KEADBY
NEXT GENERATION
POWER STATION
Hydrogen-enabled flexible power

A collaboration between SSE Thermal and Equinor

The Keadby Next Generation Power Station Project

Document Ref: 5.6

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The Keadby Next Generation Power Station Development Consent Order [year]

Land at, and in the vicinity of, the existing Keadby Power Station (Trentside, Keadby, Scunthorpe DN17 3EF)

Design and Access Statement

The Planning Act 2008

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

Applicant: Keadby Next Generation Limited

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1. Executive Summary

1. This Design and Access Statement has been prepared by DWD on behalf of Keadby Next Generation Limited (‘the Applicant’) which is a subsidiary of SSE plc. It forms part of the application for a Development Consent Order ('DCO') (the 'Application'), that has been submitted to the Secretary of State (the ‘SoS’) for Energy Security and Net Zero, under Section 37 of ‘The Planning Act 2008’.

2. The Applicant is seeking development consent for the construction, operation and maintenance of a new combined cycle gas turbine ('CCGT') electricity generating station on land at, and in the vicinity of, the existing Keadby Power Station, Trent Side, Keadby, Scunthorpe DN17 3EF (‘the Site’).

3. National Policy Statements (NPS) provide a framework for examining and determining applications for energy Nationally Significant Infrastructure Projects (‘NSIPs’) including matters related to design. The Overarching NPS for Energy (EN-1) recognises that while the visual appearance of a building and how it relates to the landscape is sometimes considered to be the most important factor in good design, high quality and inclusive design goes far beyond aesthetic considerations. The functionality of buildings and infrastructure, including fitness for purpose and sustainability, are equally important. EN-1 goes on to state that applying good design to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates ‘good aesthetic’ as far as possible. It is acknowledged however (at paragraph 4.7.2):

   “…that the nature of energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of an area.”

4. The NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) similarly recognises that the main structures for generating stations are large and will inevitably have an impact on the surrounding landscape and visual amenity. EN-2 requires the Secretary of State (as the decision maker) to give ‘limited weight’ to the visibility of a generating station in the planning balance where the location is appropriate, and the development has been sensitively designed.

5. The location of the Proposed Development is appropriate given that it will be seen in the context of the two existing power stations, Keadby 1 and 2. The design reflects the need for functionality and fitness for purpose, though the opportunity exists at detailed design stage for further consideration of aesthetic matters, including materials.

6. It is important to recognise that the Proposed Development (if consented) would be a 'first of a kind' for this type of power station infrastructure project and could represent the UK's first hydrogen-fired power station. Consequently, at this consenting stage of the project, a number of the design aspects and features of the Proposed Development cannot be confirmed until the detailed design of the Proposed Development has been completed. For example, the building sizes may vary, depending on the Engineering, Procurement and Construction ('EPC') contractors selected and their specific configuration and selection of plant and equipment. It is also important that the consent retains some flexibility to allow for changing economic conditions and the advancement of hydrogen-fired CCGT technology in the period between preparing the Application, starting construction and starting hydrogen and/or natural gas -fired operations.

7. In order to provide sufficient flexibility and ensure a robust EIA, the Applicant has adopted the principles of the 'Rochdale Envelope' approach and assessed maximum (and where appropriate minimum) design parameters for the elements of the Proposed Development where flexibility needs to be retained at the consenting stage. These parameters include the limits within which the various elements of the Proposed Development can take place (as defined by the Works Plans – Application Document Ref. 2.3) in addition to maximum dimensions for the main buildings and structures.

8. The draft DCO includes articles and Requirements that allow for this flexibility but also provide certainty to the Secretary of State that the detailed design will be in accordance with the design parameters.

2. Introduction

2.1. Overview

2.1.1 This Design and Access Statement (**Application Document Ref. 5.6**) has been prepared by DWD Property and Planning Limited ('DWD') on behalf of Keadby Next Generation Limited ('the Applicant') which is a subsidiary of SSE plc. It forms part of the application for a Development Consent Order ('DCO') (the 'Application'), that has been submitted to the Secretary of State (the 'SoS') for Energy Security and Net Zero, under Section 37 of The Planning Act 2008 ('the 2008 Act').

2.1.2 The Applicant is seeking development consent for the construction, operation and maintenance of a new combined cycle gas turbine ('CCGT') electricity generating station on land at, and in the vicinity of, the existing Keadby Power Station, Trent Side, Keadby, Scunthorpe DN17 3EF ('the Site').

2.1.3 The Keadby Next Generation Power Station ('the Proposed Development') is a new CCGT electricity generating station with a capacity of up to 910MW electrical output. The CCGT electricity generating station will be designed to run on 100% hydrogen and able to run on 100% natural gas or a blend of natural gas and hydrogen and will be located on land to the west of Keadby 1 and Keadby 2 Power Stations. The Proposed Development includes connections for cooling water, electricity, hydrogen and natural gas, and construction laydown areas and other associated development. It is described in full in Environmental Statement (ES) Volume I Chapter 4: The Proposed Development, of the Environmental Statement (ES) (Volume I – **Application Document Ref. 6.2.4**).

2.1.4 The Proposed Development falls within the definition of a 'Nationally Significant Infrastructure Project' ('NSIP') under Section 14(1)(a) and Sections 15(1) and (2) of the 2008 Act, as it is an onshore generating station in England that would have a generating capacity greater than 50MW electrical output (50MWe). As such, a DCO application is required to authorise the Proposed Development in accordance with Section 31 of the 2008 Act.

2.1.5 The DCO, if made by the SoS, would be known as 'The Keadby Next Generation Power Station Order' ('the Order').

2.2. The Applicant

2.2.1 The Applicant is a subsidiary of the FTSE-listed SSE plc, one of the UK's largest and broadest-based energy companies, and the country's leading developer of renewable energy. Over the last 20 years, the SSE Group has invested over £20 billion to deliver industry-leading offshore wind, onshore wind, CCGT, energy from-waste, biomass, battery energy storage, energy networks and gas storage projects. Related SSE companies own and operate the adjacent Keadby 1 and 2 Power Stations and have the benefit of the DCO for

Keadby 3 CCS Power Station (herein referred to as the 'Keadby CCS Power Station').

2.2.2 The Proposed Development is being developed with Equinor, one of the country's leading energy providers, supplying natural gas, oil and electricity. Equinor is developing multiple low-carbon hydrogen and carbon capture projects in the Humber, working towards transforming the UK's most carbon intensive industrial cluster into a net zero region.

2.2.3 SSE Renewables Limited operates Keadby Windfarm, which lies to the north and south of the Site and generates renewable electricity from 34 turbines, with a total installed generation capacity of 68MW.

2.2.4 SSE plc has set out a clear commitment to investment in low carbon power infrastructure, working with government and other stakeholders to create a Net Zero power system by 2040. This includes investment in flexible sources of electricity generation and storage for times of low renewable output which will complement other renewable generating sources, either using low carbon fuels and/ or capturing and storing carbon emissions.

2.2.5 The design of the Proposed Development demonstrates this commitment and the Proposed Development will be built with a clear route to decarbonisation, consistent with SSE's Net Zero Acceleration Programme Plus and net zero transition plan which committed to the development and progression of new low carbon flexible power including hydrogen-fuelled generation.

2.3. The Proposed Development

2.3.1 The Proposed Development would comprise a high efficiency gas fired power station with an electrical output capacity of up to 910MWe and associated buildings, structures and plant and other associated development defined in Schedule 1 of the Draft DCO (**Application Document Ref. 3.1**) as Work Nos. 1-11 and shown on the Works Plans (**Application Document Ref. 2.3**).

2.3.2 The Proposed Development will include:

- a new-build CCGT electricity generating station fuelled by hydrogen and/or natural gas with a power output of up to 910MW (Work No. 1) including:
  - a CCGT plant;
  - cooling infrastructure;
  - natural gas and hydrogen blending equipment;
  - supporting facilities including administration and control buildings, workshops, storage buildings, effluent treatment facilities, fire water storage tank(s), demineralised water treatment plant including storage tank(s), and permanent laydown areas for operation and maintenance activities;

- a hydrogen supply pipeline, including a gas compound for the hydrogen supplier's apparatus and a hydrogen gas compound for the Applicant's apparatus (Work No. 2);
- a natural gas supply pipeline including a compound for the natural gas supplier's apparatus and a natural gas compound for the Applicant's apparatus (Work No. 3);
- electrical connection works for the export and import of electricity to and from the generating station and the existing 400kV National Grid Electricity Transmission (NGET) substation located adjacent to the Keadby Power Station site, including works within the substation (which would be undertaken by NGET) (Work No. 4);
- water supply connection works to provide cooling and make-up water to the generating station, including intake structures and an underground and/or overground water supply pipeline running between the generating station and the Stainforth and Keadby Canal (Work No. 5);
- connections to and use of an existing outfall and associated pipework for the discharge of used cooling water, surface water and treated effluent to the River Trent (Work No. 6);
- public water connection pipeline from a new connection on Chapel Lane to provide potable water to the generating station (Work No. 7);
- new permanent access to the generating station (Work No. 8), comprising:
  - maintenance and improvement of an existing private access road from the A18, including replacement of a private bridge (Mabey Bridge) (Work No. 8A);
  - installation of layby and gatehouse with barriers, enclosures, drainage and lighting north of the A18 junction (Work No. 8B) and associated utilities connections (Work No. 8C); and
  - emergency access route comprising the maintenance and improvement of an existing private track running between the generating station and Chapel Lane and including new private bridge crossing over Glew Drain (Work No. 8D);
- temporary construction and laydown areas (Work No. 9A);
- maintenance and improvement of the existing access routes running between the A18 and construction laydown areas (Work No. 9B); and between Skew Bridge adjacent to the A18 and a temporary construction laydown area associated with Mabey Bridge replacement (Work No. 9C);
- retention, maintenance and improvement and subsequent removal of existing temporary haul route from the Waterborne Transport Offloading Facility (Work No. 9D) and the inspection and repair of the existing wharf, and temporary placement of mobile cranes including the temporary oversailing of crane arms (Work No. 9E); and

- landscaping and biodiversity enhancement measures (Work No. 10);
- an allocation of land to meet the requirements of the Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013 (Work No. 11).

2.3.3 The Applicant will be responsible for the construction, operation (including maintenance) and eventual decommissioning of the Proposed Development including the on-site connections to electricity, cooling water, hydrogen and natural gas supplies.

2.3.4 The Proposed Development will be capable of operating 24 hours per day, 7 days per week with programmed offline periods for maintenance.

2.3.5 The route for the hydrogen supply pipeline to the Proposed Development has not yet been confirmed. The supply pipeline is not included in the Proposed Development and will be progressed by a third party under a separate consent. In line with Government policy, it is recognised that developments such as the Proposed Development are needed to stimulate investment in the development of hydrogen production and supply infrastructure.

2.3.6 Further detail on the components of the Proposed Development is provided in ES Volume I Chapter 4: The Proposed Development (**Application Document Ref. 6.2.4**). The areas within which each numbered Work (component) of the Proposed Development are to be built are defined by the coloured and hatched areas on the Works Plans (**Application Document Ref. 2.3**).

2.3.7 The locations of the elements of the Proposed Development described above within the Site are shown in Figure 3.3: Indicative Parts of the Site and an Indicative Layout Plan is included as Figure 4.1 (ES Volume III, **Application Document Ref. 6.4**).

2.3.8 The Proposed Development is a 'first of a kind' for this type of power station infrastructure project and could represent the UK's first hydrogen-fired power station. Consequently, at this consenting stage of the project, a number of the design aspects and features of the Proposed Development cannot be confirmed until the detailed design has been completed. For example, the building sizes may vary, depending on the Engineering, Procurement and Construction (EPC) contractor(s) selected and their specific configuration and selection of plant and equipment. It is also important that the consent retains some flexibility to allow for changing economic conditions and the advancement of hydrogen-fired CCGT technology in the period between preparing the Application and starting construction.

2.3.9 In order to ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the Environmental Impact Assessment (EIA) has been undertaken adopting the principles of the 'Rochdale Envelope' approach where appropriate in accordance with the Planning Inspectorate's Advice Note 9: The Rochdale Envelope (PINS, 2018). This involves assessing the maximum (or where relevant, minimum) parameters for the elements where flexibility needs to be retained (such as the building

dimensions or operational modes for example). Where this approach is being applied to the specific aspects of the EIA, this is confirmed within the relevant chapters of this Planning Statement.

2.3.10 Justification for the need to retain flexibility in certain parameters is outlined in this chapter and also in ES Volume I Chapter 4 **(Application Document Ref. 6.2.4)**.

2.3.11 Construction of the Proposed Development is described in ES Volume I, Chapter 2: Assessment Methodology **(Application Document Ref. 6.2.2),** ES Volume I, Chapter 4: The Proposed Development **(Application Document Ref 6.2.4);** ES Volume I, Chapter 5: Construction Programme and **Management (ES Volume I, Application Document Ref. 6.2.5**); and ES Volume I, Chapter 6: Consideration of Alternatives and Design Evolution **(Application Document Ref. 6.2.6).** At this stage in the project development, a detailed construction programme is not available as this is normally determined by the EPC contractor(s) which has/ have not yet been appointed; however, an indicative construction programme is presented within Chapter 5: Construction Programme and Management on which the potential environmental effects of the Proposed Development have been assessed.

2.3.12 Construction of the Proposed Development could (subject to the necessary consents being granted and an investment decision being made) start in 2027. Assuming an approximate three-and-a-half-year construction programme followed by a period of commissioning, the Proposed Development is unlikely to commence commercial operation before 2030.

2.3.13 It is envisaged that the Proposed Development will be designed to operate for at least 25 years. At that stage, it is expected that the Proposed Development will have some residual life remaining, and an investment decision would then be made based on an assessment of the technical feasibility and the market conditions prevailing at that time.

2.3.14 At the end of its operating life, the most likely scenario is that the Proposed Development would be decommissioned. For EIA purposes, it has been assumed that the Proposed Development could operate for longer than 25 years, and in relevant chapters has considered and assessed the potential for operational impacts/ effects to continue beyond this timeframe. If the operating life were to be extended, the Proposed Development would be upgraded in line with the legislative requirements at that time.

2.3.15 A Combined Heat and Power (CHP) Assessment has been prepared to accompany the Application (**Application Document. Ref. 5.8**), which considers the feasibility of installing CHP.

2.4. The Proposed Development Site

2.4.1 The Site is located within and near to the existing Keadby Power Station site near Scunthorpe, Lincolnshire and falls within the administrative area of North Lincolnshire Council ('NLC'). The majority of the land is within the ownership or

control of the Applicant (or SSE associated companies) and is centred on national grid reference (NGR) 482351, 411796 and is shown on the Site Location Plan **(Application Document. Ref. 2.1)**. The existing Keadby Power Station site currently encompasses the operational Keadby 1 and Keadby 2 Power Station sites, including the Keadby 2 Power Station Carbon Capture Readiness reserve space.

2.4.2 The Site encompasses an area of approximately 77.1 hectares (ha), of which approximately 26.7ha of land is proposed for construction laydown.

2.4.3 Multiple proposed land uses together make up the Site, with the different areas described in turn below and shown on ES Volume III Figure 3.3 Indicative Parts of the Site Plan (**Application Document Ref. 6.4**). These terms have been used to describe land use zones within the Site. The Site is divided into the following areas of permanent and temporary land use (the proposed use is described in more detail in ES Volume I Chapter 3: Site and Surrounding Area (**Application Document Ref. 6.2.3**):

- Main Site;
- Ancillary Facilities;
- Water Connections;
- Electricity Connections;
- Waterborne Transport Off-loading Area;
- Construction Laydown Areas;
- Access routes (emergency, permanent and construction);
- Connections to Keadby 1 and Keadby 2 power stations; and
- Additional areas for landscaping and biodiversity provision.

2.5. The DCO Process

2.5.1 The Proposed Development falls within the definition of a NSIP under Section 14(1)(a) and 15(2) of the 2008 Act as a 'generating station exceeding 50 MW'.

2.5.2 As a NSIP project, the Applicant is required to seek a DCO to construct and operate the generating station, under Section 31 of the 2008 Act. Section 37 of the 2008 Act also governs the form, content and accompanying documents that are required as part of a DCO application. The requirements are implemented through the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ('APFP Regulations') which state that an application must be accompanied by an ES, where a development is considered to be 'EIA development' under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) (as amended).

2.5.3 An application for development consent for the Proposed Development has been submitted to the Planning Inspectorate (PINS) acting on behalf of the SoS. Subject to the application being accepted, PINS will then examine it and make a recommendation to the SoS who will then decide whether to grant a

DCO. The acceptance, examination, recommendation and decision stages are subject to fixed timescales and the decision is therefore anticipated to fall in 2026.

2.5.4 A DCO, if granted, has the effect of providing deemed planning permission for a development, in addition to a number of other consents and authorisations where specified within the Order.

2.6. The Purpose and Structure of this Document

2.6.1 This Design and Access Statement ('DAS') has been prepared to describe the approach that has been taken to the design of the Proposed Development and to demonstrate how regard has been had to the surrounding context and to good design. Whilst there is no statutory requirement for a DAS to accompany a DCO application, PINS' Advice on the Preparation and Submission of Application Documents (PINS, 2024) advises that 'other documents' may include information that the applicant would normally want to submit for the development proposal or which has been requested or suggested by respondents to pre-application consultation and publicity, and which the applicant wishes to include. The Applicant considers it beneficial to set out in a DAS how the design of the Proposed Development has developed.

2.6.2 The DAS has therefore been prepared to describe the approach that has been taken to the design of the Proposed Development and to demonstrate how regard has been had to the surrounding context and to good design considerations. It also sets out the Design Principles that have been applied and that will guide the detailed design.

2.6.3 The structure of the remainder of this DAS is set out in **Table 2.1** below.

Table 2.1: Design and Access Statement Structure

Section	Title	Overview
Section 3	Legislative and Policy Context	Provides a summary of relevant policy and guidance relating to design.
Section 4	Design Flexibility and Information	Explains the design flexibility that is being sought by the Applicant and sets out the design information being provided with the Application.
Section 5	Design Approach and Development	Describes the design process that has been followed, including the

		broad approach that has been taken to the design of the Proposed Development and where the design has evolved.
Section 6	Design Components and Final Arrangement	Describes the main components and final design arrangement of the Proposed Development.
Section 7	Access Arrangements	Describes how the site will be accessed.
Section 8	Securing Detailed Design	Describes how the detailed design will be secured through the DCO.
Section 9	Conclusions	
Section 10	References	
Appendix 1	Design Principles Statement	Sets out the principles that have guided the design and will underpin the detailed design.

3. Legislative and Policy Context

3.1. Introduction

3.1.1 This section summarises the design-related legislative context and policy framework in respect of NSIPs, with particular emphasis on the relevant National Policy Statements ('NPSs'). Regard has also been had to statutory development plan policy, supplementary planning documents and other local design guidance and guidelines. Planning policy more generally is considered within the Planning Statement (**Application Document Ref. 5.5**).

3.2. Legislative Context

3.2.1 Section 10(3)(b) 'Sustainable development' of the PA 2008 states that in setting policy for NSIPs (through NPSs) the SoS must have regard to the desirability of achieving 'good design'. However, the PA 2008 and related regulations do not require applications for NSIPs to be accompanied by a DAS.

3.2.2 The Town and Country Planning (Development Management Procedure) (England) Order 2015 (S.I 2015 No. 595) ('2015 Order), while applying to applications for planning permission under the Town and Country Planning Act 1990 (the 'TCPA') is of relevance as it sets out the matters to be addressed within a DAS. Article 9(3) 'Design and access statements' of the 2015 Order stipulates that a DAS must:

- Explain the design principles and concepts that have been applied to the development;
- Demonstrate the steps taken to appraise the context of the development and how the design of the development takes that context into account;
- Explain the policy adopted as to access, and how policies relating to access in relevant local development documents have been taken into account;
- State what, if any, consultation has been undertaken on issues relating to the access and design of the development and what account has been taken of the outcome of any such consultation; and
- Explain how any specific issues which might affect access to the development have been addressed.

3.2.3 Article 9(4) confirms that a DAS is not required for certain types of applications, including applications for engineering or mining operations.

3.2.4 With regard to Article 9, it is relevant to note that while the CCGT power station (Work No. 1), the hydrogen compound and above ground infrastructure ('AGI') (Work Number 2) and the natural gas connection and gas compound and above ground infrastructure ('AGI') (Work No. 3) involve new buildings and structures, the other works comprised within the Proposed Development (e.g. electricity grid and water connections (Work Nos. 4 to 7) primarily involve the installation of

pipelines and cables above and below ground and can therefore be considered to represent engineering works. The main focus of this DAS is therefore upon Works Nos. 1, 2 and 3.

3.3. National Policy Statements

3.3.1 The planning policy framework for examining and determining applications for NSIPs is provided by a number of NPSs. Section 104(3) of the PA 2008 confirms that where NPSs are in place, these shall be the primary basis for decisions by the SoS on applications for NSIPs. Policy relating to design contained with the NPSs of relevance to the Proposed Development is set out below.

Overarching NPS for Energy (EN-1)

3.3.2 The Overarching NPS for Energy (EN-1) defines the need for nationally significant energy infrastructure and sets out certain assessment principles and criteria against which applications for such infrastructure should be considered. This includes Section 4.7 'Criteria for good design for energy infrastructure'.

3.3.3 Paragraph 4.7.1 recognises that while the visual appearance of a building and how it relates to the landscape is sometimes considered to be the most important factor in good design, high quality and inclusive design goes far beyond aesthetic considerations. The functionality of buildings and infrastructure, including fitness for purpose and sustainability, are equally important. Paragraph 4.7.2 goes on to state that applying good design to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates 'good aesthetic' as far as possible. It is acknowledged however (at paragraph 4.7.2):

> *"…that the nature of energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of an area."*

3.3.4 Paragraph 4.7.3 of EN-1 notes that good design is also a means by which many policy objectives in EN-1 can be met, for example, good design, in terms of siting and use of appropriate technologies can help mitigate adverse impacts such as noise.

3.3.5 Paragraph 4.7.6 recognises that the nature of energy infrastructure can limit opportunities for good design:

> *"Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, land form and vegetation. Furthermore, the design and sensitive use of materials in any associated development such as electricity substations will assist in ensuring that such development contributes to the*

quality of the area. Applicants should also, so far as is possible, seek to embed opportunities for nature inclusive design within the design process."

3.3.6 Paragraph 4.7.7 notes that applicants must demonstrate in their application documents how the design process was conducted and how the proposed design evolved. However, it is clear that in considering applications the SoS should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements that the design has to satisfy.

3.3.7 Paragraph 4.7.10 confirms that in assessing applications, "the Secretary of State needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable and adaptable (including taking account of natural hazards such as flooding) as they can be." In doing so, paragraph 4.7.11 goes on to state that the SoS should be satisfied that:

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

3.3.8 Draft NPS EN-1 (2025) (DESNZ, 2025) does not propose any substantial revisions to the above paragraphs.

NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2)

3.3.9 EN-2 provides limited additional guidance on 'good design' for fossil fuel generating stations over and above what is set out in EN-1.

3.3.10 Paragraph 2.4.26 recognises that the main structures for natural gas generating stations are large and will have an impact on the surrounding landscape and visual amenity, as will the need for night-time lighting required to maintain continuous operation. A landscape and visual impact assessment is required to be part of the Environmental Statement (paragraph 2.4.27). Applicants are required by paragraph 2.4.28 to consider design and materials in the context of local landscape. This paragraph notes that, "*The need for good design will be particularly important where a national designated landscape is affected*."

3.3.11 Paragraph 2.6.12 of EN-2 states that "*if, having regard to the considerations in respect of other impacts set out in EN-1 and this NPS, the Secretary of State is satisfied that the location is appropriate for the project, and that it has been designed sensitively (given the various siting, operational and other relevant constraints) to minimise harm to landscape and visual amenity, the visibility of a fossil fuel generating station should be given limited weight*".

3.3.12 NPS EN-2 has not been included in the consultation by the government on revisions to the energy NPSs.

NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)

3.3.13 Paragraph 2.4.1 of NPS EN-4 (DESNZ, 2024) states that the 2008 Act requires the SoS to have regard, in designating an NPS, to the desirability of good design. Paragraph 2.4.2 states that applicants should consider the criteria for good design set out at Section 4.7 of NPS EN-1 at an early when developing proposals.

3.3.14 Section 2.21 of NPS EN-4 relates to the applicant's assessment of natural gas and oil pipelines. Paragraph 2.21.1 states that when designing the route of new pipelines applicants should research relevant constraints including proximity of existing and planned residential properties, schools and hospitals, railway crossings, major road crossings, below surface usage and proximity to environmentally sensitive areas, main river and watercourse crossings. Section 2.22 of NSP EN-4 sets out how appropriate design and mitigation measures for pipelines should be incorporated into a proposed development to minimise impacts.

3.3.15 NPS EN-4 has not been included in the consultation by the government on revisions to the energy NPSs.

NPS for Electricity Networks Infrastructure (EN-5)

3.3.16 NPS EN-5 (Ref 1-13) is also of some relevance as the Proposed Development includes electricity grid connection infrastructure.

3.3.17 As with NPS EN-4, EN-5 is clear (paragraph 2.4.2) that applicants should consider the criteria for good design set out in Section 4.7 of EN-1 at any early stage when developing projects. However, paragraph 2.4.3 states that:

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

3.3.18 Draft EN-5 (2025) proposes additional text to paragraph 2.4.2, and states that applicants should consider the criteria for good design set out in "*the Holford and Horlock rules and Electricity Transmission Design Principles*" at an early stage. The Holford and Horlock rules (Ref 1-14 and 1-15) have been set by National Grid, with the latter being of most relevance as it provides guidelines for the design and siting of substations, in addition to cable sealing end compounds and line entries. The Electricity Transmission Design Principles agreed by DESNZ in their Transmission Acceleration Action Plan (DESNZ, 2023) (Ref 1-16) provide clarity on how infrastructure design could be improved and where alternative options could be considered.

3.3.19 Draft NPS EN-5 (2025) (DESNZ, 2025) does not propose any other substantial revisions to the above paragraphs.

The National Infrastructure Commission's Four Principles of Good Design

3.3.20 The National Infrastructure and Service Transformation Authority ('NISTA') is an executive agency that reports into HM Treasury and provides impartial advice on national and long-term infrastructure needs and delivery. The National Infrastructure Commission (NIC), which forms part of NISTA have published Design Principles for National Infrastructure (2020) which set out four overarching principles to set an ambitious vision for design of national infrastructure. These principles are summarised below.

Climate

3.3.21 This principle relates to mitigating greenhouse gas emissions and adapting to climate change. It seeks to ensure opportunities are taken during design and construction to enable decarbonisation, including mitigating and offsetting residual impacts, within and outside the Order limits. It also makes reference to flexibility and adaptation to ensure resilience against climate change.

People

3.3.22 This principle relates to reflecting what society wants and sharing benefits widely. It states infrastructure should be designed for people to a human scale, and makes reference to accessible, enjoyable and safe spaces. It states that a range of views should be taken into account and reflected in design, and engagement should be diverse, open and sincere. It goes on to state good design will plan for future changes in demographics and population.

Places

3.3.23 This principle relates to providing a sense of identity and improving our environment. It states that well-designed infrastructure supports the natural and built environment and should respect and enhance local culture and character without being bound by the past. It goes on to state that good design should support local ecology and deliver a Biodiversity Net Gain.

Value

3.3.24 This principle relates to achieving multiple benefits and solving problems well. It states that good design adds value and ensures opportunities for economic, environmental and social benefits inside and outside the red line boundary are pursued and also seeks to solve multiple problems with single solutions.

3.3.25 Securing good design outcomes through the use of design principles, parameters and design codes is endorsed by the National Design Guide (MHCLG, 2021) setting out characteristics to inform good design. This includes but is not limited to consideration of:

- Context;
- Identity;
- Built form;
- Movement;

- Nature;
- Uses;
- Resources; and
- Lifespan.

Planning Inspectorate's Design Guidance

3.3.26 PINS's Nationally Significant Infrastructure Projects: Advice on Good Design (PINS, 2024) provides further advice on achieving good design through following a good design process and securing good design outcomes. 'Good Design Issues to Consider' are found at Annex A of this Advice on Good Design. These set out the considerations relating to good design which applicants should consider before applying for acceptance of an application for development consent under section 55 of the 2008 Act. The Annex sets out design issues that an applicant should consider to demonstrate that a good design process has been followed and that through design evolution the proposed development will deliver a good design outcome.

3.4. Local Planning Policy and Site Designations

Planning Policy

3.4.1 The Site is located within the administrative boundary of NLC which represents the host local authority for the Proposed Development. The development plan documents produced by NLC therefore represent the statutory development plan for the Proposed Development.

3.4.2 The local development plan for the Proposed Development comprises the following development plan documents ('DPDs'):

- North Lincolnshire Local Development Framework Core Strategy (the 'Core Strategy') (NLC, 2011) - adopted June 2011;
- North Lincolnshire Local Development Framework Housing and Employment Land Allocations DPD (the 'Allocations DPD') (NLC, 2016) - adopted March 2016; and
- Saved Policies of the North Lincolnshire Local Plan (the Local Plan) (Local Development Frameworks Government Office for Yorkshire and The Humber, 2007) - adopted May 2003, saved September 2007.

3.4.3 Appendix 7 to the Planning Statement (**Application Document Ref. 5.5**) summarises the development plan policies. The following policies are considered relevant to this DAS:

- Spatial Objective 6 (Core Strategy) - Protecting and Enhancing the World Class Environment
- Spatial Objective 10 (Core Strategy) – Creating a Quality Environment
- Policy CS5 Delivering Quality Design in North Lincolnshire

- Policy CS16 North Lincolnshire's Landscape, Greenspace and Waterscape
- Policy T2 Access to Development
- DS1 General Requirements

Planning Designations

3.4.4 To the south of the Site is the Stainforth and Keadby Canal. The lock at the junction of the canal and the River Trent is grade II listed, is a Scheduled Monument and is designated by NLC as a heritage asset in their adopted Local Plan. The River Trent, immediately to the east of the Site is part of the designated Ramsar site, SSSI and SAC for the Humber Estuary.

3.4.5 The Stainforth and Keadby Canal is designated as a Local Wildlife Site (LWS).

3.4.6 The Site is predominantly within the open countryside, adjacent to the existing Keadby Development Boundary.

4. Design Flexibility and Information

4.1.1 This section of the DAS explains the flexibility that the Applicant has sought to incorporate within the design of the Proposed Development, within the overall parameters of the Application. It also explains the purpose and status of the design information that has been submitted as part of the Application.

4.2. Design Flexibility

4.2.1 It is important to recognise that the Proposed Development (if consented) would be a 'first of a kind' for this type of power station infrastructure project and could represent the UK's first hydrogen-fired power station. Consequently, at this consenting stage of the project, a number of the design aspects and features of the Proposed Development cannot be confirmed until the detailed design of the Proposed Development has been completed. For example, the building sizes may vary, depending on the Engineering, Procurement and Construction ('EPC') contractors selected and their specific configuration and selection of plant and equipment. It is also important that the consent retains some flexibility to allow for changing economic conditions and the advancement of hydrogen-fired CCGT technology in the period between preparing the Application, starting construction and starting hydrogen and/or natural gas-fired operations.

4.2.2 A key reason for needing to incorporate flexibility within the Proposed Development at the consenting stage relates to the appointment of an EPC contractor. This would not take place until after the SoS has granted a DCO and the Applicant has made a final investment decision to proceed with the Proposed Development. Following the award of the construction contract, the appointed EPC contractor would then need to carry out detailed design studies in order to inform the decisions on the exact technology selection for the various elements of the Proposed Development and also to optimise the design and layout of these. It is also important that the consent retains some flexibility to allow for changing economic conditions and the advancement of hydrogen technology in the period between preparing the Application and starting construction. At this stage of the process, it is not therefore possible to finalise the detailed design of the Proposed Development.

4.2.3 In order to provide sufficient flexibility and ensure a robust EIA, the Applicant has adopted the principles of the 'Rochdale Envelope' approach and assessed maximum (and where appropriate minimum) design parameters for the elements of the Proposed Development where flexibility needs to be retained at the consenting stage. These parameters include the limits within which the various elements of the Proposed Development can take place (as defined by the Works Plans – **Application Document Ref. 2.3**) in addition to maximum dimensions for the main buildings and structures.

4.2.4 The maximum design parameters for the main buildings and structures that have been adopted for the purposes of the EIA of the Proposed Development are set

out below in **Table 4.1** below. Maximum heights of buildings and other structures are given in m AOD.

4.2.5 An accompanying indicative layout drawing is presented as ES Volume III Figure 4.1 (**Application Document Ref. 6.4**). Elevations drawings are provided as part of the Indicative Proposed Power Station Layout, Elevations and Sections Plans which accompany the Application (**Application Document Ref 2.13**).

Table 4.1: Maximum Design Parameters

Component	Length (m)	Width (m)	Height (m) above ground level (AGL)	Height (m AOD)
Minimum design level (final ground height) within Main Site and Ancillary Facilities areas				3.0m AOD
Gas Turbine Hall	23	53	32	35.0
Gas Turbine Generator Hall	28	22	24	27.0
Steam Turbine Hall	58	61	39	42.0
HRSG Building	33	74	58	61.0
Stack	Up to 9m external diameter (8.4m internal diameter)		85	88.0
Hybrid Cooling Towers	170	38	25	28.0

4.2.6 For buildings and structures within the Main Site and Ancillary Facilities areas, these parameters take into account the anticipated finished ground level of +3.0m AOD for CCGT infrastructure including the administration/ control building that would provide a safe place of refuge in a flood defence breach event.

4.2.7 Existing natural ground levels at the Main Site are approximately 0m to 1m Above Ordnance Datum (AOD) on the northern part of the Main Site and typically 1m to 2m AOD in the southern part of the Main Site.

4.2.8 Proposed ground elevations and final finished ground levels have been informed by flood risk assessment modelling presented in ES Volume II Appendix 12A: Flood Risk Assessment (**Application Document Ref. 6.3**).

4.2.9 Further flood resilience measures are proposed for critical operational infrastructure associated with the CCGT (defined in paragraph 12A.10.14 - 12A.10.23 of ES Volume II Appendix 12A: Flood Risk Assessment **(Application Document Ref. 6.3**). It is proposed that such infrastructure is raised to a level of 4.1m AOD where reasonably practical to do so, or a minimum of 1m above the development planform level (4.0m AOD). A minimum finished floor level of 3.3m AOD has been defined for manned buildings on the main area of the Site (e.g. Workshops/ Control/ Admin buildings). Safe refuge will be available for staff working within the other parts of the main area of the Site.

4.3. Design Information

4.3.1 The design information that has been submitted as part of the Application has been based upon the maximum design parameters. This information is set out in **Table 4.2**.

Table 4.2: Submitted Design Information

Application Document Ref	Application Documents	Purpose
2.3	Works Plans	Confirms the location and extent of the Works Nos. comprised within the Proposed Development, as set out at Schedule 1 of the DCO.
2.4	Access and Rights of Way Plans	Showing details of the Site access and works proposed in the vicinity of the A18, Chapel Lane and Bonnyhale Road.
2.6	Indicative Proposed Power Station Layout, Elevations and Sections Plans	Showing the indicative layout, elevations and sections for the main buildings and structures of the Proposed Development.
2.7	Indicative Electrical Connection Plans	Showing the indicative route and connection point for the electrical connection.
2.8	Indicative Water Supply and Effluent Discharge Connection Plans	Showing the indicative routes for the abstracted water and effluent

Application Document Ref	Application Documents	Purpose
		discharge connection works.
2.9	Indicative Public Water Connections Plan	Showing the public water connection area.
2.10	Indicative Hydrogen Supply Pipeline Connection and Above Ground Installation Plans	Showing the indicative route and connection points for the hydrogen connection including AGI.
2.11	Indicative Natural Gas Supply Pipeline Connection Plans and Above Ground Installation Plans	Showing the indicative route and connection points for the natural gas connection including AGI.
2.12	Indicative Surface Water Drainage Plan	Showing the indicative routes for the surface water drainage.
2.13	A18 Gatehouse Indicative General Arrangement and Elevations Plans	Showing the indicative arrangement and elevations of the proposed gatehouse at the A18 access.
2.14	Mabey Bridge Replacement General Arrangement Plan	Showing the indicative replacement Mabey Bridge at the A18 access and sections.
2.15	Emergency Access Bridge General Arrangement Plan	Showing the emergency access route bridge over Drain 1 (Glew Drain)
2.16	Haul Road Plans	Showing the haul road from Railway Wharf to the Main Site
2.17	Pilfrey Laydown Plans	Historic plan showing the laydown area adjacent to the North Pilfrey Bridge.

Application Document Ref	Application Documents	Purpose
2.18	Indicative Landscape and Biodiversity Plan	Showing the proposed boundary landscaping and biodiversity enhancement at the Site.
2.19	Plans of statutory and non-statutory sites or features (nature conservation, habitats, marine conservation zones, water bodies etc)	

4.3.2 Due to the nature of the Proposed Development and the need to incorporate sufficient flexibility within its design, much of the design information that has been submitted as part of the Application is indicative. However, the information that has been provided would feed into the detailed design of the Proposed Development. The mechanisms by which the detailed design of the Proposed Development would be secured are dealt with at Section 7.

5. Design Approach and Development

5.1.1 This Section sets out the approach that the Applicant has taken to the design of the Proposed Development and how the design has developed throughout the pre-application process.

5.2. Design Approach

5.2.1 The approach that the Applicant has taken to the design of the Proposed Development has been informed by the context within which it will sit, the opportunities that exist, guidance on design in infrastructure and the local planning policy framework.

5.2.2 As described in Section 2, the immediate context within which much of the Main Site sits (e.g., the areas immediately surrounding the Main Site) is already largely industrialised in terms of its character and appearance. It is characterised by the existing power generation buildings and structures associated with Keadby 1, Keadby 2 and Keadby Wind Farm, notably large turbine halls, emissions stacks, wind turbines and the NGET Substation as well as numerous overhead electric lines.

5.2.3 The Applicant acknowledged that their approach to design should be appropriate to the context and purpose of the Proposed Development, to generate and export electricity to the National Grid. It is also important to recognise that this is not a situation where large-scale development is being introduced into an area that is devoid of built development and that is characterised by particularly sensitive landscapes.

5.2.4 The Site was selected owing to the benefits of colocation within the Keadby Power Station site, such as the close proximity to the National Grid substation, gas feeder and power station infrastructure on the wider site. A full list of reasons why the Site was selected as opposed to other sites is provided below:

- the Site is suitably located to connect to the developing hydrogen supply network, which includes National Grid's Project Union (a national hydrogen transmission network for the UK, connecting hydrogen production and storage to hydrogen consumers) and Northern Gas Networks' proposed local hydrogen transmission network (East Coast Hydrogen project);
- the Site has excellent links to existing infrastructure including electrical grid and gas (specifically the National Grid electricity and National Gas Transmission natural gas transmission networks); water (given proximity to both the Stainforth and Keadby Canal and River Trent) and transport (A18 and M180 as well as waterborne options);
- the Site is located largely within the boundary of the existing Keadby Power Station site (and associated land within the ownership or control of the Applicant);

- the Main Site is a brownfield site, which is considered more appropriate to redevelop for large scale power generation than an alternative greenfield site, and has no existing major structures requiring demolition, treatment and removal;
- the location of the Main Site minimises interference with the Landscape and Creative Conservation Plan for Keadby 2 Power Station and specifically, the Habitat Management Areas secured via Conditions 31-34 inclusive of the Section 36 consent for Keadby 2 Power Station;
- the Main Site provides sufficient space to accommodate the required scale of a single high efficiency CCGT unit, without encroaching on the exclusion areas for the Keadby Wind Farm turbines to the north, the former Keadby Ash Tip to the west and the existing overhead lines to the south and east; and
- the Main Site is located in close proximity to the existing Keadby 1 and Keadby 2 Power Stations, providing opportunities for synergies and efficiencies for the Proposed Development, such as shared use of the existing cooling water discharge infrastructure and existing access routes.

5.2.5 Further information on the selection of the Site over other potential alternatives can be found in ES Volume I Chapter 6: Consideration of Alternatives and Design Evolution **Application Document Ref. 6.2.6**).

5.3. Design Development

5.3.1 As part of the ongoing design process, consideration has been given to a range of design options. Decisions taken regarding the concept design of the Proposed Development have, where relevant and possible, been informed by environmental appraisal and assessment work and by consultation with stakeholders.

Site Layout

5.3.2 As part of the design process, a number of options were considered via preliminary assessment for the site layout of the Proposed Development within what would become known as the Site. Early engineering assessments reviewed the capacity of the Proposed Development Site against necessary clearance distances and exclusion zones (such as from existing National Grid pylons and adjacent wind turbines) required to safely build the plant/technology for the Proposed Development.

5.3.3 A plan showing the indicative layout of the Site is shown on the Indicative Proposed Power and Carbon Capture Layout, Elevations and Sections (**Application Document Ref. 4.7**).

Cooling Towers

5.3.4 Following investigation of cooling water options for the Proposed Development fin-fan air coolers were ruled out based on space and power demand and hybrid

cooling towers selected. The preferred cooling option is a hybrid system using make-up water from the Stainforth and Keadby Canal.

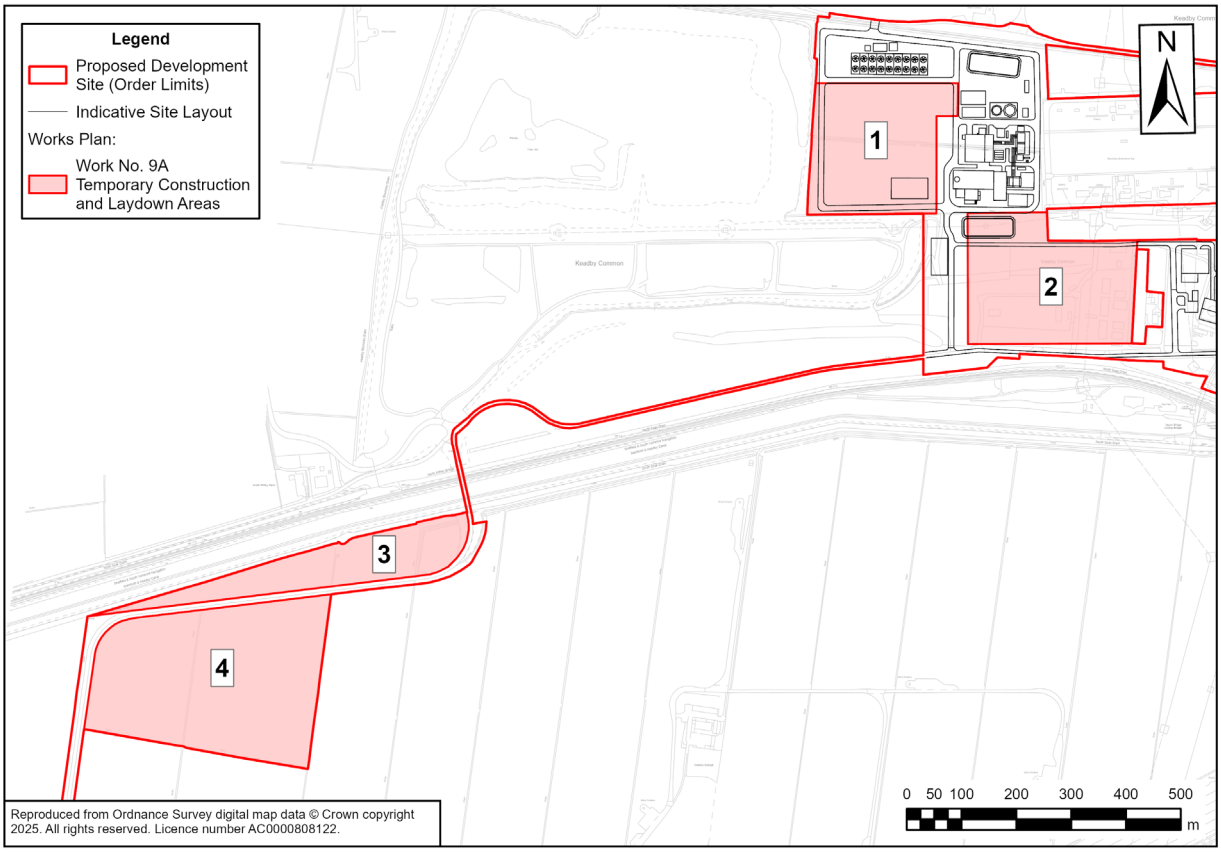
Construction Laydown Areas

5.3.5 The EIA Scoping Report (Appendix 1A – ES Volume II **– Application Document Ref. 6.3**), included areas within the southwest of the Site boundary south of the canal and within the south east of the Site boundary adjacent to the Ancillary Facilities area as 'Indicative construction laydown areas'.

5.3.6 Since the Scoping Report was published, the Applicant has reviewed the construction laydown required. In light of the early stage of design maturity and potential requirements of various contractors for laydown, the areas within the Scoping Report have been retained. The Applicant has however maximised the use of existing land within the Applicant's control previously used as temporary laydown for Keadby 2 Power Station construction, whilst continuing to supplement with additional land in agricultural use, where necessary, to be leased from the landowner. The construction laydown area sites selected are listed below and illustrated on **Plate 5.1**:

- Area 1 – an unused parcel of land owned by the Applicant forming part of the Main Site and including the CCR reserve area
- Area 2 – brownfield land to the south of the Main Site (previously used as temporary laydown for Keadby 2 Power Station construction); and
- Area 3 – comprises a strip of unused (partially agricultural land between the Stainforth and Keadby Canal and the access road, part of which (at its north east corner) was previously used as temporary laydown for Keadby 2 Power Station construction;
- Area 4 – agricultural land adjacent east and south of the A18 access road.

Plate 5.1: Construction Laydown Areas



5.4. Design through consultation

5.4.1 The NIC's Design Principles for National Infrastructure advises that a range of views should be taken into account in infrastructure design and that engagement should be diverse, open and sincere.

5.4.2 Due to the similarities between the consented Keadby 3 Carbon Capture and Storage ('CCS') Power Station in the same location as the Proposed Development, the Applicant carried out one formal statutory consultation for the Proposed Development, to reduce potential consultation fatigue for stakeholders. Details of this consultation, and the two rounds of further 'targeted consultation' that followed, are set out in the Consultation Report (**Application Document Ref. 5.1**).

5.4.3 During the consultation, participants were asked for their opinion on various design ideas for the building finish and the boundary treatments and accesses. The objective was to arrive at design principles that would ensure the final design is both functional and attractive.

5.4.4 It should be noted that many of the technical aspects of the Proposed Development are fixed by the Applicant (or fixed by the Applicant in discussion

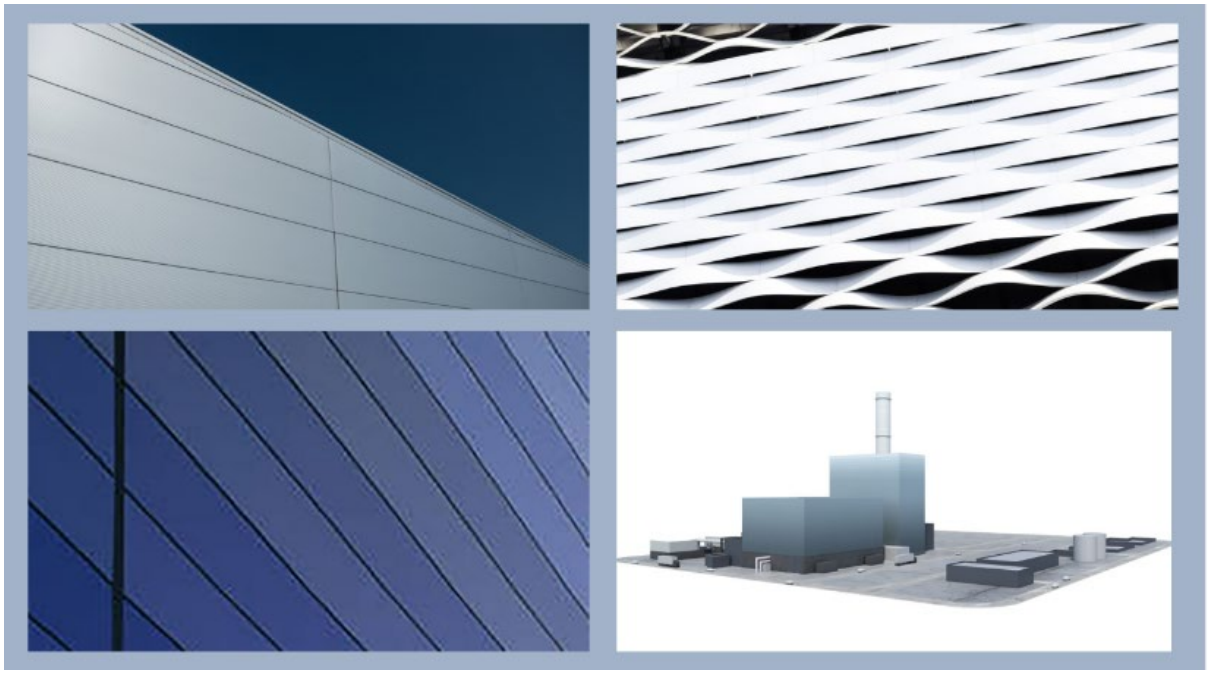
with technical consultees such as the Environment Agency). These include the use of the Applicant's land for the CCGT power station itself, the proposed generation capacity, the proposed technology/ fuel choice, the type and length of connections and the type and location of termination points, the amount of land required for laydown and construction, the proposed maximum dimensions (height, width and length) of key buildings and items of plant (for example, the height of stacks to ensure dispersion), and proposed mitigation for significant predicted environmental impacts. While the Applicant will have regard to the views and information provided by local communities on these aspects, there are elements of the Proposed Development where it is unlikely that changes can be accommodated.

5.5. Building Design

5.5.1 The architectural form of the CCGT power station was considered during the design development of the Proposed Development, with a functional design similar to that of Keadby 1 and Keadby 2 preferred as to be in keeping with the wider Keadby Power Station site aesthetic. Consideration was also given to potential alternatives in terms of building materials, finishes and colours. The Applicant wanted to explore the potential options available but were conscious that the selection of materials should not represent a considerable shift away from the established industrial context of the wider Keadby Power Station site. Therefore, a number of materials and finishes were assessed internally by the Project Team in terms of their viability, practicality and their capacity to assimilate with the existing surrounding architectural vernacular, and these were presented to stakeholders through the consultation materials.

5.5.2 Consequently, consultation participants were provided with information and options relating to the design of the CCGT power station reflective of the context within which it would sit. In particular the consultation banners provided ideas as to the types of finishes, textures (such as mesh and cladding) and shapes/ rooflines that could be adopted in the final design of the CCGT. **Plate 5.2** below is an image taken from the Stage 2 Consultation banners illustrating some of the potential ideas and options for building details which were presented to the public and mentioned in feedback forms.

Plate 5.2: Example building finishes suggested during consultation



5.5.3 Participants were encouraged to provide feedback on the design ideas via a specific question in the feedback form. There was a limited number of responses to the consultation and few comments from participants on design. A more in-depth analysis of the responses to this question at Stage 2 can be found at Section 12 of the Consultation Report (**Application Document Ref. 5.1**). See Section 6 of this DAS for further details of the design and finishes selected for the Proposed Development.

5.5.4 Whilst feedback received was considered by the Applicant, the limited number of responses on the subject indicated that building form/design was less of a priority for the local area (when compared to mitigating environmental effects, traffic etc.). As previously noted, the Applicant would prioritise and develop a design which is functional in appearance whilst according with the NPS EN-2 guidance on 'good design'.

6. Design Components and Final Arrangements

6.1.1 This section of the DAS describes the key design components of the Proposed Development. This includes in relation to use, layout, amount, the scale of the main buildings and structures, appearance and the approach taken to landscaping.

6.2. Use

6.2.1 The Site encompasses land adjacent to and partially within the operational area of the Keadby Power Station site. The Site comprises land required for the CCGT, electrical connection, hydrogen connection, natural gas connection, water abstraction and discharge corridors, public water, construction laydown and deliveries, AIL haul route and access road.

6.2.2 The majority of the Site, where the CCGT is proposed to be located is presently occupied by grassland. A portion of this grassland area has been used for the storage of excavated material from Keadby 2, with the Ash Tip also comprising a significant land form immediately to the west. The boundary to the south and east is dominated by the electrical generation infrastructure uses of the wider Keadby Power Station site and the north of the site comprises of flat agricultural land covered in wind turbines and pylons.

6.2.3 The primary use of the Keadby Power Station site is for electricity generation with ancillary activities and uses. The primary use of the land required within the wider Keadby Power Station site for the Proposed Development will also be for electricity generation. As such, much of the land within the Site boundary would retain the same use and character of the land as existing.

6.3. Layout

6.3.1 The power element of the Proposed Development (the CCGT) will be for the most part accommodated on the Main Site (Keadby Common), in the north of the Site. In this way, the Proposed Development will be seen in the context of the existing power stations. The main built elements of the CCGT will comprise the Gas Turbine Hall, Steam Turbine Hall, Heat Recovery Steam Generator (HRSG) and HRSG Stack. Up to two banks of wet / dry (hybrid) cooling towers are proposed to be located in the north west of the Main Site. The choice of cooling tower configuration between a twin or single bank array will be determined by the designer.

6.3.2 The hydrogen supply pipeline, including a gas compound for the hydrogen supplier's apparatus will be located in the south-west corner of the Main Site. The Applicant's hydrogen supply compound will be in the eastern most part of this area.

6.3.3 The natural gas supply pipeline including a compound for the natural gas supplier's apparatus will be located to the south of the Main Site. The Applicant's natural gas supply compound will be in the northern-most part of this area.

6.3.4 To the east of the Main Site will be a gatehouse, security building and staff parking. East of the gatehouse, the Site will also house administration/ control buildings (including a main reception, offices and welfare) and store buildings. To the south west of the Main Site will be the A18 Gatehouse.

6.3.5 The indicative layout of the Proposed Development on the Site is shown at ES Volume II, Figure 4.1: Indicative Site Layout of the Main Site and Ancillary Facilities (**Application Document Ref. 6.4.6**).

6.3.6 To the east of the Main Site and continuing into and across the adjacent National Grid Substation is the above or below ground 400kV electrical connection. The preferred electrical connection route option will be identified through agreement with NGET.

6.3.7 The indicative electrical connection layout is shown on the Indicative Electrical Connection Plans (**Application Document Ref. 2.7**).

6.3.8 The routing of the water abstraction and discharge corridors is described at paragraphs 3.2.14 - 3.2.18 of ES Volume I Chapter 3 Site and Surrounding Area (**Application Document Ref. 6.2.3**) and are illustrated on the Works Plans (**Application Document Ref. 2.3**) and the Indicative Water Supply and Effluent Discharge Connection Plans (**Application Document Ref. 2.8**).

6.3.9 A description and plans showing the locations of the proposed construction laydown areas across the Site is provided at Section 4.3 and on the Pilfrey Laydown Plans (**Application Document Ref. 2.17**).

6.3.10 The proposed construction, operational and emergency accesses are shown on the Access and Rights of Way Plans (**Application Document Ref. 2.4**), the Emergency Access Bridge General Arrangement Plan (**Application Document Ref. 2.15**) and the Haul Road Plans (**Application Document Ref. 2.16**).

6.4. Amount

6.4.1 The amount of development in terms of the total area of the Site is approximately 77.1 hectares, of which 11.7 ha is located within the Main Site. The approximate areas for the main parts of the Site are as follows:

- Main Site – 11.7 hectares
- Hydrogen Connection – 4.8 hectares
- Natural Gas Connection – 2.6 hectares
- 400 kV Electrical Connection and National Grid Substation – 12.4 hectares
- Water supply connection - 16.7 hectares
- Effluent discharge connection – 18.6 hectares
- Public water connection – 9.8 hectares
- Construction and operation access – 5.7 hectares
- Emergency access – 1.7 hectares
- Temporary access to construction laydown areas – 5.7 hectares

- Construction laydown areas – 26.7 hectares
- Temporary Haulage Route – 5.8 hectares
- Wharf works and waterborne transport offloading facilities – 0.6 hectares
- Landscaping and biodiversity management and enhancement areas – 4.7 hectares

6.4.2 The above areas and their extent are shown on the Works Plans (**Application Document Ref. 2.3**). A number of the areas overlap.

6.4.3 New permanent buildings and structures will be largely confined to the Main Site and the Ancillary Facilities area. The largest are as follows:

- Gas Turbine Hall – 1,800 m2
- HRSG – 2,400 m2
- Steam Turbine Hall – 3,500 m2
- Cooling Towers – 6,500 m2

6.5. Scale

6.5.1 The scale of the Proposed Development relates to the dimensions (length, width and height) of the main buildings and structures that would be constructed. The majority of the main buildings and structures will be located at the Main Site with some in the Ancillary Facilities Area. The maximum dimensions of these are set out in **Table 4.1** (Maximum Design Parameters).

6.5.2 The tallest buildings and structures will comprise the HRSG Stack (85 m above ground) and HRSG Building (58 m above ground).

6.5.3 The Indicative Proposed Power Station Layout, Elevations and Sections Plans (**Application Document Ref. 2.6**) are reproduced at **Plate 6.1** below and provide an indication of the scale and massing of the buildings and structures at the Main Site and Ancillary Facilities area.

6.6. Appearance

6.6.1 The most visible components of the Proposed Development will be the HRSG stack, HRSG Building, and Gas Turbine Hall. However, these buildings and structures will be set within the Main Site, situated between the Keadby Power Station site, Keadby Wind Farm and the Keadby Ash Tip.

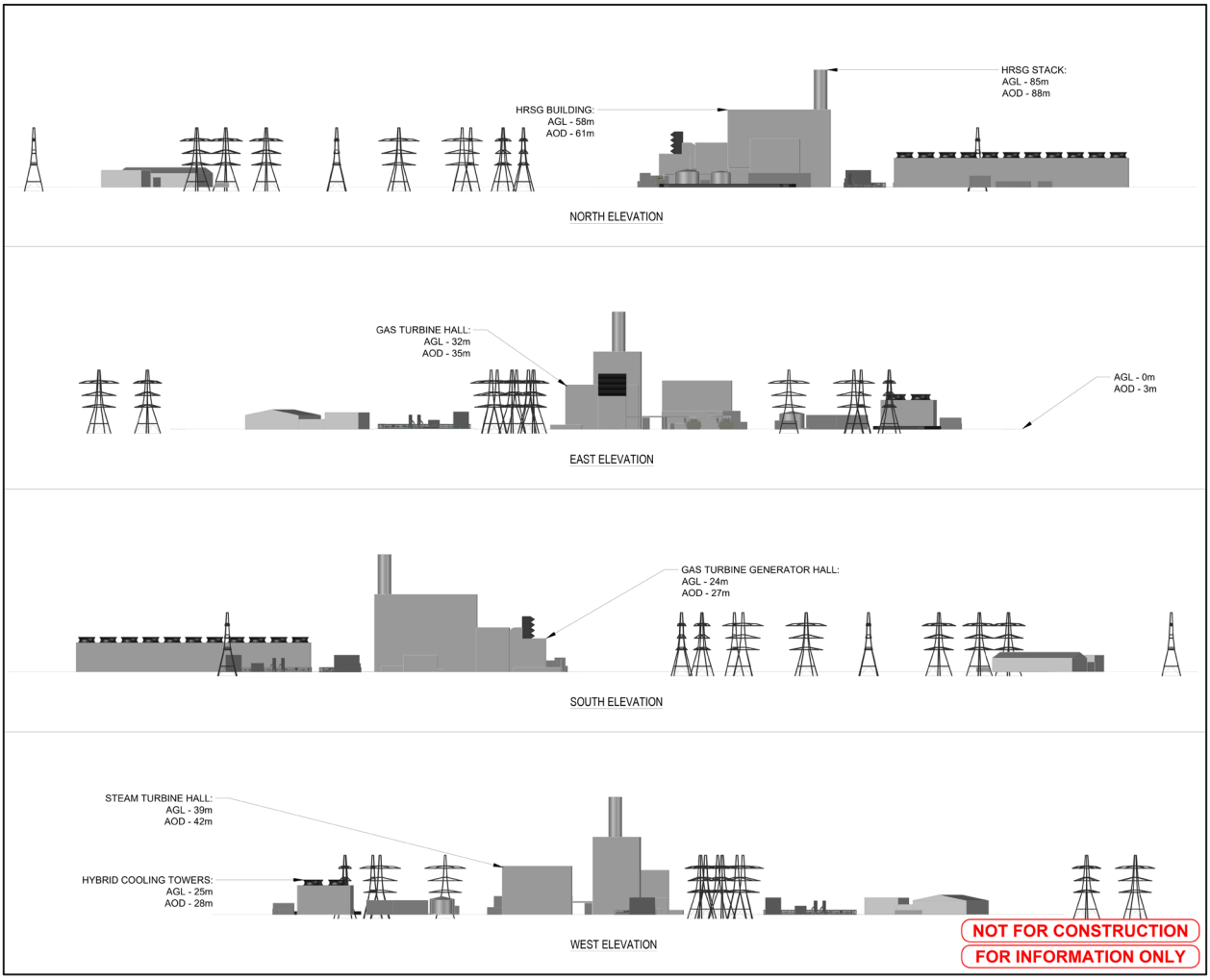
6.6.2 The appearance of the buildings and structures at the Main Site is indicative at this stage. The final design will be consistent with the industrialised context of the immediate area, which is already characterised by large industrial structures, including the complexes of Keadby 1 and Keadby 2. The appearance of the buildings and structures is representative of their function and purpose.

6.6.3 The Applicant considers a clean functional appearance to be in-keeping and reflective of the surrounding industrial setting of the Keadby Power Station site. It

is envisaged that the external finishes for the buildings and structures at the Main Site will comprise predominately metal cladding and concrete. Taking into account the comments received during public consultation, and also the experience of consultation for the Keadby 3 project, the Applicant took the view that the preferred design should be simple and functional in form and detailing. Cladding will be utilised to achieve holistic colour and treatment of the buildings/ structures. There are a number of possible cladding solutions and a decision on those to employ would be made at the detailed design stage.

6.6.4 The elevations shown at Plate 6.1 along with the photomontages at ES Volume III, Figure 14.6 (**Application Document Ref. 6.3.34**) provide an indication of how the Main Site may appear, including the colouration of the cladding employed.

Plate 6.1: Main Site Elevations



6.6.5 The AGI building will comprise a number of small metal clad kiosks for housing equipment.

6.6.6 The hydrogen, natural gas, electricity and water connections will involve below ground or low-level works and will not therefore be highly visible within the area.

6.6.7 The detailed design of the Proposed Development, including the design and appearance of buildings and the type and colour of materials to be employed would be secured by a Requirement of the draft DCO (**Application Document Ref. 3.1**).

6.7. Landscaping

6.7.1 The NIC's Design Principles for National Infrastructure highlights the importance of providing a sense of identity and improving the local environment in its advice on creating good places. Good landscaping provides an opportunity to address both of these matters. The perimeter areas of the Main Site will be landscaped and there will be opportunities for planting and biodiversity enhancement. Further details are shown upon the Indicative Landscape and Biodiversity Plan (**Application Document Ref. 2.18**) and explained within the Outline Landscape and Biodiversity Management and Enhancement Plan Report (**Application Document Ref. 5.10**), including how these areas will be managed and maintained.

6.7.2 A Landscape and Biodiversity Management and Enhancement Plan will be secured through a requirement of the draft DCO (**Application Document Ref. 3.1**). This document will set out the principles of planting, enhancement and landscape design that will be adopted in the detailed design process, as well as the areas of the Site retained for landscaping purposes.

6.8. Other Design

6.8.1 The Proposed Development includes a number of other design components, including:

- Lighting will be required for the safe operation of the Proposed Development during hours of darkness. This would be on demand or on activation by sensors in less visited parts of the site such as the gas AGI. An Outline Lighting Strategy has been included with the DCO application (**Application Document Ref. No. 5.11**).
- Security systems will be provided in respect of the Main Site and Ancillary Facilities. This will include paladin (or similar) fencing, intruder alarms and turnstiles for the Main Site to manage people access.
- Gatehouses will be located at the entrance to the Ancillary Facilities area and at the construction/ operation access off the A18.
- Surface water drainage and stormwater attenuation – an Indicative Surface Water Drainage Plan is included as part of the application (**Application Document Ref. 2.12**). Water Environment and Flood Risk is addressed at Chapter 12 of the ES (ES Volume I, **Application Document Ref. 6.2.12**) and a Flood Risk Assessment is included at Appendix 12A of the ES (**Application Document Ref. 6.3.16**)

- Internal roadways will be required for access within the Site. These will be hard surfaced with appropriate drainage systems to manage surface water runoff and pollution risk. Where possible, existing roadways will be used at the Keadby Power Station site.
- Workshop and store building(s) will be required for operation and maintenance activities and storage of materials.
- Car parks will be surfaced and provided with suitable drainage systems.

7. Access Arrangements

7.1.1 This section considers access to the Site, and also has regard to access within the Proposed Development. Access is considered more generally within Chapter 10: Traffic and Transport of the ES (Volume I - **Application Document Ref. No. 6.2.10**).

7.1.2 Permanent access to the Main Site and Ancillary Facilities during operation would be via the existing road access road from the A18 which passes via the existing North Pilfrey Bridge over the Stainforth and Keadby Canal and the Scunthorpe to Doncaster passenger rail line. Vehicles would access the Site from the A18, via this existing access road/ Bonnyhale Road/ existing private access roads and a new main access road to be constructed into the Main Site. The A18 access route was previously used for the construction of the Keadby Wind Farm and most recently for construction movements associated with Keadby 2.

7.1.3 As part of the Proposed Development, Work No. 8 comprises of maintenance and improvement of this existing private access road from the junction with the A18, replacement of private bridge (Mabey Bridge); installation of layby and gatehouse. Operational traffic movements are detailed within the Transport Assessment (TA) (Appendix 10A, ES Volume II - **Application Document Ref. 6.3.8**).

7.1.4 Mabey Bridge (a structure which enables access from the A18 over the Hatfield Waste Drain) is proposed to be replaced as part of the Proposed Development. This is required for the new structure to support the necessary loads associated with the construction and operation lifespan of the project. Details of the design can be seen in the Mabey Bridge Replacement General Arrangement Plan (**Application Document Ref. 2.14**).

7.1.5 The proposed gatehouse, required for security purposes, is to be constructed on the foundations/ area of the former Keadby 2 gatehouse at the entrance to the Site off the A18. The proposed gatehouse will incorporate a minimal brick design of up to 6m in height, 6m length and 7m in width, making it relatively small and un-intrusive within the surrounding landscape.

7.1.6 The Ancillary Facilities Area includes a main car park, including muster point in the event of emergency, a manned gatehouse and a control building which shall be designed as a place of safety in the event of emergency.

7.1.7 Emergency access is proposed via an existing private track running between the Main Site and Chapel Lane, Keadby and including a new private bridge.

7.1.8 Secure cycle parking facilities will be provided within the Ancillary Facilities Area close to the Administration Block and there will be shower and changing facilities for those cycling to work.

7.1.9 Where possible, pedestrian routes, parking areas and buildings within the Proposed Development will be designed to provide for inclusive access. This will

need to take account of operational and safety considerations given the nature of the use and operations.

7.1.10 Buildings will comply with the access requirements set out in the Buildings Regulations except where exemptions apply. Building Regulations approval would only be sought once an EPC contractor has been appointed and detailed design has been completed.

7.1.11 The locations of access points to the Site are illustrated on Access and Rights of Way Plans (**Application Document Ref. 2.4**).

8. Securing Detailed Design

8.1.1 Where flexibility is being sought in the design of a development it is important to ensure that appropriate mechanisms are in place to provide certainty to the SoS, the LPA and any other relevant bodies, that its detailed design will be in accordance with the design parameters upon which the EIA has been based.

8.1.2 The Applicant has drafted the DCO for the Proposed Development (**Application Document Ref. 3.1**) to ensure that it must be carried out within the limits shown upon the Works Plans (**Application Document Ref. 2.3**) and the maximum design parameters set out in the ES Volume I, Chapter 4: The Proposed Development (**Application Document Ref. 6.2.4**) (the Design Parameters are included in Schedule 10 to the draft DCO). The DCO therefore includes a number of 'articles' and 'requirements' to secure the detailed design of the Proposed Development. The details secured by the requirements must be submitted to the relevant LPA for approval. The articles and requirements are summarised in **Table 8.1**.

Table 8.1: DCO Articles and Requirements relating to Detailed Design

Title	Description
Development consent etc. granted by the Order	Requires the Proposed Development to be constructed within the Order Limits – being the defined limits shown on the Works Plans.
Design parameters	Defines the maximum design parameters for the main buildings and structures (Work Nos. 1A and 1B).
Detailed design	Requires details of Work No. 1 to 10 to be submitted to the relevant planning authority for approval, and that they comply with the maximum design parameters noted above.
Landscape management plan	Requires a landscape management plan to be submitted to the relevant planning authority. The plan must include details of further survey work, measures to protect existing shrubs and trees, and biodiversity and habitat mitigation and impact avoidance. Also requires a landscape and biodiversity management and enhancement plan, including a landscape and biodiversity strategy, must be approved by the local planning authority.
External lighting	Requires details of all permanent external lighting (with the exception of aviation warning lighting covered by a separate Requirement) to be submitted to the relevant authority for approval.
Means of enclosure	Requires details of any permanent means of enclosure be submitted to the relevant authority for approval.
Site security	Requires a written scheme detailing security measures to minimise the risk of crime be submitted to the relevant authority for approval.

Title	Description
Surface water drainage	Requires details of all permanent surface water drainage systems to be submitted to the relevant authority for approval.
Flood risk mitigation	Requires a scheme for the mitigation of flood risk during operation submitted to the relevant authority for approval.
Restoration of land	Requires a scheme for restoration of any land used temporarily for construction to be approved by the local planning authority and implemented within three years of the authorised development being brought into commercial use.
Combined heat and power	Requires the undertaker to demonstrate to the satisfaction of the relevant planning authority that it has allowed space and routes within the design of the Proposed Development for the later provision of heat pass-outs for off-site users of process or space heating and its later connection to such systems, should they be identified and commercially viable.
Aviation warning lighting	Requires the submission of details of aviation warning lighting in respect of Work No. 1.
Amendments agreed by the relevant planning authority	Restricts the relevant planning authority from giving any approval or agreement unless it has been demonstrated that the subject matter of the approval or agreement does not give rise to any new or materially different environmental effects from those assessed.

8.1.3 The above will ensure that the detailed design of the Proposed Development is controlled and secured.

9. Conclusions

9.1.1 This DAS sets out how the Applicant has had regard to design and access considerations in designing the Proposed Development. The document explains how the Site's context, wider setting and planning policy has been taken into account in the design of the Proposed Development.

9.1.2 While flexibility has been sought in the design of the Proposed Development, the Applicant has defined design parameters upon which to base the EIA to ensure that the likely significant effects of the Proposed Development have been robustly assessed. The Applicant has also included appropriate articles and requirements within the DCO to ensure that the detailed design of the Proposed Development is controlled and secured.

9.1.3 The final design of the Proposed Development, notably the Main Site, is functional, reflecting its purpose and the context in which it will sit, which includes the two existing power stations. In terms of siting and layout, the main buildings and structures are set well within the plot and have been grouped together where feasible from a technical and safety perspective to consolidate the built form.

9.1.4 In conclusion, it is considered that the Proposed Development represents 'good design' for the purposes of energy infrastructure and policy set out in the relevant NPSs, other planning policy documents and also local design guidelines.

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Appendix 1 : Design Principles Statement

Design Principle	Description	Relevant DCO Document
Built Appearance	The indicative design of the Proposed Development has sought to minimise adverse impacts on visual amenity through appropriate siting of infrastructure and selection of appropriate materials and colours and this approach will continue as the design moves to the final detailed stage (in line with EN-1, EN-2, N1, SD8). The following impact avoidance measures in relation to built structures are highlighted as part of the landscape and visual amenity assessment (Chapter 14: Landscape and Visual Amenity (**ES Volume I - Application Document Ref. 6.2.14**) and will be taken into consideration as part of the detailed design of the Proposed Development: • suitable materials will be used, where possible, in the construction of structures to reduce reflections and to assist with breaking up the massing of the buildings and structures; and • the selection of finishes for the buildings and other infrastructure will be informed by the finishes of the adjacent developments (including Keadby 1 Power Station), in order to reduce the visual impact of the Proposed Development.	ES Volume I, Chapter 14: Landscape and Visual Amenity (ES Volume I - **Application Document Ref. 6.2.14**) & Indicative Proposed Power Station Layout, Elevations and Sections (**Application Document Ref. 2.6**).
Cladding	Buildings and structures will where feasible be covered in appropriate forms of metal cladding and use neutral colours (e.g., greys, whites and blues) and be potentially graded	Indicative Proposed Power Station Layout, Elevations and Sections

	(i.e., employing bands of different darknesses of the same colour, or of different colours). This can achieve holistic colour and treatment of the buildings/structures to improve coherence and legibility of the site from nearby locations and may also assist in reducing the visibility of larger buildings from more distant locations when viewed against the skyline. There are a number of possible cladding solutions and a decision on those to employ would be made at the detailed design stage. The elevations and 3-D visualisations presented at **Application Document Ref. 2.6** provide an indication of how the Proposed Power Station may appear, including the potential colouring of the external cladding.	(**Application Document Ref. 2.6**).
Gatehouse Design	The proposed gatehouse will use a minimal design, utilising traditional brick materials considered typical to the setting and area. The restrained design of the gatehouse will minimise intrusion within the surrounding flat landscape.	A18 Gatehouse Indicative General Arrangement and Elevations Plans (**Application Document Ref. 2.13**).
Landscape and Biodiversity Enhancement	Proposals for landscape and biodiversity enhancement (as set out in the Outline Landscape and Biodiversity Management and Enhancement Plan Report (**Application Document Ref. 5.10**) ('LBMEP') have been designed to achieve the following outcomes: • no net loss of biodiversity and a quantifiable gain for biodiversity as a result of the Proposed Development; • enhance field drain habitats for the benefit of water vole to compensate for temporary and permanent losses of habitat to the Proposed Development;	Outline Landscape and Biodiversity Management and Enhancement Plan Report (**Application Document Ref. 5.10**).

	• enhance grassland habitats for the benefits of pollinators and other invertebrates, birds, badger, brown hare and other species; • provide nesting and roosting features for birds and bats to address a general lack of natural features in the local area to meet this need; and • enhance the habitat and green infrastructure network adjacent to and through the Proposed Development Site. Habitat Creating Principles Where new native habitats are to be created, or new native planting undertaken, the following principles will apply: • all seed mixes and planting stock will be ordered as early as reasonably practicable following a decision to commence the project to allow supply to be met without risk of substitution; • all seed mixes and planting stock will be sourced from a specialist producer of British grown native plants and seed who can source-identify all stock (i.e., not a non-specialist nursery that buys in stock or an agricultural/ general merchant that buys stock from diverse sources, including non-British sources); and • terms of supply will include a condition that no part of the order shall be substituted with stock of alternative species or origin and that any change must be mutually agreed. The above requirements will be incorporated into contractor specifications and contracts,	

	as appropriate, to deliver genuinely native plantings in accordance with the biodiversity objectives of the submitted Outline LBMEP Report (**Application Document Ref. 5.10**). The Report also provides a full list of areas within the Site proposed for enhancement.	
Habitat Reinstatement	Minor/small scale temporary disturbances to specific habitats across the Site are expected during the construction period. These are listed in full in the Outline LBMEP Report (**Application Document Ref. 5.10**). Habitats that will be disturbed during construction, mainly comprising small areas of species-poor road verge and flood bank grassland and arable farmland, will be reinstated (i.e., returned to a condition consistent with the existing baseline) following the completion of construction. Some areas such as the use of arable farmland for temporary construction laydown is not in the permanent control of the Applicant, and no ecological enhancement measures are proposed within these areas. Some habitats lost during construction of permanent infrastructure will also be restored. These areas will remain within the permanent control of the Applicant so will be managed with the aim of increasing (relative to the existing baseline) their biodiversity value. This includes land within and immediately adjacent to the Proposed Power Station Site on Keadby Common where the existing species-poor improved grassland and unvegetated disturbed ground will be sown with a locally appropriate native wildflower meadow mixture and appropriately managed thereafter.	Outline Landscape and Biodiversity Management and Enhancement Plan Report (**Application Document Ref. 5.10**).

	The following areas will be reinstated to the original baseline conditions: • Land Affected by the Temporary Construction Haul Road • Drains Crossed by Electrical Connections • Stainforth and Keadby Canal	
Boundary Treatments	Where existing vegetation is present along the Proposed Development Site boundary, this will be retained, as far as reasonably practicable, and managed to support its continued presence to aid the screening of low-level views into the Proposed Development Site. The siting of development should consider the potential for new boundary planting. Secure boundary treatment (i.e. fencing) should generally be open in design rather than of solid design.	Outline Landscape and Biodiversity Management and Enhancement Plan Report (**Application Document Ref. 5.10**).
Lighting	Construction temporary lighting will be arranged so that glare is minimised outside the Proposed Development Site as far as reasonably practicable. Measures to minimise the impact of lighting are detailed in the Outline Lighting Strategy (**Application Document Ref. 5.11**) and Outline CEMP (**Application Document Ref. 7.4**). The submitted Outline Lighting Strategy (Application Document Ref. 5.11) also sets out details of aviation lighting requirements (including legislation and CAA guidance), such details will be secured by a requirement of the draft DCO (**Application Document Ref. 2.1)**	Outline Lighting Strategy (**Application Document Ref. 5.11**)

	In terms of operational lighting for the Site, the main overarching lighting design principles for the Proposed Development are: • to ensure the health and safety of employees and visitors performing normal working duties; • to ensure the safe movement of vehicular and pedestrian traffic around the Proposed Development Site during the hours of darkness; • to minimise light pollution in terms of light trespass, sky glow and glare to the identified sensitive receptors; and • to ensure the security of the Proposed Development Site and its occupants including lighting suitable for the correct functioning of the preferred CCTV system. The overarching philosophy underpinning the design of the lighting for the Proposed Development is to have a reduced light site. Lighting will be restricted to focused point use where reasonably practicable. Permanent lighting will be for general pedestrian movement, safety and security purposes only. Any lighting that may be required for maintenance purposes will be produced by temporary lighting sets specific to the required task. Lighting shall be further reduced to only critical lighting from 23:00 to 05:00 hours to reduce the impact of obtrusive lighting on the local environment (i.e., 23:00 hrs as per recommendation from the ILP GN01/20 (ILP, 2020) and 05:00 hrs as per the usual recommendation from local authorities and the PPG). Lighting will be designed so as not to illuminate foraging habitats adjacent to the Proposed	

	Development Site of greater potential value to bats including the former Keadby Ash Tip, habitat being created to maintain habitat connectivity between the Ash Tip, and adjacent habitats including the Stainforth and Keadby Canal habitat corridor).	
Replacement Mabey Bridge design & colourway	The Mabey Bridge replacement will comprise a wider structure with the ability to sustain heavier loads. The structure will be designed to be capable of serving the Proposed Development over its 25-year lifetime. The replacement bridge will adopt similar materials and colours, where possible, to that of the North Pilfrey Bridge (using dark green or other dark neutral colours for metal surfaces) for consistency within the area and to minimise apparent bulk when viewed against surrounding undeveloped land.	Mabey Bridge Replacement General Arrangement Plan (**Application Document Ref. 2.14**)
A18 Access Track and Emergency Access	The semi-rural character of the existing tracks will be retained where possible. Surfacing of the existing A18 access road will be kept the same with some maintenance works and improvements where appropriate. The emergency access to the PCC Site from Chapel Lane will also be surfaced and rendered accessible to emergency vehicles as required.	N/A