XLINKS' MOROCCO-UK POWER PROJECT

Design Approach Document

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Abbreviations & Acronyms

Acronym	Meaning
AIL	Abnormal Indivisible Load
AONB	Area of Outstanding Natural Beauty
BEIS	The former Department for Business, Energy & Industrial Strategy
CTMP	Construction Traffic Management Plan
DAD	Design Approach Document
DCO	Development Consent Order
DESNZ	The Department for Energy Security and Net Zero
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ES	Environmental Statement
EU	European Union
FRA	Flood Risk Assessment
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
LPA	Local Planning Authority
MDS	Maximum Design Scenario
NIC	National Infrastructure Commission
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
SSSI	Site of Special Scientific Interest
SuDS	Sustainable urban Drainage Systems
TJB	Transition Joint Bay
UK	United Kingdom
ZTV	Zone of Theoretical Visibility

Definitions

Term	Meaning
Terminology Relating to the Proposed Development	
AIL route works	Potential minor works to the Abnormal Indivisible Loads (AIL) routes, which are required for the transportation of the transformers and cable drums. The proposed AIL route runs from Appledore to the Onshore Infrastructure Area.
Alverdiscott Substation	The existing National Grid Electricity Transmission substation at Alverdiscott, Devon, which comprises 400 kV and 132 kV electrical substation equipment.
Applicant	Xlinks 1 Limited.
Bipole	A Bipole system is an electrical transmission system that comprises two Direct Current conductors of opposite polarity.
Converter Site	The Converter Site is proposed to be located to the immediate west of the existing Alverdiscott Substation Site in north Devon. The Converter Site would contain two converter stations (known as Bipole 1 and Bipole 2) and associated infrastructure, buildings and landscaping.
Converter Station	Part of an electrical transmission and distribution system. Converter stations convert electricity from Direct Current to Alternating Current, or vice versa.
Horizontal Directional Drilling	Horizontal Directional Drilling is a method of installing underground pipelines, cables and service conduit (or ducts) through trenchless methods to avoid obstacles and sensitive features (e.g. roads, watercourses, woodlands, etc.).
HVAC Cables	The High Voltage Alternating Current cables which would bring electricity from the converter stations to the new Alverdiscott Substation Connection Development.
HVAC Cable Corridors	The proposed corridors (for each Bipole) within which the onshore High Voltage Alternating Current cables would be routed between the Converter Site and the Alverdiscott Substation Site.
HVDC Cables	The High Voltage Direct Current cables which would bring electricity to the UK converter stations from the Moroccan converter stations.
Landfall	The proposed area in which the offshore cables make landfall in the United Kingdom (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Cornborough Range, Devon, between Mean Low Water Springs and the transition joint bays inclusive of all construction works, including the offshore and onshore cable routes, and landfall compound(s).
Maximum Design Scenario	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the Proposed Development.
National Grid Electricity System Operator	National Grid Electricity System Operator operates the national electricity transmission network across Great Britain. National Grid Electricity System Operator does not distribute electricity to individual premises, but its role in the wholesale market is vital to ensure a reliable, secure and quality supply to all.
National Grid Electricity Transmission	National Grid Electricity Transmission owns and maintains the electricity transmission network in England and Wales.

Acronyms & Glossary

Term	Meaning
Offshore Cable Corridor	The proposed corridor within which the offshore cables are proposed to be located, which is situated within the UK Exclusive Economic Zone.
Onshore HVDC Cable Corridor	The proposed corridor within which the onshore High Voltage Direct Current cables would be located.
Onshore Infrastructure Area	The proposed infrastructure area within the Order Limits landward of Mean High Water Springs. The Onshore Infrastructure Area comprises the transition joint bays, onshore HVDC Cables, converter stations, HVAC Cables, highways improvements, utility diversions and associated temporary and permanent infrastructure including temporary compound areas and permanent accesses.
Order Limits	The area within which all offshore and onshore components of the Proposed Development are proposed to be located, including areas required on a temporary basis during construction (such as construction compounds).
Proposed Development	The element of the Xlinks Morocco-UK Power Project within the UK. The Proposed Development covers all works required to construct and operate the offshore cables (from the UK Exclusive Economic Zone to Landfall), Landfall, onshore Direct Current and Alternating Current cables, converter stations, and highways improvements.
The national grid	The network of power transmission lines which connect substations and power stations across Great Britain to points of demand. The network ensures that electricity can be transmitted across the country to meet power demands.
Transition joint bay	A transition joint bay is an underground structure at the landfall area where the offshore cables are jointed to the onshore cables.
Utility diversions	Works required by statutory utility providers to re-route infrastructure around the Proposed Development.
Xlinks Morocco UK Power Project	The overall scheme from Morocco to the national grid, including all onshore and offshore elements of the transmission network and the generation site in Morocco (referred to as the 'Project').
Further Terminology	
Abnormal Indivisible Loads	Loads or vehicles that exceed maximum vehicle weight, axle weight or dimensions as set out in the Road Vehicles (Construction and Use) Regulations 1986 as amended.
Biodiversity Net Gain	An approach to development that leaves biodiversity in a better state than before. Where a development has an impact on biodiversity, developers are encouraged to provide an increase in appropriate natural habitat and ecological features over and above that being affected to ensure that the current loss of biodiversity through development will be halted and ecological networks can be restored.
Climate change	A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.
Climate resilience	The capacity of social, economic and ecosystems to cope with a hazardous event or trend or disturbance.

Term	Meaning
Construction Environmental Management Plan	A document detailing the overarching management principles for construction, which includes construction-related environmental management measures, pollution prevention measures, the selection of appropriate construction techniques and monitoring processes.
Construction Traffic Management Plan	A document detailing the construction traffic routes for heavy goods vehicles and personnel travel, protocols for delivery of Abnormal Indivisible Loads to site, measures for road cleaning and sustainable site travel measures.
Development Consent Order	An order made under the Planning Act 2008, as amended, granting development consent.
Environmental Impact Assessment	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Flood Risk Assessment	A flood risk assessment is an assessment of the risk of flooding from all flood mechanisms, including the identification of flood mitigation measures, in order to satisfy the requirements of the National Planning Policy Framework and Planning Practice Guidance.
Local Authority	A body empowered by law to exercise various statutory functions for a particular area of the United Kingdom. This includes County Councils, District Councils and County Borough Councils. The relevant Local Authorities for the Proposed Development are Devon County Council and Torridge District Council.
Local Planning Authority	The local government body (e.g., Borough Council, District Council, etc.) responsible for determining planning applications within a specific area.
National Policy Statement(s)	The current national policy statements published by the Department for Energy Security and Net Zero in 2023.
Planning Inspectorate	The agency responsible for operating the planning process for applications for development consent under the Planning Act 2008.
Preliminary Environmental Information Report	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project, and which helps to inform consultation responses.
Receptor	The element of the receiving environment that is affected.
Site of Special Scientific Interest	A site designation specified and protected in the Wildlife and Countryside Act 1981. These sites are of particular scientific interest due to important biological (e.g. a rare species of fauna or flora), geological or physiological features.

1.0 Introduction

1.0 Introduction

1.1 General Overview

1.1.1 This Design Approach Document (DAD) is submitted on behalf of Xlinks 1 Limited (the Applicant) to support an application (the Application) for a Development Consent Order (DCO) submitted to Planning Inspectorate for a decision by the Secretary of State (SoS) for Energy Security and Net Zero. The application relates to the UK elements of the Xlinks' Morocco UK Power Project. The UK (within the UK Exclusive Economic Zone (EEZ)) elements of the Project are referred to hereafter chapter as the 'Proposed Development.

1.1.2 This DAD focuses on the Offshore and Onshore elements of the Proposed Development. The Onshore element includes three zones: Landfall, Onshore Cable Route Corridor and The Converter Station Site.

1.1.3 The document outlines the design development process of the Onshore Infrastructure Area , detailing its refinement through consultation and explaining how the Proposed Development would achieve good design, guided by relevant policies and guidelines, including:

- The National Infrastructure Commission's Design Principles for National Infrastructure;
- National Policy Statement (NPS) for Energy (EN-1);
- National Policy Statement (NPS) for Renewable Energy Infrastructure (EN-3); and
- National Policy Statement (NPS) for Electricity Networks Infrastructure(EN-5).

1.1.4 Despite the absence of specific guidance for Design Approach Document (DAD) for nationally significant infrastructure projects, this DAD has been prepared following the principles outlined in Design and Access Statements: How to Read, Write and Use Them (CABE 2006).

1.1.5 This DAD should be read in conjunction with the range of technical documents submitted as part of the DCO application. These documents include:

- Volume 1, Chapter 3: Project Description (Document Ref. 6.1.3)
- Volume 1, Chapter 4: Need and Alternatives (Document Ref. 6.1.4)
- Volume 1, Chapter 5: Environmental Impact Assessment Methodology (Document Ref. 6.1.5)
- Volume 2, Chapter 1: Onshore Ecology and Nature Conservation (Document Ref. 6.2.1)
- Volume 2, Chapter 3: Hydrology and Flood Risk (Document Ref. 6.2.3)
- Volume 2, Chapter 4: Geology, Hydrogeology and Ground Conditions (Document Ref. 6.2.4)
- Volume 4, Chapter 1: Climate Change (Document Ref. 6.4.1)

1.2 The Proposed Development

1.2.1 Xlinks' Morocco UK Power Project is a proposal by Xlinks to connect the generation assets in Morocco and associated cable infrastructure (routed through Morocco, Spain, Portugal and France) to the national grid high voltage transmission network, via cable infrastructure and converter stations within UK jurisdiction.

1.2.2 The Proposed Development would supply 3.6GW of electricity to the Great British (GB) market. It provides a viable addition to the UK energy portfolio to deliver consistent and reliable volumes of electricity for the UK. The Proposed Development would complement the proposed low-carbon energy mix of domestic renewable (including the offshore wind development) and nuclear.

1.2.3 Once complete, the Proposed Development would be capable of supplying approximately 8 percent of Great Britain's electricity needs and increase the country's ability to meet its Net Zero commitments under the Paris Agreement and Nationally Determined Contributions (NDC's).

1.2.4 The UK Offshore elements of the Proposed Development would include the Offshore Cable Corridor, located within the Bristol Channel and Celtic Sea, extending from the Landfall to the limit of UK EEZ, south west of the UK.

1.2.5 The UK Onshore elements of the Proposed Development would include three main zones within the Onshore Infrastructure Area :

- Landfall at Cornborough Range along the Devon coast, with associated Transition Joint Bays (TJBs) which connect the Offshore and Onshore HVDC cables at landfall
- Onshore Cable Route Corridor, a network of HVDC cables installed underground from TJBs at landfall to the Onshore Converter Station Site located at the Old Webbery Showground.
- The Onshore Converter Site, with two Converter Stations which would convert Direct Current (DC) from the HVDC cables into Alternate Current (AC) to allow onward connection to the National Grid through an existing Substation.

1.2.6 The design details provided in this document are indicative and reflect the design journey up to the DCO application submission. The initial design assessed for the Environmental Statement is based on a Project Design Envelope and for certain elements maximum design scenarios as detailed in Volume 1 Chapter 3 Project Description (Document Ref. 6.1.3).

1.0 Introduction

1.3 Delivering Good Design

1.3.1 Requirement for Good Design

1.3.1.1 Good design brings a wide range of benefits for the Proposed Development. It not only addresses problems with innovative solutions but also:

- Enhances the surrounding environment and visual quality;
- Mitigates potential adverse impacts; and
- Results in infrastructure that is both efficient and durable over the long term.

1.3.1.2 Incorporating good design principles, as outlined in the Overarching National Policy Statement for Energy (NPS EN-1), ensures that:

- Good design extends beyond aesthetics to include sustainability, efficiency and fitness for purpose;
- Infrastructure is sensitive to it's setting, efficient in the use of natural resources and is aligned with modern construction methods.

1.3.1.3 By applying these principles from the outset, the Proposed Development can better mitigate adverse impacts whilst contributing to long-lasting and sustainable infrastructure.

1.3.2 Sustainable Design

1.3.2.1 A key purpose of the Proposed Development is to help mitigate climate change by generating and supplying renewable electricity, thereby supporting the de-carbonisation of the UK's grid. With a design life of 50 years, the Proposed Development would make a significant contribution to the UK's net zero targets throughout the majority of its operational life.

1.3.2.2 Whilst the Proposed Development would produce some Green House Gas Emissions(GHG), particularly during the construction phase, the Applicant aims to balance environmental, engineering, commercial and social factors in the Proposed Development's aim to achieve a sustainable design. The Environmental Statement (ES) details the assessments and surveys undertaken to date, identifying any potential environmental, social and economic impacts, along with measures to mitigate them. Volume 4- Chapter 1 Climate Change (Document Ref. 6.4.1) provides further information on the detailed GHG Assessment undertaken by the Applicant.

1.3.2.3 The permanent infrastructure within the Proposed Development would be designed to meet the Applicants' technical requirements and specifications, which are based on industry-leading engineering codes and standards. The materials required for the proposed development would be assessed for their environmental impact, with a focus on sourcing materials responsibly and prioritising materials with high recycled content where practicable.

1.3.2.4 The design would prioritise, where possible, minimising the use of steel and concrete to only what is essential during construction. Regular maintenance, where necessary, would be prioritised to extend the lifespan of materials. There'll also be focus on maximising the re-use and recycling of construction materials at the end of the project's design life.

1.3.3 Consultation

1.3.3.1 The consultation process plays an essential part in achieving good design. Through engagement with stakeholders and independent professionals, the design is better aligned with the needs and concerns of those directly or indirectly impacted by the Proposed Development.

1.3.3.2 The Applicant has undertaken a transparent and comprehensive pre-application consultations with a wide range of stakeholders as part of the EIA process. An overview of the consultation process and its influence on the Proposed Development's design evolution is available in Chapter 4 -Consultations within this document. Feedback from these consultations have contributed to site selection and design, with further details provided in Volume 1-Chapter 4 Need and Alternatives (Document Ref. 6.1.4)

1.3.3.3 Consultation outcomes have also had a significant impact on shaping the Proposed Development's design principles, which are detailed in the Design Principles Statement (DPS).(Document Ref. 7.4)

1.3.3.4 The consultation process for the detailed design of the Proposed Development would continue beyond the submission of the DCO application. The Applicant would engage with relevant stakeholders through detailed design as part of the process for gaining approval of the detailed design by Torridge District Council. Further details are provided in Section 5.0 of this document.

2.0 Relevant Law, Policy & Guidance

2.0 Guidance & Policies

2.1 Introduction

2.1.1 This Design Approach Document (DAD) should be read in conjunction with the Planning Statement (Document Ref. 7.2) submitted as part of the DCO application. It provides a detailed review of the legislative context and policy framework relevant to the Proposed Development. This section of the DAD provides a brief overview of the legislative context and policy framework for the Proposed Development including the National Policy Statement for Energy Infrastructure (NPS, 2024) and how it promotes good design as part of the application process.

2.2 Planning Act 2008

2.2.1 The objective of the Planning Act 2008 is to streamline and expedite the planning process for major infrastructure projects in the UK. It aims to improve the efficiency and transparency of planning decisions, ensuring that essential infrastructure developments, such as energy, transport, water, and waste projects, can be delivered in a timely manner.

2.2.2 The Planning Act 2008 established the framework for National Policy Statements (NPSs), which are key documents that outline the government's objectives and policies for the development of specific types of infrastructure.

2.2.3 Section 104 of the Planning Act, Clause (2) specifies that the Secretary of State must take the following into account when deciding on an application for development consent for a Nationally Significant Infrastructure Project:

(a) Any National Policy Statement (NPS) which has effect in relation to development of the description to which the application relates (a "relevant national policy statement"),

2.2.4 Section 104 of the Planning Act, Clause (3) specifies that the Secretary of State must make their decision in alignment with the relevant NPS. This means the decision should be consistent with the policies and guidelines outlined in the NPS.

2.3 National Planning Policy

2.3.1 The National Policy Statements for Energy Infrastructure (NPS, 2024) provides the policy framework and specific guidelines that ensure projects such as the Proposed Development support the national energy objectives, address environmental and social impacts, and comply with regulatory requirements during planning and development.

2.4 'Good Design' as part of NPS EN-1

2.4.1 NPS EN-1 provides the overarching framework for the development of energy infrastructure, ensuring that projects align with national energy policy goals such as security of supply, climate change mitigation, and economic growth.

2.4.2 It outlines general considerations for energy projects, including the need for the project, environmental impacts, safety, and community engagement.

2.4.3 It also establishes the principles for decision-making, emphasizing the importance of considering alternative sites, technologies, and mitigation measures to minimize negative impacts.

2.4.4 Section 4.7 of NPS EN-1 outlines the criteria for 'Good Design' for energy infrastructure. Key policy requirements and considerations include the following paragraphs:

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

4.7.2 *'Applying good design to energy projects should produce sustainable infrastructure sensitive to place, including impacts on heritage, efficient in the use of natural resources, including land-use, and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible. It is acknowledged, however that the nature of energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area.'*

4.7.3 *'Good design is also a means by which many policy objectives in the NPSs can be met, for example the impact sections show how good design, in terms of siting and use of appropriate technologies, can help mitigate adverse impacts such as noise. Projects should look to use modern methods of construction and sustainable design practices such as use of sustainable timber and low carbon concrete. Where possible, projects should include the reuse of material'*

4.7.4 *'Given the benefits of good design in mitigating the adverse impacts of a project, applicants should consider how good design can be applied to a project during the early stages of the project lifecycle.'*

4.7.5 *'To ensure good design is embedded within the project development, a project board level design champion could be appointed, and a representative design panel used to maximise the value provided by the infrastructure. Design principles should be established from the outset of the project to guide the development from conception to operation. Applicants should consider how their design principles can be applied post-consent.'*

4.7.6 *'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.'*

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

4.7.8 ' Applicants should consider taking independent professional advice on the design aspects of a proposal. In particular, the Design Council can be asked to provide design review for nationally significant infrastructure projects and applicants are encouraged to use this service. Applicants should also consider any design guidance developed by the local planning authority.'

2.4.5 These paragraphs can be summarised into five key aspects:

1. **Visual Appearance and Context** - The visual integration of a building structure, or piece of infrastructure is a significant factor. While aesthetics are crucial, they are not the sole component of good design.

2. **Functionality and Sustainability** - High quality design prioritises the functionality and sustainability of the infrastructure. This includes ensuring that the proposed development is fit for its intended purpose and makes efficient use of natural resources, land and energy throughout its construction and operation.

3. **Sensitivity to Place** - Good design should create sustainable infrastructure that is sensitive to its location and heritage, aiming to minimise any adverse impacts on the environment and local heritage.

4. **Mitigation of Adverse Impacts** - Good design helps meet policy objectives, such as mitigating adverse impacts like noise. This can be achieved through appropriate siting and the use of modern, sustainable technologies and construction methods such as low-carbon concrete and re-use of materials where possible.

5. **Early Consideration** - To maximise the benefits of good design, it should be considered early in the project lifecycle. This proactive approach helps in effectively mitigating adverse impacts and ensures the proposed development meets high design standards from the outset.

2.5 NPS for Renewable Energy Infrastructure EN-3 (2024)

2.5.1 Section 2.5 describes some considerations of good design for energy infrastructure. Paragraph 2.5.2 highlights that '*Proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence/ co-location with other marine and terrestrial uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage*.'

2.5.2 Paragraph 2.7.60 also states ' *good design that is sympathetic and contributes positively to the landscape character and quality of the area will go some way to mitigate adverse landscape and visual effects*.'

2.6 NPS for Electricity Networks Infrastructure EN-5 (2024)

2.6.1 Paragraph 2.4.3 of Section 2.4 outlines that while applicants should consider the criteria for good design set out in EN-1 Section 4.7, '*the Secretary of State should bear in mind that electricity networks infrastructure must in the first instance be safe and secure, and that the functional design constraints of safety and security may limit an applicant's ability to influence the aesthetic appearance of that infrastructure*.'

2.6.2 As outlined in paragraph 2.4.4, it's essential to explore every opportunity to enhance good design, including avoiding and mitigating potential adverse impacts. However, this must not come at the expense of the infrastructure's functional performance, particularly in ensuring security of supply, public safety, and occupational safety.

Table 2.1 NPS Assessment Requirements and the Design response

NPS Requirement	NPS Reference	Design Response
EN-1 Overarching NPS for Energy (2024)		
The visual appearance of a building, structure, or piece of infrastructure, and how it relates to the landscape it sits within, is sometimes considered to be the most important factor in good design. But high quality and inclusive design goes far beyond aesthetic considerations. The functionality of an object – be it a building or other type of infrastructure – including fitness for purpose and sustainability, is equally important.	Paragraph 4.7.1	**Chapter 5.0 of the Design Principles Statement (DPS)** outlines the design considerations for the Onshore Converter Station Site. The infrastructure within this zone would have the most significant visual impact on the surrounding context. Careful consideration has been given to ensure balance is achieved between the visual appearance, sustainability and functionality of each building and operational equipment.

NPS Requirement	NPS Reference	Design Response
Good design is also a means by which many policy objectives in the NPSs can be met, for example the impact sections show how good design, in terms of siting and use of appropriate technologies, can help mitigate adverse impacts such as noise. Projects should look to use modern methods of construction and sustainable design practices such as use of sustainable timber and low carbon concrete. Where possible, projects should include the reuse of material	Paragraph 4.7.1	**Chapter 5.0 of the Design Principles Statement (DPS)** outlines the considerations given to potential material selection to ensure that it meets functional, technical and structural requirements while promoting sustainability through responsible sourcing and the potential to reuse at the end of its operational life. The chapter also includes principles relating to materiality for the Onshore Converter Station. Other documents to refer to also include **Volume 4, Chapter 2: Landscape, Seascape and Visual Resources – 6.4.2**
Given the benefits of good design in mitigating the adverse impacts of a project, applicants should consider how good design can be applied to a project during the early stages of the project lifecycle.	Paragraph 4.7.4	**Chapter 5.0 of the Design Approach document (DAD)** demonstrates the applicant's commitment to embedding good design from the outset of the Proposed Development, achieved through early engagement with key stakeholders and experts to guide the design development process.
To ensure good design is embedded within the project development, a project board level design champion could be appointed, and a representative design panel used to maximise the value provided by the infrastructure. Design principles should be established from the outset of the project to guide the development from conception to operation. Applicants should consider how their design principles can be applied post-consent.'	Paragraph 4.7.5	A **Design Principles Statement (DPS)** is to be submitted as part of the DCO application. It has been an evolving document, updated throughout the design development process to capture key design principles to be adhered to post-consent. **Chapter 6.0 of the Design Principles Statement (DPS)** outlines the Applicant's plans on nominating a Project Design Champion, which will be confirmed in 2025, along with the relevant Construction Contractors.

NPS Requirement	NPS Reference	Design Response
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.	Paragraph 4.7.6	**Volume 1, Chapter 4: Need and Alternatives – 6.1.4** details the site selection process. **Chapter 5.0 of the Design Approach document (DAD)** highlights how feedback from consultations influenced the site selection process. **Chapter 5.0 of the Design Principles Statement (DPS)** explores opportunities for nature inclusive design including the use of soft landscaping to screen and mitigate the visual impact of the Converter Stations.
Applicants must demonstrate in their application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected.	Paragraph 4.7.7	**Chapter 5.0 of the Design Approach document (DAD)** highlights the extensive non-statutory and statutory consultation process the Applicant conducted with key stakeholders. The feedback from these consultations informed the design evolution of the Proposed Development.
Applicants should consider taking independent professional advice on the design aspects of a proposal. In particular, the Design Council can be asked to provide design review for nationally significant infrastructure projects and applicants are encouraged to use this service. Applicants should also consider any design guidance developed by the local planning authority.	Paragraph 4.7.8	The Applicant has engaged with the local planning authorities during pre-application, and their feedback was taken into consideration when developing the design for the Proposed Development, as documented in the Consultation Report (Document Ref. 5.1) and **Chapter 5.0 of the Design Approach document (DAD)**

NPS Requirement	NPS Reference	Design Response
EN-3 NPS for Renewable Energy Infrastructure (2024)		
Proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence/ co-location with other marine and terrestrial uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage.	Paragraph 4.7.1	**Volume 1, Chapter 4 Need and Alternatives** outlines considerations for site selection of Landfall, the Onshore Cable Route Corridor and the Onshore Converter Site to mitigate impacts such as noise and effects on ecology and heritage. **Chapter 5.0 of the Design Principles Statement (DPS)** outlines the design principles established through design development and consultation to ensure good design in respect of landscape and visual amenity.
Good design that is sympathetic and contributes positively to the landscape character and quality of the area will go some way to mitigate adverse landscape and visual effects.	Paragraph 4.7.4	**Chapter 5.0 of the Design Approach document (DAD)** outlines the various design developments aimed at mitigating the visual impact of the Proposed Development. Key principles from this chapter are captured in **Chapter 5.0 of the Design Principles Statement (DPS)**
EN-3 NPS for Renewable Energy Infrastructure (2024)		
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.	Paragraph 4.7.4	**Chapter 5.0 of the Design Principles Statement (DPS)** highlights the design strategies considered for the Converter Stations with the aim of achieving a good balance between a secure site access, appropriate boundary treatments to ensure safety and security, and a sympathetic aesthetic, sensitive to the context.

2.7 National Infrastructure Strategy (NIS, 2020)

2.7.1 The primary aim of the National Infrastructure Strategy is to improve the quality of the UK's infrastructure in order to support economic recovery, reduce regional inequalities and achieve the country's net zero emissions target by 2050.

2.7.2 Part of that strategy is incentivising good design. Seen as an essential element in securing high performance of infrastructure from the start, the NIS sets out three methods for embedding good design that closely reflects the NIC's Design Principles for National Infrastructure.

2.7.3 The three methods are:

- Local plans which set clear rules rather than general policies for development, so that quality cannot be negotiated away nor can the lived experience of the consumer be ignored too readily;
- A reformed planning system which brings forward a new focus on design and sustainability in national policy and practice, building on the National Design Guide published in October 2019.
- Requiring all infrastructure projects to have a board level design champion in place by the end of 2021 at either the project, programme or organisational level, supported where appropriate by design panels.

2.8 Local Planning Policy

2.8.1 Whilst NPS En-1 represents the primary policy document for determination of the DCO application, local policy can provide guidance with regard to local context and defining local mitigation measures. The North Devon and Torridge Local Plan 2011-2031 (adopted 2018) contains general policies that are relevant to the Proposed Development.

2.8.2 Table 2.2 outlines some of the policies which may be relevant to this application.

2.0 Guidance & Policies

Table 2.2 Relevant North Devon and Torridge District Council Local Plan Policies

Local Policy	Design Consideration	Design Response
Policy DM04	Development proposals to adhere to the standards of good design. The policy states that good design seeks to guide overall scale, density, massing, height, landscape, layout, materials, access and appearance of any new developments.	**Chapter 2.4 of the Design Approach document (DAD)** outlines how criteria of good design as part of the National Policy Statement (NPS) has been considered for the Proposed Development. **Chapter 5.0 of the Design Principles Statement (DPS)** addresses the scale, massing, height, landscape, layout, materials, access and appearance of the Onshore Converter Stations, which form a significant part of the permanent infrastructure within the Onshore Infrastructure Area.
Policy ST04 (Improving the Quality of Development)	Sets out that development proposals must achieve high quality inclusive and sustainable design to support the creation of successful, vibrant places. The sub-text of this policy explains how the development proposals should show how they have responded positively to design policy and guidance.	**Chapter 5.0 of the Design Principles Statement (DPS)** outlines the need to meet the operational and safety requirements of the Converter Stations whilst adhering to principles which ensure high quality inclusive and sustainable design.
Policy DM08A (Landscape and Seascape Character)	Sets out that all development proposals should demonstrate regard to landscape characteristics proportionately, and respect both designated and undesignated landscape.	**Chapter 4.0 of the Design Approach document (DAD)** outlines the site constraints considered as part of the design development. **Chapter 5.0 of the Design Principles Statement (DPS)** outlines design principles to mitigate the impact of the Proposed Development on the local landscape and includes an outline landscape strategy aimed at enhancing the surrounding landscape especially within the context of the Converter Site.
Policy ST14	Notes the importance of protecting and enhancing local landscape character per Policy ST04. Paragraph 6.7 of the Joint North Devon and Torridge Local Plan highlights the significance of North Devon's topography, geology, soil, climate, and cultural heritage in decision-making. The key characteristics of all landscape types are detailed in the 2010 Joint Landscape Character Assessment.	The protection and enhancement of local landscape has been a throughout the design evolution of the Proposed Development. **Chapter 5.0 of the Design Principles Statement (DPS)** outlines design principles to mitigate the impact of the Proposed Development on the local landscape and includes an outline landscape strategy aimed at enhancing the surrounding landscape especially within the context of the Converter Site.

3.0 Offshore Cable Route Corridor

3.0 Offshore Cable Route Corridor

3.1 Overview

3.1.1 The Offshore Cable Corridor is located between the UK Exclusive Economic Zone and the landfall at the Cornborough Range. The total length of the Offshore Cable Corridor in UK waters is approximately 370km.

3.1.2 The Offshore Cable Corridor has a nominal width of 500m within which the cable bundles will be installed. The 500m provides flexibility within the cable corridor for micro routing of the eventual cable placement with the corridor for sensitive habitats, cultural heritage etc.

3.1.3 The cables will be installed as two bundled pairs (each pair within its own trench). This minimises potential environmental impacts by only requiring two trenches and reduces installation times.

3.2 Location and Siting

3.2.1 The location and siting of the Offshore Cable Corridor has been informed by a site selection, route optimisation and consultation process. Multiple desktop studies and marine investigation surveys have been completed, as well as formal and informal consultation with key stakeholders. Route optimisation had consideration for water depth, seabed (benthic) features and geohazards, metocean influences, external stakeholders (e.g. seabed leaseholders, general fishing activities, shipping etc) and environmental constraints such as marine protected areas including Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Marine Conservation Zones (MCZ).

3.2.2 The Offshore Cable Corridor at ES stage is consistent with that presented within the EIA Scoping Report and that presented in the PEIR. The width of the Offshore Cable Corridor will allow some flexibility for micro-routing of the final cables within it. Flexibility for micro-routing within the Offshore Cable Corridor will be retained until cable installation, to:

- Allow for the final precise cable route to adapt to the conditions encountered during construction (noting that extensive seabed characterisation surveys and an Outline Cable Burial Risk Assessment – Volume 1, Appendix 3.4 of the ES - have been undertaken);
- Allow potential micro-routing comments from relevant stakeholders to be addressed as far as reasonably practicable, including e.g. for example Historic England inputs via the Archaeological Outline Offshore Written Scheme of Investigation; and
- Allow the flexibility to avoid as far as reasonably practicable currently unforeseen hazards (such as potential unexploded ordinance (UXO) identified during the pre-cable lay geophysical survey).

3.3 Offshore Cable Route Corridor Design Evolution

3.3.1 The Offshore Cable Corridor (OCC) assessed within the Environmental Statement has undergone a process of design evolution following various rounds of consultation and engagement with stakeholders. The design development and updates have been informed by:

- Initial landfall identification
- Identification of the initial cable route
- Development of the cable route following engagement with marine experts
- Refinement of the cable corridor following consultation with stakeholders
- Ongoing design refinement following statutory engagement with community, local groups and Statutory Environmental Bodies. The majority of the feedback has been regarding construction methodologies

3.3.2 The initial route for the offshore HVDC cables has been developed in three stages:

Stage 1

3.3.3 Global Marine was commissioned in 2019/20 to conduct a desktop options analysis of the entire offshore cable route and to identify a preferred subsea cable route from Morocco to the UK, based on existing data. The study identified three potential route options:

- **Option 1** - Cable route in water depths less than 700m, keeping on the continental shelf, and relatively close to coasts of Portugal and Spain (red route) ‘the Preferred Route’;
- **Option 2** - Cable route in water depths less than 3,000m, taking a deeper route across the Straits of Gibraltar and the Bay of Biscay (blue route); and
- **Option 3** - A more direct route from Morocco to the UK (green route).

3.3.4 The more direct route between Morocco and the UK is significantly shorter (c.25%). than the other options but has a maximum depth of over 5,000m in the Bay of Biscay.

3.3.5 The number of cable systems operating in water depths beyond 700m is extremely limited. There are some HVDC cables that have been installed and are in operation up to depths of 1,640m in the Mediterranean. In addition, the EuroAsia interconnector is currently under development with a maximum depth of 3,000m however this has no operational track record. As such the more direct routes were not considered as feasible.

3.3.6 The Preferred Route (Option 1) has a maximum depth of 700m deep cable and follows a route close enough to the continental shelf to be deemed

technically feasible. Option 1 was therefore selected as the preferred option for further optimisation.

Stage 2

3.3.7 Intertek conducted a desktop feasibility assessment in 2022 to select the optimum route that balanced avoiding natural hazards and conservation areas, technological feasibility, and ease of installation, protection, and operation. The 700m deep cable route (red) option followed a route close enough to the continental shelf to be deemed technically feasible and was selected as the preferred option for further optimisation.

Stage 3

3.3.8 The Preferred Route was further refined by a Routing Workshop that considered water depth, seabed features, geohazards, metocean influences, external stakeholders (e.g. seabed leaseholders, general fishing activities, shipping, etc.) and environmental constraints such as marine protected areas, including Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Marine Conservation Zones (MCZ).

3.4 Preferred Route Position List (RPL)

3.4.1 In conjunction with the initial route option analysis described above, a separate analysis of optimum landing points (See Document Ref, XXX) confirmed that the Cornborough Range would be the preferred entry point for the proposed landfall HDD.

3.4.2 This enabled a more precise corridor to be defined in UK waters through a series of further workshops with the marine survey contractors (GEOxyz), and offshore marine consultants 4C Offshore and Global Marine. These workshops provided the definition of a survey corridor, using the following process:

- The centreline of the preferred route from the landfall out to the limit of the UK EEZ was used as the base case Route Position List (RPL)
- A 500m wide survey corridor was determined to provide sufficient flexibility for detailed cable route engineering within the survey corridor
- A Geographic Information System (GIS) was used to conduct a detailed review of the most up-to-date information about regarding seabed conditions and possible challenges to cable installation within the base case survey corridor
- The Offshore Cable Corridor was then modified through an iterative process to optimise the survey corridor further using considering the following factors:

3.4.3 Sensitive habitats and designated sites:

- Sensitive environmental sites were excluded from the survey corridor wherever reasonably practicable. For example, the preferred Offshore Cable Corridor was modified to avoid the East of Haig Fras Marine Conservation Area.

3.4.4 Existing and proposed seabed infrastructure and other marine users:

- Existing and planned offshore installations (oil, gas and renewables) were excluded from the survey corridor by at least 500m where reasonably practicable.
- In-service and out-of-service submarine cable assets required the Offshore Cable Corridor to be extended to up to 1,500 m width at some crossing locations where the offshore HVDC cable would need to cross existing power and telecoms cables. This provides the HVDC cables sufficient installation space to cross existing assets as close to 90 degrees as possible and thereby reducing the crossing footprint and environmental impact.
- The Offshore Cable Corridor width was also extended to 1,500 m width at the western edge of The Crown Estate's Project Development Area 3 (Offshore Wind Leasing Round 5) to provide flexibility in this area to ensure sufficient separation from the wind farm and the edge of the Marine Conservation Zone (MCZ).
- Navigation and Traffic Separation Schemes (TSS) present a continuous risk of planned and unplanned anchoring. The survey corridor was adjusted to avoid areas of significant shipping activity as far as reasonably practicable.
- Dredging and dumping operations have a direct impact on the seabed and, therefore, are a potential threat to the cable, installation and future security. Therefore, designated areas for dredging and dumping were avoided as far as reasonably practicable.
- Coastal firing ranges crossed by the route pose a UXO risk to marine operations. Military exercises can clash with the installation programme or schedules. Preference was therefore given to avoid areas where concentrations of UXO may exist.

3.4.5 Seabed Morphology

- Seabeds of the hardest clay-based soil type, with boulder fields and outcrops that go deep into the seabed would make cable burial more challenging and could introduce greater environmental impacts. The chosen route therefore avoids the largest of the zones of this morphology. Seabed sediment distribution and transportation post construction could affect the burial depth of the cable, for example

in sands and gravels resulting in potential exposure after burial. Consequently, the route avoids, where practicable, sandwaves which are highly mobile.

- Pockmarks, rock outcrops and reefs were avoided for example near Whitecross) as they can damage equipment or cause abrasion, suspension and/or exposure.

3.4.6 Wrecks

- The RPL was modified to exclude all known wrecks from the survey corridor by at least 500m. If uncharted wrecks were found during the subsequent surveys, separation of 1x water depth within the surveyed corridor was achieved.

3.5 Cable system bending forces

3.5.1 Consideration was given to the minimum bending radius of the cable system (bundled) to ensure the RPL would not damage the cable system during installation

3.5.2 The output of the process above gave the Offshore Cable Corridor and associated survey corridor, which has been used as the survey area for all of the Proposed Development's offshore marine surveys. These survey results in turn have informed the Proposed Developments Environmental Impact Assessment (EIA).

3.5.3 Detailed geophysical, geotechnical and environmental surveys were carried out in UK waters during 2022 and 2023 to further inform the cable routing, and form the location of the offshore HVDC cable RPL and develop the impacts and mitigations in the PEIR issued for the statutory consultation in May - June 2024.

3.5.4 As no further changes to the Offshore Cable Corridor have been requested through the statutory consultation process, and the design and engineering process has optimised the route to minimise as far as reasonably practicable the environmental impacts, the Offshore Cable Corridor at ES stage is therefore consistent with that presented within the PEIR.

4.0 Site Context

4.0 Site Context

4.1 Order Limit

4.1.1 As shown in Figure 4.1 and Figure 4.2, The Order Limits define the maximum extent within which the development works can be carried out, allowing for a realistic worst-case assessment. Spanning approximately 206 km², this area encompasses all components of the Proposed Development, including both Offshore and Onshore elements.

4.1.2 The Offshore elements of the Proposed Development, which includes a 370 km long Offshore Cable Corridor, would be located within the Bristol Channel and Celtic Sea, extending from the Landfall to the limit of UK EEZ, south west of the UK. The HVDC cables, installed within the Offshore Cable Corridor would bring electricity from its generation source to the Landfall.

4.1.3 The Onshore elements of the Proposed Development would be located within the Onshore Infrastructure Area and AIL Route Works. The Onshore Infrastructure Area lies within the local authority area of Torridge District Council (and Devon County Council at county level), in north Devon. The Onshore Infrastructure Area comprises all permanent and temporary components in the onshore section of the Proposed Development. This includes the Converter Site and connection to the national grid, utility connections and diversions, permanent highways improvements as well as temporary highways alterations during construction, Onshore HVDC Cable Corridor, HVAC Cable Corridors, temporary compounds and haul roads, and the Landfall.

4.1.4 The Onshore Order Limits has undergone extensive optioneering due to the iterative development of the Cable Route Corridor and the design evolution of the Converter Site. Figure 4.3 and Table 4.1 summarise the considerations and feedback that shaped the current Proposed Order Limits.

4.2 Landfall

4.2.1 The offshore HVDC Export Cables make landfall at Cornborough Range on the North Devon coast, to the south-west of Cornborough and approximately four km west of Bideford. This area of the site lies within the North Devon Coast National Landscape and the Heritage Coast. The Mermaid's Pool to Rowden Gut Site of Special Scientific Interest (SSSI) is also situated along this stretch of coastline.

4.3 Onshore Cable Route Corridor

4.3.1 The Onshore HVDC Cable Corridor begins at the Converter Site and heads southwest. Trenchless drilling e.g HDD (horizontal directional drilling) would be used to allow the cables to pass beneath the woodland adjacent to the southern boundary of the Converter Site. The route then continues southwest, crossing two unnamed roads and Gammaton Road, before passing south of the Bideford and District Angling Club Lake. From there, the cable corridor runs adjacent to Gammaton Road, heading towards Bideford.

4.3.2 As it moves northwest along Gammaton Road, the cable corridor passes along the southern and western sides of Woodville Farm. It then continues west towards the River Torridge, passing north of Tennacott Farm and April Cottage (Tennacott Lodge) and crossing Tennacott Lane. The corridor crosses under the River Torridge using HDD, with the entry bay located to the east of the Tarka Trail. The cables are routed beneath the Tarka Trail, Torridge River, and A386, emerging north of Hallsannery House, while avoiding the Hallsannery County Wildlife Site and Kynoch's Foreshore Local Nature Reserve (LNR).

4.3.3 On the western side of the River Torridge, the cable corridor passes west of Hallsannery Farmhouse, south of Ashridge Cottage, and heads west toward West Ashridge. HDD would also be required to cross a small stream, 290 meters south of Jennetts Reservoir and west of West Ashridge, which feeds into the reservoir. After this crossing, the corridor continues south of Dunn Farm, moving westward between Robin Hill Farm and Littleham.

4.3.4 The route proceeds beneath Littleham Wood using HDD and continues northwest, passing north of Moorhead and towards Winscott Barton. It then heads north towards the A39, where trenchless drilling techniques e.g HDD would again be employed to cross beneath the road, approximately 250 meters southwest of the Abbotsham Cross roundabout.

4.3.5 From the A39, the corridor continues north, passing west of Abbotsham and east of Chapter House, moving towards Kenwith Stream. Minor roads in this area would be crossed using open trench techniques. Trenchless drilling e.g HDD crossing would be needed to pass Kenwith Stream, located just south of Rickard's Down, as it flows towards the River Torridge.

4.3.6 The cable corridor then runs northwest, passing south of the Cornborough Sewage Treatment Works, before diverting west towards the landfall. It terminates at the buried Transition Joint Bay at the landfall site.

4.0 Site Context

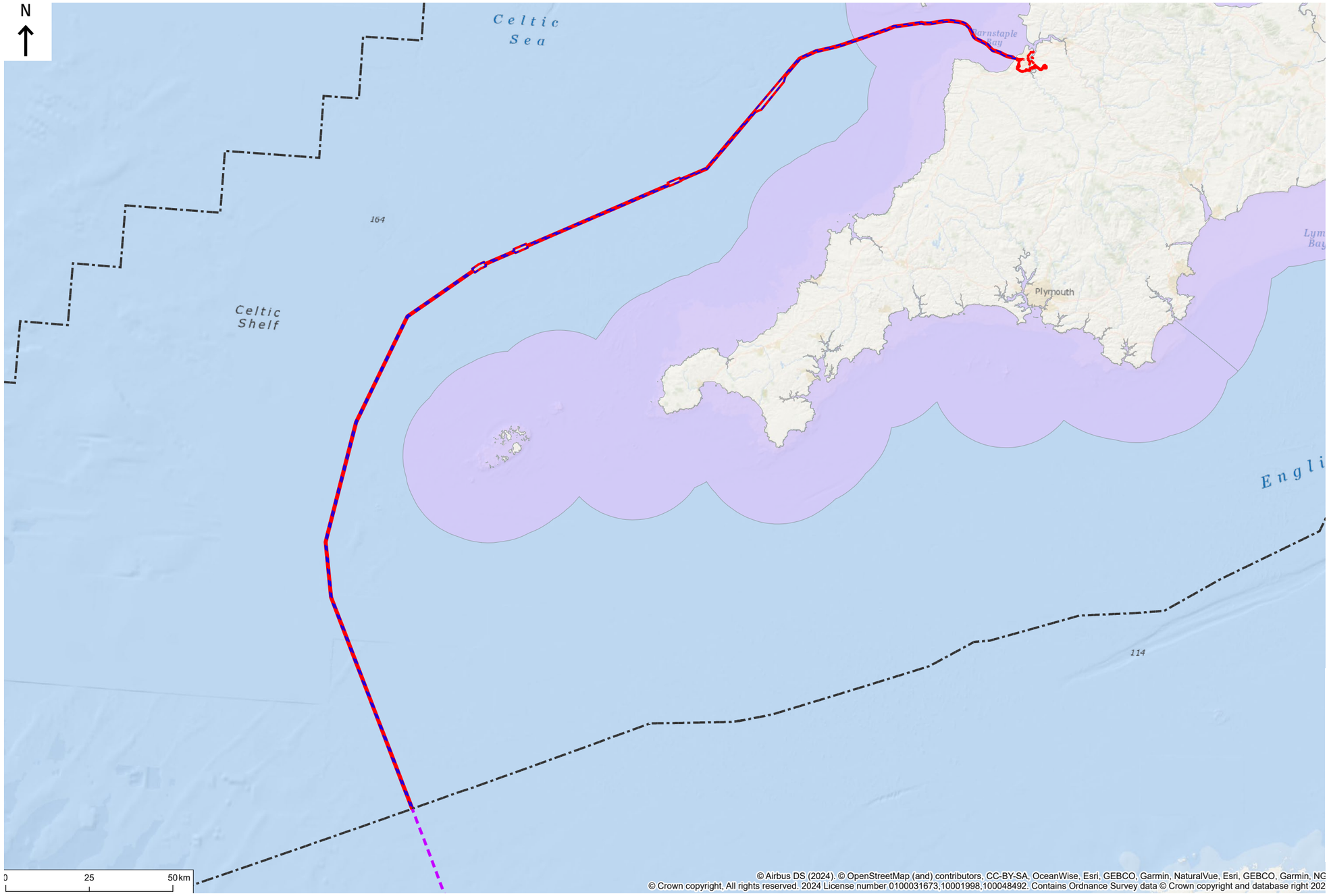


Figure 4.1 Plan showing Offshore Order Limit

4.0 Site Context

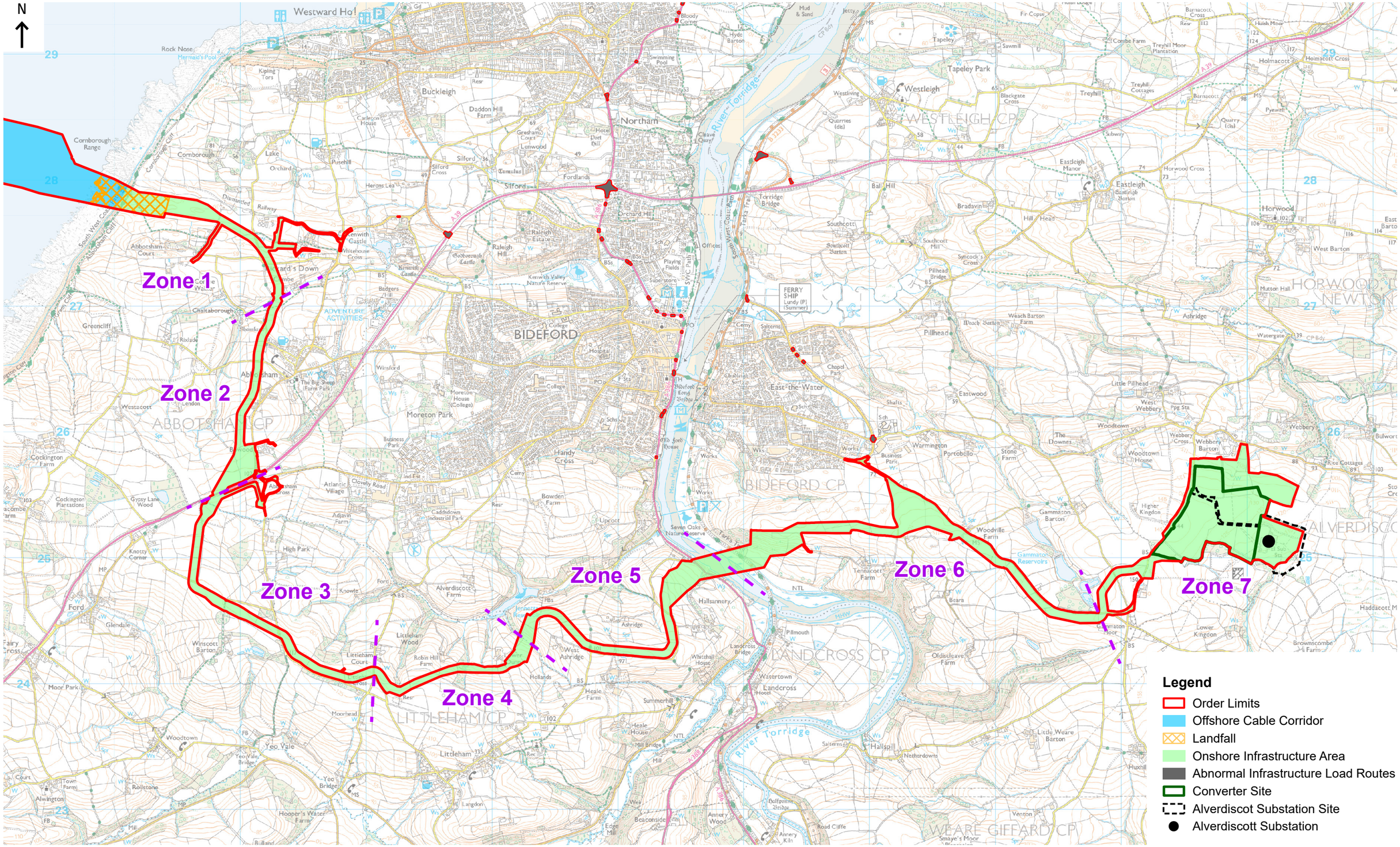


Figure 4.2 Plan showing Onshore Order Limit

4.0 Site Context

Figure 4.3 Diagrammatic plan showing the optioneering for the Order Limits

4.0 Site Context

Table 4.1 Order Limits Optioneering Reference Key

Reference	Optioneering
A	Cornborough Range – After a site walkover visit by technical team, the assessment of the topography of the large field known as the 'Old Racecourse' and the location of seasonal water courses led to a refinement of the proposed routing of each Bipole. The extent of the Order Limits was reduced from previous red line version as compound areas were refined.
B	Blue route – Closer to the original Atlantic Array routing, this option was discounted due to the proximity to the strip of woodland running north to south and the consequent anticipated ecology impact.
C	Red route – Closer to Abbotsham Village than alternative routes, this route was presented at the public consultations for the TCPA series of consultations. There was significant local opposition to this route from the Abbotsham Community reflected in the consultation feedback. Some local landowners opposed this route due to the potential of the land for development, with one plot of land at the time included in the Local Plan for housing (Allocation reference ABS01- land at the Glebe, Abbotsham). This cable route option also crossed the public highway twice and would have therefore had a higher impact on local traffic than the alternative route finally chosen.
D	Orange route. As with B. this option had greater ecology impact, with more disruption to the farmland by bisecting fields, leaving a significant proportion of each field orphaned.
E	Green route – As with F. this option was considered too close to the A39 Clovelly Cross roundabout.
F	Red route – the proximity of the cable route to the Clovelly Cross roundabout as it crossed the A39 was the subject of feedback by Torridge District Council, which pointed to the potential expansion and movement to the west of this roundabout to accommodate the development of housing near the roundabout. Additionally the landowner to the south commented on the plan, identifying this land as potentially hosting a service station, which would not be possible if the cable route orphaned this land plot.
G	Buckland Road – the northern section of the red route shows the originally planned Horizontal Directional Drill (HDD) to cross the deep gully which runs to the south west of Jennetts Reservoir. The configuration of the HDD and the haul road resulted in a constricted access from the land to the east of the spit of woodland into the land parcel to the east of this, where the looped haul road joined the HDD at the east compound. This constricted access effectively would have limited the haul road to light vehicles, necessitating the use of the private track at H, and the private lane at I. The updated and latest white option cable route solved several issues at G, H and I by foregoing the HDD and replacing it with a looped cable route to the south which crossed an additional landowner's land and thereby enabled the haul road to continue, negating the need for the use of the private tracks. This also addressed the concerns expressed during the TCPA consultation expressed by several residents of Littleham that the red option would have brought construction vehicles close to Littleham and on to the public roads for short sections, which would have had significant impact on local traffic.
H	Private track – this track would have been required for construction traffic had the red route HDD been retained. As well as bringing construction traffic closer to Littleham, this option was opposed by the landowner who expressed concern that the use of his track by construction traffic would have set a precedent for uncontrolled use by local residents of this private track as a cut through, which would have had safety implications for his large farm vehicles servicing his large dairy farm.
I	Dunn Lane – this private unadopted road would have been required for the red route HDD option as set out in G. The owner of Woods Engineering expressed concern that the use of this narrow road would have impacted his agricultural engineering business as the access track for the business (Dunn Lane) is not sufficiently wide for two vehicles to pass.
J	West Ashridge – a review of the HDD and cable route between Dunn Farm and West Ashridge, resulted in a relocation of the proposed HDD and cable route at West Ashridge. A revised HDD reduced the delta in height between the HDD entry point and exit point, reducing risk of frack out during the drilling operation. This revision also distanced the cable route further from the Stag and Otter holiday cottages at West Ashridge.

4.0 Site Context

Reference	Optioneering
K	This alternative (purple) crossing option for the Torridge River was investigated with a site visit by the technical team for a stitch drill solution to the crossing. Adverse topography and proximity to a County Wildlife Site (ST14 - North Devon and Torridge Local Plan 2011-2031) meant that this alternative crossing was ruled out.
L	The original leading option for the Torridge Crossing was superceded on review by the contracted HDD specialist due to the long length (circa 900m) and the large delta in height between the HDD entry point and exit point, which increased risk of frack out during the drilling operation. A shorter alternative (see white route) was selected with lower risks.
M	The initial option for the converter station site was at the Old Webbery Showground near the Alverdiscott sub-station into which the AC cables will connect from the converter stations. An advisory note from Torridge District Council cautioned against selecting this site on account of the height and potential visibility impact. Xlinks selected a south site (N.) towards Huntshaw as an alternative. This was strongly opposed by the local community during the series of public consultations held as part of preparations for the originally planned TCPA application.
N	There was strong opposition in particular from 10 households in proximity to the south site option for the converters. These views along with the feedback from the wider community at Huntshaw Water, Huntshaw and Great Torrington were taken into account by Xlinks in reviewing the public consultation feedback. The decision was taken to revert to the original selected location of Old Webbery Showground which was assessed to be less impactful to the local community.
O	The south site option for the converter stations also included approximately 2 km of AC cable, with 12 AC cables instead of the 4 cables for DC cable corridor. The resulting wider corridor over the 2km would have also created greater ecology impact than the north option of Old Webbery Showground which had an AC cable length of circa 200m.
P	To the west of Gammaton Cross the orange option of the cable route passed closer to several properties at Gammaton Cross and on the road leading north from Gammaton Cross. The route was adjusted to pass further from these properties (white route), in view of the duration of the haul roads along the cable corridor being required for the full duration of construction of the converter stations.

Reference	Optioneering
Q	A narrow corridor was included around the woodland as part of the yellow route option to allow for potential utility diversions. Subsequent communication with utilities companies clarified that this route was not required and it was therefore removed.
R	Similar to Q. this strip was included within the Order Limits to enable utility diversions within this area if required. After communication with utilities companies Xlinks clarified that this route was not required and it was therefore removed.
S	The yellow option included a greater area around the chosen converter station site, to preserve maximum optionality for discussions to advance with utility companies with regards to overhead line and water and gas pipeline diversions. These discussions have reduced the options and in consequence the Order Limits were tightened from the yellow to white option.
T	As the design for the converter site has progressed, with requisite visual impact mitigation through cut and fill techniques and the creation of bunds, the footprint of the converter site has developed and required a larger area to accommodate all the design elements. For this reason the Order Limits were increased from the orange option to the yellow option (much wider for utility diversions) and then the white version (incorporating an extra field to allow for the design evolution.
U	The yellow Order Limits options included public roads which the construction traffic and Abnormal Indivisible Loads (AILs) would use. The subsequent white option includes only those areas of the public highway where adjustments may be required (eg removal of street furniture).

4.0 Site Context

4.4 Onshore Converter Site

4.4.1 The current site for the Converter Station is situated between Gammaton and Alverdiscott, approximately 5km southwest of the town of Bideford. The 30.28 ha site is currently comprised of agricultural fields and solar farms with boundaries defined by trees,hedgerows and small ditches.

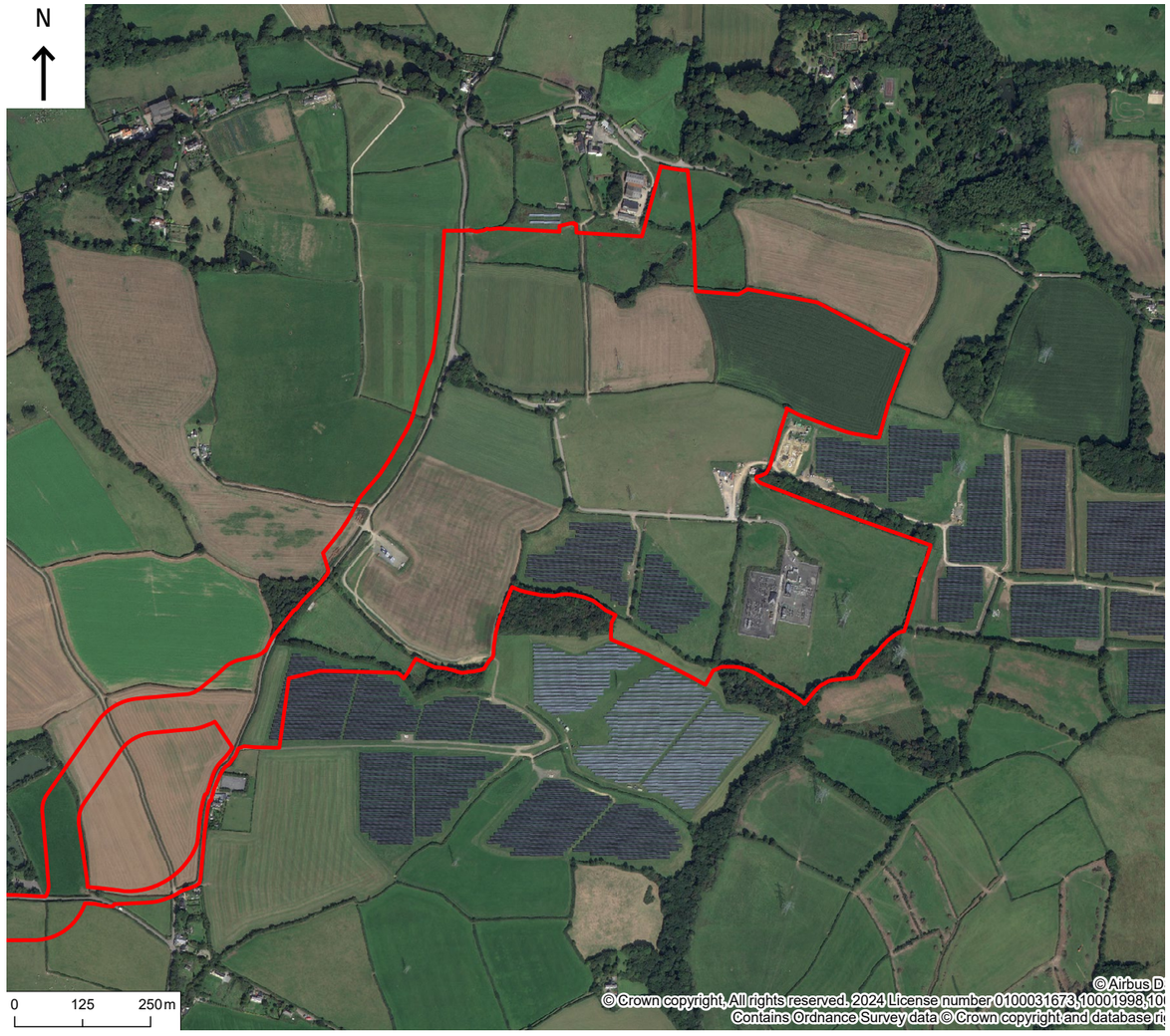
4.4.2 The site is bound by the existing Alverdiscott 400kV substation with agricultural fields to the East, a solar farm and agricultural fields to the south, a narrow country road to the west and additional agricultural fields as well as the hamlet of Webbery Barton to the North.

4.4.3 The site lies within the North Devon Biosphere Reserve, which is a site internationally recognised by UNESCO as one of excellence to balance conservation and socioeconomic development between nature and people. It also falls within a SSSI impact zone. The closest SSSI to the site boundary is Taw-Torridge Estuary more than 2km to the west. A Nitrate vulnerable zone, Gammaton Lower Reservoir Eutrophic Lake, is located approximately 1.3km southwest of the Converter site. The site also contains several monuments including a scheduled ancient monument approximately 156m to the west, recorded as an iron age enclosure and roman marching camp. Other monuments are primarily located in the southwest and northeast corners.

4.4.4 Infrastructure within the site includes an existing road that runs from west to east, providing access to the current substation. Various buried utilities such as gas pipes, underground electric lines, and telecom lines are present, along with overhead electric lines that cross the site.

4.4.5 Although the site features some vegetation and tree coverage, it is primarily characterized by wide, unobstructed views. The proposed development would consider these views and aim to enhance the area's character through thoughtful design and landscaping.

Figure 4.4 Diagram showing existing site with the Order Limits overlaid



4.4.6 Site Photographs

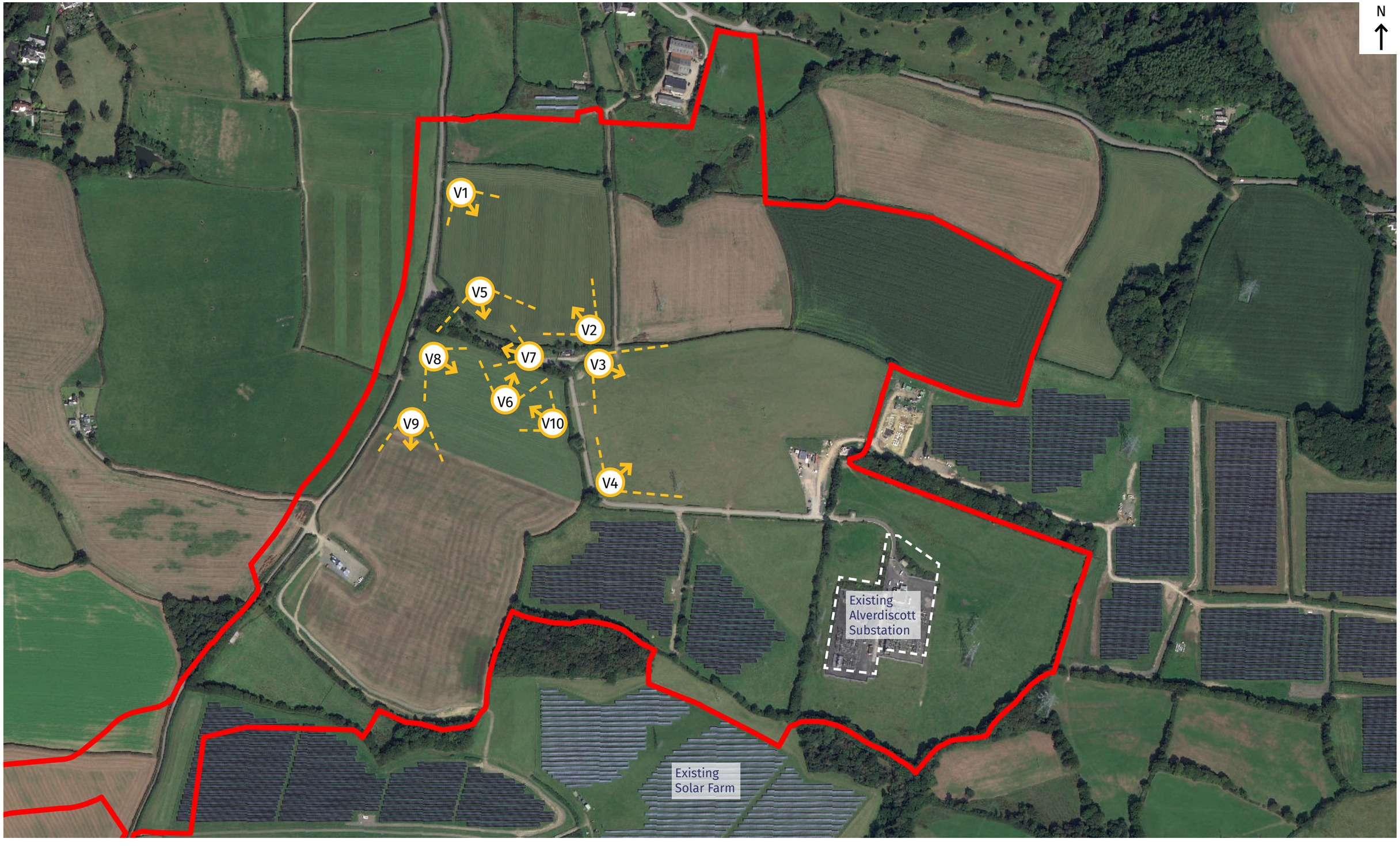


Figure 4.5 Site Photographs key

4.4.6 Site Photographs

Figure 4.6 Converter Site View 01

Figure 4.7 Converter Site View 02

Figure 4.8 Converter Site View 03

Figure 4.9 Converter Site View 04

Figure 4.10 Converter Site View 05

Figure 4.11 Converter Site View 06

Figure 4.12 Converter Site View 07

Figure 4.13 Converter Site View 08

Figure 4.14 Converter Site View 09

Figure 4.15 Converter Site View 10

4.4.7 Site Constraints & Opportunities

4.4.7.1 Existing Utilities

4.4.7.1.1 There are numerous existing utilities within the footprint of the proposed Converter Site which present a constraint for the construction phase of the Proposed Development. These include:

- 132kV dual circuit electrical overhead line
- 132kV 'Trident' electrical overhead line
- 132kV electrical overhead line
- 11kV electrical overhead lines
- Low pressure, intermediate pressure and medium pressure gas mains
- 400mm and 500mm water mains
- Private water connection to the NGET site
- Telecommunications connection to the NGET site

4.4.7.1.2 The Applicant has determined, in consultation with all Statutory Undertakers, that existing utilities would be diverted where required during the construction phase.

4.4.7.2 NGET Existing Substation

4.4.7.2.1 The existing Alverdiscott Substation Site is located directly east of the Proposed Converter Site. The Converter Site shares its eastern boundary with the Alverdiscott Substation Site. An existing NGET access road runs through the middle of the Proposed Converter Site from west to east and is required to remain 'open' on a 24/7 basis. The access road would require re-routing around the Proposed Converter Site to provide unimpeded access for NGET.

4.4.7.2.2 The Alverdiscott Substation Site contains a 132kV and a 400kV substation within its boundary. A new 400kV substation is proposed by NGET to connect to the Proposed Development. This new substation would be developed separately to the Proposed Development under a separate local planning application process to be undertaken by NGET.

4.4.7.3 Sonnedix Solar Farm

4.4.7.3.1 Sonnedix have begun the construction of a new solar farm to the west, north and northeast of the Alverdiscott Substation Site. The Sonnedix Solar Farm includes development within the two fields directly south of the existing NGET access road and west of the Alverdiscott Substation Site. The solar panels within this section of land would require decommissioning and removal as part of the Proposed Development. The Applicant is continuing discussions with Sonnedix around the decommissioning and removal of the solar farm infrastructure within the two fields.

4.4.7.4 Cleave Park Solar Farm

4.4.7.4.1 Cleave Solar Farm is located south of the Proposed Converter Site and outside of the Order Limits. The Proposed Development has no direct land impact on the existing Cleave Solar Farm.

4.4.7.5 Gammaton Moor Solar Farm

4.4.7.5.1 The Gammaton Moor Solar Farm, associated with planning application 1/1057/2021/FULM, includes a 36 MW facility spanning 63.2 hectares. The construction of the Converter Site and part of the Onshore HVDC Cable Corridor would require the removal of approximately 6 hectares of solar panels which overlaps within the Converter Site. This would result in the loss of approximately 2.5 MW of installed capacity for the solar farm.

4.4.7.6 Scheduled Monuments and Listed Buildings

4.4.7.6.1 The closest Scheduled Monuments are an Iron Age enclosure and a Roman marching camp located approximately 160m west of the Converter Site. Additionally, the Converter Site boundary lies approximately 210 m from the closest listed building at Webbery Barton to the north, which is a Grade II Listed Building.

4.4.7.7 Existing Site Topography

4.4.7.7.1 The existing topography of the site, shown in Figure 3.17, varies significantly in elevation. The highest point on the site, at +145 AOD, is located in the southwest corner. In contrast, the lowest points are found at the far north-eastern corner, where the elevation is +115 AOD, and to the east of the site, adjacent to the existing substation, with an elevation of +120 AOD. The flattest area of the site is around the existing road that traverses through the middle connecting the main road to the existing substation. The elevation in this location is relatively consistent at +132 AOD.

4.4.8 Site Constraints & Opportunities

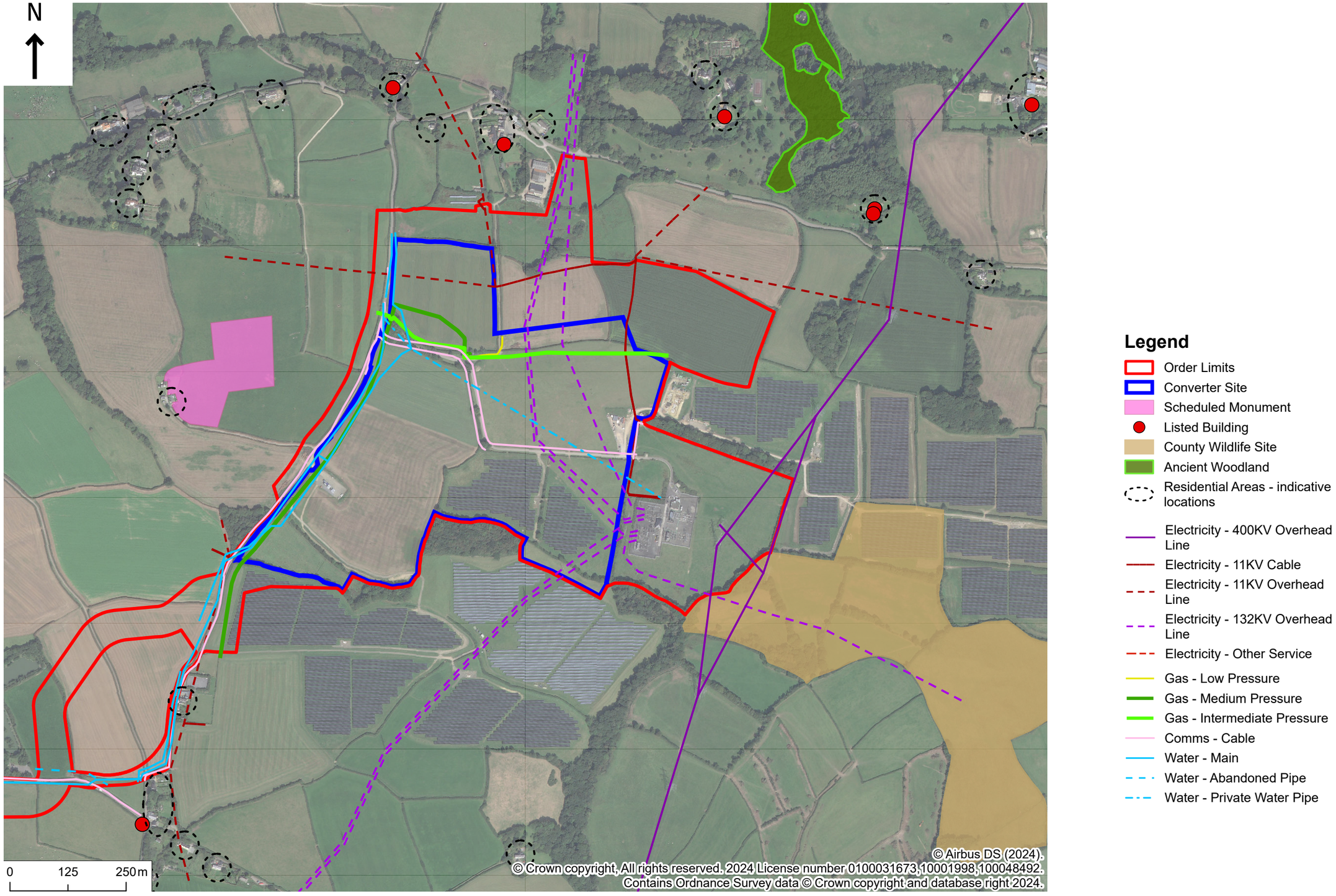
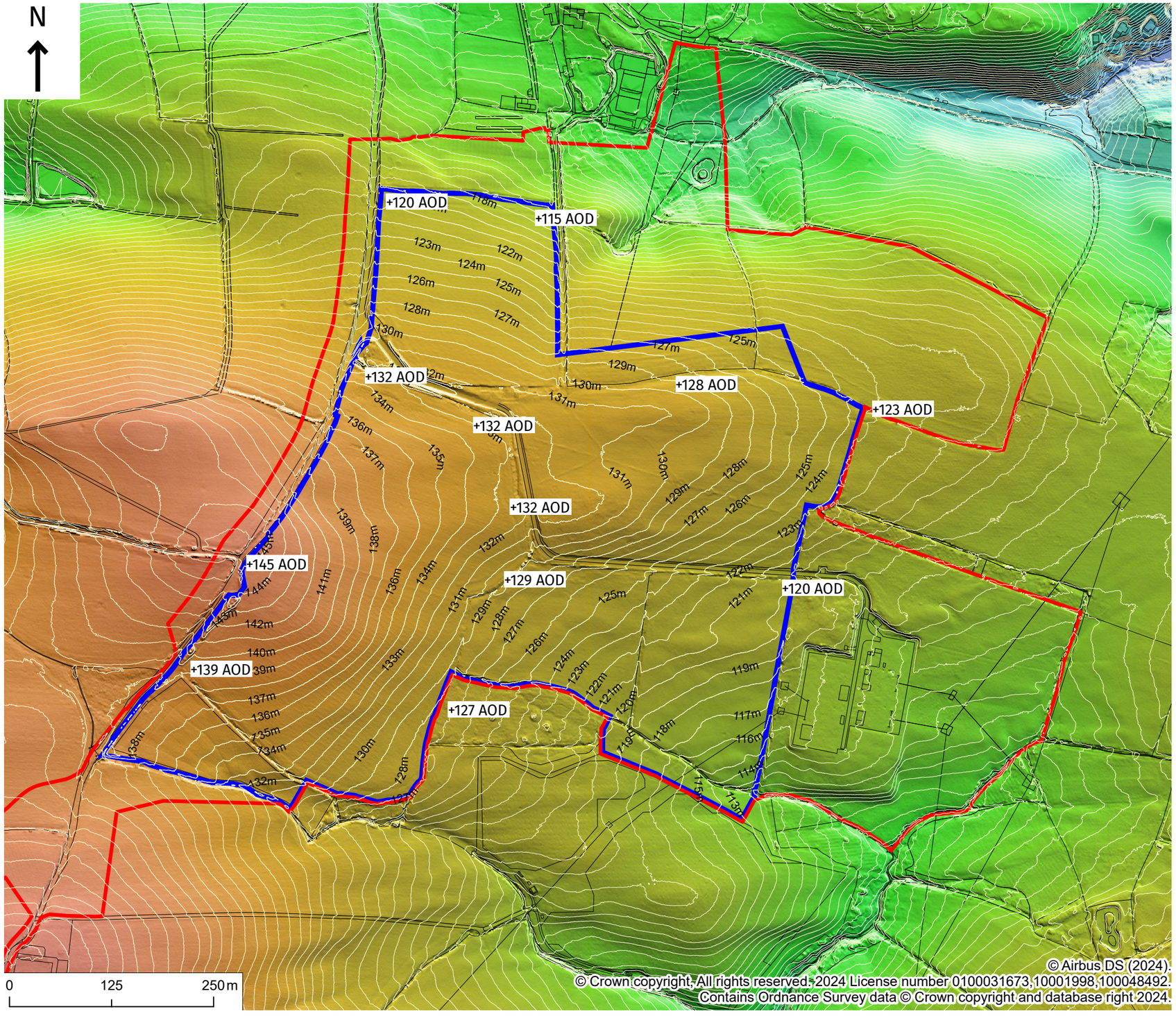


Figure 4.16 Map of the existing site with constraints overlaid

4.0 Site Context



Legend

- Order Limits
- Converter Site

Figure 4.17 Existing site topography with existing levels

5.0 Consultation & Design Evolution

5.0 Consultation & Design Evolution

5.1 Introduction

5.1.1 The Proposed Development design assessed within the Environmental Statement has undergone a process of design evolution following various rounds of consultation and engagement with stakeholders. The design development and updates have been informed by:

- Initial landfall identification, cable routeing and Converter site selection as part of a potential Town and Country Planning Act application through Torridge District Council in June 2020.
- Development of the cable route and Converter Site location following engagement with landowners and the community during non-statutory consultation in 2022 and 2023.
- Ongoing sizing and scale development for the Converter Site during Original Equipment Manufacturers (OEM) engagement in 2023 and 2024.
- Refinement of the cable corridor and Converter Site layout for the Preliminary Environmental Impact Report (PEIR) assessment and associated statutory engagement in 2024.
- Updates to the Converter Site Order Limit boundary following ongoing engagement with Statutory Utilities about potential utility impacts and need for temporary connections and diversion of existing utility assets
- Ongoing design refinement following statutory engagement and broader ongoing engagement with the Local Planning Authorities and Statutory Environmental Bodies to address community and stakeholder concerns including traffic and landscape impacts at the Converter Site, ready for assessment as part of the Environmental Statement and DCO application.

5.1.2 Feedback has been an essential part of the design evolution of the Proposed Development. The Applicant has conducted an extensive consultation process from the outset, engaging with a wide range of stakeholders and the local community.

5.1.3 A more detailed overview of the consultation process can be found in the Consultation Report (Ducument Ref. 5.1) submitted as part of the Xlinks' Morrocco UK Power Project DCO application, in line with the requirements of Section 37(3)(c) of the Planning Act 2008. Figure 5.1 shows the summarised time-line of the consultation process.

5.1.4 This chapter of the Design Approach Document (DAD) will focus on the design evolution of the Proposed Development which has been centred around non-statutory and statutory consultation periods and how the outcomes of both these consultation events and broader engagement with key stakeholders and potential OEM have influenced the design evolution of the Proposed Development to meet key requirements of good design, which include the following:

- **Early consideration**

NPS EN-1, Section 4.7.4 *'Given the benefits of good design in mitigating the adverse impacts of a project, applicants should consider how good design can be applied to a project during the early stages of the project lifecycle.'*

- **Proposed Design Evolution**

NPS EN-1, Section 4.7.7 *'Applicants must demonstrate in their application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected.'*

5.1.5 The structure of this chapter will be as follows:

4.2 Initial design development for TCPA pre-application (Stage 1)

4.3 Non Statutory Consultations (Stage 2)

- Initial Non-Statutory Consultations
- 2nd Non-Statutory Consultations

4.4 Design evolution between Non-Statutory Consultation and PEIR (Stage 3)

- Onshore HVDC Cable Corridor
- Onshore Converter Site

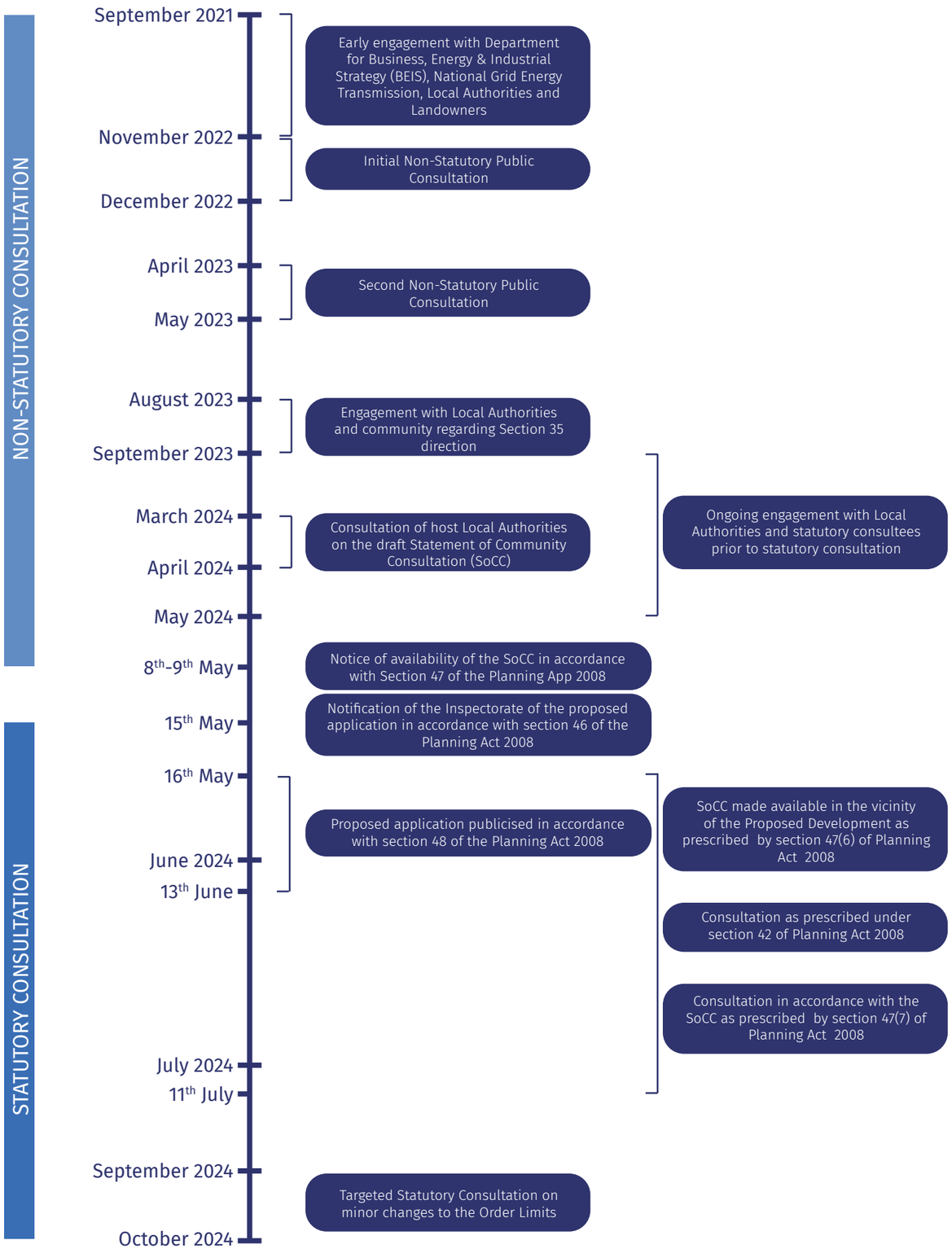
4.5 Design evolution post PEIR and Statutory Consultation (Stage 4)

- Onshore HVDC Cable Corridor
- Onshore Converter Site

5.1.6 Designs shown in this section of the document are for illustrative purposes and do not represent a final design.

5.0 Consultation & Design Evolution

Figure 5.1 Summarised timeline of consultation process



5.0 Consultation & Design Evolution

5.2 Initial design development for the TCPA pre-application (Stage 1)

5.2.1 The initial landfall and cable route considerations were informed by existing information available from the proposed Atlantic Array project application which also had a proposed connection point at the existing Alverdiscott Substation Site.

5.2.2 Potential landing points were reviewed in the vicinity of the proposed Atlantic Array landing point at the Cornborough Range. As part of the initial consideration of options for the landfall the Applicant undertook a site walkover with a trenchless drilling technical expert to review and refine a proposed landing point for the TCPA pre-application.

5.2.3 The Applicant also undertook site walks with available landowners along the proposed Onshore HVDC Cable Corridor which involved reviewing the cable corridor and making adjustments where agreed. It is noted that not all landowners were available for site walks during this period.

5.2.4 Considerations informing the selection of the landfall and Onshore HVDC cable corridor included:

- Land availability
- Site access
- Constructibility
- Proximity to the Alverdiscott Substation Site
- Potential obstacles requiring trenchless drilling techniques
- Environmental constraints, including ecology, heritage and waterways
- Cost

5.2.5 The Applicant undertook a review of potential converter site locations using the following factors:

- Area of land available to house two converter buildings
- Topography of available land
- Landscaping and screening opportunities
- Environmental constraints including flood risk, ecological habitats and archaeology
- Proximity of sensitive receptors
- Existing road access to and from the site
- Avoidance of Public Rights of Way (PRoW)
- Distance and potential impact of the HVAC cable corridor

5.2.6 The Applicant initially identified the Old Webbery Showground as an appropriate site for consideration for the proposed Converter Site and this was communicated to the Local Planning Authority as part of the pre-application process. The Local Planning Authority issued a subsequent advisory note requesting a different site be considered for the Converter Site.

5.2.7 Following an additional review, the Applicant identified a potential site at Huntshaw which was taken through to consultation in 2022 as part of the consultation for a potential TCPA application. The proposed Huntshaw Converter Site was located near Great Huxhill, approximately 0.7km south of the Gammaton Crossroads.

5.2.8 For the purposes of the DCO application, the consultation in 2022 and early 2023 is referred to as non-statutory consultation.

5.3 Non Statutory Consultations (Stage 2)

5.3.1 Prior to the statutory consultations, the client conducted two non-statutory consultations following initial engagements with key stakeholders, including the Department for Energy Security and Net Zero, National Grid Energy Transmission, local authorities, and landowners. Feedback from these consultations led to changes that shaped the proposed development presented during the statutory consultation stage. Further details on the feedback and design changes at Stage 2 are outlined in Sections 4.3.3 and 4.3.4.

5.3.2 The key changes made by the Applicant as a result of feedback from the Non-Statutory consultation process includes:

- Moving the converter station site from it's original proposed location north of Gammarton cross to it's current proposed location at the Old Webbery Showground.
- Amending the proposed cable corridor to avoid new homes and a school in Abbotsham.
- Moving the Eastern Converter Station building south and west within the converter station site.

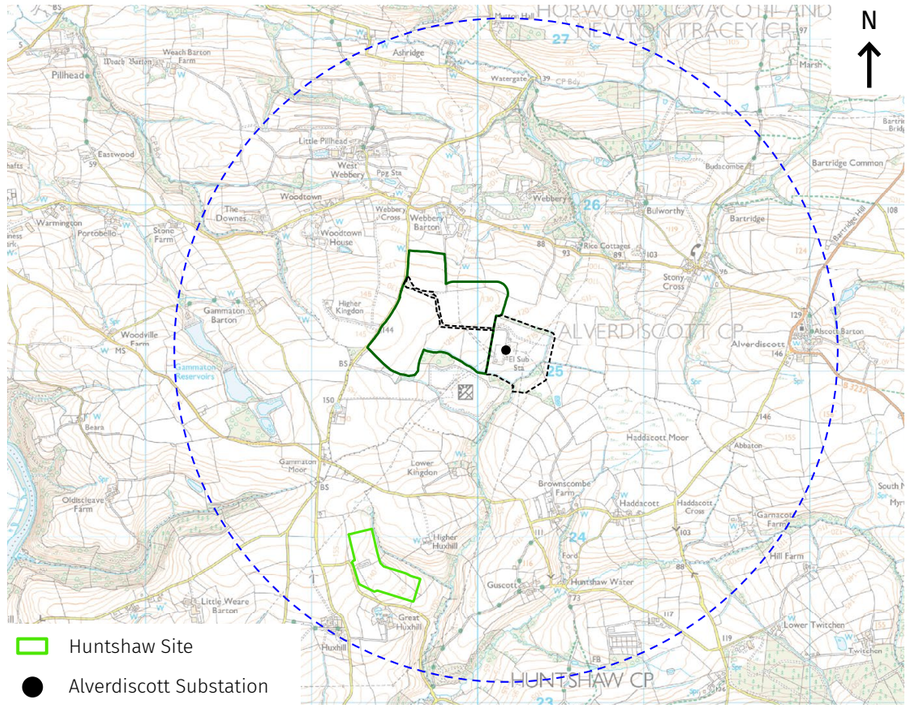
5.0 Consultation & Design Evolution

5.3.3 Initial Non-Statutory Public Consultation

5.3.3.1 The purpose of the consultation, held at Hunsthaw Parish Hall and Bideford (Caddsdown Business Support Centre), was to seek feedback on the location of the converter station at the Huntshaw site and options for the onshore cable route.

5.3.3.2 Situated southwest of the existing Alverdiscott Substation, the primary advantage of the Huntshaw site was its lower elevation, which minimises visibility from key western viewpoints, such as the beaches at Westward Ho, as well as northern locations like Horwood and the elevated viewpoint at Codden Hill.

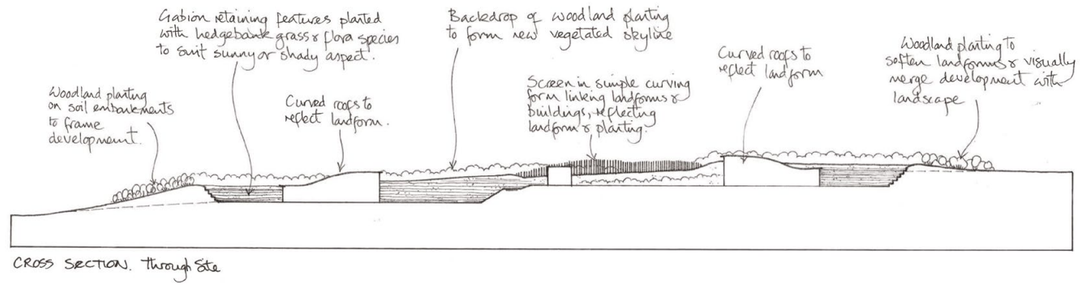
Figure 5.2 Map showing the location of the Huntshaw site in relation to the Alverdiscott Substation



5.3.3.3 Substantial cut and fill earthworks were required due to the site's existing steep gradient. The initial proposal called for a two tier platform with the two bipoles arranged north and south. HVAC cables were proposed to travel North to the existing Alverdiscott substation.

5.3.3.4 The initial concept design for the converter station featured a curved roof for the Converter Halls, the largest building within each bipole. The design choice was made due to limited space within the site to accommodate landscape bunding to screen the Converter Halls. The curved roof profile followed the contours of the proposed landscaping allowing the Converter Halls to assimilate with the surrounding context and minimise the overall visual impact.

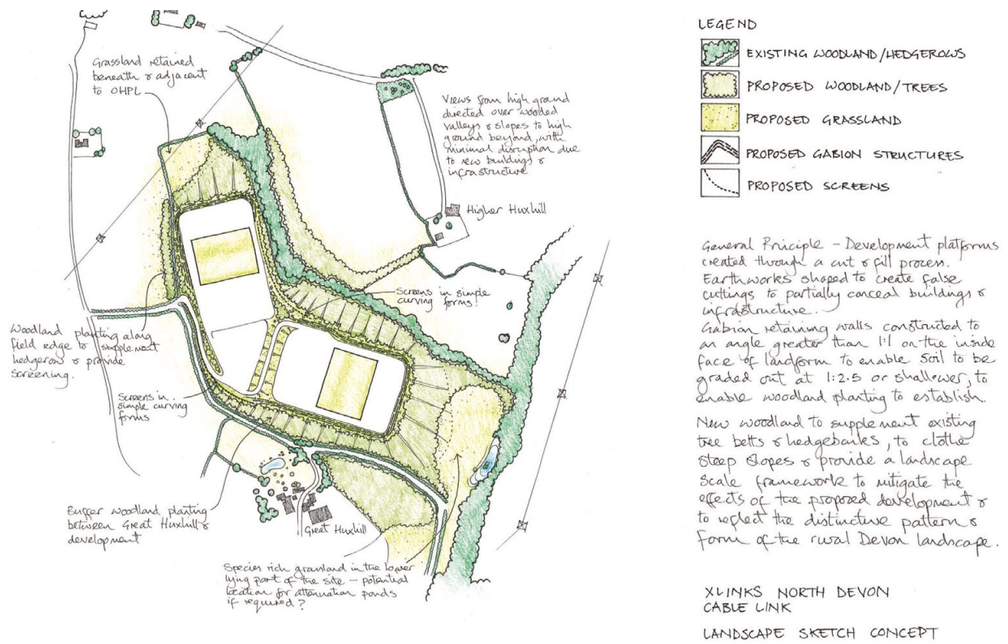
Figure 5.3 Sketch showing the proposed cross-section through the Hunstshaw site with the proposed curved profile roof of the converter hall



5.3.3.5 Landscaping was proposed to the perimeter of the site to provide screening to the buildings and infrastructure. New woodland planting was to supplement the existing tree belts, hedgerows and grasslands, particularly from views from higher ground to the North at Higher Huxhill.

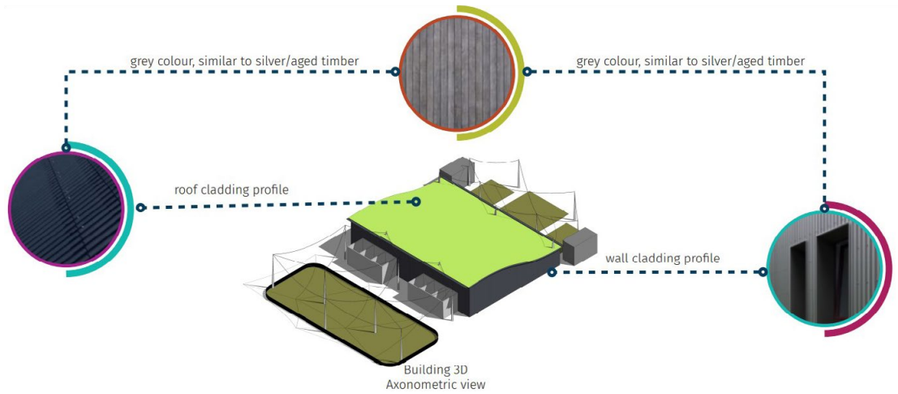
5.3.3.6 The primary material proposed for the initial concept design was profiled metal cladding for the converter hall elevations and a green roof.

Figure 5.4 Conceptual sketch showing proposal for landscaping



5.0 Consultation & Design Evolution

Figure 5.5 3D model showing the initial design concept for a proposed Converter Station Bipole



5.3.3.7 Feedback from the non-statutory consultation and a special Town Hall meeting in December 2022 at the Alverdiscott Village Hall indicated strong opposition to the proposed Converter Site at Huntshaw. Concerns about the proposed Huntshaw location included:

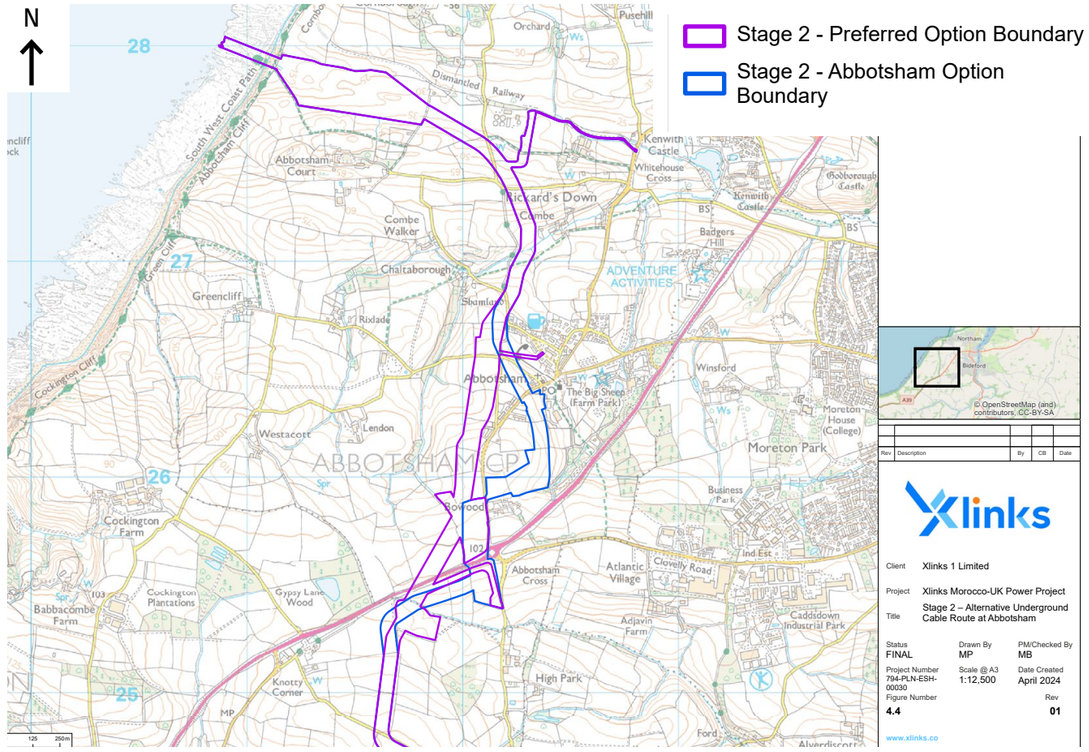
- Proximity to and associated construction phase impacts on residential dwellings, including listed buildings within 300m of the proposed Converter Site.
- Visual impacts created by the proximity of Converter Site to residential dwellings and scale of landscaping mitigation required within close proximity.
- Steep topography with a steep drop in ground levels towards the south east of the proposed site.
- The need for a widening of existing roads and construction of a new temporary road for construction access to the proposed site.
- Potential impacts on ecology.

5.3.3.8 Based on the feedback received and the disadvantages listed above, a decision was made that an alternative site should be considered for the next stage of design.

5.3.4 2nd Non-Statutory Public Consultation

5.3.4.1 Following the initial non-statutory consultation feedback, the HDVC cable route corridor was revised to avoid close proximity to residential properties and the local primary school in Abottsham. Figure 5.6 shows the amended route presented at the stage 2 consultation at Hunstshaw Parish Hall and Alverdiscott Community Hall in April 2023. Further consultation events were held at Pollyfield Community Centre and Caddsdown Business Support Centre in May 2023.

Plate 5.6 Revised HDVC cable route corridor through Abbotsham following feedback from Stage 1 consultation



5.3.4.2 After careful consideration, an alternative site was developed and presented by the Applicant. Situated further north to the Huntshaw site, the proposed site, locally known as the Old Webbery Showground, sits immediately to the west of the existing Alverdiscott substation. Further site description and analysis of the Old Webbery Showground site can be found in Section 3.0 of this document.

5.3.4.3 The new location offered several key advantages over the Huntshaw site, including:

- The close proximity to the existing Alverdiscott significantly reduced the length of the HVAC cables between the Converter Site and the substation, helping to mitigate against the impacts associated with the HVAC cable route.
- Access to an existing road network, with a proposed haul road to mitigate the impacts of construction traffic between the proposed Converter Site and a potential construction compound on Gammaton Road.

- No impacts on ecological designations, PRoW or potential flood risk
- Flatter topography compared to the proposed Huntshaw site, noting that the proposed old Webbery showground is still located on a rolling hillside. The old Webbery showground site falls away from the road with the proposed converter buildings sitting further down the slope, with a backdrop of existing electricity pylons and a substation (the Alverdiscott substation).

5.3.4.4 The new location also presented some constraints. Table 5.1 gives a summary of the identified challenges and proposed mitigations following the design development outlined within the rest of this chapter.

Table 5.1 Identified Challenges and Proposed Mitigation

Identified Site Challenge	Proposed Mitigation
Existing NGET access road across site	NGET access relocated within the Converter Site outside the fence boundary. Separate Converter Site and NGET site access
Existing utilities within Converter Site	Review of locations of existing utilities with Statutory Utilities and confirmation of diversion requirements following detailed design.
Overlapping boundary with proposed solar farm	Discussions and agreement with solar farm operator to decommission and remove impacted solar panels and appropriate compensation for loss of generating capacity.
Proximity to scheduled monument to west of site and potential impact on setting	Landscape led solution for landscaping bunding. Appropriately sized and landscaped bunds to minimise views of Converter Building within the landscape setting. Engagement with Historic England during detailed design process.
Balancing cut and fill requirements to minimise material imported to or disposed of from site.	Landscape bund sizing taken into account in finalising finished floor levels to balance cut and fill as much as is reasonably practicable.

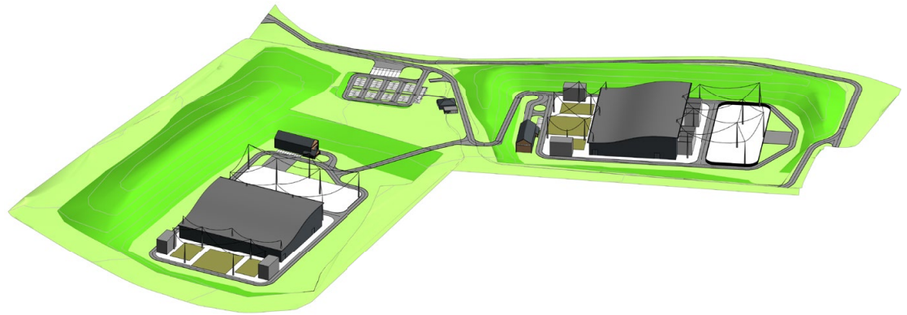
5.3.4.5 The change of site for the Onshore Converter stations to the Old Webbery Showground required an updated site layout. The proposed converter stations were located immediately to the west of the Alverdiscott substation. The West converter station was oriented roughly North-South and the East converter station oriented roughly East-West. This accommodated the consented but not implemented solar farm (ref: 1/1057/2021/FULM—Land At Webbery Barton And Cleave Farm Bideford Devon), which makes use of the field adjacent to the Alverdiscott substation. A new layout for the internal road network was also developed to suit the context of the site's topography.

5.3.4.6 Due to the higher elevation of the new Converter Site compared to the Huntshaw location, there was potential for increased visual impacts associated with the converter buildings being visible over the ridge line.

5.3.4.7 The mitigation strategy was reducing the platform levels for the Converter stations and constructing appropriately sized landscaped bunds to the west of the western converter station and to the north of the eastern converter station to screen the majority of the building structure from these viewpoints. A landscape feature was also considered within the northern field to help mitigate potential visual impacts north of the proposed Converter Site. Figure 5.7 shows the 3D concept for the Converter Site with the proposed bunding layout.

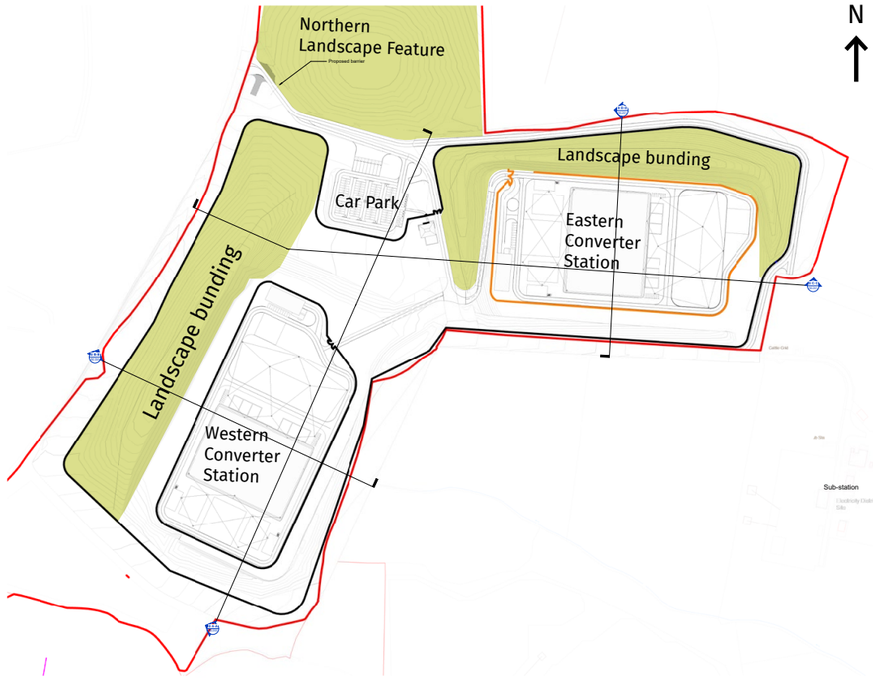
5.3.4.8 The proposed design incorporating the lower platform levels and proposed bunding required substantial cut and fill. Figure 5.8 shows the diagrammatic Site Plan of the Converter Site.

Figure 5.7 3D view of conceptual site layout



5.3.4.9 Potential impacts on views from the south and east of the proposed Converter Site at old Webbery showground would be mitigated by landscaped planting. The curved roof for the main converter halls were retained as a further mitigation measure.

Figure 5.8 Diagrammatic Site Plan



5.0 Consultation & Design Evolution

5.4 Design evolution between Non-Statutory Consultation and PEIR (Stage 3)

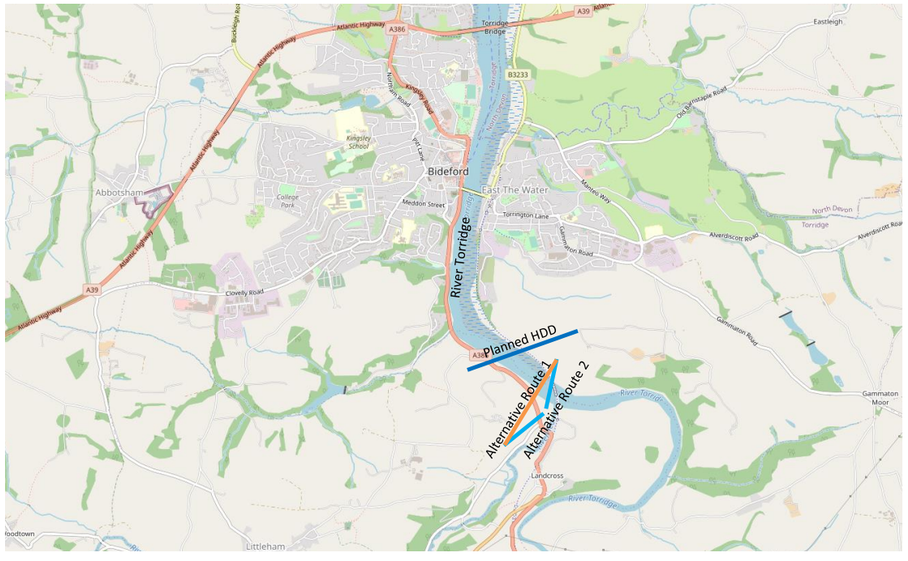
5.4.1 Following Design Stage 2, the Applicant further developed the conceptual layouts of the proposed converter stations at the old Webbery Showground location and made minor amendments to the proposed HVDC HDD locations along the route. The output of this process was presented within the PEIR and was the subject of statutory consultation.

5.4.2 Onshore HVDC Cable Corridor

5.4.2.1 The location of proposed HDD compounds for the onshore HVDC cable corridor was reviewed during Stage 3, resulting in minor amendments to the locations proposed during Stage 2. The amendments largely affected the proposed HDD compounds at Buckland Road and West Ashridge where the proposed cable route was amended to mitigate potential impacts on an existing groundwater well at Buckland Road and to move the northern HDD compound at West Ashridge to a flatter peace of agricultural land, reducing the need for substantial cut into the existing ground levels for the compound.

5.4.2.2 The Applicant also considered a potential change in the onshore HVDC cable corridor crossing route at the River Torridge, however, following technical review by an independent consultant the alternative option was not considered as providing a more beneficial crossing solution, therefore this potential option was not taken forward to PEIR and statutory consultation. The alternative crossing point slightly further south than the proposed crossing also potentially increased impacts on neighbouring properties due to the proximity of the required drilling compound.

Figure 5.9 Overview of the HDD crossing options at the River Torridge



5.4.3 Onshore Converter Site

5.4.3.1 As the demand to support the energy transition to net zero grows, the HVDC industry has shifted towards adopting standardised designs. Early engagement with the potential OEM suppliers for the high-voltage converter equipment at stage 3, post non-statutory consultation, resulted in an increase in the dimensions of the main converter buildings and associated infrastructure and equipment, including the platforms for both converter stations.

5.4.3.2 Internal clearances to ensure safe distances from the electrical equipment to the building structure, together with definition of parameters to accommodate differences in the standard designs offered by the different suppliers meant that the curved roof had to be modified. A new reference design for a typical converter station was also developed with these increased dimensions in mind. Details for the reference design, including the height parameters, can be found in section 5.2 of this document.

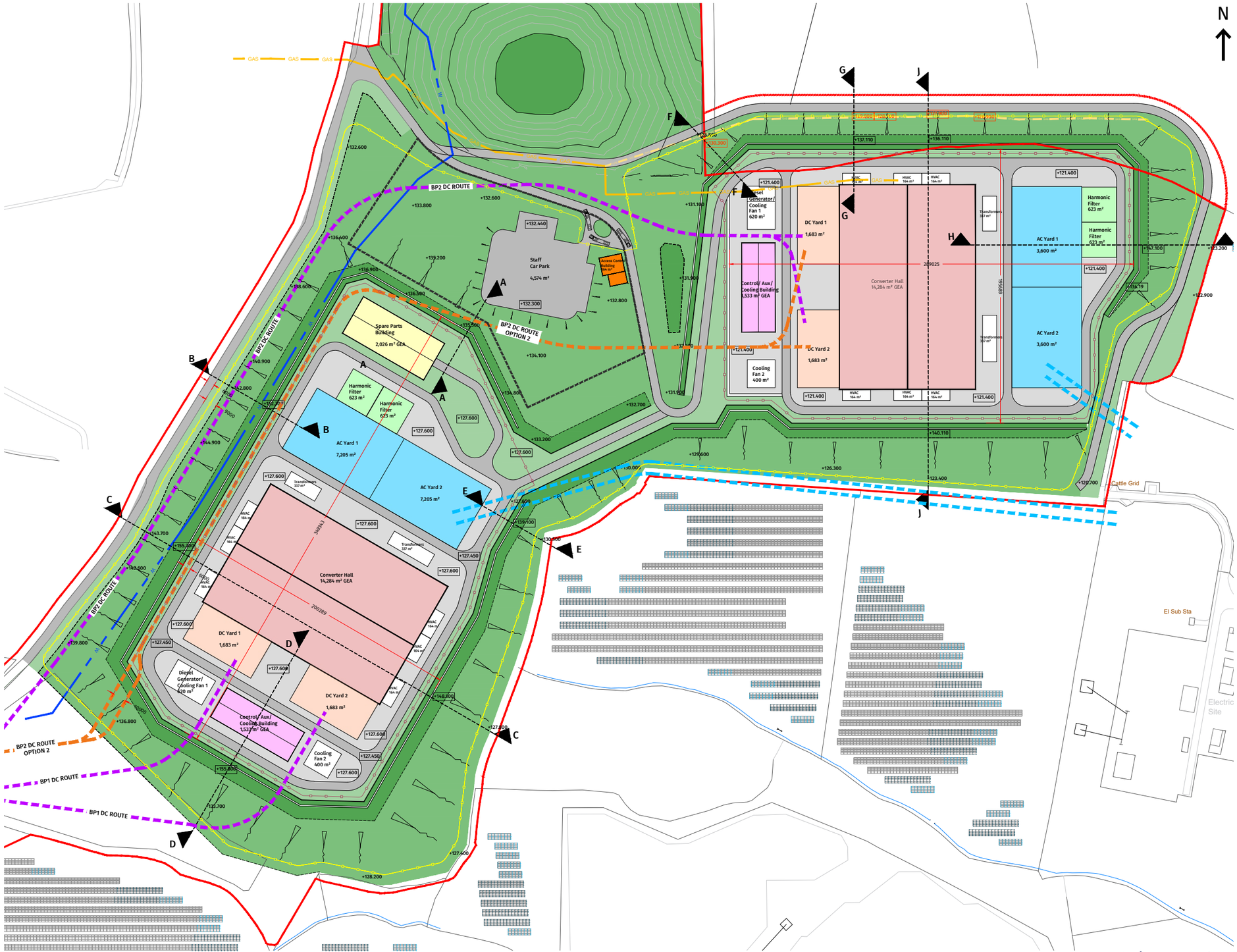
5.4.3.3 Early conceptual site plans incorporating the new reference design sought to retain the overall site layout with minor amendments to the orientation of the Western Converter Station. The aim was to provide a more adequate screening for the larger converter halls by increasing the landscaped bunding to the west.

5.4.3.4 The extent of the proposed red line boundary to the South-East was amended to accommodate the larger Converter Station platforms. Some existing utilities to the North of the site were also proposed to be diverted. Further details on site constraints can be found in Chapter 3.0 Site Context within this document.

5.4.3.5 Figure 5.10 shows the conceptual layout following the development of a typical Converter station reference design.

5.0 Consultation & Design Evolution

Figure 5.10 Early conceptual Site Plan with reference designs for the Converter Station

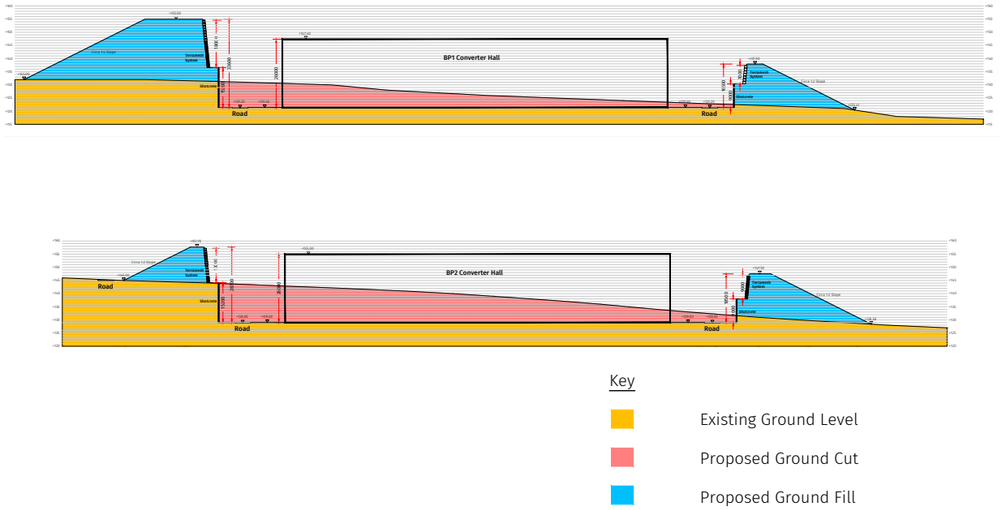


5.0 Consultation & Design Evolution

5.4.3.6 Consideration of the cut and fill operations required further re-orientation of both converter stations, aligning them in a North to South direction. The proposed reorientation reduced the extent of cut required into the hillside to site the converter buildings, thereby reducing the volume of materials generated during excavation. A review of the size and volume of proposed landscaped bunds also helped to balance the cut and fill operations, resulting in an overall reduction in the anticipated number of construction vehicle (HGV) movements required during the construction phase.

5.4.3.7 The design development of the site plan also proposed the reduction of the Converter Stations' visual impact by increasing the visual mitigation using landscaping bunds on all sides of the converter stations. This alteration to include additional bunds while accommodating supply chain feedback for a larger platform necessitated the use of steeper, near-vertical internal bund construction to allow sufficient space for the converter stations inside the bunds. The proposed vertical internal facing of the bunds was to be a combination of shotcrete with appropriate stabilisation fixings (e.g. rock bolts) and gabion baskets (rock filled basket). Figure 5.13 shows some illustrative cross-sections through both Converter Stations, showing how the proposed bunds relate to the scale of the proposed Converter Halls.

Figure 5.11 Proposed Cross-Section for both Converter Stations

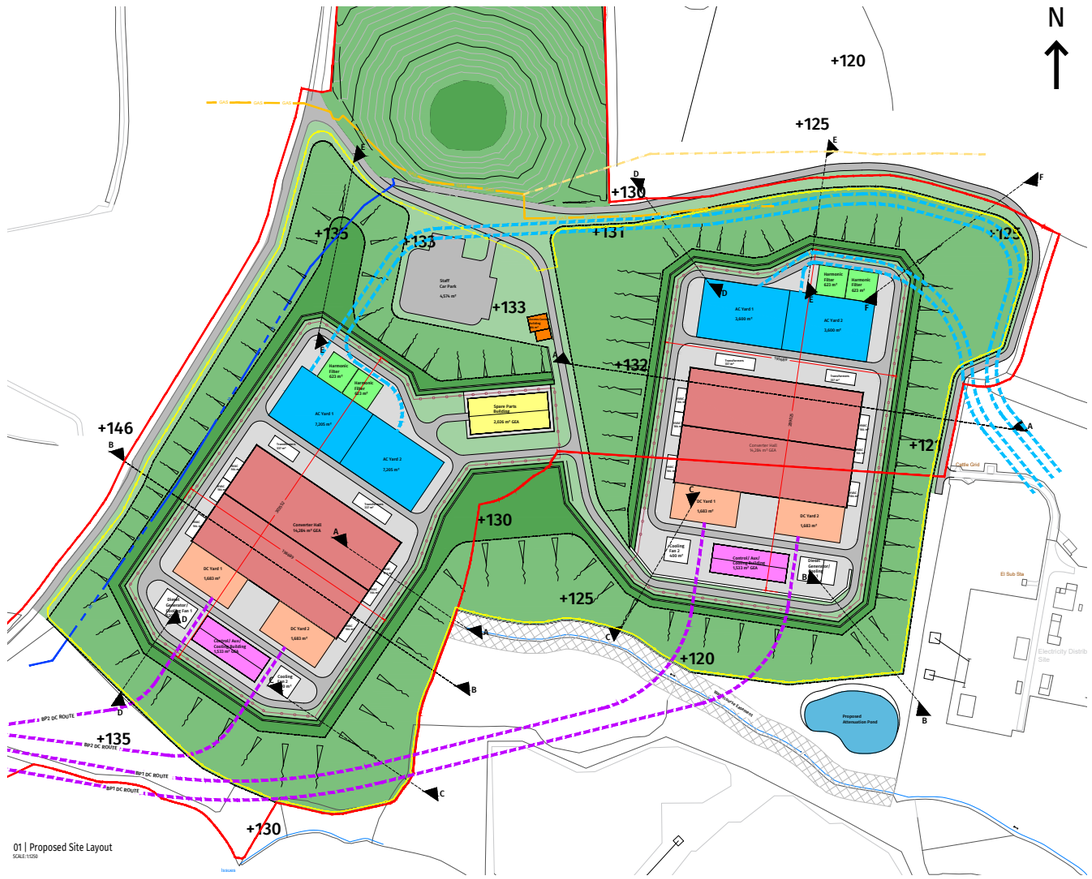


5.4.3.8 The advantages of the proposed design with bunding surrounding the converter buildings were:

- A reduction in the potential for surplus materials from cut operations requiring export from site, thereby reducing the project's potential construction traffic impacts.
- A reduction in visual impacts from views from the south and east (in addition to views from the north and west) associated with a greater volume of landscape bunding.

5.4.3.9 The proposed design required the removal of a portion of a consented solar farm currently in the construction phase (planning reference: 1/1057/2021/FULM - Land At Webbery Barton And Cleave Farm Bideford Devon) in the field immediately west of the existing Alverdiscott substation. This equated to circa 10% (4.5MW) of the solar farm's overall proposed installed capacity. The loss of 4MWp from the solar farm would be offset by 3.6GW of clean energy from the Proposed Development. The Applicant engaged with the solar farm owner to confirm the impacts on their development and how the decommissioning of the constructed solar panels would be managed.

Figure 5.12 Illustrative Site Plan showing the re-orientation of the Converter Stations



5.0 Consultation & Design Evolution

5.5 Design evolution post PEIR and Statutory Consultation (Stage 4)

5.5.1 The design evolution during Stage 4 has taken into account responses from the Statutory Consultation and ongoing engagement with the Local Planning Authorities and Statutory Environmental Bodies. The indicative design developed during Stage 4 has informed the final environmental assessment for the development of the Environmental Statement.

5.5.2 Onshore HVDC Cable Corridor

5.5.2.1 The Onshore HVDC Cable Corridor was further refined in Stage 4 following an additional site walk with an independent trenchless drilling specialist to review the full cable corridor route (full access was not previously available during earlier design stages) and a review of the siting of drilling compounds. This resulted in minor edits to the locations of the proposed drilling compounds and the alternation and reduction of the Order Limits for the Onshore HVDC cable corridor, particularly around Buckland Road, West Ashridge and the eastern side of the River Torridge.

5.5.2.2 The need for trenchless drilling at Buckland Road was reviewed during the site visit during Stage 4 and following review and engagement with relevant landowners, the Applicant determined that a better solution was to trench around the existing woodland and waterway rather than drilling underneath. The engagement with the landowner identified an option to construct the proposed haul road on the same alignment as the proposed cable corridor instead of ending the access at the initially proposed trenchless drilling compound. This allowed for the removal of Dunne Lane from the Order Limits as access along the lane and private road at Littleham was no longer required.

5.5.3 Onshore Converter Site

5.5.3.1 The design evolution of the Converter Site during Stage 4 was primarily driven by the Applicant's objective to reduce the overall import requirements, while also enabling a more landscape focused approach for the proposed bunding, following the design development in Stage 3. This was achieved by reducing the proximity between the two converter platforms and re-orientating them within the existing topography to further reduce the cut export.

5.5.3.2 The reduction in the spacing of the platforms allows for:

- A more compact site thereby reducing the length of the bunding required to provide screening to the Converter Stations.
- The separation of operational access roads for the Proposed Development and the existing Alverdiscott Substation Site, for which NGET requires 24/7 unrestricted access.

5.5.3.3 A revised landscape bunding strategy relies on providing a visually overlapping hill arrangement. The profile of the bunds has been designed to have a more naturalistic gradient that would help to assimilate into the wider landscape. Mixed native woodland planting would be used to provide further screening, soften the bunds, provide habitat creation and assist in soil stabilisation.

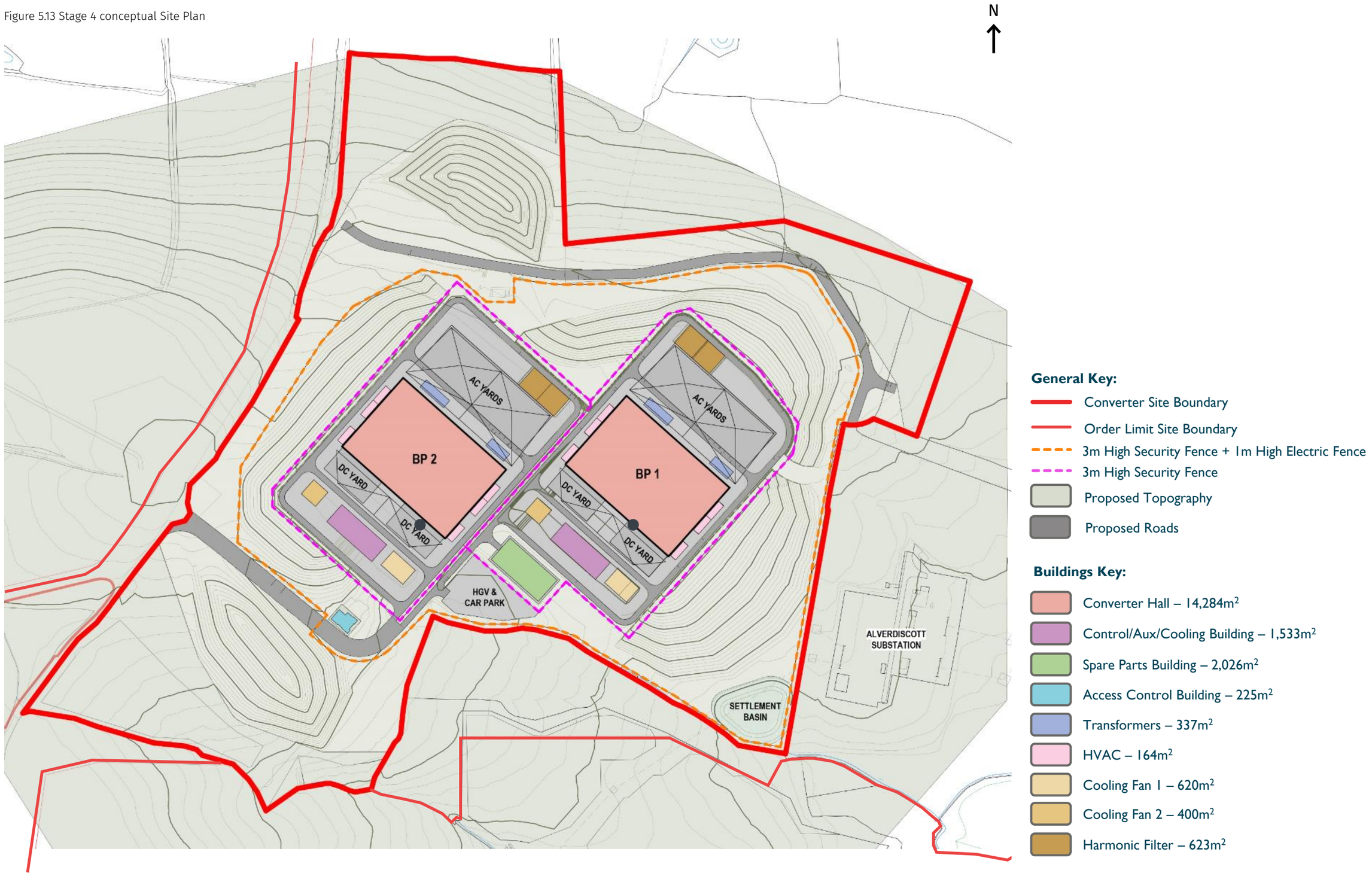
5.5.3.4 The overlapping hill arrangement also has the added benefit of enabling better routing of the HVDC cables into the converter halls without passing under the bunds, avoiding thermal limitations.

5.5.3.5 The Order Limits boundary at the Converter Site was also reduced during Stage 4 compared to those presented in PEIR. This was driven by ongoing discussions with Statutory Undertakers, particularly National Grid Electrical Distribution (NGED), in which the requirements for potential diversions of existing utilities were confirmed, allowing the reduction in boundary as the extent of working and operational areas were confirmed by each relevant Statutory Undertaker.

5.5.3.6 A utilities corridor was retained in Stage 4 along the western side of the unnamed road connecting to the Converter Site. This was retained to provide flexibility for the detailed design in the event that the western landscape bund screening views of the Converter buildings from the west, clashes with the existing water mains (two off) and medium pressure gas main. In the event of a clash, the utilities would be diverted to the utilities corridor before connecting back into the Converter Site near the proposed NGET access road.

5.0 Consultation & Design Evolution

Figure 5.13 Stage 4 conceptual Site Plan



5.0 Consultation & Design Evolution

Table 5.2 - Summary of key feedback and Design Evolution to date

	Feedback	Design Evolution
STAGE 2	Community feedback to find alternative Onshore Cable Route Corridor to avoid close proximity to residential properties and the local primary school in Abottsham.	Alternative route proposed to avoid close proximity to residential properties and the local primary school in Abottsham.
	Community feedback to find alternative Converter Site to Hunstshaw due to the impact of the proposed development within the local context.	Alternative Converter Site at Old Webbery showground presented with an initial conceptual site plan. Western and Northern Landscape bunds proposed to mitigate visual impact.
STAGE 3	Requirement for an increase in the dimensions of the main converter buildings and associated infrastructure and equipment following early engagement with supply chain. Requirement for internal clearances to ensure safe distances from the electrical equipment to the building structure.	Development of Site Plan to incorporate the increase in the dimensions of the main converter buildings and associated infrastructure and equipment. Existing utility diversions proposed. Curved roof of the Converter Halls modified to pitched/ gabled roof to ensure safe distances from the electrical equipment.
	Concerns raised about the visual impact of the larger converter halls and the affected views from the South and East.	Development of additional landscape bunds around the perimeter of the converter site to provide better screening.
	Outline analysis and review of cut and fill shows a requirement to reduce the extent of cut to reduce the number of construction vehicle movements during construction.	Re-orientation of Converter Stations within the Converter Site to reduce the extent of cut within the existing topography. Draft Order limit revised to include additional land to accommodate
STAGE 4	Post statutory consultation review of the traffic numbers for the Converter site with aim of reducing the overall import requirements.	Alternative layout proposed which reduces the proximity between the two Converter Platforms and re-orientating them within the existing topography to further reduce the cut export.
	Review of engineered bunding proposed in Stage 3 with the aim of developing more natural landscaped bunds more sympathetic with the contextual landscape.	The development of landscape bunding which utilises a visually overlapping hill arrangement. Proposed new profile of the bunds with more natural gradient to better assimilate into the wider landscape. Proposed mixed native woodland planting used to provide further screening, soften the bunds, provide habitat creation and assist in soil stabilisation. The new bunding increases the fill requirement therefore further reducing the cut export.
Post DCO Consent	Further development of detailed design guided by established design principles outlined within the Design Principles Statement (Document Ref. 7.4)	

6.0 Design Review Process

6.0 Design Review Process

6.1 Detailed Design Approval - Converter Site Only

6.1.1 The Detailed Design Approval is a mechanism secured within the DCO (Requirement 4) which is only applicable to the Converter Site. The project would ensure:

- The continued engagement with the relevant stakeholders following the DCO Application and through to detailed design.

6.1.2 The Design Review Process would build upon the design developed for the Environmental Statement in accordance with this Design Principles Statement (Document 7.4) and would be undertaken in consultation with relevant stakeholders, to inform the detailed design developed by the responsible Contractors.

6.1.3 The process would be initiated upon contractual engagement of the Converter Station civils and OEM Contractors and is anticipated to commence in 2025.

6.2 Local Design Panel

6.2.1 The Project is committed to working with the local planning authorities and key stakeholders to develop the detailed design of the Converter Site. There are certain elements of the design that the Applicant would not be able to consult on or provide flexibility for as they are driven by other considerations such as safety standards or technical constraints (size, type and suitability of equipment). However, where elements are not controlled by external constraints, the Applicant is committed to a design review process that ensures the continued participation of the relevant stakeholders which would be essential to delivering a design that adheres to the requirements of good design.

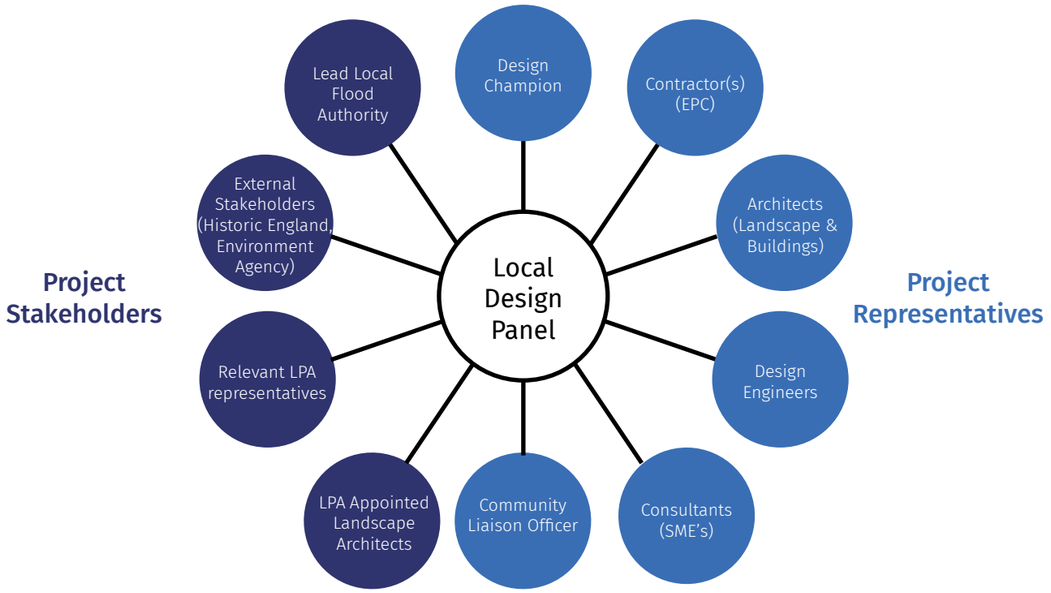
6.2.2 The Applicant proposes the establishment of a Local Design Panel, membership of which requires confirmation, but is anticipated to include relevant members of Torridge District Council and Devon County Council operating in their capacity such as architectural treatments, landscaping design and highways design. External stakeholders including Historic England and Environment Agency would be consultation on matters related to their statutory duties.

6.2.3 The purpose of the Local Design Panel is to facilitate the development of the detailed design consistent with the Proposed Development's Design Principles and technical requirements, resulting in a consultative process that delivers a detailed design Torridge District Council can approve as the nominated approval authority.

6.2.4 Terms of Reference, meeting frequency and duration would be confirmed prior to the start of the meetings. Meeting minutes would be recorded to support future decision making and evidence agreement within the Local Design Panel.

6.2.5 To ensure a holistic approach is taken, the Applicant would appoint a Project Design Champion to lead the consultation and design review process. The Project Design Champion would chair the Local Design Panel meetings.

Figure 6.1 Representatives of the Local Design Panel



6.3 Project Design Champion

6.3.1 The *NPS-EN1* requires the appointment of a Project Design Champion. The Applicant nominated Project Design Champion would be confirmed in 2025 along with the relevant Construction Contractors.

6.3.2 The Design Champion is accountable for delivering coherent good design and holds the project team to account in terms of a macro vision of design. The Design Champion would guide and champion an iterative design process to test the best way of achieving the design principles as set out in this document.

6.3.3 The Design Champion would:

- Chair the Local Design Panel
- Be the focal point for coordination of good design for the Proposed Development's Converter Site
- Ensure good coordination with National Grid and other statutory undertakers who have existing and new assets within the Converter Site boundary.
- Ensure good design continues to be prioritised and would provide a continual emphasis on the design vision throughout the detailed design process, holding the Project team accountable for delivering the design principles outlined in the Design Principles Statement (Document 7.4) and incorporating the stakeholder feedback as practicable within the Local Design Panel.

6.3.4 The Design Champion would be supported by the Project Design Leads to ensure that the Design Champion's vision is embedded in the core of the project team.