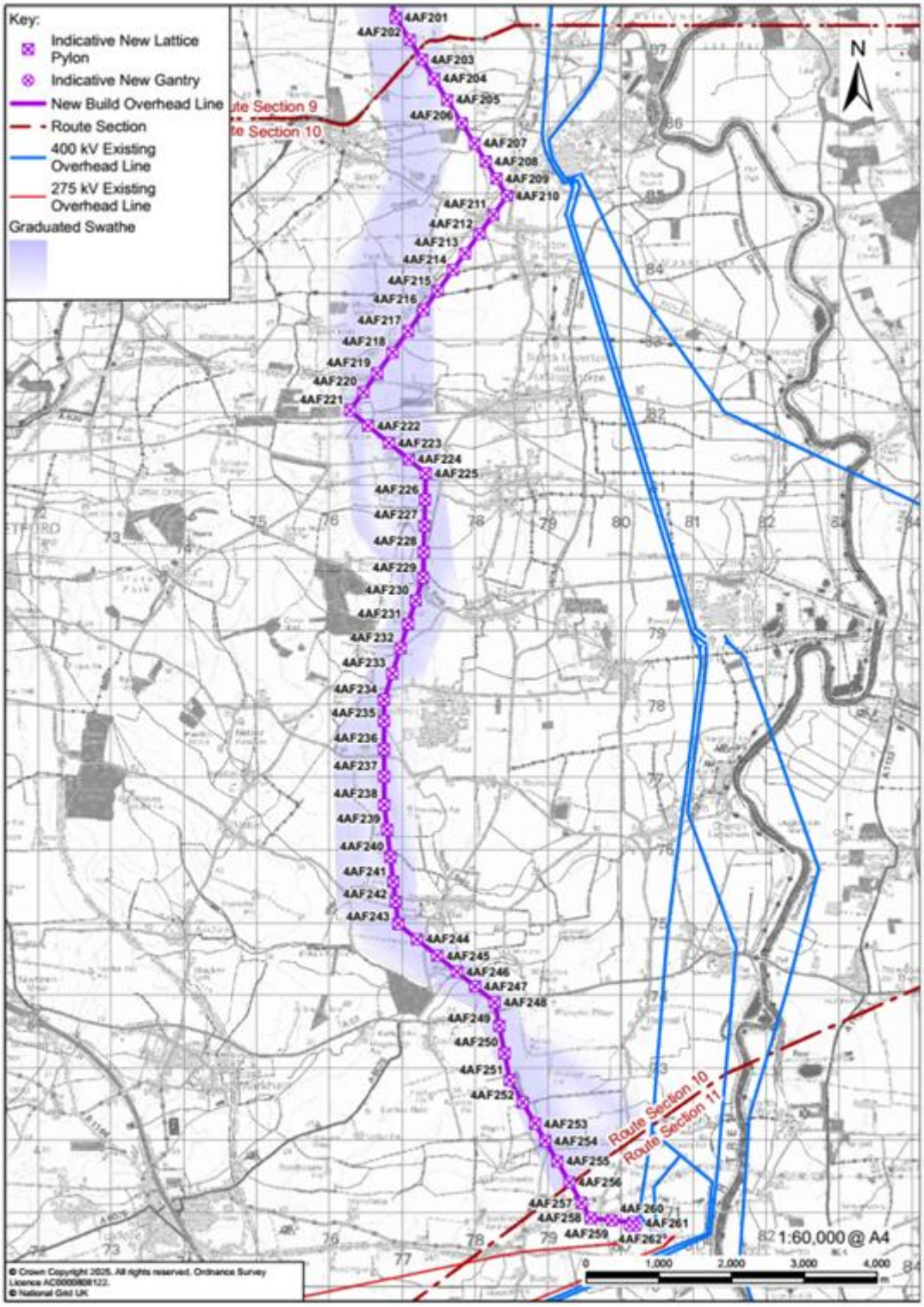
Overview

3.6.110 Route Section 10 ran from the A620 in a southeasterly direction crossing the Sheffield to Lincoln Railway Line at Sturton le Steeple, before continuing in a broadly southerly direction towards the existing 400 kV substation at High Marnham in Route Section 11.

3.6.111 The preferred alignment was 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 continued in a southeasterly direction through Route Section 11 for 1 km before connecting into the proposed new 400 kV substation at High Marnham.

3.6.112 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. The alignment of the western corridor is shown at Image 3.21.

Image 3.21 – Preferred alignment between South Wheatley and High Marnham



Preferred alignment and siting

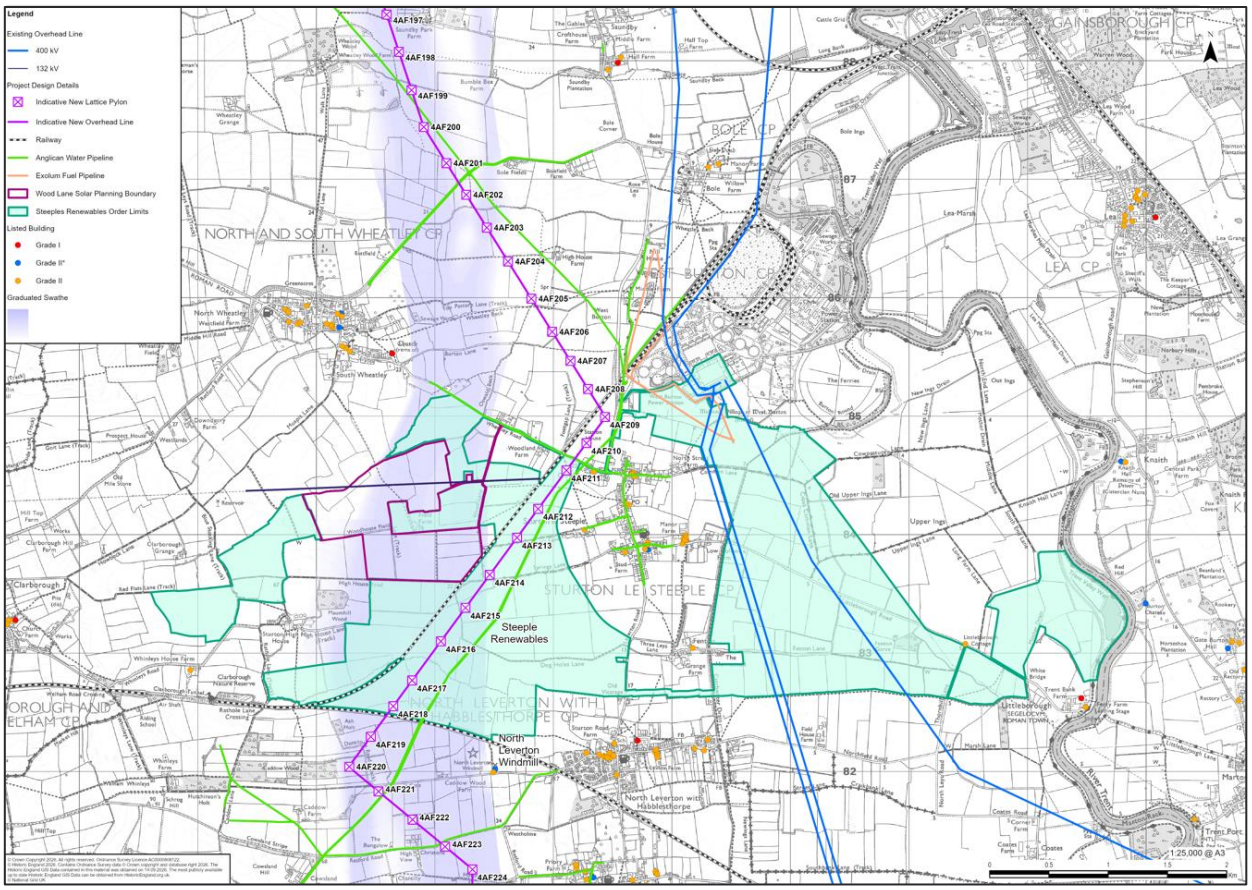
Preferred alignment between A620 and west of North Leverton with Habblesthorpe

3.6.113 The preferred alignment in Route Section 10 extended in a southeasterly 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 unlicensed grass

airstrip. As the preferred alignment directly crossed this airstrip, existing operation as an airstrip would have needed to cease.

3.6.114 At pylon 4AF206 the preferred alignment extended outside the western corridor graduated swathe presented during the non-statutory consultation 2023, but stayed within the eastern corridor graduated swathe consulted on in 2024. Once across the railway line, the preferred alignment routed in a southwesterly 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. Image 3.22 shows the preferred alignment at this location.

Image 3.22 – Preferred alignment between South Wheatley and North Leverton



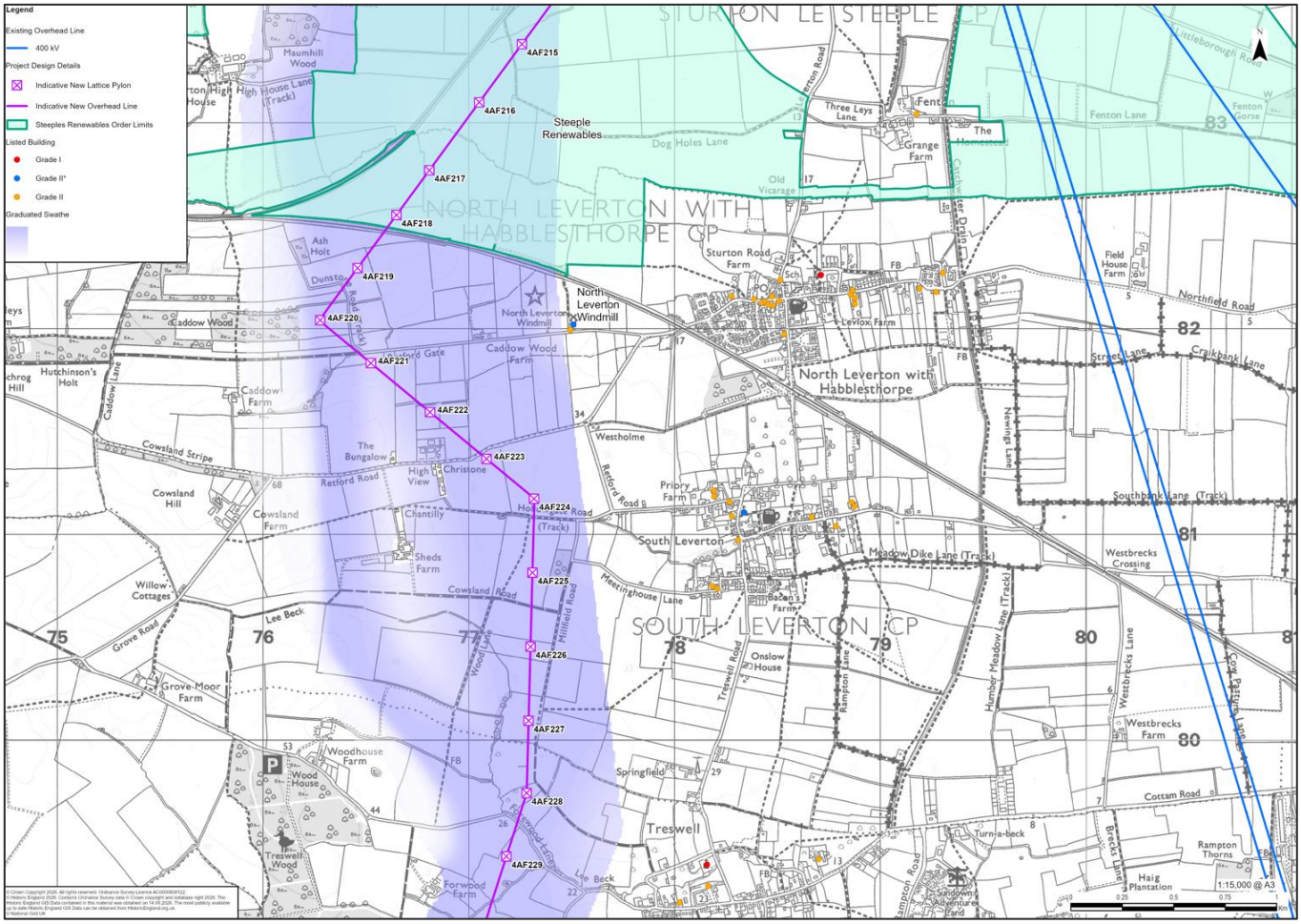
3.6.115 The preferred alignment avoided the consented Wood Lane Solar Farm and existing NGED 132 kV steel lattice overhead line section, which if crossed, would have resulted in increased technical complexity and would likely have required replacement of the existing overhead line with a section of 132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

3.6.116 The preferred alignment moved 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.

3.6.117 As mentioned above, the preferred alignment routed in a southwesterly 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 changed direction to route in a southeasterly direction towards South Leverton at pylon 4AF225, as shown in Image 3.23.

Image 3.23 – Avoidance of North Leverton Windmill



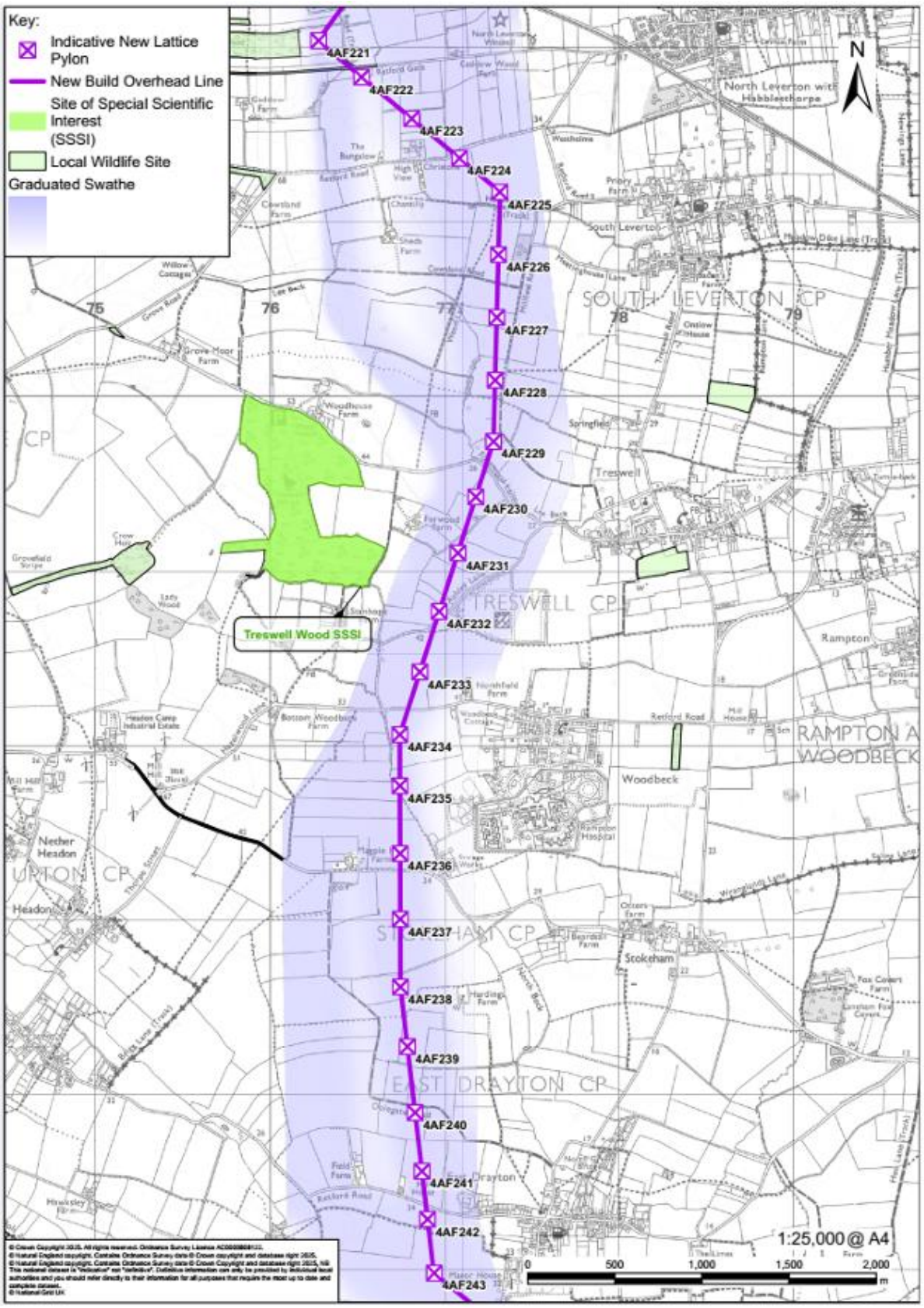
3.6.118 The purpose of the preferred alignment configuration between pylons 4AF216 and 4AF225 was to minimise potential impacts on the setting of the Grade II* listed North Leverton Windmill by maximising distance between the preferred alignment and the windmill, located on Mill Lane to the west of North 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 was therefore considered to be preferable.

Preferred alignment west of South Leverton to East Drayton

3.6.119 The preferred alignment moved back to the western 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 eastern path of the graduated swathe. This increased the distance of the preferred alignment from the Grove Farm Airfield and Forwood Farm Airfield when compared to the eastern path of the graduated swathe between Retford Road and Forwood Lane. Both Grove Farm Airfield and Forwood Farm Airfield are unlicensed grass airstrips.

3.6.120 Near to Treswell, the preferred alignment routed 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 routed 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 was also 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 which sought to take the most direct route and minimise tension pylons. Routeing the preferred alignment within the eastern path of the graduated swathe also increased the distance from the unlicensed Headon Airfield located to the west of the graduated swathe.

Image 3.24 – Preferred alignment West of South Leverton to East Drayton



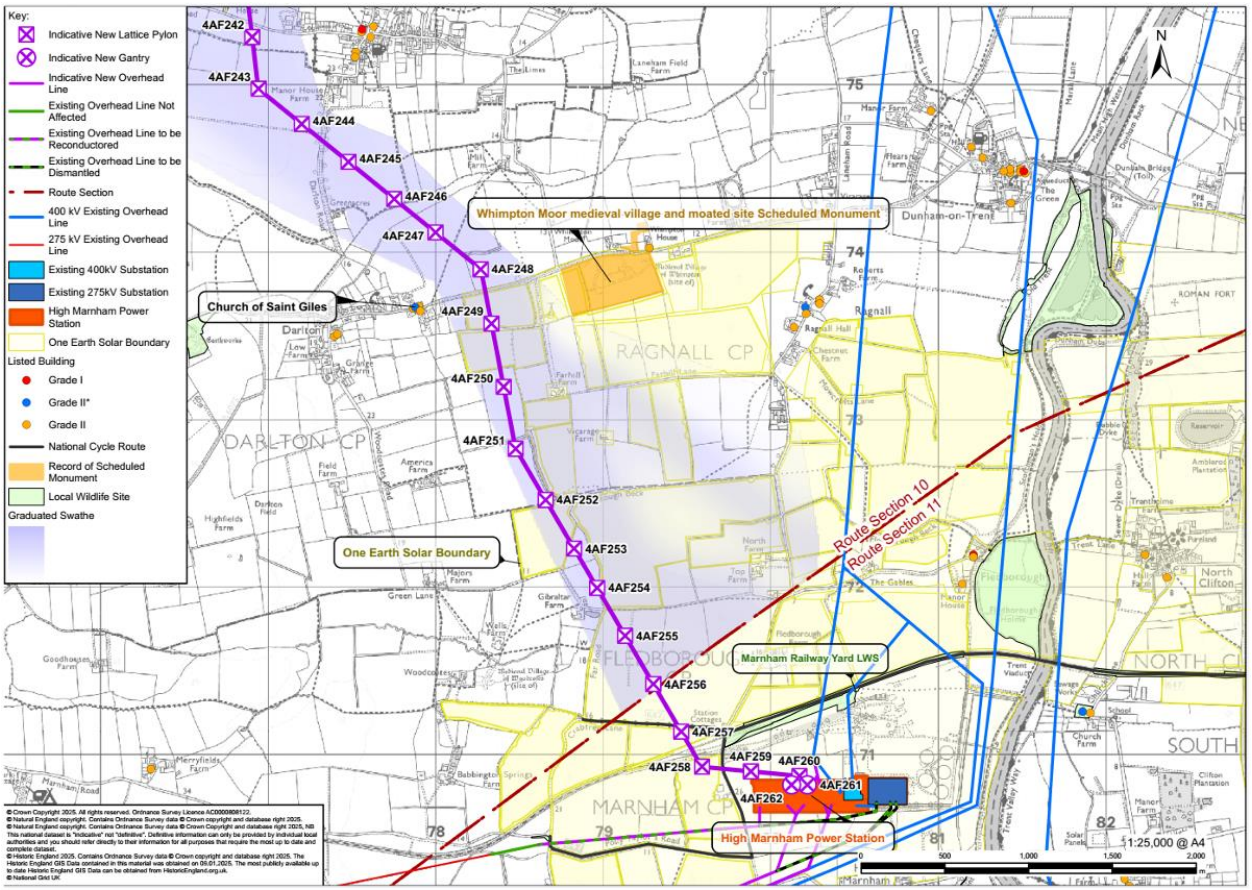
Preferred alignment from East Drayton to High Marnham Substation

3.6.121 At pylon 4AF243, located to the west of East Drayton, the preferred alignment routed in a southeasterly direction before crossing the A57 between the settlement of

Darlton and the Whimpton Moor Scheduled Monument. At pylon 4AF248, the preferred alignment routed south towards the new 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 routed at an eastward angle in order to maximise the stand-off distance from Darlton and the Grade II* listed St. Giles Church. The unlicensed grass airstrip at Darlton Gliding Club was located over 1.5 km to the west of the preferred alignment.

3.6.122 Moving into Route Section 11, the preferred alignment continued in a southeasterly 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 Image 3.25. This proposed alignment also avoided routeing through two Nottinghamshire LWSs along the northern edge of the High Marnham Substation.

Image 3.25 – Preferred alignment and line entry into the new High Marnham Substation



Statutory Consultation 2025

3.6.123 National Grid held an eight-week statutory consultation between 18 February and 15 April 2025 on the preferred alignment (known as the '2025 design' for the purpose of chronologically explaining the iterative design process within this chapter) as detailed above. In summary this was:

- Approximately 90 km of new 400 kilovolt (kV) overhead line between the proposed new 400 kV Birkhill Wood Substation and the proposed new 400 kV High Marnham Substation;

- Replacement and realignment of a section of the existing 400 kV overhead line route between Brantingham and east of Broomfleet;
- Replacement and realignment of a section of the existing 400 kV overhead line route between Ealand and west of Keadby;
- A new 400 kV Birkhill Wood gas insulated switchgear substation with a new permanent access;
- Replacement and realignment of a section of existing 400 kV overhead line to connect the new Birkhill Wood Substation;
- A new 400 kV High Marnham air insulated switchgear substation, with a new permanent access;
- Replacement and realignment of the existing 4ZV and XE 275 kV overhead line routes and existing 400 kV ZDA and ZDF overhead line routes, to allow for connection to the proposed new High Marnham Substation; and
- Other required works, such as temporary diversions for works on existing overhead line routes, temporary access roads, highway works, temporary works compounds, work sites, utility diversions, drainage works and ancillary works.

Consultation on the preferred alignment (the defined proposal (2025 design))

3.6.124 During statutory consultation, the route was presented in 11 geographical sections to aid consultees in providing feedback. It should be noted that these sections differ from the six geographical sections into which the Project has since been divided, for reader accessibility of the Application (the Project Route Sections).

3.6.125 The Project Route Sections are illustrated on **Application Document 6.1.F1 Figure 1.1 Project Location and Route Sections** and detailed in Table 3.2.

Table 3.2 – Project Route Sections

Route Sections within the application for development consent	Corresponding Route Sections at statutory consultation
Route Section A Between the proposed Birkhill Wood Substation and the River Ouse	Route Section 1 – Creyke Beck to Skidby Route Section 2 – Skidby to A63 Dual Carriageway Route Section 3 – A63 Dual Carriageway and the River Ouse crossing
Route Section B Between the River Ouse and Crowle	Route Section 4 – River Ouse crossing Route Section 5 – River Ouse crossing to Luddington; Route Section 6 – Luddington to M180 motorway
Route Section C Between Crowle and North Moor (M180)	Route Section 6 – Luddington to M180 motorway
Route Section D Between North Moor (M180) and the River Idle	Route Section 7 – M180 motorway to Graizelound

Route Sections within the application for development consent	Corresponding Route Sections at statutory consultation
	Route Section 8 – Graizelound to Chesterfield Canal
Route Section E Between the River Idle and Darlton	Route Section 8 – Graizelound to Chesterfield Canal Route Section 9 –Chesterfield Canal to A620 east of North Wheatley Route Section 10 –A620 east of North Wheatley to Fledborough
Route Section F Between Darlton and the proposed High Marnham Substation	Route Section 10 –A620 east of North Wheatley ato Fledborough Route Section 11 – Fledborough to High Marnham

Consideration of statutory consultation feedback

3.6.126 A total of 473 feedback submissions were received during the statutory consultation period from local communities, statutory consultees, stakeholders and other consultees.

3.6.127 All of the feedback received during the statutory consultation has been carefully reviewed and considered, alongside 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 **Application Document 5.1 Consultation Report**. This includes feedback which resulted in partial design changes being accepted, which are more minor changes that are not detailed within this chapter. Further consideration of this consultation feedback in relation to the design is set out in section 3.7.

3.6.128 Some consultation feedback requested changes to the design. These requests were carefully considered in the context of environmental, land, socio-economic, health and wellbeing constraints and opportunities, engineering feasibility and cost, and planning policy considerations.

3.6.129 The process of considering the proposed design changes and requests comprised an initial feasibility review, 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.

3.6.130 The outcome of the consideration of potential design changes and requests was either that the request was accepted and incorporated into the design or that the request was not accepted following balanced and informed assessment.

3.7 Alternatives Considered at the Assessment and Land Rights Stage

3.7.1 Careful consideration has been had to the feedback to the 2025 statutory consultation and further targeted Person with an Interest in Land (PIL) statutory consultations, further stakeholder engagement and results of survey findings and technical assessments. As a result, a number of changes to the location of individual elements of the permanent assets and temporary works have been taken forward in the design of the Project.

3.7.2 Many of these changes have been of a minimal nature and include, for example, minor amendments to pylon siting, adjustments to accesses and working areas. These changes are not reported within this chapter. However, changes which have been made in response to consultation feedback are documented d within **Application Document 5.9 Design Development Report** and Application **Document 5.1 Consultation Report**, which also addresses all feedback requesting changes and provides confirmation of whether or not the feedback resulted in a change to the design.

3.7.3 The alignment has been developed in response to feedback received during statutory consultation, supported by further environmental and technical assessments and survey work, and a review of work undertaken to date.

3.7.4 This section describes design considerations and decisions made that have informed the development of the Project, including permanent infrastructure and temporary construction works. All proposed changes to the design requested in feedback received during statutory consultation in 2025 on the Project's preferred alignment (referred to as the 2025 design), and additional consultation with Persons with an Interest in Land (PILs) undertaken during June 2025 and September 2026. were considered. However, not all design changes were accepted and incorporated into the preliminary design of the Project.

3.7.5 The outcome of the statutory consultation and iterative design process has resulted in the design for the Project. This Project design forms the basis of the EIA and wider DCO application. If the DCO is made, further detailed design will occur prior to construction of the Project.

Substations

3.7.6 Following statutory consultation on the Project in 2025, a decision was taken to remove both the proposed 400 kV Birkhill Wood Substation and 400 kV High Marnham Substation and associated works from the Project.

3.7.7 Separate planning applications for the 400 kV Birkhill Wood Substation, and 400 kV High Marnham Substation were submitted by National Grid in July and November 2025 to the local planning authorities of East Riding of Yorkshire Council and Bassetlaw District Council, respectively. The planning applications have subsequently been approved in 2026.

3.7.8 A full description of the design evolution of the Project is provided in **Application Document 5.9 Design Development Report**.

Whole Route

Mitigation planting

3.7.9 The 2025 design presented at statutory consultation included initial draft locations for mitigation planting within the draft Order Limits. These areas were identified to provide suitable space for planting to offset the loss of trees removed during construction of the overhead line. At this stage of project development, they were considered sufficient and, in some locations, also offered opportunities for screening or filtering views of the proposed overhead line. Following the statutory consultation period, the design of the Project has evolved to reflect feedback received from landowners and stakeholders, in regard to the most appropriate location, orientation and area required for planting to take place.

3.7.10 Subsequent to further assessment of the extent of tree removal required for the overhead line, additional mitigation planting areas have been incorporated within the Order Limits. This ensures that sufficient land is available to deliver mitigation planting in accordance with the required replacement ratios. The location of these areas has been informed by the existing landscape context, including established woodland and tree belts, and is designed to respond positively to these features. The proposed planting will comprise a mix of native species and is generally located adjacent to the overhead line alignment and areas affected by tree removal. In addition to replacing trees removed during construction of the overhead line, new planting will filter or fully screen lower-level elements of a development. The approach to mitigation planting is set out in **Application Document 7.8 Outline Landscape and Ecology Management Plan including an Outline Landscape Maintenance and Management Plan**.

Species mitigation

3.7.11 The Project has been designed to avoid environmentally sensitive features, where reasonably practicable. Embedded mitigation measures have been incorporated into the design to avoid or reduce potentially significant effects, during both construction and operation. As the Project design has been refined, requirements for species mitigation have been reviewed and updated in response to completed survey work and design iterations. This includes the incorporation of appropriate buffer zones to maintain suitable stand-off distances between temporary construction activities (such as haul roads) and protected species populations where reasonably practicable.

Following further assessment, a number of species mitigation measures have been identified and incorporated to further reduce potential significant environmental effects. These measures are set out in **Application Document 7.3 Register of Environmental Actions and Commitments** and **Application Document 7.8 Outline Landscape and Ecology Management Plan**.

Landowner requests

3.7.12 A number of requests for design changes were received through consultation feedback and further engagement with landowners, which often explained the reasons for the change to support the continued use and management of wider land holdings.

3.7.13 There were instances where a landowner or tenant farmer requested a minor amendment to pylon siting, or adjustments to accesses and working areas, to

minimise disturbance to land use or ensure existing practices could continue. One such example would be an amendment to the proposed alignment to ensure there remains sufficient space to navigate agricultural machinery around pylons to maintain agricultural practices.

3.7.14 All of these types of requests were considered and appraised. Where the design change was technically feasible, and could be accommodated without introducing other impacts which outweighed the benefit of the change, they were implemented.

3.7.15 Due to the large number of these requests and the often minimal nature of changes, they are not all detailed within this report. Where these requests came through consultation feedback, they are summarised and responded to **in Application Document 5.1 Consultation Report**, including confirmation of whether the suggested change was incorporated into the Project's design or not.

Veteran Trees

3.7.16 Throughout the design development of the Project, early and ongoing consideration was given to the presence of known and identified veteran trees along the route. Opportunities to avoid veteran trees and their associated root protection areas were considered wherever reasonably practicable through route refinement, adjustments to temporary construction infrastructure and changes to access arrangements. In locations where complete avoidance was not achievable, bespoke control, mitigation and management measures were developed to minimise potential effects during construction and operation. These measures have been incorporated into the Project's environmental commitments and are set out within **Application Document 7.3 Register of Environmental Actions and Commitments**.

Archaeological avoidance

3.7.17 Throughout the design development of the Project, consideration was given to archaeological remains identified through geophysical surveys and subsequent targeted trial trenching investigations. As the understanding of archaeological constraints evolved, opportunities were taken to avoid or reduce potential effects through amendments to the location of permanent infrastructure, construction compounds, access routes and temporary working areas. This design development process resulted in a number of changes across the route. These included amendments associated with the proposed construction compound at Ellerker, the inclusion of access optionality at Ousefleet in proximity to the Hall Garth Moated site and the refinement of access arrangements in the High Melwood area.

3.7.18 Where avoidance was not reasonably practicable, appropriate mitigation and management measures were developed to minimise potential impacts and ensure that archaeological remains are appropriately protected, investigated and recorded. The measures to be implemented are set out within the archaeological section of the **Application Document 7.3 Register of Environmental Actions and Commitments**.

Route Section A – Between the Proposed Birkhill Wood Substation and the River Ouse

Realignment of pylons 4AF5 to 4AF8 to avoid Platwood Farm

3.7.19 Following consultation, a potential alternative alignment was considered between pylons 4AF5 and 4AF8.

3.7.20 Three alternatives were considered. Options 1a and 1b proposed a more southerly alignment that would route closer to the existing 4ZQ overhead line corridor and move the route away from the proposed Creyke Beck Solar Farm. Option 3 retained a northern alignment broadly consistent with the 2025 Design but sought to reduce the number of pylons within the solar farm boundary. A further option (Option 2) was considered during an earlier design stage but was not taken forward for more detailed assessment and has therefore not been covered in this document.

3.7.21 The alternative alignments offered some potential benefits in reducing interactions with the proposed solar farm development. However, Options 1a and 1b introduced additional interactions with other emerging infrastructure projects, including the Hornsea Four Offshore Wind Farm and Dogger Bank D cable corridors, and resulted in parallelling a high pressure gas pipeline over an extended distance. These options would have increased the complexity of construction activities and utility interfaces and would likely have required additional mitigation to existing electricity infrastructure. Whilst Option 3 reduced the number of pylons within the solar farm boundary, it would have increased land-take requirements, placed infrastructure closer to a residential property and reduced flexibility within the overhead line design through longer span lengths.

3.7.22 Consideration was also given to the potential effects on existing land interests and nearby receptors. The southerly alignment options would have brought the overhead line considerably closer to the Lazaat Hotel, creating the potential for increased effects on visual amenity and business operations. Although these options could reduce some interactions with solar farm infrastructure, they also introduced additional planning, stakeholder and compensation risks. Option 3 would reduce some interactions with proposed energy developments but would require a greater extent of land-take and increase constraints around agricultural land use.

3.7.23 Environmental considerations also influenced the development of the design. The more southerly routes would have required the removal of woodland associated with the Drove Road candidate LWS and would have brought the alignment closer to the Lazaat Hotel. Option 3 offered some advantages over the baseline through the removal of a pylon and a reduction in tree loss and land-take within higher-quality agricultural land. However, these benefits were not considered sufficient to justify the wider changes required to the established alignment.

3.7.24 During design development, the route in this area was further refined through optimisation of the baseline alignment, including amendments to pylon positions and associated infrastructure to reduce interactions with the proposed solar farm and avoid a number of the constraints identified through the alternative options. This provided a solution that maintained the advantages of the established route while avoiding many of the engineering, environmental and stakeholder issues associated with the alternative alignments

3.7.25 In reaching a decision on this potential alternative, it was concluded that the 2025 design represented the most appropriate solution, balancing constructability, interactions with existing and proposed infrastructure, environmental considerations and stakeholder impacts. Therefore, the alternatives were not adopted and the optimised 2025 design alignment was taken forward.

Rationalise design within Creyke Beck Solar Farm between pylons 4AF3 and 4AF9

3.7.26 A design change was developed to reduce interactions between the Project and the Creyke Beck Solar Farm proposals between pylons 4AF3 and 4AF9. The alternative sought to rationalise land-take, amend working areas and realign construction and maintenance access routes to better align with the evolving solar farm layout.

3.7.27 The revised arrangement reduced direct interaction with proposed solar panel infrastructure through amendments to working areas and construction access routes. In several locations, access was redirected to utilise existing or proposed solar farm access tracks, reducing the need for additional infrastructure and minimising sterilisation of land that could otherwise accommodate solar development. Whilst the revised access arrangements introduced an additional crossing beneath an existing electricity line, this was considered manageable through detailed design and clearance assessments.

3.7.28 The proposed changes would also have reduced the overall impact on the solar farm by avoiding panel locations where practicable and improving compatibility between the two projects. Existing environmental constraints within the area, including hedgerows, woodland and veteran trees, were taken into account during the development of the revised layout. However, the amended construction access tracks would be located closer to a Farmstead.

3.7.29 In reaching a decision on this alternative, it was concluded that the revised layout would reduce interactions with the Creyke Beck Solar Farm while maintaining a workable construction and maintenance strategy. The alternative design was therefore accepted and incorporated into the design.

Amendment to stringing area at Socken Wood between pylons 4AF24 and 4AF26

3.7.30 A design change was considered to reduce the extent of the temporary construction area for stringing activities adjacent to Socken Wood, a priority woodland habitat and identified by the Project as ‘Woodland with Characteristics of Ancient Woodland’. The 2025 design included stringing areas extending closer to the woodland edge, while the proposed alternative reduced these areas to provide a 15 m buffer from the woodland wherever practicable which increased the protection of the priority woodland habitat

3.7.31 This change was able to be accommodated without affecting the ability to safely undertake conductor stringing operations and therefore incorporated into the design, alongside commitments to minimise disturbance during construction as set out in **Application Document 7.1 Register of Environmental Actions and Commitments** Although some vegetation management would still be required beneath the conductors of the overhead line the revised arrangement maintained sufficient flexibility for construction activities while reducing the extent of land required for temporary works.

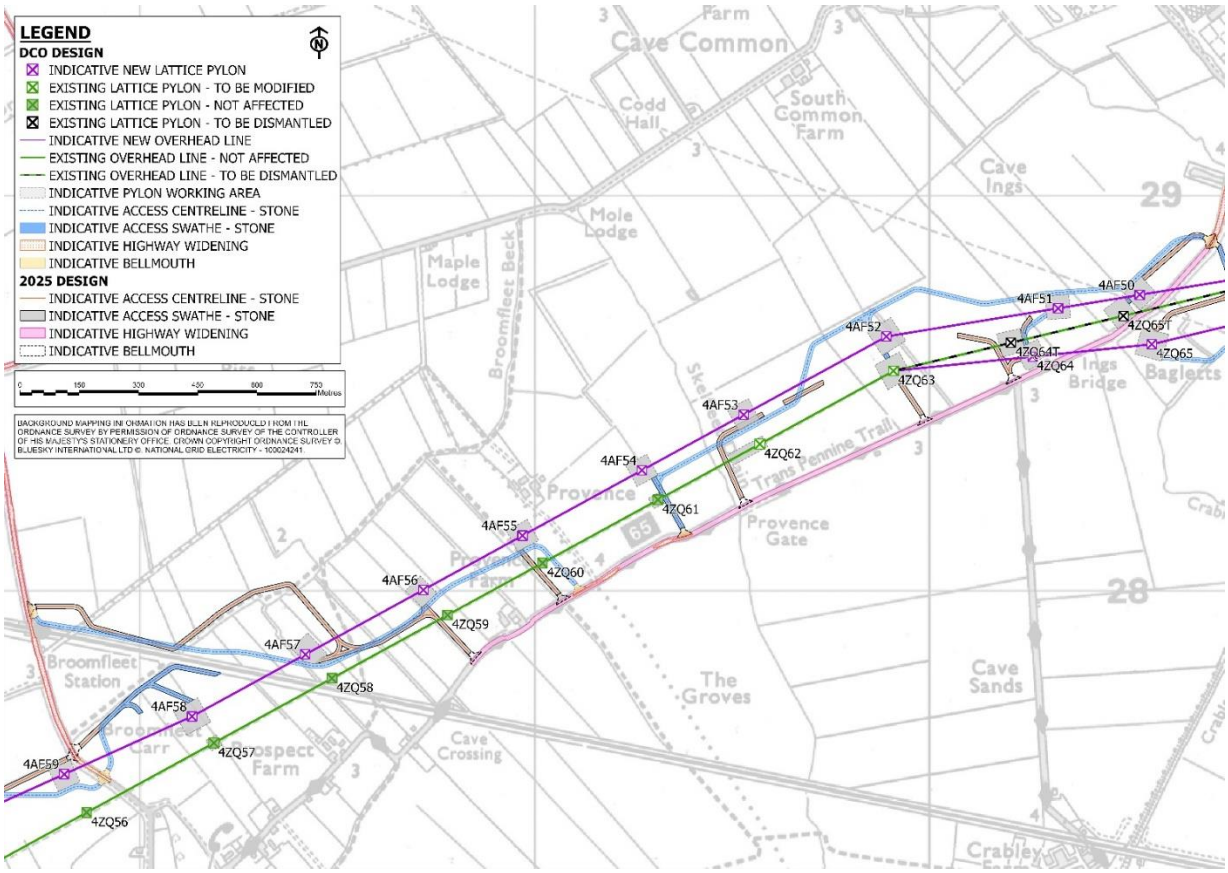
Ings Lane construction access route

3.7.32 As the 2025 design routes to the south of Ellerker, oversailing Ings Lane, the proposed construction works in this area include 1.2 km of non-continuous haul road, requiring multiple bellmouths and 2.1 km of highway widening along Ings Lane. A review of the 2025 design identified an opportunity for a more continuous construction access between pylons 4AF50 and 4AF57. As part of this change, it was proposed that the construction access rejoined Ings Lane for approximately 300 m, to avoid it crossing the driveway of Provence Farm.

3.7.33 The continuous construction haul road arrangement would be more cost-effective due to a reduction in the extent of highway widening and the number of bellmouths required. A 1 km increase of the construction haul road length, one additional watercourse crossing, and the crossing of more individual fields by the construction access, when compared to the 2025 design, are outweighed by the reduction in bellmouths and highway widening in terms of cost and overall impact from this greater extent of temporary construction works. The rejoining of Ings Lane would reduce potential impacts to Provence Farm by avoiding the need for the haul road to cross the driveway of this property.

3.7.34 The change would also redirect heavy goods vehicles (HGVs) predominantly onto the construction access, thereby removing them from a section of Ings Lane, reducing traffic volumes on the public highway and thus disruption to local users. Overall, it was considered the change was an improvement to the 2025 design and the change as shown on Image 3.26 was incorporated into the design of the Project, including the haul road rejoining Ings Lane for 300 m, in light of the associated benefits.

Image 3.26 – Ings Lane haul road realignment



Elleker construction compound near the A63

3.7.35 A review of construction compound locations was undertaken in the Ellerker area following identification of archaeological remains within the 2025 design compound location. Five alternative locations were considered to the north, south and east of Ellerker, with each seeking to balance proximity to the main construction works as well as access and land requirements alongside any environmental constraints.

3.7.36 Option 1 to the south of Ellerker was identified as the most suitable alternative location. Surveys had not identified significant archaeological findings within the area and this location also avoided many of the agricultural, heritage and stakeholder constraints associated with the other options. As per the 2025 design, Option 1 remained close to the principal construction works with access from the public highway noting the inclusion of an additional construction access spur, approximately 426 m in length, to avoid concentrating all compound traffic down the main construction access route. This increase in the extent of temporary infrastructure was deemed preferrable when considering the potential increase in vehicle movements along the public highway for other options located further from the works, particularly Options 3 & 4. Similarly, this increased access length was preferred over the potential heritage impacts associated with the 2025 design.

3.7.37 Option 3 proposed the use of an existing area of hard standing north of Ellerker. Whilst this option appeared to have sufficient access and would have reduced the extent of groundworks required, the available space was insufficient to accommodate the required construction compound functions and the proximity to a nearby gas site was also deemed unfavourable.

3.7.38 It was concluded Option 1 was the most appropriate location for the construction compound. The site was capable of accommodating construction requirements whilst avoiding known heritage assets and providing suitable access from the public highway.

Movement of Pylon 4ZQ74 and construction access

3.7.39 As a result of geophysical and trial trenching surveys identifying well preserved below ground archaeological features associated with a Roman Settlement in in proximity to pylon 4ZQ74, it was proposed to move the pylon approximately 69 m to the northeast and to realign the temporary construction access to minimise impacts on below ground archaeology. This would avoid substantial archaeological excavations, associated programme delays and increased construction costs and aligned more closely with adjacent field boundaries and increased separation from nearby residential properties.

3.7.40 The revised alignment introduced some engineering challenges, including longer spans between adjacent pylons and a longer haul road connection. However, these changes remained technically achievable and any structural implications could be addressed through detailed design. Sufficient space remained available for construction activities in proximity to the A63 and therefore the revised pylon location and access arrangement could be accommodated within the Project design.

Route Section B – Between the River Ouse and Crowle

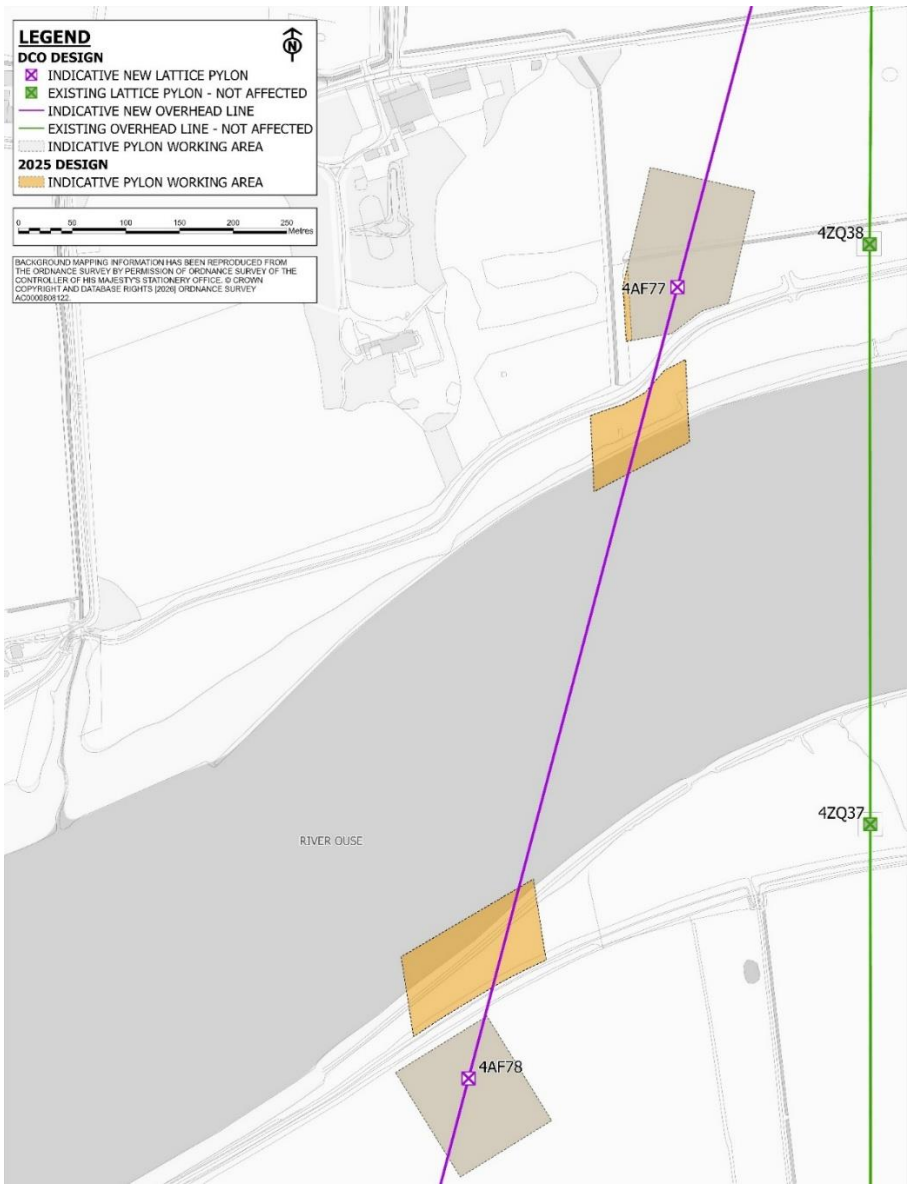
River Ouse working areas

3.7.41 Flexibility was built into the 2025 design for multiple construction and conductor stringing methodologies to be used for the River Ouse crossing between pylons 4AF77 and 4AF78.

3.7.42 Following ongoing design development and investigation into the stringing methods. National Grid could confirm that alternative stringing methodologies such as helicopter and/or drones could be used and that the use of vessels launched from the bank of the river could be ruled out due to the impacts on the ecological designated sites.

3.7.43 The refinement of the construction and stringing methodologies, and thus removal of the working areas within the designated sites was incorporated into the Project design as shown on Image 3.27.

Image 3.27 – Working areas near the River Ouse



Realignment of pylons 4AF100 to 4AF114 near Luddington and Ox Pasture Lane

3.7.44 Following consultation and ongoing design development, a potential realignment of the overhead line between pylons 4AF100 and 4AF114 was considered in the vicinity of Luddington and Ox Pasture Lane. The alternatives sought to increase separation from residential properties, minimise impacts on the wind farm development and optimise the positioning of pylons against field boundaries to facilitate agricultural operations. The alternatives involved moving the alignment southwards to varying degrees from pylon 4AF100 before reconnecting with the established route corridor.

3.7.45 Three alternative alignments were considered all of which increased separation from residential receptors compared to the 2025 design whilst also maintaining sufficient stand-off from the turbines at Keadby Wind Farm. A further option (Option 3) was considered but was not taken forward for more detailed assessment as it did not achieve the required stand off from the wind turbines and, as such, it has not been covered in this document.

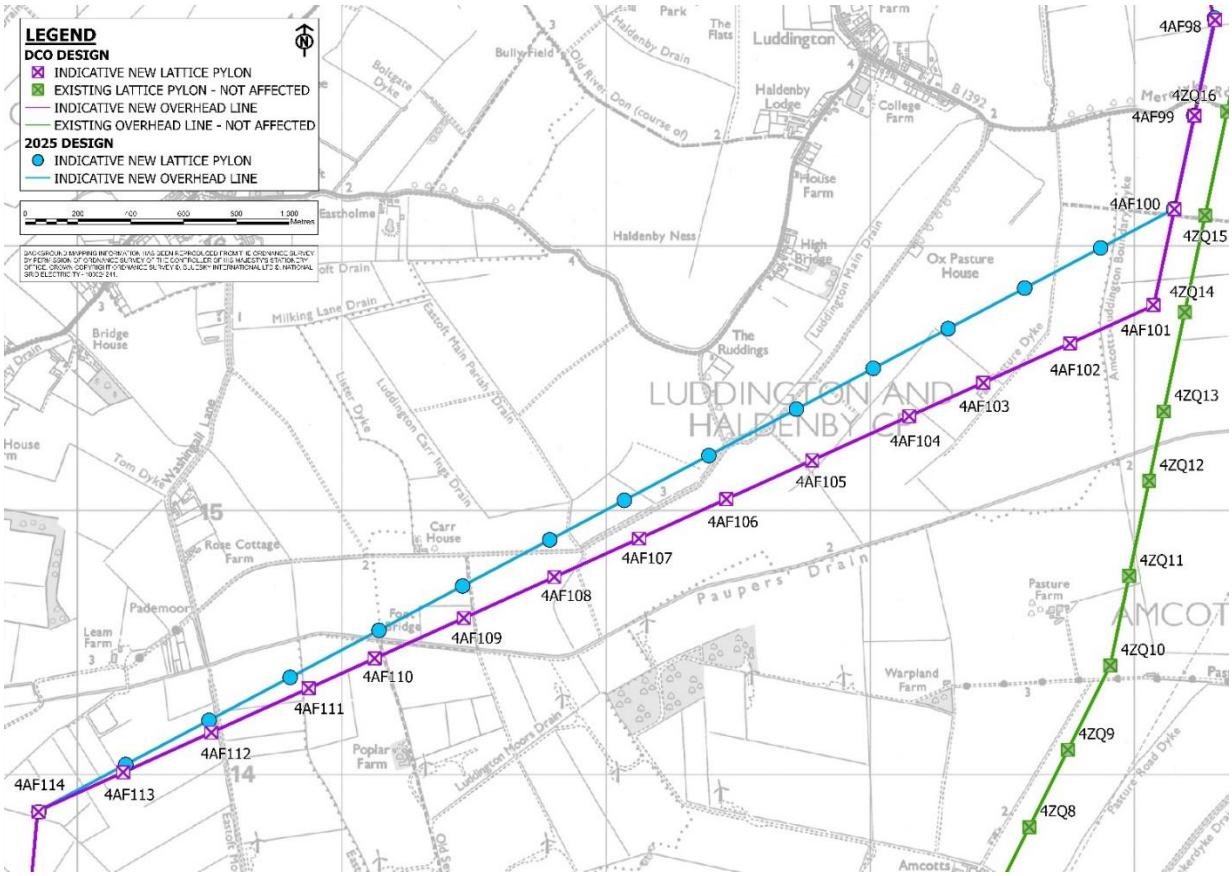
3.7.46 Option 1 avoided the introduction of any additional pylons whilst maintaining appropriate span lengths and enabling a general reduction in pylon heights compared to the 2025 design. This option also avoided oversail of Carr Lane and Ox Pasture Lane thereby eliminating the need for a potentially large and complex scaffold structure. Comparatively, Options 2 and 4 necessitated a number of pylon height increases, introduced additional angles and pushed span lengths close to the maximum allowable value. As per the 2025 design, these options did not avoid the oversail of Carr Lane and the subsequent construction complexities associated with the scaffold structure.

3.7.47 Whilst the options differed in terms of their constructability, pylon requirements, span arrangements and interactions with the local highway, all options facilitated an alternative construction access route that reduced the need for highway widening and minimised the number of bellmouths required compared to the 2025 design.

3.7.48 Following consideration of the alternatives, Option 1 was identified as the most suitable option. The alignment provided a straight route between pylons 4AF101 and 4AF114, removing the need for a complex scaffold arrangement over Carr Lane and Ox Pasture Lane whilst maintaining acceptable span lengths and enabling a general reduction in pylon heights. This option also reduced highway widening requirements and the number of bellmouths required for construction access compared to the 2025 design.

3.7.49 In addition to the engineering benefits, Option 1 increased separation from residential properties in Luddington and along Ox Pasture Lane and provided a more direct route through the landscape. Whilst the other alternatives achieved some of these objectives, they introduced additional tension pylons, increased span lengths and retained construction constraints associated with highway crossings. It was concluded that Option 1 represented the most appropriate route and this alternative was therefore accepted for incorporation into the design of the Project as shown on Image 3.28.

Image 3.28 – Overhead line realignment south of Luddington



Route Section C – Between Crowle and North Moor (M180)

Ealand Viaduct access

3.7.50 A review of construction access arrangements was undertaken in the vicinity of Ealand Viaduct to identify opportunities to simplify access routes, reduce temporary infrastructure requirements and address landowner feedback. The 2025 design included an access track network crossing several watercourses and interacting with a number of utilities and environmental features. The revised access arrangement sought to improve access to pylon 4AF127 by making greater use of existing access infrastructure, reducing the extent of temporary works required and overcoming constraints associated with the viaduct arches, adjacent watercourses and existing overhead line infrastructure.

3.7.51 The revised access arrangement would significantly reduce construction access track length, remove a number of watercourse crossings and eliminate the need for a bridge crossing over the watercourses. The revised access arrangement would also reduce interactions with gas pipelines, electricity infrastructure and telecommunications assets, simplifying construction and reducing the amount of temporary disturbance required.

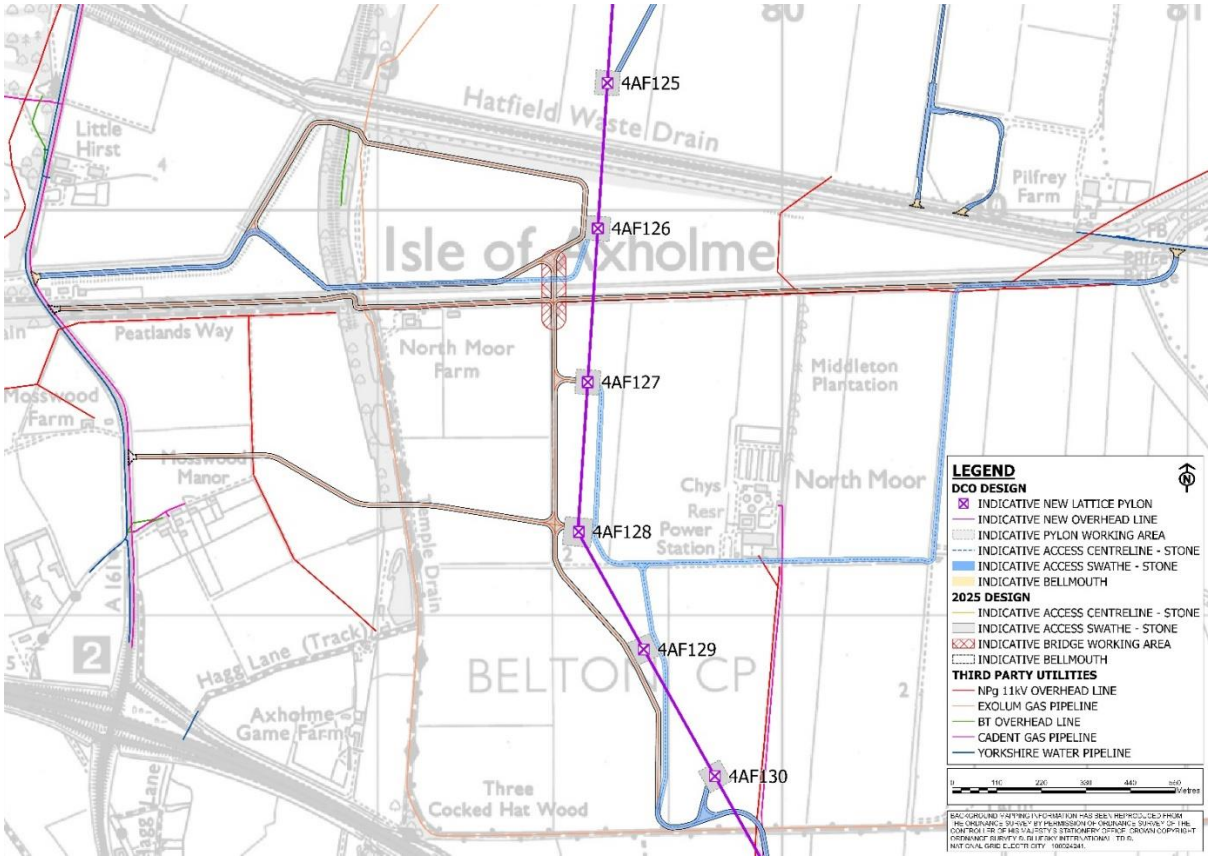
3.7.52 The revised route would avoid areas of potentially contaminated land associated with the former railway corridor, reduce interactions with woodland and remove access requirements close to visual receptors and sensitive heritage assets.

3.7.53 The revised arrangement would also make greater use of the existing business access track, reducing the need for new ground disturbance and minimising works through areas containing drainage features and embankments.

3.7.54 The change also addressed concerns raised by affected landowners regarding access through wet ground, mature hedgerows and drainage features.

3.7.55 In reaching a decision on this alternative, it was concluded that the revised access arrangement would substantially reduce construction complexity and the extent of temporary impacts whilst maintaining effective access to the works. The revised access arrangement was therefore incorporated into the Project design as shown on Image 3.29.

Image 3.29 – Ealand Viaduct construction access



Route Section D – Between North Moor (M180) and the River Idle

Overhead line realignment between pylons 4AF132 and 4AF142

3.7.56 A realignment of the overhead line between pylons 4AF132 and 4AF142 was considered following consultation with an affected landowner. The statutory consultation design included pylons 4AF137 and 4AF138 within the landholding, whilst the alternative sought to relocate these structures and realign the route through the area.

3.7.57 The revised alignment enabled reductions in pylon heights and positioned structures closer to field boundaries whilst avoiding nearby gas infrastructure. Although the alternative resulted in a slightly more oblique crossing of the M180, this remained

technically achievable and reduced the angle of deviation at pylon 4AF132. Construction access arrangements would also be amended to suit the revised alignment.

3.7.58 The change responded directly to landowner feedback whilst avoiding a woodland area north of the M180. The revised route also increased the extent to which the proposed overhead line paralleled existing transmission infrastructure, helping to reduce the spread of infrastructure across the wider landscape and reduce impacts on the Isle of Axholme Area of Special Historic Landscape Interest.

3.7.59 The revised alignment reduced impacts on the affected landholding, enabled reductions in pylon heights and increased the extent of paralleling with existing transmission infrastructure. Amendments to the construction access strategy also reduced the extent of highway widening required and resulted in a net reduction in the number of bellmouths required. Although the alignment moved closer to Beltoft in places, it increased separation from an individual residential property and positioned pylon 4AF137 closer to existing woodland adjacent to Gurry Lane, helping to filter views of the overhead line. Additional mitigation planting was also incorporated along the western edge of the village to further assist in filtering views.

On balance, the revised alignment addressed landowner feedback whilst maintaining an efficient route through the area enabling a general reduction in pylon heights and an increase in the extent of routeing alongside existing transmission infrastructure. The revised alignment also facilitated a more continuous construction access strategy, reducing the extent of highway widening and the number of bellmouths required compared to the 2025 design. The alternative was therefore accepted and incorporated into the Project design.

Pylon 4AF148 construction access rationalisation

3.7.60 A design change was considered in the vicinity of pylon 4AF148 to review construction access track arrangements and reduce interactions with environmental constraints. Several alternative access options were developed, together with alternative bellmouth locations to provide flexibility should archaeological remains affect the 2025 design access arrangements.

3.7.61 Compared to the 2025 design, all of the alternative access options avoided known protected species in the area. Several of the options also avoided interaction with known archaeological features however this subsequently introduced additional complexities such as increased third-party interactions, sub-optimal bellmouth positioning along the public highway and interactions with existing transmission infrastructure.

3.7.62 Whilst the preferred access option (Option A) did retain some interaction with known archaeological features, it provided a technically feasible access route whilst avoiding known protected species, interaction with existing transmission infrastructure and any increases in the extent of highway widening. It also followed more favourable topography and maintained a similar access length to the 2025 design. This access arrangement was therefore accepted and incorporated into the Project design.

3.7.63 During design development, alternative bellmouth locations were also considered to provide contingency should further archaeological investigations deem the known constraints to be of a significant nature thereby limiting the feasibility of the preferred access option.

3.7.64 One alternative bellmouth location provided a shorter access route, maximised separation from nearby residential properties and avoided a number of utility interactions. Although this arrangement was not selected as the preferred access strategy, it was retained within the design as a contingency option should significant archaeological constraints be encountered during delivery.

Compound movements at 4AF165 (previously pylon 4AF166 in the 2025 design) for Northern Powergrid connections

3.7.65 A review of the 2025 design construction compound in proximity to pylon 4AF165 (previously pylon 4AF166 in the 2025 design) was undertaken to identify a location that would better accommodate electricity supply requirements to the compound and reduce constraints associated with the 2025 design. Three alternative locations were explored to the west of the Spalding and Doncaster railway line.

3.7.66 Compared to the 2025 design, all three options optimised the power supply connections to the compounds by avoiding a cable crossing of the railway line and A-road as well as a number of underground utility conflicts. Options B and C in particular also increased stand-off from residential receptors with existing field boundaries and vegetation also providing some screening in the case of the latter.

3.7.67 The revised compound locations enabled subsequent amendments to the construction access routes. All three options elongated the construction access compared to the 2025 design with Option B also introducing an additional bellmouth. Despite the longer construction access, movement of the bellmouth under Option C enabled a reduction in the extent of highway widening compared to the 2025 design.

3.7.68 In reaching a decision on this alternative, it was concluded that relocating the compound to the east of pylon 4AF168 (previously 4AF169 in the 2025 design) as per Option C, provided the most practical solution. This option optimised the provision of temporary power supplies to the compound by reducing utility and infrastructure conflicts and also improved construction access arrangements. The revised compound location was therefore incorporated into the Project design.

Route Section E – Between the River Idle and Darlton

Overhead line realignment to the west of Gringley on the Hill

3.7.69 Potential alternative alignments were considered following consultation regarding the routeing of the overhead line in the vicinity of Gringley on the Hill. The two alternatives proposed a more south westerly route before reconnecting with the statutory consultation design further south past North Wheatley. The objective of the change was to increase separation from Gringley on the Hill and reduce perceived visual effects on the settlement and its surrounding landscape.

3.7.70 The alternatives would have resulted in a significantly longer overhead line routeing of up to approximately 2.7 km, requiring additional infrastructure. The revised routes would have crossed the Chesterfield Canal at more oblique angles and passed through a constrained corridor between settlements, individual properties and existing infrastructure, reducing flexibility during both design and construction. The alternatives would also have increased interactions with other developments and land interests, including consented and proposed solar developments within the area and aviation interests associated with Willow Farm Airfield.

3.7.71 The proposed routes would have introduced new interactions with a range of environmental receptors, including conservation areas, listed buildings, scheduled monuments, priority habitats and flood risk areas that are largely avoided by the baseline alignment. Whilst the alternatives would have increased separation from Gringley on the Hill, they would also have introduced new effects elsewhere and increased impacts on heritage assets and sensitive landscapes.

3.7.72 It was concluded that the increased route length, additional environmental constraints and reduced design flexibility outweighed the benefits associated with moving the route further from Gringley on the Hill. As such, the alternative alignments were not adopted.

Move overhead line east from pylon 4AF175 (previously 4AF176)

3.7.73 A consultation response proposed a substantial realignment of the overhead line eastwards between pylons 4AF175 and 4AF203 (previously 4AF176 and 4AF204 in the 2025 design). The objective was to move the route further from certain land interests and residential receptors.

3.7.74 Whilst the route proposed by the consultee was technically achievable, it would have resulted in a substantial departure from the established corridor and introduced new interactions with consented and emerging solar developments. The proposal would have introduced new land interests that had not previously been affected by the Project.

3.7.75 The route proposed would have also moved infrastructure closer to residential properties in Walkeringham and Beckingham and introduced interactions with ecological and heritage receptors, including Saundby Park Wood LWS and nearby listed buildings. The change would also have increased the extent to which the settlements of Beckingham and Walkeringham were affected by overhead line infrastructure within the surrounding landscape.

3.7.76 Having considered the implications of the proposed route, it was concluded that the introduction of new land interests, increased effects on nearby communities and departure from the previously developed corridor did not justify the proposed change. The route proposed by the consultee was therefore not incorporated into the Project design.

Position the overhead line more equidistant between Gringley on the Hill and Walkeringham

3.7.77 An alternative alignment was considered between pylons 4AF179 and 4AF194 (previously pylon 4AF180 and 4AF195 in the 2025 design) which sought to reposition the overhead line more centrally between the settlements of Gringley on Hill and Walkeringham. The alternative also offered a straighter route and a reduction in overall route length when compared with the 2025 design.

3.7.78 The revised alignment would have reduced the number of pylons required and created a straighter route through the area. The alternative also avoided positioning infrastructure within the potential Oaks Lane Solar Farm development area, although this resulted in longer and less evenly balanced span lengths between adjacent pylons. It would also have avoided interaction with an active oil well site addressed through other accepted design changes. However, the proposal introduced additional interactions with existing utility infrastructure and resulted in notable increases in pylon heights at several locations.

3.7.79 Although the proposed alternative would have reduced some environmental interactions, including watercourse crossings and flood risk constraints, it would have moved the overhead line into a more visually prominent position within the landscape and closer to a number of existing residential receptors. The 2025 design was considered to work more effectively within the local landform, maintaining greater separation from properties along Fountain Hill and reducing the influence of the overhead line on views from nearby dwellings and holiday accommodation.

3.7.80 In reaching a decision on this alternative, it was concluded that the benefits associated with a straighter route did not outweigh the increased visual impacts on residential receptors and the relationship of the route with the surrounding landscape. As such, the proposed alternative route was not adopted into the Project Design.

Overhead line realignment between pylons 4AF217 and 4AF225

3.7.81 A request was received to remove an existing tension pylon between pylons 4AF216 and 4AF224 (previously 4AF217 and 4AF225 in the 2025 design), and create a straighter overhead line route. The proposed alternative sought to straighten the alignment and respond to concerns regarding agricultural operations and existing land management practices.

3.7.82 The alternative would have reduced overall route length by approximately 700 m and straightened the alignment through this section of the route. It would also have addressed concerns regarding field operations, perimeter hedgerows and agricultural infrastructure. However, the proposal would have required an additional tension pylon and moved the overhead line closer to the settlements of North and South Leverton. It also would have increased interactions with a proposed solar development within the area.

3.7.83 Consideration was also given to previous design work undertaken during earlier stages of route development. A similar alignment had previously been requested at non-statutory consultation (see section 3.5) which subsequently led to the increase in separation of the route alignment from North Leverton Windmill, a Grade II* Listed Heritage Asset, and nearby settlements. The 2025 design therefore reflected an earlier design refinement intended to reduce potential effects on heritage assets and residential receptors.

3.7.84 In reaching a decision on this alternative, it was concluded that the established 2025 design provided a more appropriate balance between agricultural land use considerations, heritage effects and settlement separation. Therefore, the alternative was not adopted.

3.7.85 Realignment for unlicensed Airfields Alternative alignments were considered in the vicinity of Headon Airfield and Forwood Farm following concerns regarding aviation operations and aircraft training circuits. Two revised route options were developed which sought to increase separation from the flight path whilst maintaining the overall route corridor.

3.7.86 Both alternatives required a longer route and additional infrastructure. The revised alignments also introduced additional larger tension pylons, including increased interaction with the existing West End Solar Farm and nearby residential properties. Whilst the proposals sought to address aviation concerns associated with Forwood Farm Airfield, it was uncertain whether any change to existing flight paths would be acceptable and the alternatives did not materially alter the relationship between the overhead line and Headon Airfield.

3.7.87 The alternatives would also have increased visibility of the overhead line from North Leverton Windmill and brought larger structures closer to residential receptors around South Leverton. Although some local environmental benefits were identified, these were not sufficient to offset the additional infrastructure requirements and wider routeing implications of the proposal.

3.7.88 In reaching a decision on this alternative, it was concluded that the 2025 design remained the more appropriate solution and avoided a number of the additional constraints introduced by the alternative alignments. Although the alternatives sought to address aviation concerns associated with Forwood Farm Airfield, they introduced additional infrastructure requirements, increased effects on nearby receptors and did not materially improve the relationship with Headon Airfield. In addition, the alternative would still have required adjustments to airfield operations. The alternative routes were therefore not adopted.

Overhead line realignment west between pylons 4AF220 and 4AF235

3.7.89 A consultation response proposed relocating the overhead line westwards between pylons 4AF219 and 4AF234 (previously 4AF220 and 4AF235 in the 2025 design) to create a straighter alignment, reducing visual impacts and minimising disruption to local livestock and farming practices.

3.7.90 The proposed route would have marginally reduced overall route length whilst retaining a similar number of pylons. However, the revised alignment would have introduced new interactions with utility infrastructure and would likely have necessitated closure of Forwood Farm Airstrip due to the proximity of the proposed pylons to operational flight paths. The proposal would also have introduced additional land interests.

3.7.91 The alternative would have also moved infrastructure onto higher ground, increasing visibility across the surrounding landscape and introducing closer relationships with ecological designations including Treswell Wood SSSI and Cowsland Stripe LWS. Whilst some localised benefits were identified, these did not outweigh the wider implications associated with the revised route.

3.7.92 Having considered the implications of the alternative, it was concluded that the revised route would introduce additional complexity and impacts without providing a proportionate benefit. The change was therefore not adopted.

Overhead line realignment between 4AF234 and 4AF243

3.7.93 A proposal was submitted to relocate the overhead line westwards between pylons 4AF233 and 4AF242 (previously 4AF234 and 4AF243 in the 2025 design). The objective was to increase separation from nearby settlements and residential properties and create an alternative route through the area.

3.7.94 The revised alignment would have increased route length and introduced additional infrastructure requirements when compared with the 2025 design. The proposal would also have increased interactions with existing and proposed solar developments.

3.7.95 The route would have required mature tree removal and moved the overhead line closer to existing businesses, including a livery enterprise and Headon Airfield. Whilst the alternative offered some landscape benefits through increased separation from

East Drayton, these advantages were offset by the increased interactions with existing businesses and infrastructure.

3.7.96 In reaching a decision on this alternative, it was concluded that the revised route introduced additional infrastructure requirements and greater interaction with existing developments without providing sufficient overall benefit. As such, the change was not incorporated.

Consideration of Proposed Steeple Renewables Solar Farm

3.7.97 Throughout the development of the Project, National Grid engaged with the promoters of the proposed Steeple Renewables Solar Farm affected landowners and other stakeholders to understand the potential interactions between the two NSIPs. Engagement commenced during the early stages of the Project and continued through route development, statutory consultation and subsequent design refinement, with the objective of identifying opportunities to reduce interactions between the projects whilst maintaining the ability of both projects to come forward.

3.7.98 In response to ongoing engagement, a number of alternative overhead line alignments were considered in the vicinity of the proposed solar farm. This included three route options located west of the railway corridor, together with a subsequent landowner-promoted alignment. The alternatives sought to reduce interactions between the Project and the solar farm whilst maintaining a technically feasible route between Creyke Beck and High Marnham.

3.7.99 Of the three alternatives located west of the railway corridor, Option 1 was identified as the most suitable. It provided the shortest route length, reduced engineering complexity, and reduced interactions with both the proposed Steeple Renewables Project and the consented Wood Lane Solar Farm. The route still included interactions with the existing NGED 132 kV overhead line, however it was the least complex of all the options. Of the three western options, Option 1 maintained a more direct route past the scheduled monument Church of St Helen's minimising impacts on the setting of this heritage asset.

3.7.100 Option 1, as the preferred alignment to the west of the railway line was then compared against the 2025 design alignment to the east of the railway line. Whilst the alternative to the west would have marginally reduced interactions with the proposed Steeple Renewable Solar Farm, it introduced additional interactions with the consented Wood Lane Solar Farm. The western option would have required the undergrounding of an existing NGED 132 kV overhead line within the consented Wood Lane Solar Farm development area, introducing considerable additional cost, greater construction complexity and additional programme risk. The undergrounding works would also have increased construction activity and environmental disturbance within the area. The westerly alignment would have passed across higher ground and in closer proximity to South Wheatley and a number of isolated residential properties, increasing potential landscape and visual effects. The 2025 design alignment also maintained a greater separation distance from the Church of St Helen's. As a result, the 2025 design remained the preferred option.

3.7.101 A further alternative route west of the railway line promoted by the promoter of the Steeple Renewables Project was also reviewed. This alignment would have routed the overhead line closer to residential properties along South Wheatley Road, potentially resulting in oversailing of residential and commercial property, including an existing animal care facility. The route would also have crossed elevated ground near Maumhill Wood, increasing visibility of the overhead line within the landscape,

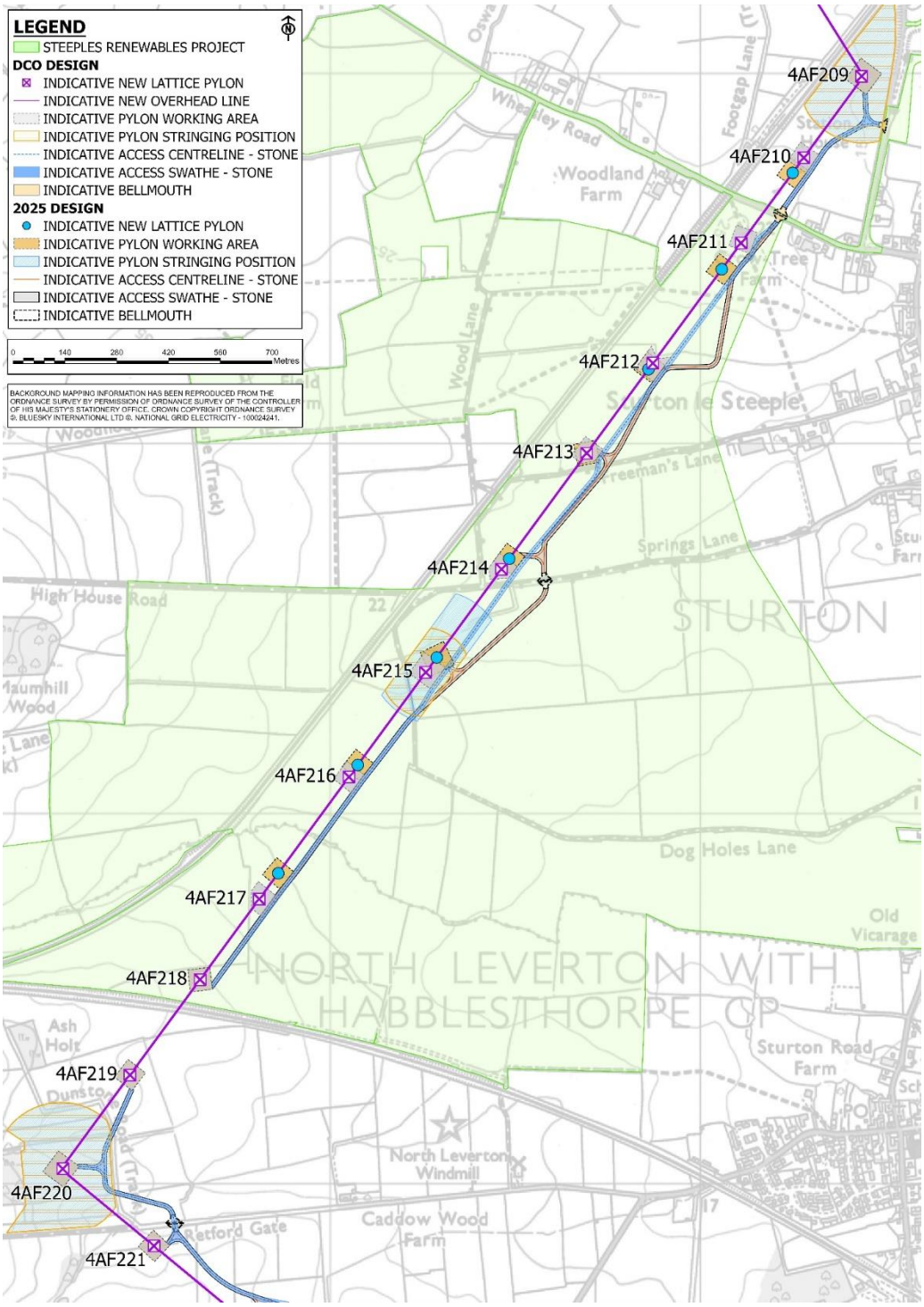
and similarly required undergrounding of the existing NGED 132 kV overhead line. In addition, it would have passed substantially closer to the scheduled monument Church of St Helen's than the 2025 design. Consequently, the landowner-promoted alignment was not taken forward.

3.7.102 Whilst the 2025 design was retained, design development continued following statutory consultation in collaboration with the promoters of the Steeple Renewables Solar Farm and affected landowners. This resulted in a series of localised refinements to further reduce interactions between the two NSIPs and minimise temporary and permanent land requirements within the proposed solar farm boundary.

3.7.103 These refinements included shortening and rationalising construction access routes, reducing the extent of temporary construction land required within the solar farm boundary, avoiding a proposed attenuation pond, reducing the extent of conductor stringing areas and revising operation and maintenance access arrangements to better align with the proposed solar farm access network where reasonably practicable.

3.7.104 Further amendments were made to pylon locations and associated working areas to reduce interactions with proposed solar infrastructure. This included relocating pylon 4AF211 (previously 4AF212 in the 2025 design) outside of the proposed solar development area, repositioning other pylons and working areas closer to field boundaries where reasonably practicable, and reducing the extent of construction activities within developable areas of the solar farm. As a result of this iterative design process, temporary and permanent land-take requirements within the Steeple Renewables Solar Farm were reduced where reasonably practicable whilst maintaining compliance with National Grid's safety, operational and engineering requirements. The 2025 design was therefore retained, with localised refinements incorporated into the Project design to support the future coexistence of the two projects as shown in Image 3.30.

Image 3.30 – Pylon positions and construction accesses near Sturton-Le-Steeple



Route Section F – Between Darlton and the proposed High Marnham Substation

Pylon rationalisation towards High Marnham Substation

3.7.105 Following statutory consultation, an opportunity was identified to rationalise the number of pylons leading into the High Marnham Substation, reducing it by one compared to the 2025 design. This change would, however, increase the overall span lengths.

3.7.106 The removal of the 2025 design pylon 4AF254 and subsequent repositioning of the remaining pylons would reduce impacts on the One Earth Solar Farm, with whom National Grid has engaged to minimise interactions. This change would also maintain sufficient distance from field boundaries and not impact nearby PRoWs. Some pylons would need to increase in height given the longer spans, but this impact would be balanced by the reduction in the number of pylons and the Project's interaction with utilities in this area would remain unchanged.

3.7.107 The removal of a pylon was preferred by the affected landowner. The change would also move the alignment from Flood Zone 3 into Flood Zone 1, reducing the risks to pylon integrity with lower probability of flooding impacts, which is preferred by National Grid. Given the range of advantages, it was concluded that the change would be taken forward as part of the Project design.

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