The Great Grid Upgrade

Eastern Green Link 5 (EGL 5)

Converter station - background to potential design approaches

May 2026

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nationalgrid

Contents

1. Introduction

1.1 Introduction

1.1.1 Eastern Green Link (EGL) 5 is a proposed new electrical connection being developed by National Grid Electricity Transmission plc (referred to in this document as NGET). This document has been prepared on behalf of National Grid Electricity Transmission (NGET), the Applicant, and is intended to provide a background to how good design would be achieved, as well as further information regarding the potential landscape and architectural design approaches that could be applied to the converter station site. The topics covered by this document will be addressed in more detail in a Design Approach Document (DAD) when the application for Development Consent is made.

Figure 1.1 Eastern Green Link 5 Project Overview Diagram

Purpose of the document

1.1.2 This document has been produced for the EGL 5 stage 2 consultation and should be read alongside the following stage 2 consultation documents:

- Stage 2 consultation document
- Stage 2 consultation feedback form
- Draft Design Principles Statement
- Preliminary Environmental Information Report (PEIR)

1.1.3 This document provides background to the illustrative outline design approach materials that have been provided for the EGL 5 stage 2 consultation. It offers an explanation as to how the existing context has informed design decisions and what precedents have inspired the design responses that are being developed. By offering this detail we are inviting stakeholder feedback on our process as well as design outputs as we believe this will lead to a better understanding of what matters to the local community and lead to better outcomes for the project.

1.1.4 The design approaches included in this document are at an early stage of development and suggest potential ways in which the design could work. The images suggest a direction of travel rather than showing finished designs. The images are deliberately sketchy to leave room for development in line with feedback. Four different potential building design approaches have been included in the document, with each one coming from a different aspect of the context. Whist there will be an opportunity to express a preference in the **Stage 2 consultation feedback form** we would also welcome views as to how aspects could be combined or modified. We will take on board responses to the document when developing the landscape and building design approaches.

Structure of the document

1.1.5 The document is split into five sections:

- Section 1 - Introduction: includes a project overview, the approach to coordination, and a summary of the design approaches.
- Section 2 – Achieving good design: includes the response to the design vision and the relationship with the draft Design Principles Statement setting out the design intent.
- Section 3 – Outline design approach: showing the overall English Onshore Scheme and the wider landscape approach.
- Section 4 – Proposed converter station site: this section focuses on the area around the converter station and is split into three main sub-sections:
    - Introduction to converter stations – covering what the converter station is with information regarding the indicative layout that has been used to develop the design sketches in this document. It also shows examples of other completed converter stations for reference.
    - Emerging landscape design approach – covering the key elements of site analysis identifying the key landscape patterns of the context that inform the key themes developed in the landscape proposals.

- Emerging architectural design approach – covering how the four different building design options have been developed from context analysis and development sketches.

- Section 5 – Next steps – explaining how stakeholder feedback will be used in developing a Design Approach Document in the application for Development Consent, and how commitments to design quality will be captured in the Design Principles Statement.

1.1.6 Defined terms and acronyms are provided within the **PEIR Glossary**. Any reference made in this document to the 'site' should be interpreted as the location of the converter station and the surrounding landscape mitigation proposals.

1.2 The Project

1.2.1 EGL 5 is a proposed 2 Gigawatt (GW) high voltage link being developed to reinforce the electricity transmission system between Scotland and England. Separate consents are required and will be sought for the Scottish elements of EGL 5 by Scottish and Southern Electricity Networks Transmission (SSEN-T). The Project spans both marine (offshore) and terrestrial (onshore) environments and have therefore been split into two geographical parts, referred to as the 'English Onshore Scheme' and the 'English Offshore Scheme', collectively termed 'the Project'. This document only applies to the English Onshore Scheme.

1.2.2 The English Onshore Scheme would be located within Lincolnshire. Elements of the English Onshore Scheme would be located along the Lincolnshire coast in East Lindsey, at Anderby Creek. From the coastline, the Project would continue for approximately 8 km (new underground HVDC cable) and connect into the EGL 5 converter station in the vicinity of the proposed 400 kV Lincolnshire Connection Substation-B (LCS-B) in East Lindsey (the LCS-B substation is considered as part of the NGET Grimsby to Walpole (GtW) Project). In addition, approximately 1 km of new underground HVAC cable will be required between the EGL 5 converter station and the connection point at the proposed 400kV LCS-B.

1.2.3 The Project has been designed to increase the capability of the electricity transmission network to carry low carbon and renewable energy from where it is generated to where it is used in homes across the country.

English Onshore Scheme: permanent infrastructure

1.2.4 The EGL 5 English Onshore Scheme would comprise the construction of:

- A new converter station, in the vicinity of the proposed 400 kV LCS-B, in East Lindsey;

- A Transition Joint Bay (TJB) connecting the offshore and onshore HVDC underground cables at the Anderby Creek Landfall;

- Up to 8 km of new underground HVDC cable, from the Landfall point at Anderby Creek to the EGL 5 converter station in the vicinity of the proposed

400 kV LCS-B in East Lindsey;

- Up to 1 km of new underground HVAC cable, between the EGL 5 converter station and the connection point at the proposed 400 kV LCS-B (the LCS-B substation is considered as part of the NGET GtW Project);
- Temporary construction traffic access from the public highway and for land access and permanent public highway modifications and upgrades to accommodate construction deliveries; and
- Temporary and permanent drainage and drainage mitigation, and utilities modifications and diversions.

1.2.5 NGET will also need to commission local changes to lower voltage distribution networks and provide appropriate utility connections to the converter station to facilitate the construction of the English Onshore Scheme components.

1.2.6 Further detail on the Project can be found in the **Non-Technical Summary** of the PEIR.

1.3 Approach to coordination

1.3.1 The options appraisal process concluded that EGL 5 could be connected near to a Main Interconnected Transmission System Substation. The new LCS are proposed to be consented and developed as part of the NGET GtW Project. The GtW Project is being developed by NGET to reinforce the electricity transmission system to help deliver the UK Government's Net Zero targets. It forms part of a major programme of reinforcement of the electricity transmission system to accommodate substantial increases in north-south power flows. As part of the GtW Project, two new 400 kV substations are proposed in East Lindsey, one of which (LCS-B) is to be located northeast of Bilsby. The GtW Project held a stage 2 consultation in June 2025. Documents can be found on the following website https://www.nationalgrid.com/the-great-grid-upgrade/grimsby-to-walpole/document-library.

1.3.2 Coordination with the GtW Project has been a key part of making sure the two neighbouring projects sit together in their context. Workshops have been undertaken to ensure the landscape proposals of both schemes present a joined-up approach that takes into consideration cumulative effects on the context. This process will continue throughout the development of the design approaches in line with the commitments identified in the **draft Design Principles Statement**.

1.3.3 When developing the design approach for the buildings the GtW scheme will be considered as part of the context and the sketch views show the proposed substation and overhead line in the background. The substation is not proposed to contain any significant buildings, therefore coordination of architectural design approaches across the projects is not considered necessary.

1.4 Summary

1.4.1 Section 4.1 includes an introduction to the proposed converter station identifying the scale and type of development that would be required. It also includes a diagram of the

indicative typical layout used in the potential design approach sketches. The platform dimension for the converter station would comprise an area of approximately 8.8 ha and house specialised electrical equipment. The height of the tallest buildings would be up to 30 m, not including the need for additional platform raising to allow for flood risk protection and surface water drainage. Additional space would be required for landscaping, drainage and access requirements.

1.4.2 Section 4.2 covers the emerging landscape design approach proposed for the converter station site. The three key themes that have been identified are:

- **Theme 1 - Landform & site integration:**
  - The ground will be carefully shaped from north to south to help the converter station sit into the fen-edge landscape. This will make it look like the converter station is tucked into the existing fields;
- **Theme 2 - Planting & habitat development:**
  - Layers of local trees, hedges, and wild grass will be planted around the site. This will help hide the large buildings and make the edges of the station look softer. Biodiversity will also be improved and additional screening provided by planting and wetlands in and around the whole site;
- **Theme 3 - SuDS & water management:**
  - Sustainable Urban Drainage Systems (SuDS) will be built to manage rainwater. This includes ponds to hold extra water and “swales”(which are like shallow ditches for water to flow through). Blue-green systems will help the site handle heavy rain and create a natural way to contain the water.

1.4.3 Section 4.3 covers the emerging architectural design approach options for the proposed converter station. The ideas for these designs consider feedback from other similar DCO applications including Sea Link [1] and EGL 3&4 [2], as well as feedback from the EGL 5 stage 1 consultation. The four options are as follows:

- Design option 1 - Responding to the functional agricultural and aircraft hanger buildings found in the local area.
- Design option 2 - Using curved roofs to soften the shape of the buildings and responding to the landscape.
- Design option 3 - Layering the cladding to break up the flat surfaces, taking inspiration from the furrows in ploughed fields.
- Design option 4 - Taking inspiration from the large stacks of hay bales seen in the landscape to add texture to the buildings.

1.4.4 During the EGL 5 stage 2 consultation, people are invited to share their thoughts on the four design options. Feedback can also include new ideas that haven’t been mentioned yet. The project team will look closely at all these comments when deciding on the architectural design approach.

1 https://www.nationalgrid.com/the-great-grid-upgrade/sea-link
2 https://www.nationalgrid.com/the-great-grid-upgrade/eastern-green-link-3-and-4

2. Achieving good design

2.1 Response to our Design Vision

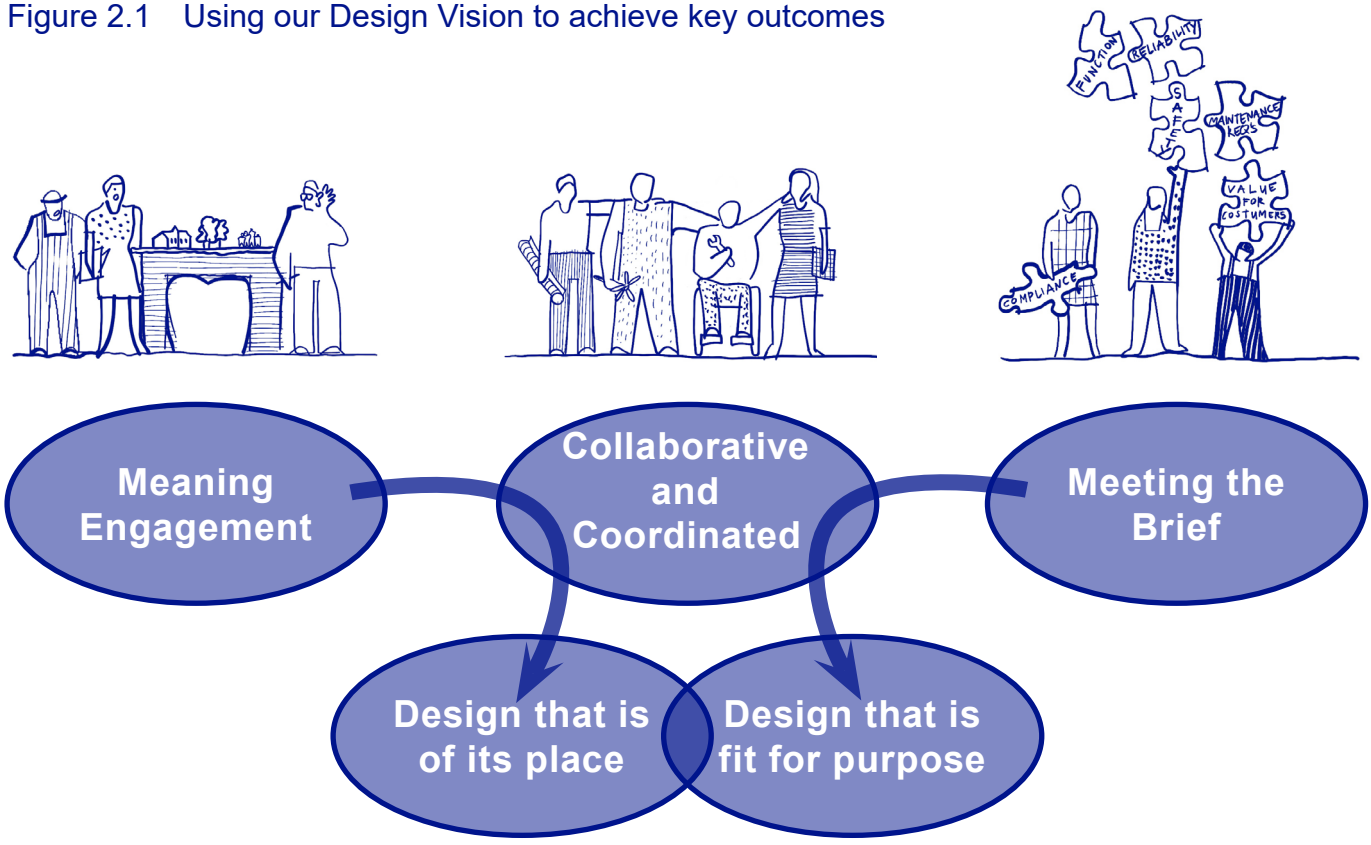
2.1.1 Government policy recognises that whilst energy infrastructure projects have lasting impacts, if well-designed and integrated with their context they can contribute to the quality of the landscape. This ambition has guided the Design Vision for the project which is set out in the draft **Design Principles Statement**.

2.1.2 The vision has three key parts that broadly cover the following:

- Meaningful Engagement - with people and place
- Collaborative and Coordinated - a multi-disciplinary design approach
- Meeting the Brief - functional, sustainable and value for money

2.1.3 The Figure 2.1 shows how our Design Vision sets in place a process for achieving good design that is both fit for purpose and also follows good place-making principles.

Figure 2.1 Using our Design Vision to achieve key outcomes



Approach to good design

2.1.4 Our design process is iterative and outputs will be refined at each stage in response to stakeholder consultation feedback as well as emerging technical and environmental information. We are at an early stage of the project and as such the design solutions are not fully resolved. Following a rigorous step-by-step design process will ensure these early design steps provide a foundation that can be built upon.

2.1.5 Our process is inspired by the guidance provided by the Planning Inspectorate's guidance, Nationally Significant Infrastructure Projects: Advice on Good Design[1]. This describes steps aligned to the flow diagram in Figure 2.2. Further to this we have identified three key stages of a design process:

- Taking research information, whether it be site analysis, precedent studies or technical constraints, and interpret this to identify the key elements which would inform the design.
- Forming a narrative response to the research, identifying the key concept themes and the intended outcomes.
- Applying these key concepts to the site, identifying the opportunities to adapt the engineering solution to achieve good place-making, and identifying the constraints the concept may need to be adapted to work within.

2.1.6 The design work in Section 4 shows how this process has been applied. This holistic environment-led design approach will shape the project outcomes ensuring a focus on mitigation measures that add the greatest value to the Project and the community.

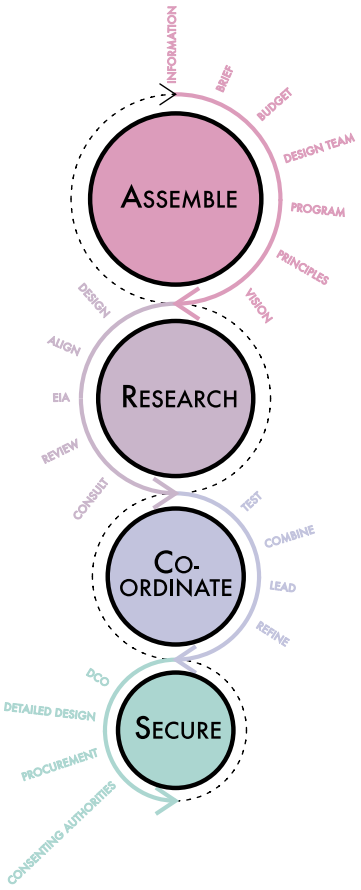


Figure 2.2 Flow diagram

1 https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-good-design#annex-a--good-design-issues-to-consider

3. Outline design approach

3.1 Wider onshore approach

3.1.1 The landscape reinstatement strategy for the English Onshore Scheme has been developed to reflect the specific landscape character context described within the Preliminary Environmental Information Report (PEIR) baseline. The reinstatement approach responds directly to the distinctive patterns of the Lincolnshire Coast and Marshes and the transition inland across the Tetney Lock to Skegness Coastal Outmarsh and Holton le Clay to Great Steeping Middle Marsh Landscape Character Assessments (LCAs). These landscapes are defined by regular rectilinear field systems, engineered drainage networks, and the long established agricultural land uses that dominate the fen, marsh and reclaimed coastal environments.

3.1.2 Reinstatement following construction would focus on restoring agricultural land capability, and reinstating soils in accordance with a Soil Management Plan. This reinstatement strategy would ensure the continuity of drainage infrastructure that is fundamental to landscape function. This includes the preservation or reinstatement of ditches, drains, culverts and riparian vegetation where practicable. The strategy avoids creating isolated, unproductive land parcels and maintains the coherence of existing field geometries that arise from historic reclamation and enclosure.

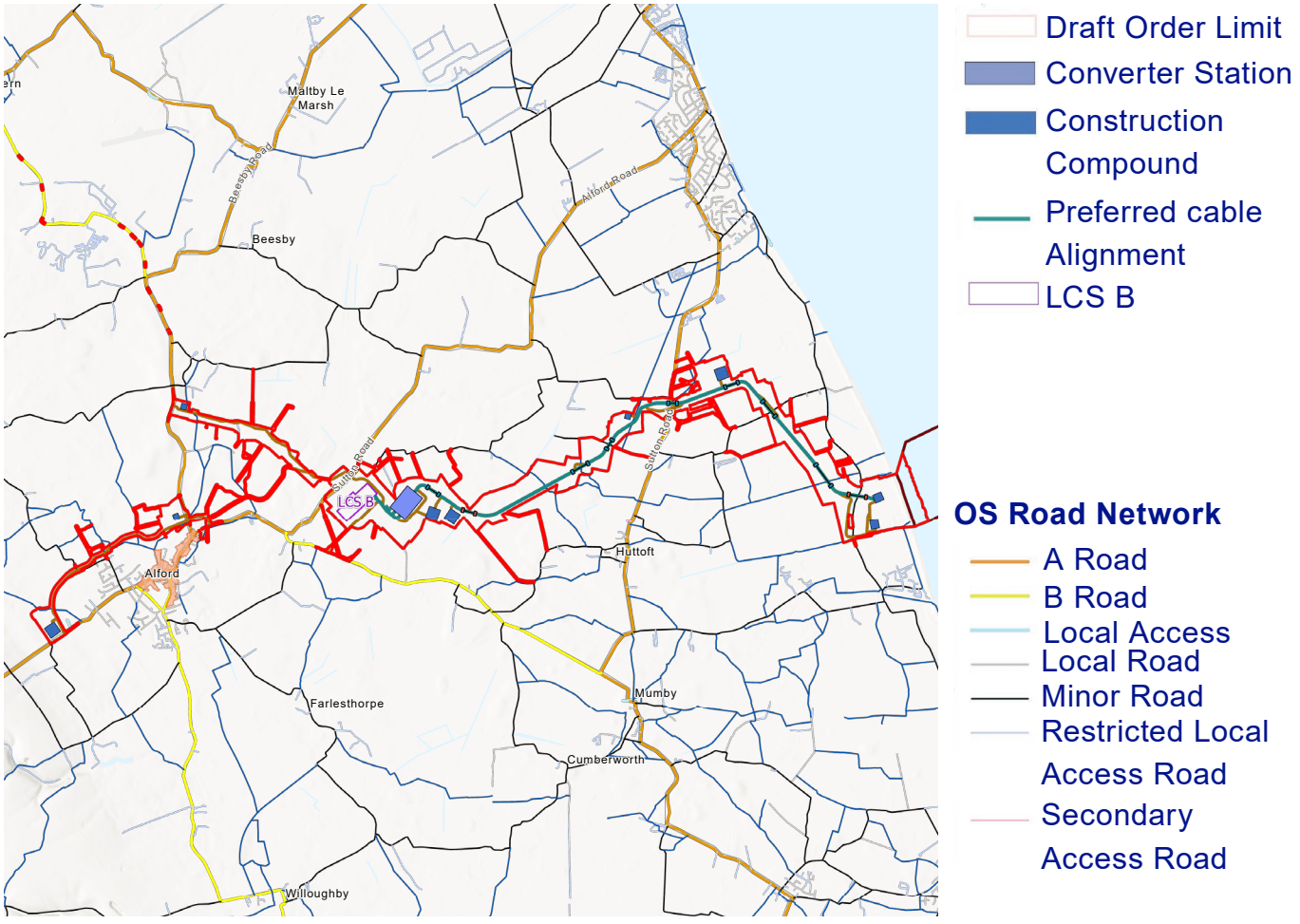


Figure 3.1 Landscape framework for the onshore approach

3.1.3 The plan for fixing the land matches the way the local area is shaped. It follows the patterns of the man-made drains and the different types of field edges. It also respects the way the land changes from the low, flat “Outmarsh” to the slightly different “Middle Marsh”. The study area also includes the Lincolnshire Wolds, which have hills that form a background to the site. The landscape design will include hedgerows and wet grasslands to reflect the surrounding landscape.

3.1.4 When building work affects hedgerows, they will be replaced with types of plants that are suitable for the LCA. If HVDC/HVAC cables are buried underground in these locations, only plants with shallow roots can be used in those spots. The plan looks at how the land will look over 1 year and 15 years. While the fields and soil can be fixed quickly, it will take longer for the trees and hedges to grow to their full size.

3.1.5 The landscape design for the English Onshore Scheme looked at three themes: landform, vegetation and habitat structure, and managing water. Each theme will inform the development of the Outline Code of Construction Practice (CoCP) and Outline Landscape and Ecological Management Plans (LEMP).

- Keep landform subtle;
- Reinforce existing patterns;
- Use planting that fits the place;
- Match SuDs to drainage lines;
- Restore farmland as found;
- Respect openness and key views;
- Follow easement rules for planting;
- Strengthen biodiversity links; and
- Blend infrastructure into its landscape setting.

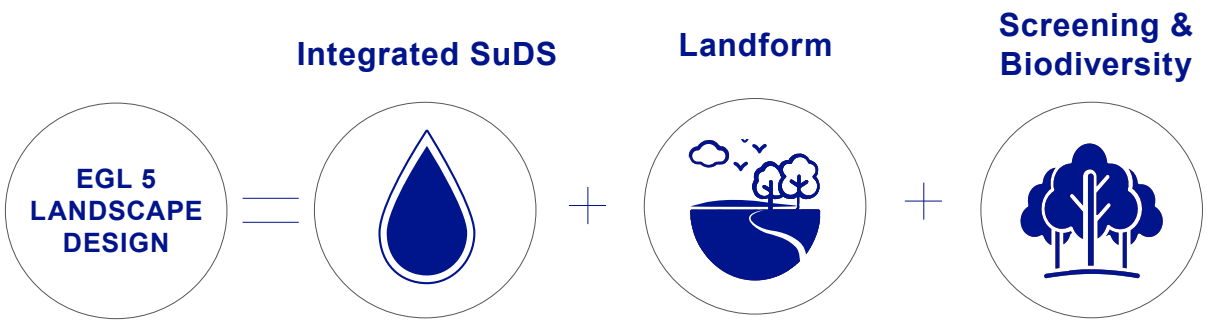


Figure 3.2 Diagrams showing landscape design approach

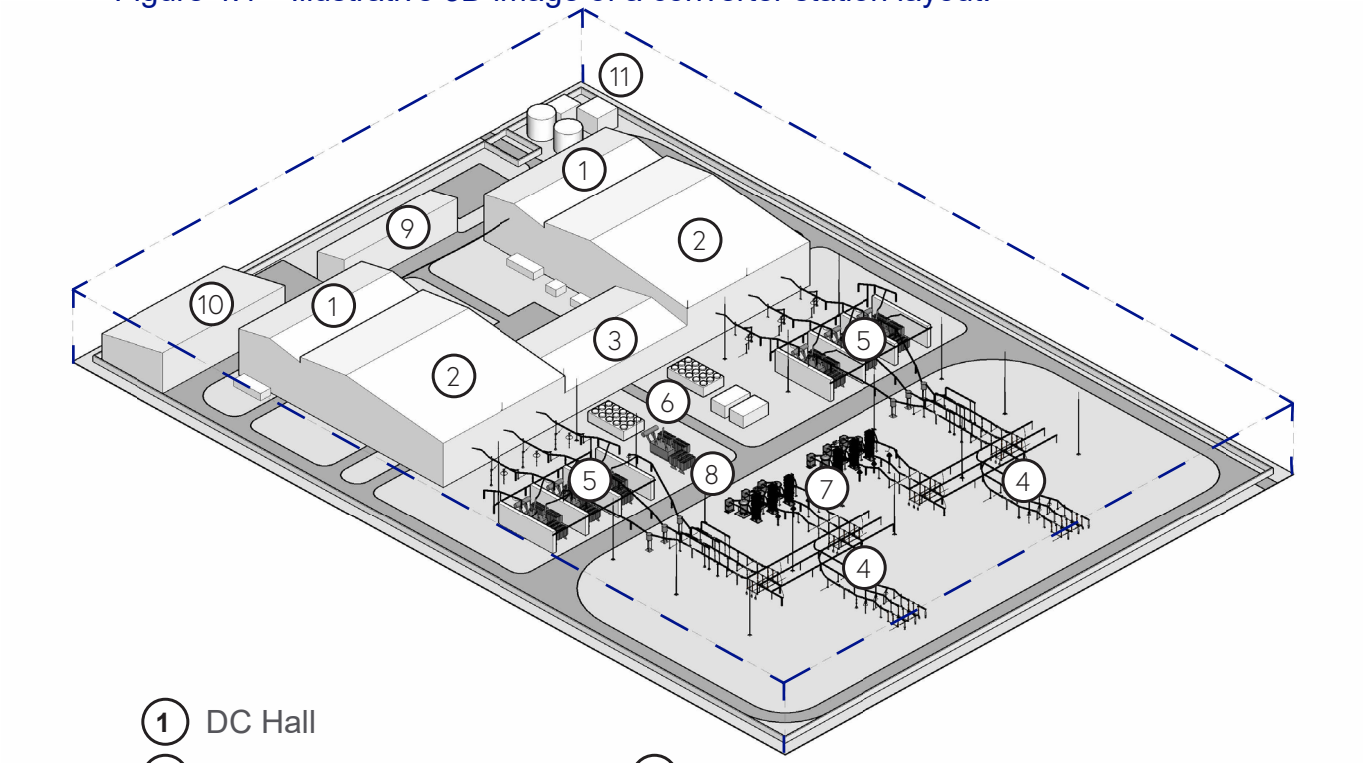
4. Proposed converter station site

4.1 Introduction to converter station design

4.1.1 The materials and cladding used in converter station environments are typically simplistic, utilising greys and greens to blend into the surroundings. Exact specifications vary depending on location and stakeholder engagement. A description of the infrastructure that would be required for the converter station can be found in the PEIR at **Volume 1, Part 1, Chapter 4: Description of the Project**. The development platform for the proposed converter station would comprise an area of approximately 8.8 ha and house specialised electrical equipment. It should be noted that this excludes related development including permanent access, peripheral landscaping, earthworks, drainage (i.e. attenuation basins) and other related works. The height of the tallest buildings would be up to 30 m, not including the need for additional platform raising to allow for flood risk protection and surface water drainage.

4.1.2 At this stage of the consenting process, the layout of the converter station is indicative and a Rochdale Envelope approach may be used to define a design envelope and parameters within which the final design would sit. This is indicated in Figure 4.1 below by a blue dashed line.

Figure 4.1 Illustrative 3D image of a converter station layout.



1. DC Hall
2. Valve and Reactor Halls
3. Control Building
4. AC Equipment
5. Transformers
6. Valve Coolers
7. AC Filters
8. Spare Transformer
9. Amenities Building
10. Storage & Maintenance Building
11. Ancillary Buildings & Fire Safety Equipment

Converter station precedents

4.1.3 The design team has studied other converter station projects in the UK and Europe. These examples show the types of buildings needed and different ways they have been designed. Each project is slightly different, depending on the technology used, how much power it handles, and the voltage. These factors affect how large the buildings need to be.

Viking Link, Biker Fen, Lincolnshire

This is the closest finished converter station to the Bilsby area. The buildings are painted green to match nearby farm buildings. Bands of colour are used to break up the shape, which helps reduce how noticeable they are, especially from further away.

Figure 4.2 Viking Link converter station, UK

Viking Link, Resing, Denmark

These buildings have a simple dark base, and on the upper section has metallic cladding. The top layer of the rainscreen cladding is decorated with perforation patterns designed by a local artist to reflect the area's history and culture.

Figure 4.3 Viking Link converter station, Denmark

IFA2, Fareham, Hampshire

Earth banks and planting have been carefully placed around the site to help hide it from certain viewpoints. One side is more open because it faces an airport. The building colours match nearby airport buildings so they fit in better.

Figure 4.4 IFA2 converter station, UK

NordLink, Wilster, Germany

This area has a landscape similar to Bilsby, with very few trees for screening. The buildings are simple in shape and painted green. The site also includes a drainage ditch around the edge.

Figure 4.5 Nordlink converter station, Germany

4.2 Emerging landscape design approach

Landscape character & visual baseline

4.2.1 The site lies within a flat, open landscape comprising several character areas, from the Naturalistic Coast at Donna Nook and Gibraltar Point, with wide skies and open views, to the inland Coastal Outmarsh farmlands characterised by large rectilinear fields, drains and limited tree cover.

4.2.2 Further west, the Middle Marsh area introduces gently rising land, smaller and more irregular fields, increased hedgerows and planting, and villages on slightly elevated ground with distant views toward the Lincolnshire Wolds.

4.2.3 Water infrastructure such as drains, dykes and pumping stations strongly influences the landscape, reinforcing its managed and agricultural character. Overall, the area is quiet and expansive, with long-distance views across open land, punctuated by occasional vertical elements such as pylons and farm buildings.

4.2.4 The Lincolnshire Wolds form a key visual backdrop, emphasising the contrast between the low-lying fenland and higher ground. This character informs the landscape strategy for EGL5, guiding planting, landform and integration of new development within the existing landscape.

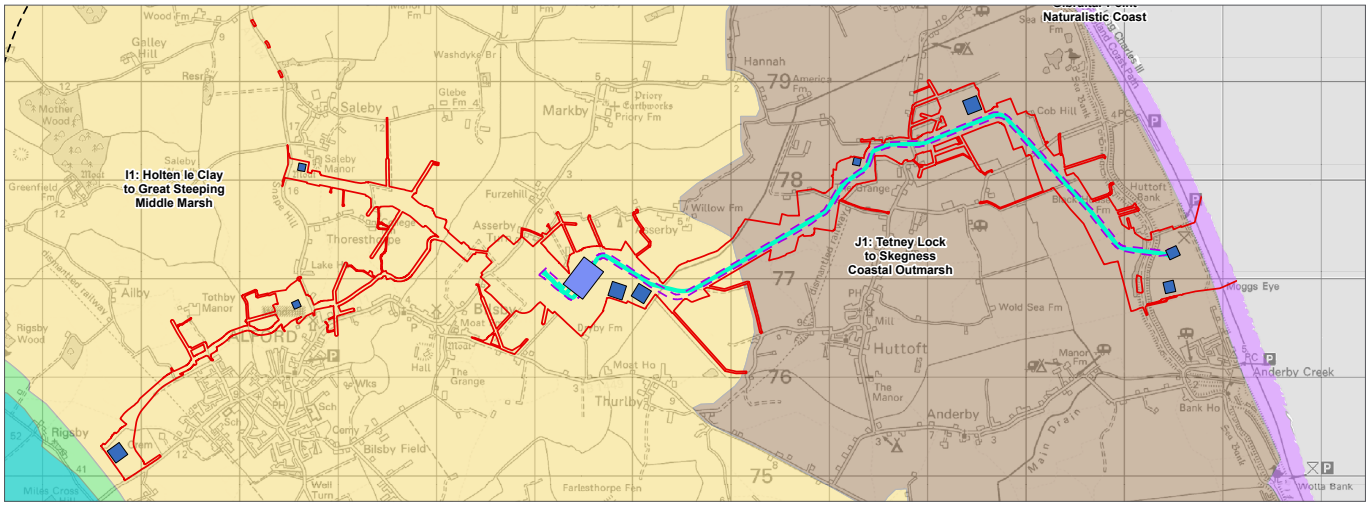


Figure 4.6 Local Landscape Characters

ELDC Landscape Character Area

- Draft Order Limit
- Study Area
- Construction Corridor
- Construction Compound
- Converter Station
- Donna Nook to Gibraltar Point Naturalistic Coast
- Holten le Clay to Great Steeping Middle Marsh
- Little Cawthorpe to Skendleby Wolds Farmland
- Tetney Lock to Skegness Coastal Outmarsh

Landscape pattern analysis

4.2.5 The landscape around the site is shaped by long-established farming and small rural settlements. Figure 4.7 shows a historic map with the current and proposed field margin reinforcement overlaid. The proposed position of the converter station is indicated in grey. The map shows how, over time, fields have been consolidated into larger more productive land parcels by removing hedgerows. It highlights the opportunity to reinstate some of these. Historic mapping shows the area has remained largely open and agricultural over time. The land is generally flat and low-lying, with wide skies and long views across open fields.

4.2.6 Large arable fields dominate, divided by hedgerows, ditches and occasional lines of trees. Smaller pasture fields are found closer to villages and along rural roads, where grazing animals are common. Straight drains and ditches are a noticeable feature, reflecting the area's role as managed farmland.

4.2.7 Trees and woodland are limited and tend to be clustered around villages, buildings and former transport routes. Nearby settlements, including Asserby, Bilsby and Thurlby, are small in scale and rural in character, with traditional buildings that sit comfortably within the surrounding countryside.

4.2.8 Overall, the landscape is defined by openness, working farmland and scattered villages, providing a clear framework for sensitive landscape enhancement and planting.

Figure 4.7 Landscape pattern analysis showing the proposed converter station location in grey.

Settlement | Predominant Land use | Drainage

Figure 4.8 Landscape pattern analysis diagrams

Landscape visual baseline

4.2.9 Views across the outmarsh, fens and marshland landscapes are typically wide, open, and horizontal in nature, offering long vistas over arable fields framed by drainage dykes, distant shelter belts, and isolated farm buildings. The subtle topography and absence of major vertical features create a strong sense of openness offering panoramic views both east and west.

4.2.10 The key visual receptors within the converter station site are listed below:

- Residents on the southern edge of Asserby Village
- Residents on the eastern edge of Bilsby Village
- Public Right of Way Bils/11/1 to the southwest of Asserby
- Public Right of Way Bils/13/1 to the east of Thurlby
- Public Rights of Way to the south-east of Bilsby

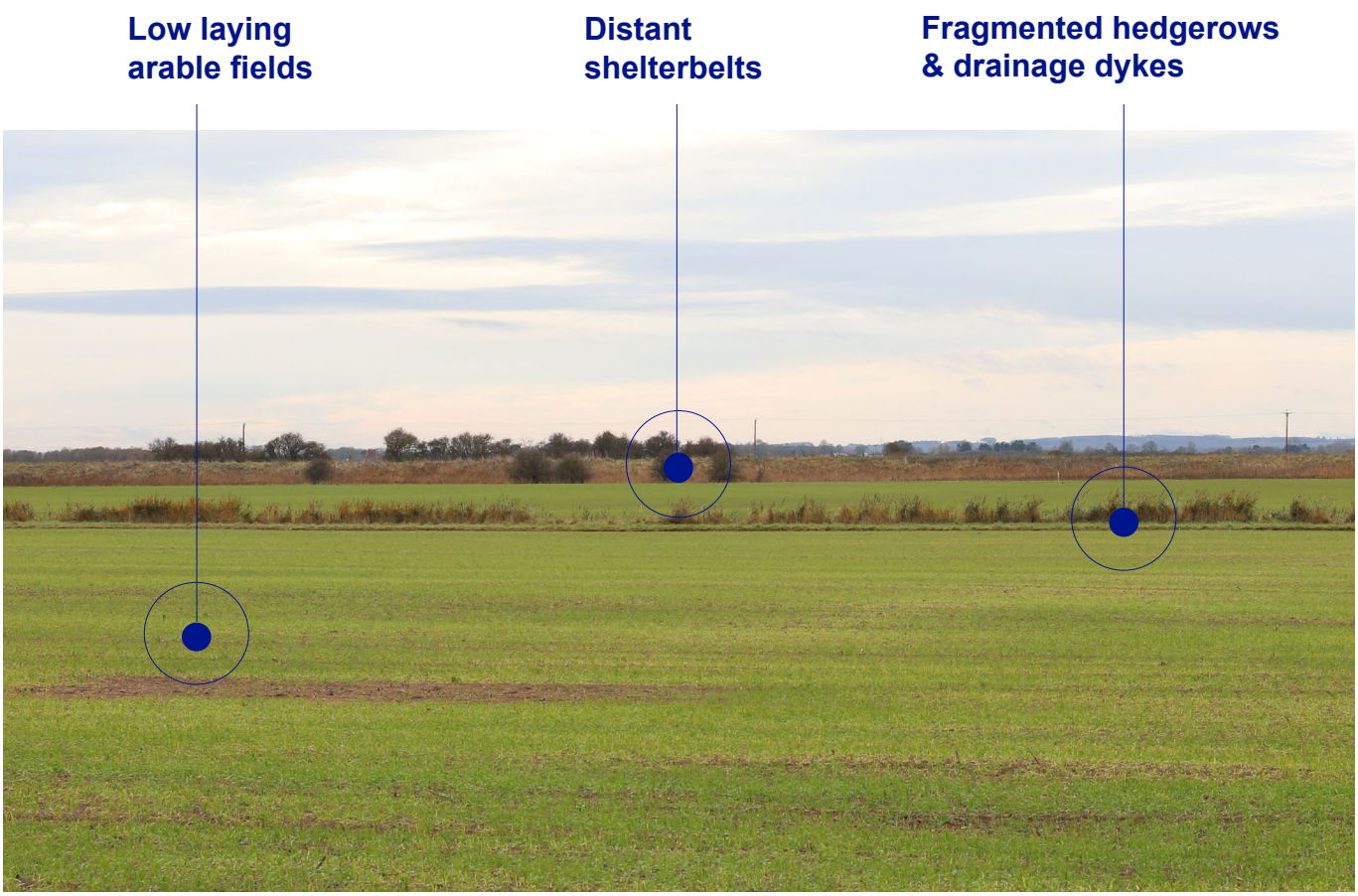


Figure 4.9 Visual labelled LVIA photograph

Opportunities and constraints introduction

4.2.11 The English Onshore Scheme converter station site is located to the north-east of Bilsby, crossing Sutton Road (A1111) and extending towards Saleby in the north-west. The surrounding area is predominantly rural, with no large towns nearby, although key transport routes including the A52 and A1111 pass through the wider landscape and influence access and movement. The site falls within the administrative areas of East Lindsey District Council and Lincolnshire County Council. Within 10 km of the site are several nationally and internationally designated ecological sites associated with the Lincolnshire coast and estuarine environments, including the Greater Wash SPA, Humber Estuary SAC/SPA/ SSSI/Ramsar, and the Saltfleetby–Theddlethorpe Dunes and Gibraltar Point SAC/SSSI. This indicates a wider landscape of high ecological value and sensitivity. Although no priority habitats are present within the converter station site itself, areas of woodland occur within the surrounding landscape, particularly to the north-west and south, contributing to local landscape structure and ecological connectivity. The fen and marshland landscape is further defined by an engineered network of drains, ditches and field margins, which also function as linear green infrastructure corridors. Together, these features present opportunities to integrate landscape mitigation, drainage and habitat enhancement within a coherent framework that responds to the established field pattern, hydrological systems and wider ecological context.

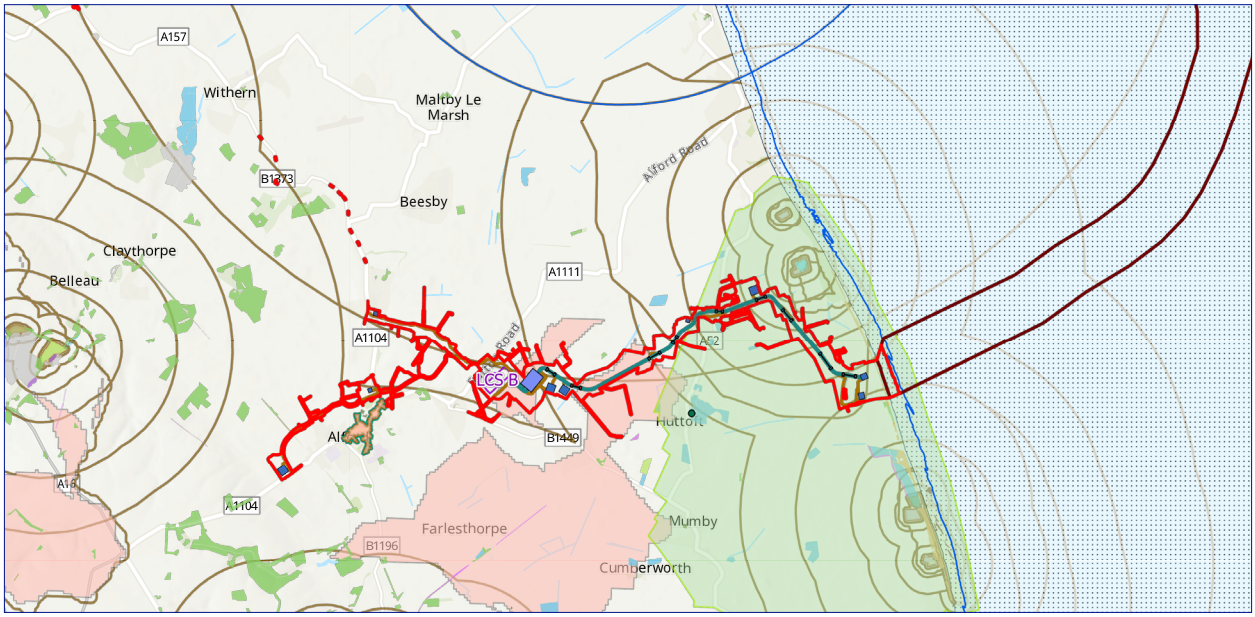


Figure 4.10 GIS Map & Key

- English Onshore draft Order Limits
- Converter Station
- Conservation Area – East Lindsey
- Great Crested Newts sites
- Priority River Habitat Headwater Area
- Special Areas of Conservation
- Special Protection Area
- SSSI Interest Unit
- SSSI Impact Risk Zone
- Lincolnshire Coastal Country Park

Priority Habitats Inventory (MainHabs)

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Deciduous woodland

Constraints

4.2.12 The closest listed buildings are located within Bilsby and Alford, with the nearest approximately 230 m west of the proposed converter station. As a result, the setting of nearby heritage assets is an important consideration within the site design. Parts of the site are also affected by Flood Zones 2 and 3, primarily around the Wold Grift Drain, which represents a notable constraint and influences drainage and land use across the site.

4.2.13 The Viking Link underground cable corridor runs through the northern part of the site between Saleby and the Wold Grift Drain, further restricting where development can take place and requiring careful coordination with existing infrastructure. The main converter station platform is approximately 8.8 hectares, with additional land required for access, drainage, landscaping and associated infrastructure. This increases the importance of minimising land take and managing cumulative effects.

4.2.14 Overall, the key constraint is the need to balance flood risk, hydrological function, ecological considerations, heritage setting and infrastructure requirements. Field margins and drainage corridors also present opportunities to integrate landscape mitigation, water management and habitat enhancement within a coordinated framework that reflects the character of the surrounding landscape.

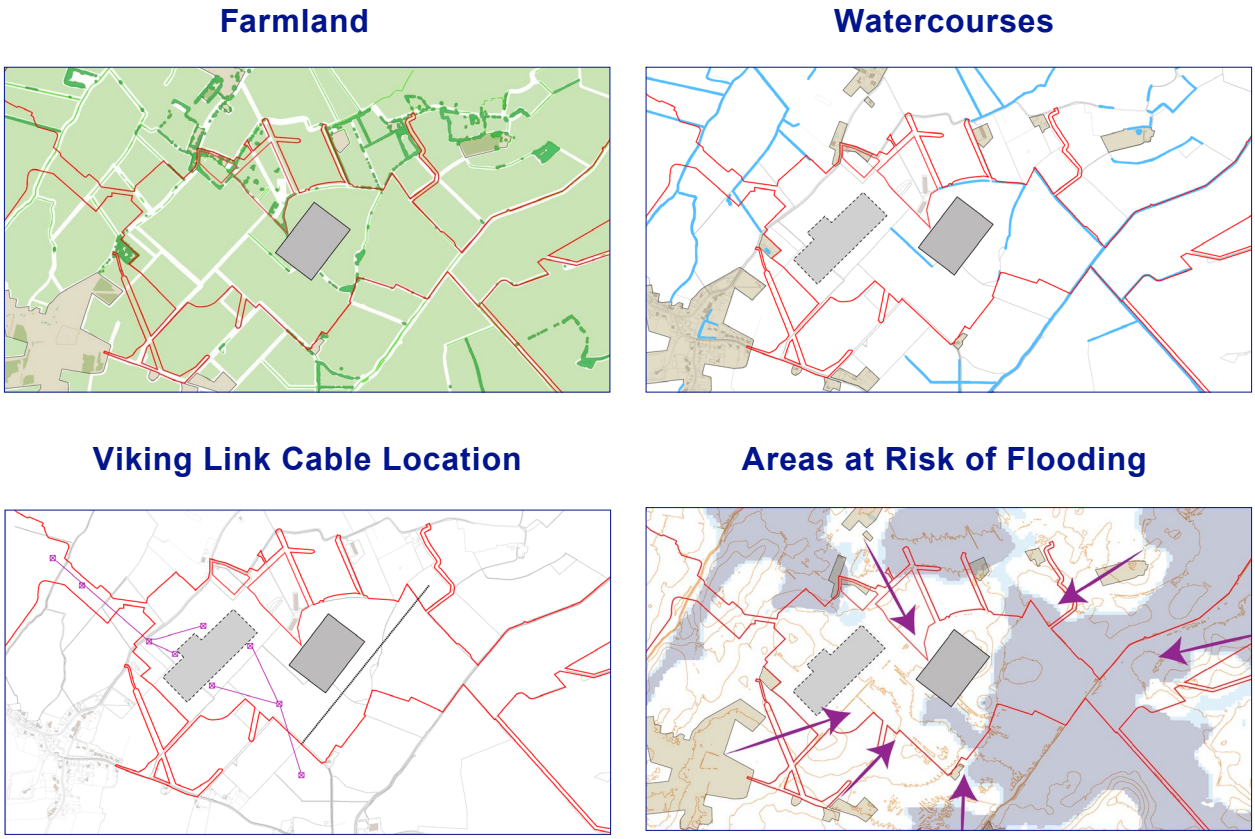
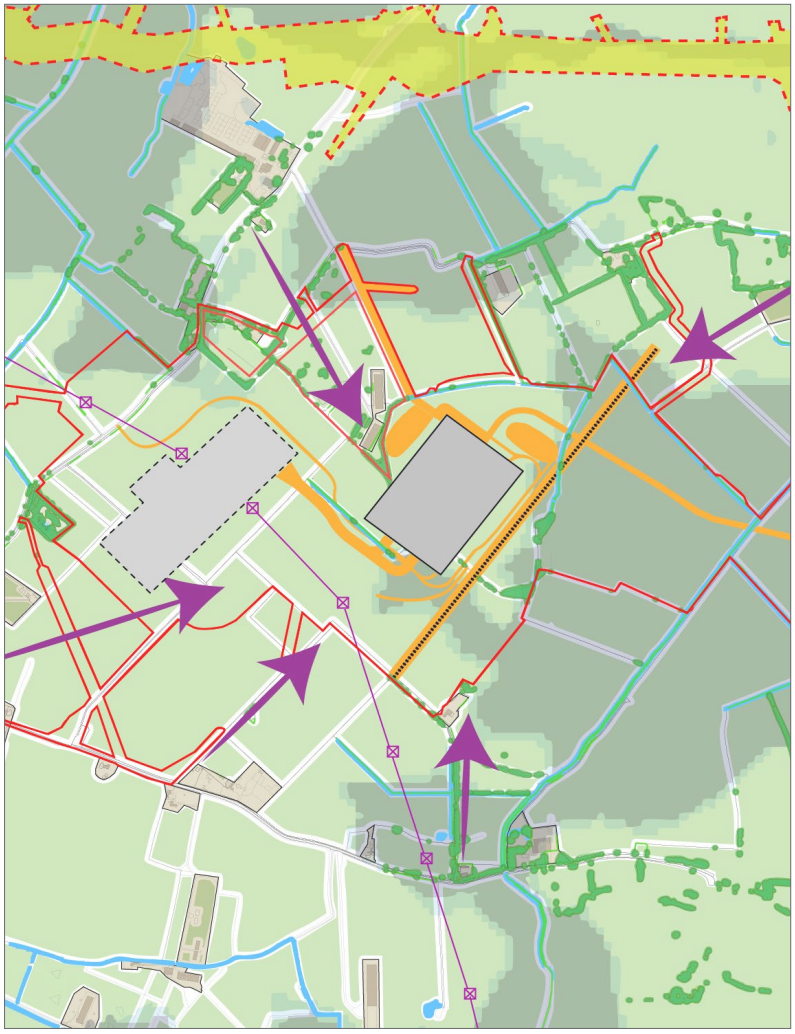


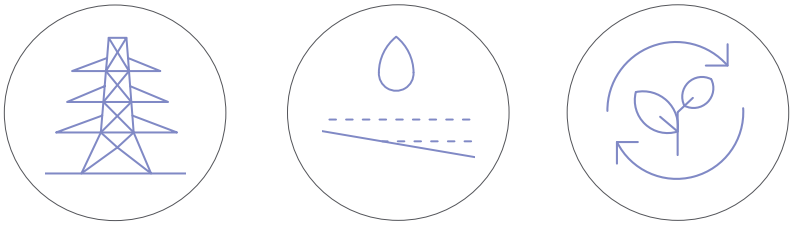
Figure 4.11 Constraints Diagrams

Constraints plan



- Development boundary
- Woodland planting
- Hedgerows
- Watercourse
- Contextual built form
- PRoW
- Existing gas line
- Existing settlements
- Proposed converter station
- Indicative location of LCB 2
- Indicative pylon locations
- Indicative exclusion zones
- Field pattern
- Flood zone
- Views
- Proposed Viking Link

Figure 4.12 Constraints Plan



Infrastructure & easements

Hydrology & flood zones

Ecological sensitivities

Figure 4.13 Constraints Diagrams

Opportunities

4.2.15 The English Onshore Scheme converter station offers an opportunity to show how major infrastructure can sit positively within a working farming landscape, rather than appearing as a purely functional feature. Its long-term presence allows landscape change to happen gradually, supporting local character, wildlife and ongoing agricultural use. The scheme can build on existing landscape features such as drainage channels, field boundaries and access routes. Working with this established pattern, landscape planting can help create a clearer and more organised setting, defining open farmland, village edges and infrastructure.

4.2.16 Well-placed planting can provide screening where needed while maintaining long views and a strong sense of openness, with seasonal variation adding visual interest. There are also opportunities for environmental improvement by linking habitats along drains and field edges. Coordinating planting with existing water features can support wildlife and reinforce the relationship between farming and water management.

4.2.17 Finally, the English Onshore Scheme offers the chance to set a positive example for how nearby infrastructure projects work together. A coordinated approach with other NGET schemes can help reduce overall visual impact and create a stronger sense of place across the wider landscape.

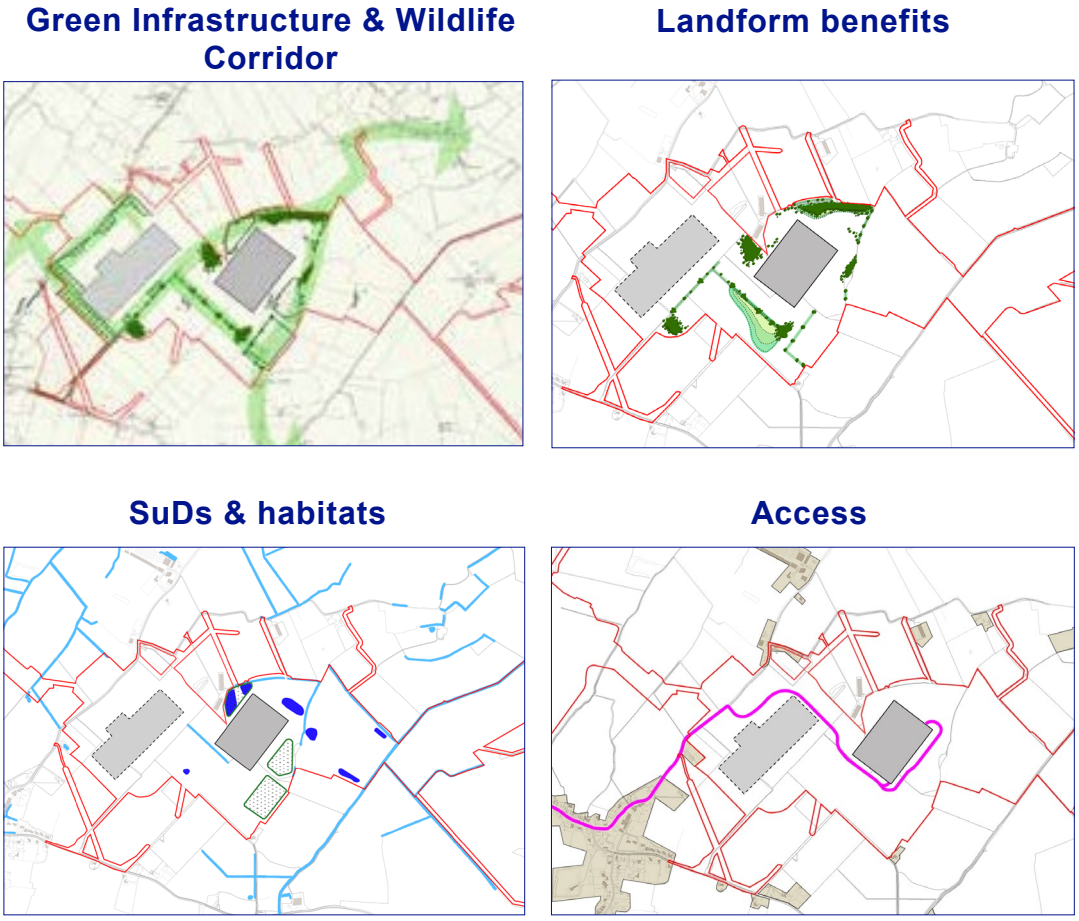


Figure 4.14 Opportunities Diagrams

Opportunities plan

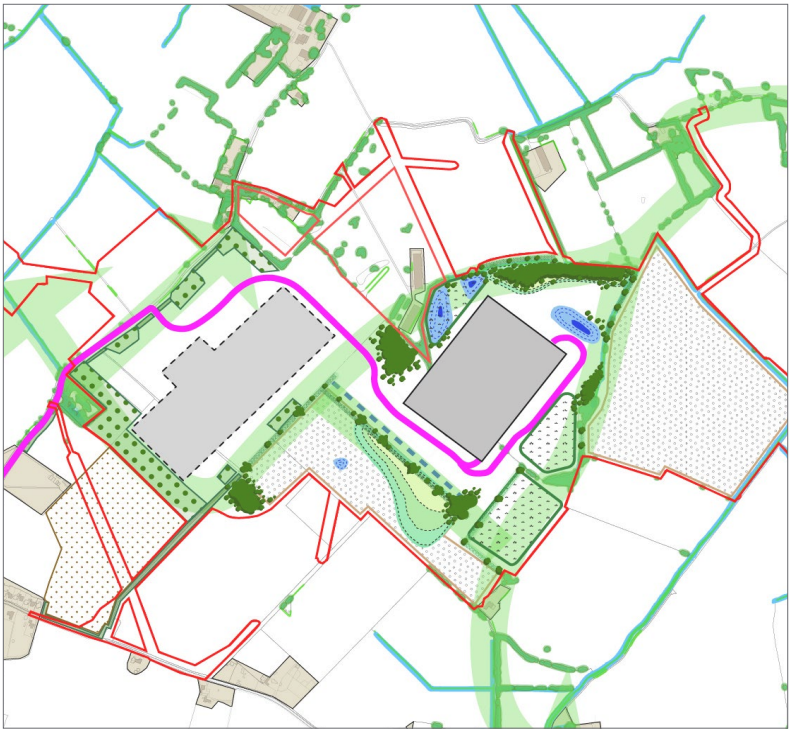


Figure 4.15 Opportunities plan

Existing Landscape Elements

- Development Boundary
- Trees & Woodland
- Hedgerows
- Water Courses
- Settlements

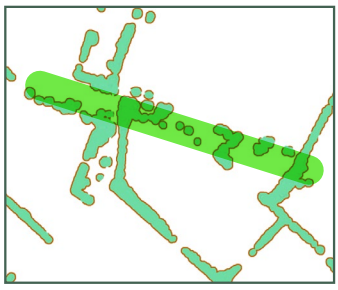
Indicative LCB 2 Features

- Location of LCB 2
- Native Hedgerow & Trees
- Woodland
- Habitat Creation

Proposed EGL5 Features

- Converter Station
- Trees & Woodland
- Hedgerows with Trees
- Habitat & Biodiversity
- Level Alterations
- Permanent Access
- SuDS
- Restored Agriculture
- Diverted Channel

Defragmentation of green infrastructure



Existing & former field patterns strengthened

Introducing new wild-life corridors

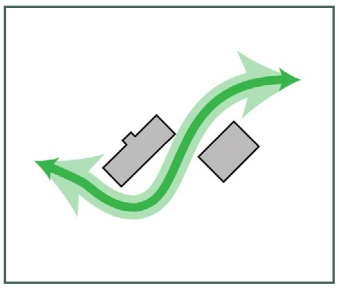


Figure 4.16 Opportunities diagrams

Landscape design precedents

4.2.18 The following examples give ideas on how the landscape around the converter station could be designed. Examples were chosen that help the building fit better into their surroundings.

Figure 4.17 Viking Link converter station, Bicker Fen, Lincolnshire.

Viking Link converter station, Bicker Fen, Lincolnshire

The converter station is located within a flat, open fenland landscape and demonstrates how large-scale electrical infrastructure can be integrated through landscape-led mitigation. Design measures include:

- Use of subtle landform and earth shaping to reduce visual scale.
- Structural planting and reinforced field boundaries to screen the built form and enhance ecological connectivity.

Figure 4.18 Hawthorn Pit converter station, UK

Hawthorn Pit converter Station, UK

Part of a 2GW high-voltage electricity link between East Lothian and Durham. Design measures included:

- Integrating the station with existing substations and nearby woodland.
- Adding public open spaces, replacement habitats and planting.
- Removing three existing electricity pylons and replacing them with a single one.

4.2.19 The design team will continue to study more converter station projects as they are built or planned. This helps show the different ways these buildings can be designed.

4.2.20 It also helps the team understand what is possible, while still meeting the technical needs and safety rules required for handling very high voltages.

4.2.21 The plans for the land around the English Onshore Scheme were made by a team of different professions working together. The goal is to make sure the converter station fits into the countryside without looking out of place. To do this, the landscape team worked with environmental, engineering, architecture and heritage disciplines.

4.2.22 The landscape team aims to create a design that reflects the surrounding land, introduces planting and meets the needs of the buildings. This plan focuses on long term sustainability, include Biodiversity Net Gain (BNG) goals, adds SuDS and continues the distinct boundary patterns.

The landscape design ideas (design approach)

4.2.23 The new plan for the land is built around three main ideas: shaping the ground, planting for nature, and managing water. These three ideas work together to make the area around the converter station strong, green, and tidy.

- **Theme 1 - Landform & site Integration:**
  - Shaping the ground to help the converter station blend into the flat countryside. By making gentle slopes and low hills, we can slightly cover the new buildings so they blend into the area. The forming of the land will also create SuDS features.

- **Theme 2 - Planting & habitat development:**
  - Planting local trees, hedges, and tall grass will help match the existing landscape pattern. Woodlands on the south and east sides will act like a screen. Hedgerows and wetland edges help support habitats and allow connection across the wider landscape.

- **SuDS & water management:**
  - Using smart water features like ponds, wet grassland margins, drainage swales and blue/green roofs (if feasible), will help manage on-site water. These help prevent flooding and match the look of the local drainage channels. They also create new homes for wetland wildlife, making the site stronger and more eco-friendly.

Figure 4.19 Landscape design diagrams

Strategic landscape plan

4.2.24 The map in Figure 4.20 shows the spatial relationships of the proposed landscape mitigation.

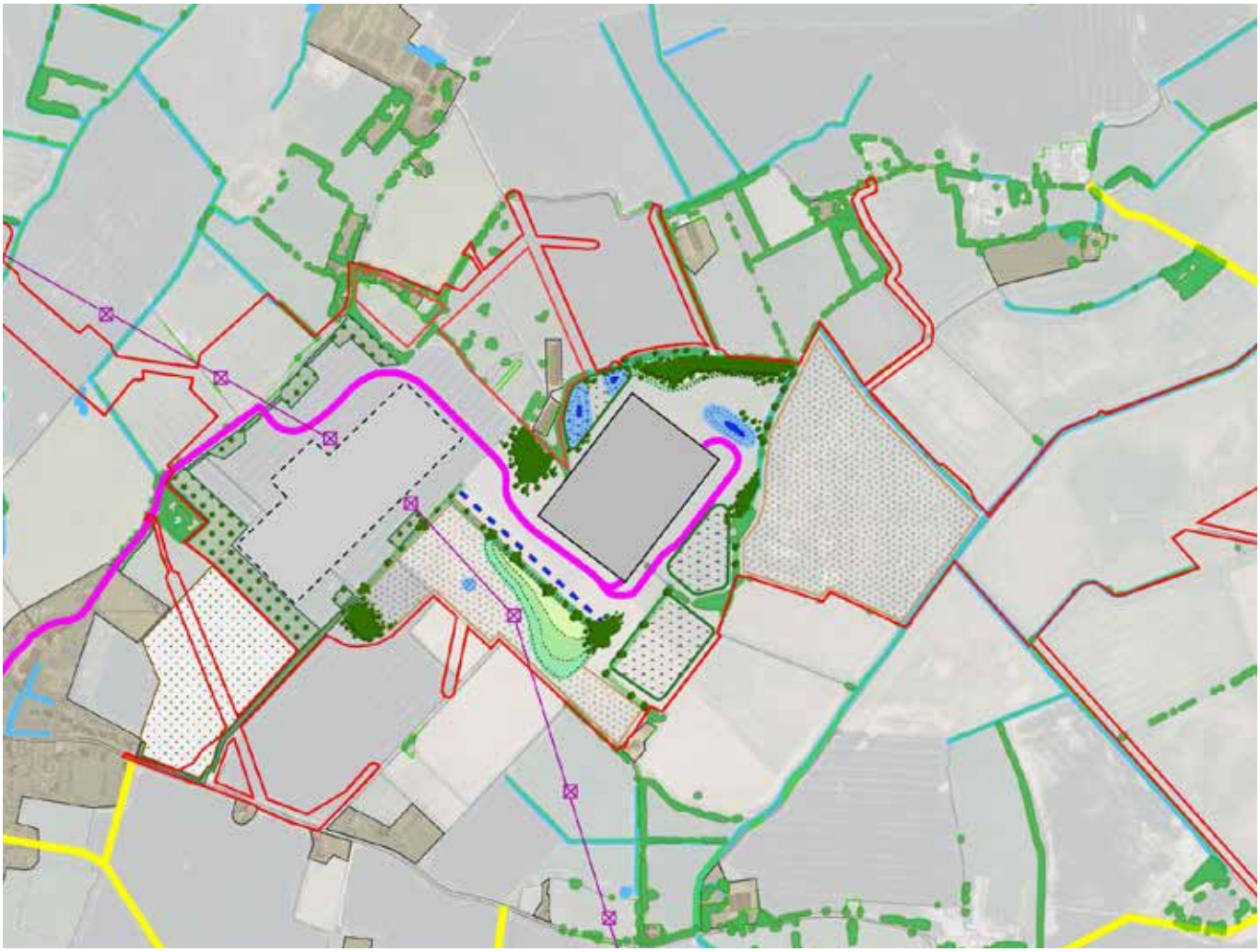


Figure 4.20 Illustrative landscape masterplan showing land around converter station and substation

Existing Landscape Elements

- Development Boundary
- Trees & Woodland
- Hedgerows
- Water Courses
- PRoW
- Settlements

Proposed EGL5 Features

- Converter Station
- Trees & Woodland
- Hedgerows with Trees
- Habitat & Biodiversity
- Level Alterations
- Permanent Access
- SuDS
- Restored Agriculture
- Diverted Channel

Indicative LCB 2 Features

- Location of LCB 2
- Native Hedgerow & Trees
- Woodland
- Habitat Creation
- Pylon locations

Site sections

01. Proposed Restored Agriculture
02. Proposed Tree/ Woodland
03. Proposed Permanent Access
04. Soil Grading
05. Proposed wetland Habitat
06. Proposed SUDs
07. Existing Water course & Hedge/ woodland
08. Converter Station Site
09. Abutting Property
10. Development Zone
11. Proposed Hedge with Tree
12. Diverted Channel

Figure 4.24 Sections reference plan

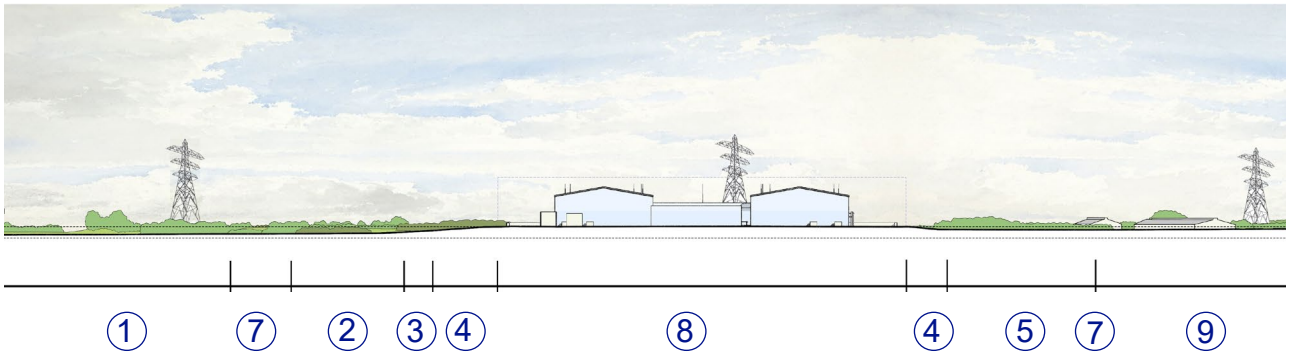


Figure 4.21 Section AA

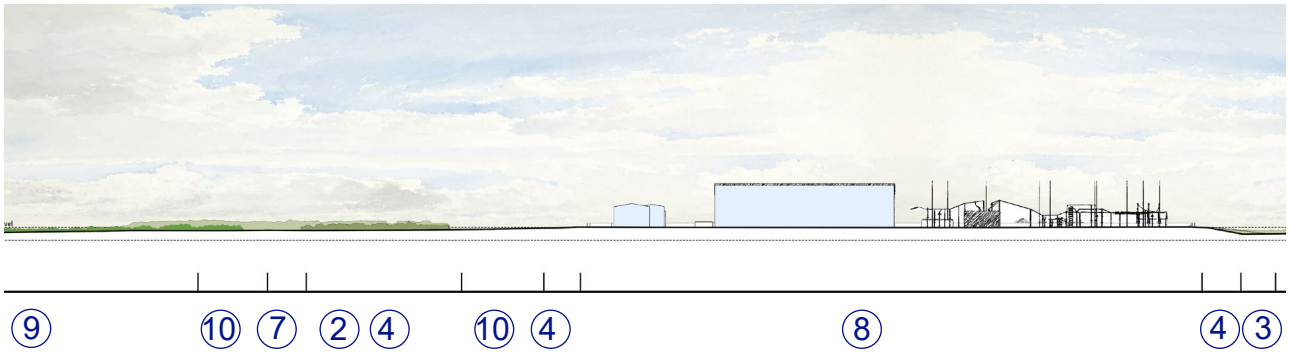


Figure 4.22 Section BB

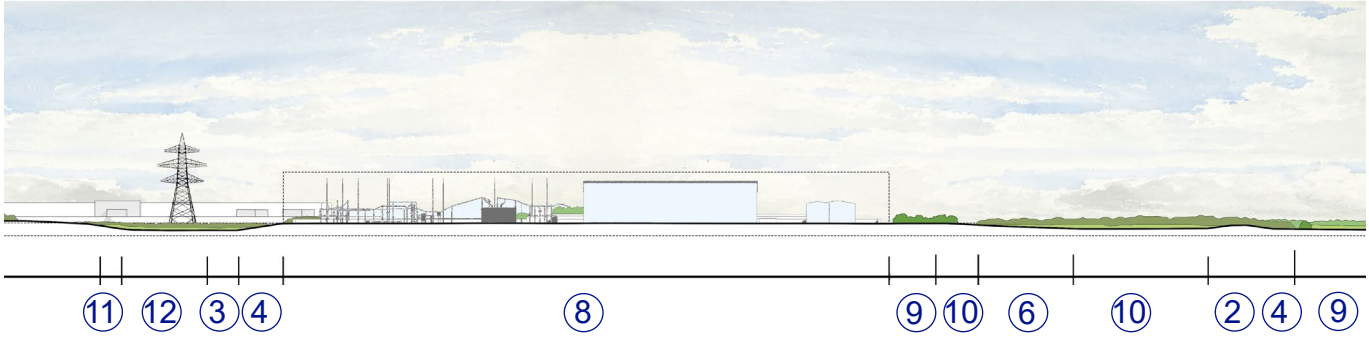


Figure 4.23 Section CC

Aerial view

4.2.25 Image 4.22 shows a how the converter station and substation will look from an aerial view. Bilsby can be seen in the top left corner to help understand the size and scale.

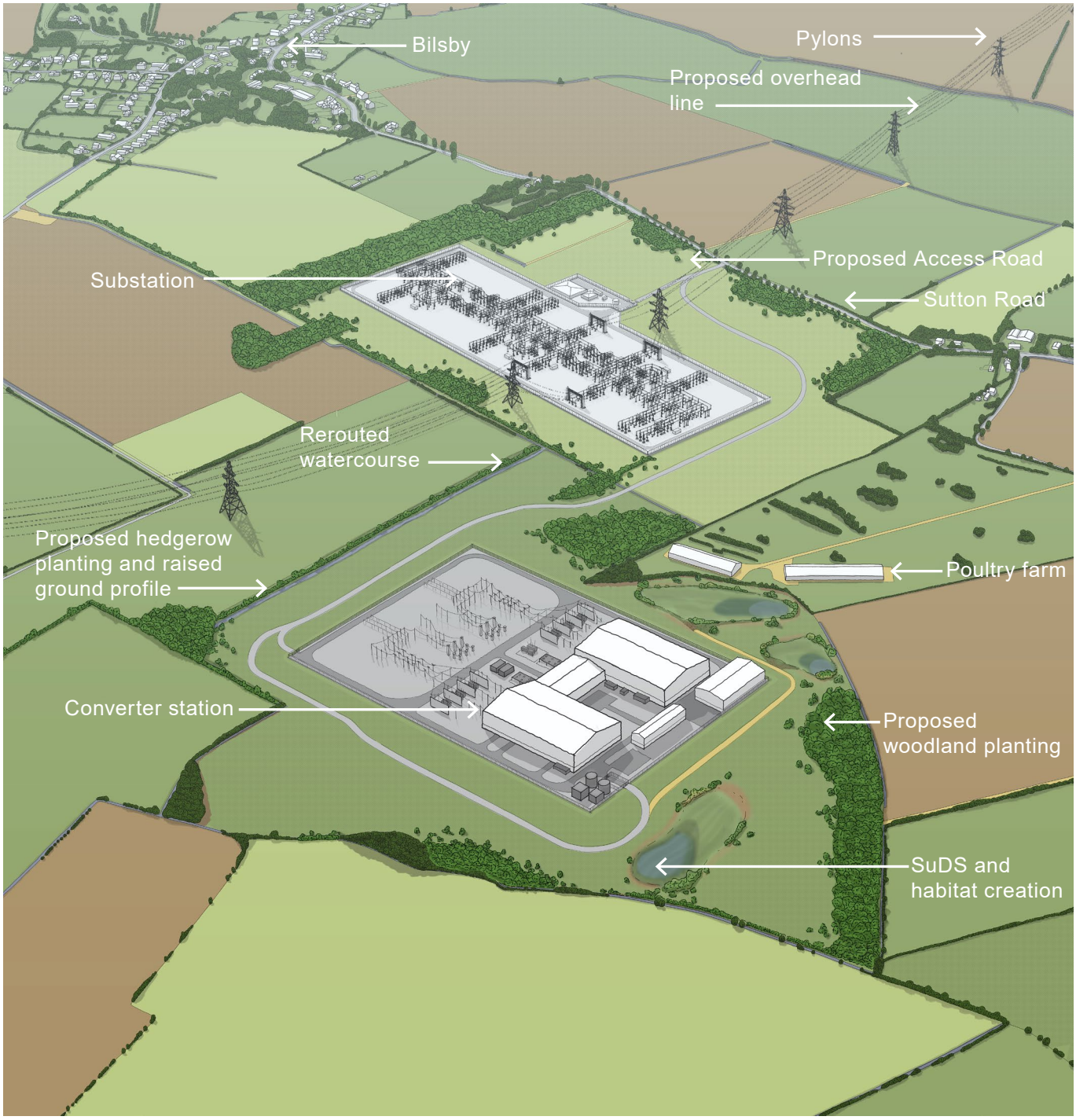


Figure 4.25 Aerial view of the proposed converter station and substation (not to scale)

4.3 Emerging architectural design approach

Site analysis

4.3.1 To inform the architectural approach for the converter station, the design team undertook site visits in Autumn, Winter and Spring. This enabled the team to observe the surrounding architecture, materiality, colours and texture. Visiting the site at different seasons provides a year-round understanding of the areas character and behaviour. Changes observed throughout the site visits include: crop cycles, landscape colour and weather conditions.

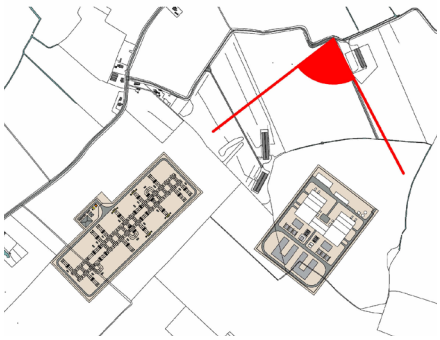
4.3.2 As the project has not been active for a full year, a summer visit has not yet been possible. A summer visit is scheduled and will provide further insight into seasonal landscape conditions and environmental characteristics. The findings from this visit will be used alongside the other visits to help inform subsequent converter station designs.

Viewpoints 07A

4.3.3 Photographs were taken from a series of viewpoints around the converter station site to understand how the building may appear from different locations, heights and distances.

4.3.4 Viewpoint 07A is taken from a road near Bilsby and Asserby Turn (A1111 Sutton Road), looking south towards the site. You can see across a large open field. The site would mostly be visible, with some cover by the hedges around the field edge.

Figure 4.26 Photograph of LVIA Viewpoint 07A



Viewpoint 07A has been used as the primary reference for understanding the massing and cladding of the converter station. This viewpoint was selected as it is the closest to the converter station site and represents the location of greatest visual exposure compared to the other locations. The photograph above has been turned into a sketch, allowing different cladding design options for the converter station to be explored and compared. This approach enables the proposed scale and form to be assessed effectively within the landscape.

Figure 4.27 Key Plan of VP07A

Development and presentation of the design options

4.3.5 The four options cover the following design themes which have the potential to be applied separately or in combination:

- Design option 1 - Responding to the functional agricultural and aircraft hanger buildings found in the local area.
- Design option 2 - Using curved roofs to soften the shape of the buildings and responding to the landscape.
- Design option 3 - Layering the cladding to break up the flat surfaces, taking inspiration from the furrows in ploughed fields.
- Design option 4 - Taking inspiration from the large stacks of hay bales seen in the landscape to add texture to the buildings.

4.3.6 During the EGL 5 stage 2 consultation, people are invited to share their thoughts on the four design options. Feedback can also include new ideas that haven't been mentioned yet. The project team will look closely at all these comments when deciding on the architectural design approach.

Understanding the Design Process behind each option

4.3.7 To help understand the different ideas, we have included a summary of how each design was created. For every option, this includes:

- **Local Reference:** Photographs of local buildings and landscape
- **Precedent Images:** Photos that show similar ideas or styles used on other buildings;
- **Development Sketches:** Early drawings that show how the design idea first started;
- **Perspective Drawings:** Sketches showing what the project looks like from the side and from the height of a person standing on the ground.

4.3.8 In line with Landscape Institute guidance on Environmental Colour Assessment[1] a Natural Colour System (NCS) Index of colours was taken to site to be photographed alongside colours observed in the context. This is for the purpose of identifying the true colour of objects and helping to translate this into a colour system by which appropriate cladding colours can be selected.

1 https://landscapeinstitute.org/technical-resource/environmental-colour-assessment/

Architectural design approach option 1

Option 1 - research

4.3.9 Our research into the local area has identified that the most common large buildings are agricultural barns or aircraft hangers. These buildings typically have simple pitched roofs with forms and details driven by functionality. Older buildings often feature wooden cladding but more modern buildings tend to use corrugated metal sheet cladding. This is very similar to how converter stations are typically designed, though it is noted that a converter station is taller than the buildings found in the area.

4.3.10 These buildings are often painted green or grey to blend into the rural landscape setting. We have observed that the colours of the fields changes throughout the year. As such it is more important to select colours that compliment the setting than try to match it.

Figure 4.28 Site visit photos of agricultural buildings (2026)

Figure 4.29 Site visit photos of local fields during autumn, winter and spring.

Option 1 - key concept themes

4.3.11 This option aims to demonstrate a baseline for architectural design making simplicity a virtue by which essential features and details are integrated into a cohesive considered design. This would be in keeping with other comparable nearby buildings. We have looked at precedents of similar buildings where good design principles have been applied to achieve beautiful buildings.

4.3.12 For this option we have suggested using a dark grey for the upper part of the buildings, similar to the nearby chicken sheds. This would create a crisp profile in the landscape that would contrast with the seasonal changing of the landscape and a big sky that changes with the weather. This cladding could be ribbed to add texture. The lower part of the buildings could be designed to blend into the background of the layers of landscape screening and perimeter fencing.

Precedent

Ademia Office Building and Warehouse, Portugal.

This building uses clean lines and simple materials. The large building is broken into smaller sections with sloping roofs to make it look less bulky. Extra care is needed where the roof sections meet to manage rainwater properly.

Figure 4.30 Ademia Office Building & Warehouse, Portugal

Initial design sketches

The initial design looked at the principles of typical agricultural buildings found in the local area, and annotated key features including pitched roofs, vertical profiled cladding and use of landscaping to conceal the base of the building.

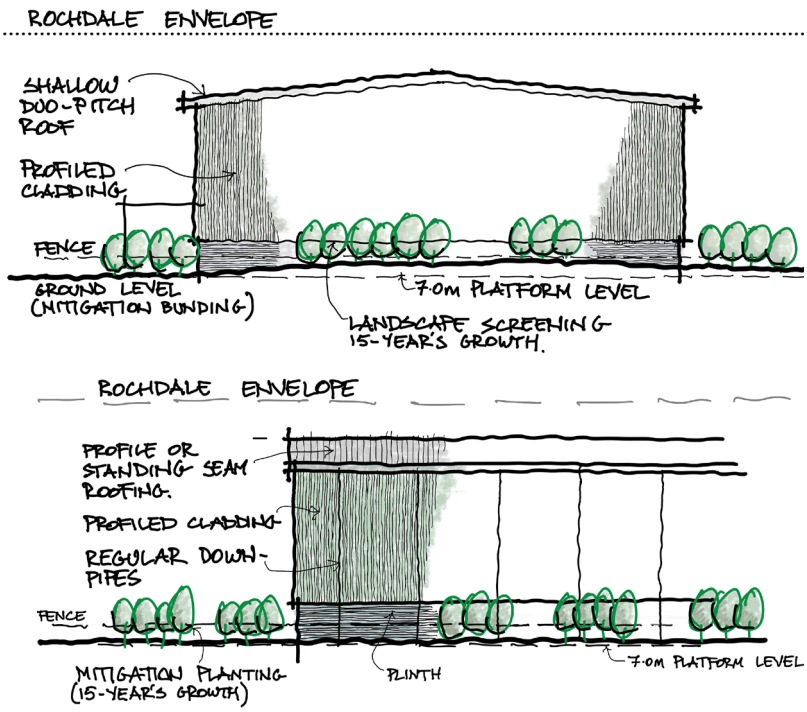


Figure 4.31 Option 1 Design Sketches

Option 1 - illustrative sketches

4.3.13 Figure 4.32 is a sketch of how the converter station could look if the key concept themes from option 1 were applied. The intention is that the buildings look like large barns similar to the nearby chicken sheds on the right-hand-side of the image. The buildings are shown in the existing context alongside an approximate representation of the landscape proposals as they could appear after 15 years of growth.

4.3.14 Figure 4.33 shows the side of the converter station with the smaller buildings at one end, larger buildings in the middle, and external equipment in the AC end. Figure 4.34 shows the DC end of the converter station with two taller buildings side by side and smaller buildings in the foreground. The landscape bunding and planting is shown in each to connect the buildings to the ground.

Figure 4.32 Coloured illustrative sketch of Option 1 from viewpoint 07A showing converter station from eye-level

Figure 4.33 Coloured (northeast) side elevation showing Option 1 and landscape proposals

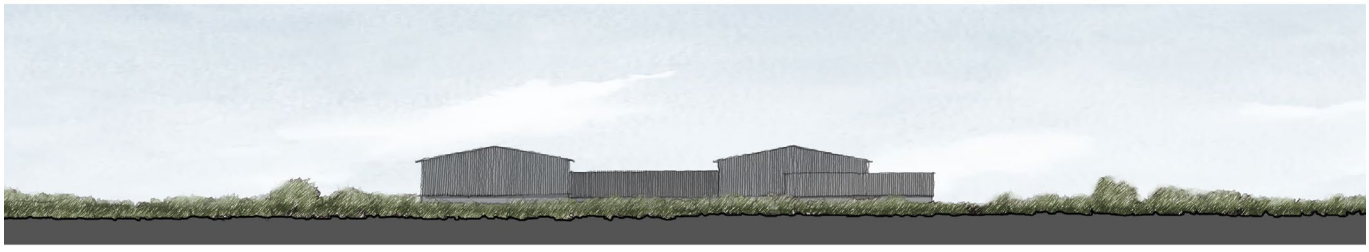


Figure 4.34 Coloured (northwest) end elevation showing Option 1 and landscape proposals

Architectural design approach option 2

Option 2 - research

4.3.15 By visiting a broad range of viewpoints identified in the PEIR Volume 1, Part 2, Chapter 8 Landscape and Visual Amenity, we have observed how the way the buildings are seen varies depending on the direction, proximity and relative elevation of the viewpoints. Whilst the surrounding land is quite flat it is overlooked from hills to the west. As such we consider the profile of the buildings to be an important consideration in the design. We have seen how the use of curves can soften buildings. Examples include the curved roofs of aircraft hangers at Elsham Wolds Airfield, and round hay bales seen in the landscape.

4.3.16 We have observed that green is often used for aircraft hangers to help them blend into the landscape. It is anticipated that the curve will create a gradient of tone across the roof that would add interest and soften the ridge line of the buildings.

Figure 4.35 Curved roof design seen in an airfield building in Lincolnshire

Figure 4.36 Site visit photos of curved features in buildings

Figure 4.37 Site visit photos of local fields and vegetation during autumn, winter and spring.

Option 2 - key concept themes

4.3.17 This option aims to demonstrate how a curved roof profile could soften the form of the buildings helping them to blend into the landscape. This would add interest to the shape of the buildings from near views where the profile is seen against the sky. It could also benefit long distance views from hills that would look down onto the roof and see it against the ground. For this reason a dark green is suggested as the main colour.

4.3.18 Whilst the roof is the main feature the elevations are also tall and prominent. The suggestion is that a vertical pattern could be used to break up the flat facades, noting that many of the taller features in the landscape such as trees and windmill towers are vertical with softened curved edges.

Precedent

2GW HVDC Link, France

The design was enhanced in this way to respond to the sensitive landscape setting. This shows that it is possible to have a curved roof on a converter station. Care needs to be taken to not increase the risk of leaks through the flatter ridge section of the roofing.

Figure 4.38 Inelfe converter station, Baixas, Southern France

Initial design sketches

The context of the converter station site was used to inspire the form of the new building, with sketches undertaken to understand the layout and shapes that can be seen. This has then confirmed the long, horizontal presence across the landscape as well as the curved, natural forms that are created by the planting lining the boundaries.

Figure 4.39 Option 2 design sketches

Option 2 - illustrative sketches

4.3.19 Figure 4.40 is a sketch of how the converter station could look if the key concept themes from option 2 were applied. The intention is that the curved roof makes the building profile softer with fewer hard edges helping it to blend into the landscape setting. The walls show vertical curved cladding panels that will create shadow lines where the panels meet, and gradient highlights that change with the direction of the sun. This would create buildings that are more responsive to the changing conditions, in way similar to the surrounding planting. There is a suggestion that the roofs of the smaller foreground buildings could help to screen the larger elevations.

4.3.20 The elevations in Figure 4.41 and Figure 4.42 show how the curved profiles would be orientated, with gables on the ends of the large halls, and long sides with the curve coming down to eaves. It shows how the curved façade panels would be used on the cladding seen above the screening.

Figure 4.40 Coloured illustrative sketch of Option 2 from viewpoint 07A showing converter station from eye-level

Figure 4.41 Coloured (northeast) side elevation showing Option 2 and landscape proposals

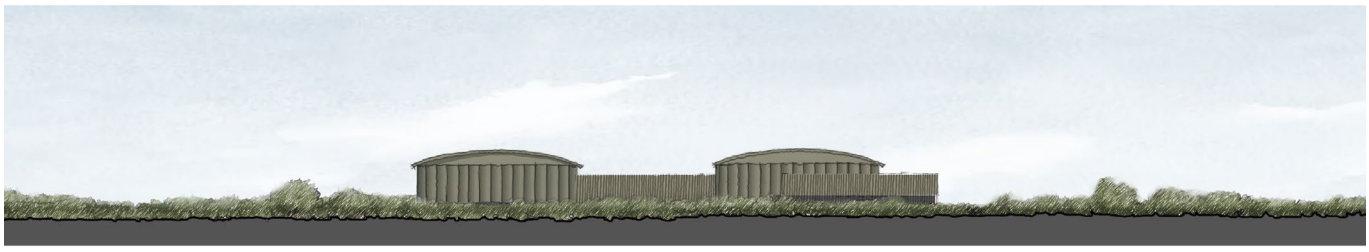


Figure 4.42 Coloured (northwest) end elevation showing Option 2 and landscape proposals

Architectural design approach option 3

Option 3 - research

4.3.21 Option 3 draws inspiration from the strong patterns that are an expression of the function and order found within a cultivated landscape and considers how this could be related to the extraordinary equipment and processes that are otherwise hidden within the converter station buildings. Like a farmers field that has a grain from the direction of ploughing and tram lines for mechanised equipment, each part of the converter station is handling different types of electricity, changing the positive and negative opposites of direct current to the wave form of alternating current.

4.3.22 On our site visits we have observed the variety of textures and colours found in the landscape around the local area. It is apparent that the pattern is stronger when looking down the tramlines than across them. Over the seasons we have seen the bright flourish of flowering crops and margins, as well as the bare earth of ploughed land. The design will need to respond to this changing context.

Figure 4.43 Site visit photos of local fields and crops during autumn and spring site visits.

Figure 4.44 Site visit photos of local fields and vegetation during autumn, winter and spring.

Option 3 - key concept themes

4.3.23 This option aims to demonstrate how the cladding of the building can express the change of the electricity wave form happening within, and in doing so add interest and texture that will make the buildings more sympathetic to their context. We have observed how tilting and turning the cladding panels can create variations in light and shade. The panels could have a long side and short side and by combining these panels in different patterns textures can be created.

4.3.24 For the DC Halls these panels could all face the same way but in opposite directions for each building, representing how one building is a positive pole and the other a negative pole. For the AC end the cladding panels could alternate in direction in the same way alternating current does. The pattern in the middle section could blend, representing how the current is inverted.

4.3.25 The intention would be to keep the colour scheme simple to avoid conflicting with the shading effect, though the smaller buildings could be made simpler to avoid detracting from the main design. Earthy tones could be used to represent the ploughed fields when the patterns in the landscape are strongest.

Precedent

Arklow Wastewater Plant, Dublin

The wastewater cladding aids ventilation to control odours and conceals the plant equipment inside the structure. The use of colour helps set the building into the site and the design of the cladding provides the building with an identity whilst respecting its sensitive location.

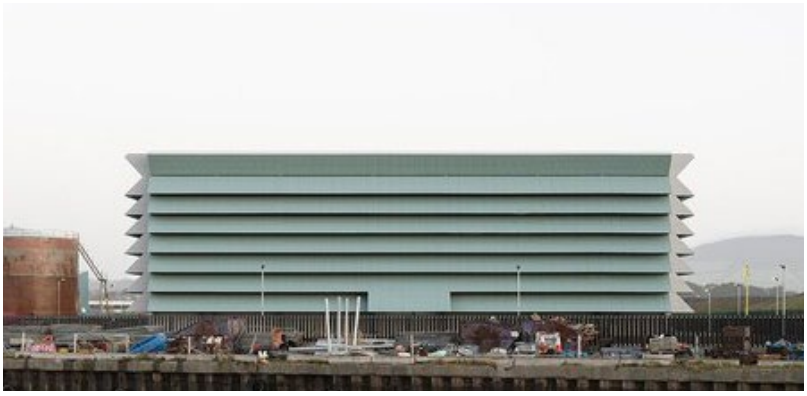


Figure 4.45 Arklow Wastewater Treatment Plant, Dublin

Initial design sketches

Drawing on the rigid and precise layering of crops visible within the farm plots, the design team explored layering these agricultural planting patterns and how these elements converge when read across the landscape. Integrating this concept with the function of the building informed the development of this design option.

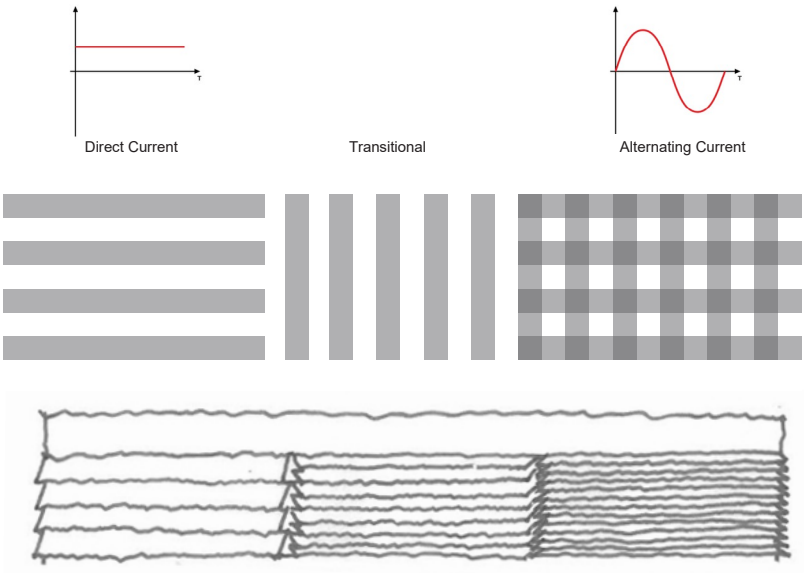


Figure 4.46 Option 3 Design Sketches

Option 3 - illustrative sketches

4.3.26 Figure 4.47 is a sketch of how the converter station could look if the key concept themes from option 3 were applied. The intention is that the patterns on the facades are the main feature and the roof is pushed into the background with a strong eaves line. The sketch shows how the angles of the cladding panels could create textures using light and shade. The near ends of the building would have a pattern representing direct current, and the far end would represent alternating current.

4.3.27 Figure 4.48 shows the side of the main halls with the DC pattern on the left and AC pattern on the right. The smaller building has been shown with a simple grey green colour to be seen as secondary. Figure 4.49 shows the ends of the DC Halls each with the DC pattern flipped to present the positive and negative poles.

Figure 4.47 Coloured illustrative sketch of Option 3 from viewpoint 07A showing converter station from eye-level

Figure 4.48 Coloured (northeast) side elevation showing Option 3 and landscape proposals

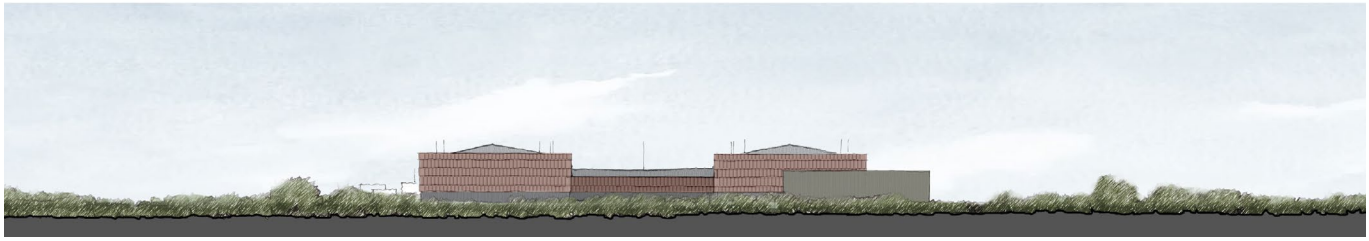


Figure 4.49 Coloured (northwest) end elevation showing Option 3 and landscape proposals

Architectural design approach option 4

Option 4 - research

4.3.28 On our site visits we have observed that one of the most distinctive features in the landscape are the large haystacks. We have noted that there are different formats of hay bales, with different shapes and sizes and that sometimes they are kept in the open and sometimes under cover of open sided barns.

4.3.29 The texture of the bales is created by the way the baling machinery forms and wraps them. The wrapped sides tend to be smoother with bands created by the string. The open sides tend to be rougher, showing the end grain of stalks. The way the bales are stacked creates a strong pattern. The bales are often turned or overlapped on some levels of taller stacks to give more stability. Even with the rectangular Heston bales, the forming of the bale tends to slightly curve the ends making the short sides appear different to the long sides.

4.3.30 The rich yellows and browns come from the landscape and the colours fit in well even if contrasting green fields and blue skies. There is a natural variation in tone that develops further when exposed to the weather for long periods.

Figure 4.50 Site visit photos of local fields during autumn, winter and spring.

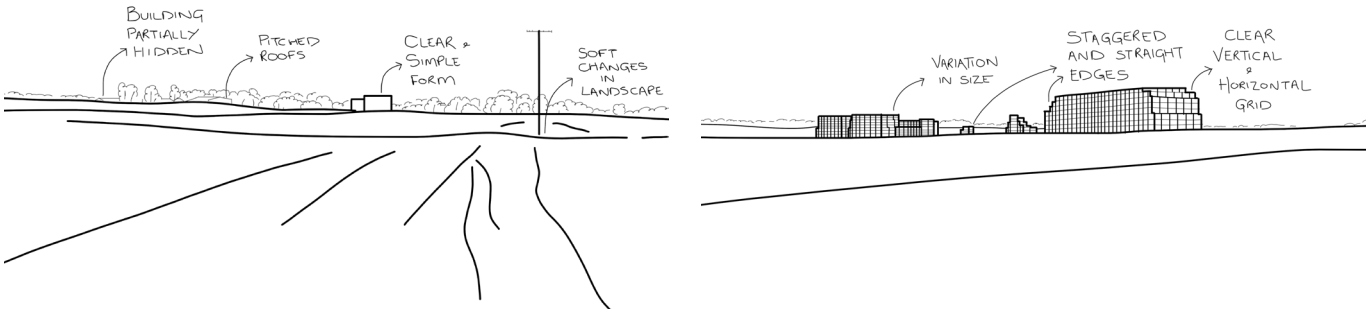


Figure 4.51 Sketches of site observations

Option 4 - key concept themes

4.3.31 The way that haystacks are formed and kept in sheds has helped inform this option and can be seen in Figure 4.52. There is often a plinth that raises the bales off the ground to keep them dry. The buildings often have clad gables but open sides to provide a balance between shelter and ventilation. The structural bays also restrict how the stacks can be accessed by machinery so the pattern repeats down the side. The upper bales are often set back to improve stability.

4.3.32 The hay bales would be represented by cladding panels applied to the building elevations. These could have patterns applied to represent the texture of the bales, and could have a slight curvature to give a more natural articulation.

4.3.33 Some variations on colour tone could be used for the cladding panels to represent the natural variation of hay and straw. The suggestion is that the gables be coloured in a pale grey colour for a strong contrast with the yellow/ brown colour of the sides. The roofs could be pitched like option 1, or curved like option 2.

Precedent

Typical sheds seen used to store the hay bales consist of shallow pitched roofs, solid gable end and columns along the long elevation to support the structure. This provides colours differentiation across he different elevations.

Figure 4.52 Hay bales stored under shed

Initial design sketches

The initial sketches looked at the stacking and colour variations seen in hay bales and how this could be represented across a building face. This was explored through the use of different coloured cladding panels as well as using different depths to determine if shadows would create natural colours variations.

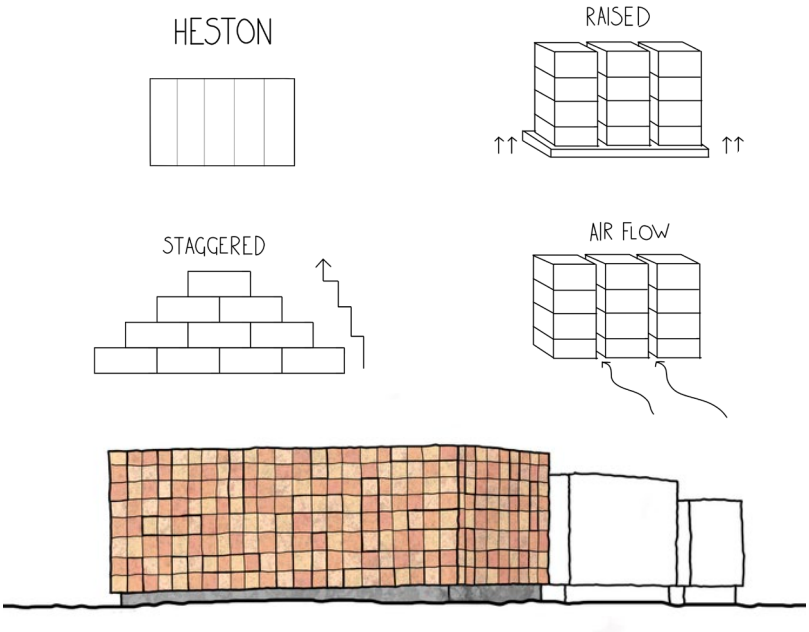


Figure 4.53 Option 4 Design Sketches

Option 4 - illustrative sketches

4.3.34 Figure 4.54 is a sketch of how the converter station could look if the key concept themes from option 4 were applied. It shows the buildings as simple pitched roofs with solid gables and the appearance of hay bales applied to the sides. The same approach is applied to the smaller buildings.

4.3.35 Figure 4.54 shows the gable of the smaller buildings and the side of the larger halls. A suggestion of structural bays is made with shadow gaps around vertical divisions. The impression of the bales is created by the gaps around the panels. Variations could be achieved by adjusting colours and texture added with different perforation patterns. Overall this will add interest to what could be a large blank elevation.

4.3.36 Figure 4.55 shows the gable end of the larger halls and the sides of the smaller buildings. The difference between the gable and side treatment helps to create a design benefit from the differing orientation of the building massing.

Figure 4.54 Coloured illustrative sketch of Option 4 from viewpoint 07A showing converter station from eye-level

Figure 4.55 Coloured (northeast) side elevation showing Option 4 and landscape proposals

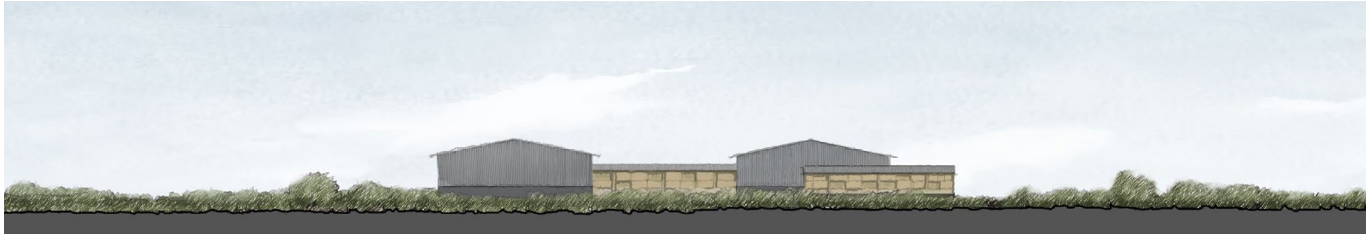


Figure 4.56 Coloured (northwest) end elevation showing Option 4 and landscape proposals

5. Next Steps

5.1 Working towards an application for Development Consent

5.1.1 Feedback provided in response to the consultation, including comments of the design approaches described in this document, will be set out in the Consultation Report that accompanies the application for Development Consent. It will also include the Applicant's responses to the issues raised on all topics.

5.1.2 Further engagement on the design approach will include independent design review to be undertaken during the pre-application stage in line with commitments in the DPS.

Developing a Design Approach Document (DAD)

5.1.3 This document will be expanded upon, adding more technical detail, and developed into a DAD which will cover the design process undertaken and the ambition for achieving good design on the English Onshore Scheme, with a particular focus on the site of the converter station and the landscape proposals around it. It will show how the preferred design approach has been developed in response to feedback from each stage of consultation and engagement with LPAs and other stakeholders. It is likely to cover:

- **Response to the Brief/Vision** - defining where and why flexibility is required, and the design intent for place making and providing a coherent narrative that the Project should follow.
- **Design Process** - set out how the design approach will be developed in line with the design principles, alongside technical environmental and engineering design development, and in response to feedback.
- **Site Analysis** - show how the constraints and opportunities inform the design approach and response to the context. What is included in this document is a small sample summary of this.
- **Research** - show how the design approach is informed by precedents; whether local projects that have responded to the context, or other converter stations and relevant infrastructure projects that show how the technical constraints of the development type could be addressed.
- **Design Response** - show how adverse effects could be addressed and the design evolution at each significant milestone in the process. Provide illustrations that show how the ambition for good design can be achieved within the defined limits, parameters and commitments.

5.1.4 The DAD will include appended figures such as, coloured plans, elevations, sections, and computer-generated images (CGIs) of views that all show the colours, textures, profiles and details in the context of the landscape proposals.

Developing the Design Principles Statement (DPS)

5.1.5 A draft version of the DPS has also been included in the consultation materials. This document is set up to define the design quality of the converter station. It contains Key Design Principles (KDPs) that will be developed alongside the designs in the DAD. As design approach decisions are made the text in the KDPs will be made more specific. The KDPs will be secured by a Requirement that will be put into the Schedules in the draft DCO. How this Requirement is discharged, and what evidence should be provided showing that the commitments have been met, will be developed alongside input from the host LPAs. Changes to policy and guidance will be monitored and the appropriate adaptations made to the design principles as required in the run up to making the application for Development Consent.

6. References

6.1 Bibliography

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6.1.4 Landscape Institute (2018). Environmental Colour Assessment. Available at: https://landscapeinstitute.org/technical-resource/environmental-colour-assessment/ [Accessed 5 March 2026]

6.2 List of Figures

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