The Great Grid Upgrade

Sea Link

Converter station design – background to potential architectural approaches

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1. Introduction

1.1 Overview and purpose

1.1.1 Sea Link (hereafter referred to as the 'Proposed Project') is a proposal by National Grid Electricity Transmission plc (hereafter referred to as National Grid) to reinforce the transmission network in the south-east of England and East Anglia. The Proposed Project is required to accommodate additional power flows generated from renewable and low carbon energy generation, as well as additional new interconnection with mainland Europe.

1.1.2 The Proposed Project would reinforce the transmission system by means of a High Voltage Direct Current (HVDC) Link between the proposed Friston substation in the Sizewell area of Suffolk and the existing Richborough to Canterbury 400kV overhead line close to Richborough in Kent.

1.1.3 National Grid's proposals for Sea Link at the statutory consultation stage are summarised in the Project Overview Document. As part of these proposals, National Grid is consulting on plans to build two converter stations – one in Suffolk and one in Kent. Converter stations convert alternating current into direct current and vice versa.

1.1.4 The proposed Suffolk converter station site is located to the east of Saxmundham, and to the south of the B1119. The proposed Kent converter station site would be located to the north of Richborough Energy Park and a section of the Sandwich Bay to Hacklinge Marshes Site of Special Scientific Interest, and to the west of the A256. In Kent, a new substation would be located immediately adjacent to the proposed converter station.

1.1.5 Each converter station would be up to 26 metres high, plus roof mounted equipment, which may include lightning protection, aerials and walkways. The total land needed within the perimeter fence for the proposed converter station in Suffolk would be approximately 6.5 hectares. In Kent, the proposed converter station, plus the adjacent substation, would be approximately 9 hectares in size.

1.1.6 The individual buildings that form the converter station can be designed in various ways. These configurations are subject to further design, and there may be opportunities to incorporate architectural approaches into the design of the converter station buildings included within National Grid's application for development consent.

1.1.7 A series of potential architectural approaches are presented in the **Project Overview Document** and the **Feedback Form**, which could inform future detailed design work on the proposed converter stations. This report provides a background to and summary of these of potential architectural approaches, including the more basic design assessment toolkit that informed them.

1.1.8 The architectural concepts presented in this document are not intended as depictions of the actual proposed converter stations. They are architectural concept drawings only, intended to illustrate what is meant by a particular potential design approach.

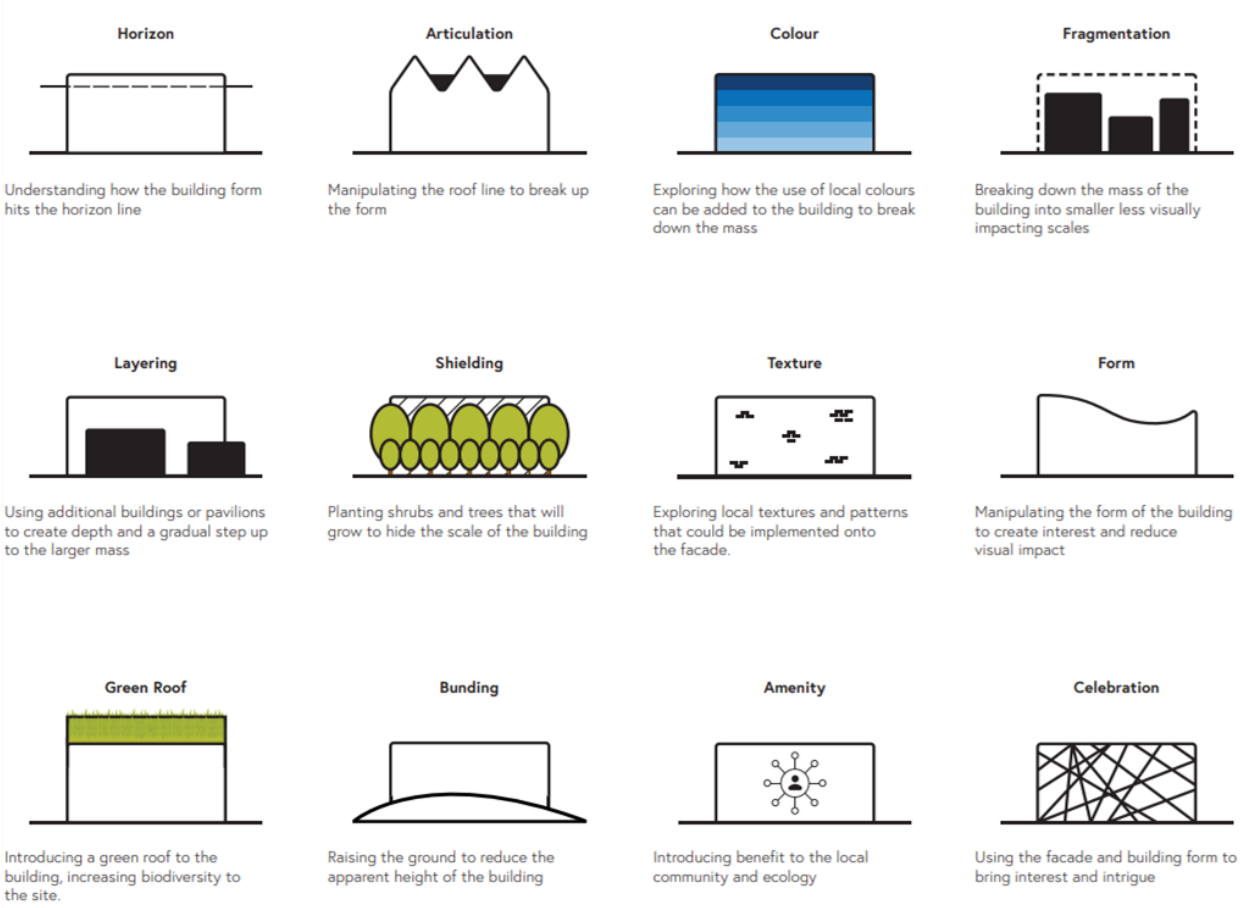
2. Potential architectural approaches

2.1 Summary

2.1.1 Prior to the statutory consultation stage, the Project Team developed a design assessment toolkit. The purpose of this toolkit was to inform the development of a range of potential design options for the two proposed converter stations.

2.1.2 This toolkit is presented in **Figure 2.1.**

Figure 2.1 Design toolkit



2.1.3 From this toolkit, a series of potential architectural approaches for the proposed converter stations were identified. The concepts are based around the following ideas:

- enhanced elevations;
- colour;
- green roof and bunding;
- agricultural barns;
- colour and curve; and
- kinetic.

2.1.4 As part of the statutory consultation on the Proposed Project, views are sought on whether any of the six approaches listed in **2.1.3** should be explored further, or whether

elements of any of these six possible approaches could be taken forward into future designs. Views can similarly be provided on possible design approaches that are not proposed in **2.1.3**. National Grid will have regard to the responses received when considering the approach to converter station design in both Suffolk and Kent.

2.1.5 The architectural approaches listed in **2.1.3** could be incorporated into the future design of a converter station in various ways. For illustration purposes, this document includes indicative artist impressions and elevations that draw from these potential architectural approaches.

2.1.6 The architectural concepts presented in this document are not intended as depictions of the actual proposed converter stations. They are architectural concept drawings only, intended to illustrate what is meant by a particular potential design approach.

2.1.7 The feasibility of all concepts, and how they could be incorporated and to what extent, will be considered in an ongoing way as the Proposed Project progresses. This will consider factors including engineering design requirements, ongoing environmental impact assessment, and consultation feedback.

2.1.8 This document speculates as to how the various architectural concepts may change how the converter stations appear or are perceived in the landscape. These are suggestions only for the purposes of demonstrating the drivers behind each potential architectural approach and do not reflect the outcome of an environmental impact assessment.

2.1.9 The rest of this chapter considers each of the six potential architectural concepts listed in **2.1.3** in turn, including how they may be applied to the proposed converter station sites in Suffolk and Kent.

2.2 Enhanced elevations

Figure 2.2 Indicative artist impression of enhanced elevations architectural approach

2.2.1 This concept considers how simple enhancements can be made to a more standard converter station design approach, which may improve the visual appeal of the proposed converter station buildings. It identifies how the introduction of coloured

cladding could start to break down the perceived mass of the buildings; an approach adopted on many large industrial/logistics facilities across the UK.

Figure 2.3 Indicative elevation of enhanced elevations architectural approach

2.2.2 In developing this architectural approach, National Grid has explored local textures and colours when proposing the cladding colours that could be applied. Muted greens from the surrounding farmlands are prominent across the landscape of both Suffolk and Kent, with the drier summer months introducing beige and lighter greens to the palette.

2.2.3 In Suffolk, the proposed converter station site can be seen whilst travelling along the B1119 and there is an existing right of way across the site that may be retained. The use of an enhanced elevations approach would be considered in this context.

2.2.4 In Kent, the proposed converter station site might be seen from long-range views. There are industrial buildings surrounding the site, which are also visible within the long-range views. This may allow for a pared back approach at this site.

2.2.5 This approach would incorporate standard cladding options and a functional layout.

2.3 Colour

Figure 2.4 Indicative artist impression of colour architectural approach

2.3.1 This concept considers simplifying the form of the proposed converter station building(s) and banding colours horizontally across the building.

Figure 2.5 Indicative elevation of colour architectural approach

2.3.2 There are several examples of where colour has been successfully used to reduce the impact of a large building, through wrapping the structure with colours that mimic the local context as it progresses up the building.

2.3.3 The immediate context of the proposed converter station sites could be used to its advantage as a means of potentially reducing the perceived scale and massing of the converter station building(s). The local context of the proposed converter station sites in Suffolk and Kent could contribute to the proposed tones that could be applied as horizontal bands wrapping the building.

2.3.4 This concept could be adapted to suit the local context and might reduce the visual impact from the B1119 in Suffolk and long-range views in Kent, as there would be less of a focal point. The simplification of the form might soften the appearance of the proposed converter station building(s) across the landscape.

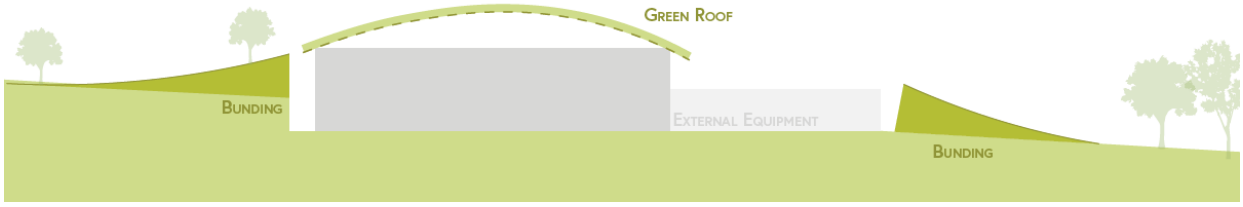
2.3.5 Standard cladding panels could be used to create the banding. The colour of the cladding may need to be bespoke so that it complements the local context.

2.4 Green roof

Figure 2.6 Indicative artist impression of green roof architectural approach

2.4.1 This concept aims to blend the proposed converter station building(s) into a landscape of natural-appearing rolling hills.

Figure 2.7 Indicative elevation of green roof architectural approach



2.4.2 The local environment would benefit from the green roof, as it would be planted with a mix of flora and grasses to encourage a wide range of insects and birds, boosting the local ecology of the site and wider environment.

2.4.3 Visually, elements of green roof may help the proposed converter stations blend more into the landscape. This concept imagines the green roof spanning across the main halls with the ground bunded up to their level. Where feasible, eaves would overhang to bring the roof down closer to the ground without comprising the internal clear heights that are required.

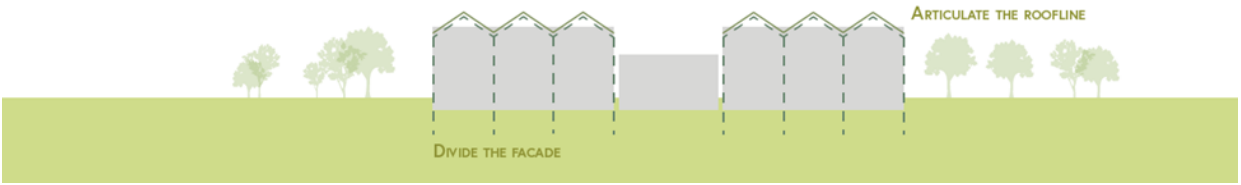
2.4.4 It must be noted that this approach would present particular technical challenges and whether/how elements of green roof could be incorporated would need to be considered as design progresses.

2.5 Agricultural barns

Figure 2.8 Indicative artist impression of agricultural barns architectural approach

2.5.1 This concept takes precedent from the existing barns around the site and the wider local context.

Figure 2.9 Indicative elevation of agricultural barns architectural approach



2.5.2 The fields surrounding the proposed converter station sites in Suffolk and Kent feature agricultural buildings that vary in scale, colour and materials. Many farms link together multiple barns, built at different times, to create one building or a series of interlinked buildings. This could be used to break down the overall scale of the proposed converter stations into a human scale.

2.5.3 Taking precedent from the local vernacular means that this architectural approach is naturally suited to its context.

2.5.4 In long range views, the proposed converter stations may appear more as part of the agricultural landscape. Along the B1119 and the public right of way in Suffolk, the use of bunding may reduce the perceived scale of the proposed converter station building(s), giving them an approachable appearance.

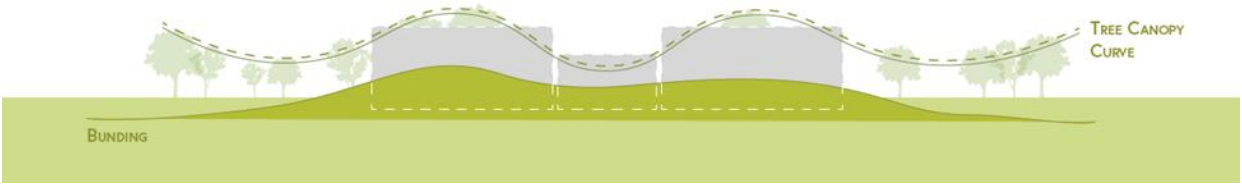
2.5.5 The form of this architectural approach is simple, with a deviation on the roof. The pitched roof structure could be achieved using lightweight trusses and the entire building(s) could be clad in one material, reducing the need for extensive coordination.

2.6 Colour and curve

Figure 2.10 Indicative artist impression of colour and curve architectural approach

2.6.1 This concept explores how curves against the horizon line and colour can be used to potentially soften the impact of the proposed converter station building(s).

Figure 2.11 Indicative elevation of colour and curve architectural approach



2.6.2 The roof line of the structure would curve to reflect the treeline. By rolling the form of the roof and mimicking the colours, the converter station building(s) may appear more similar in form to the nearby trees. This concept could also incorporate elements of green roof.

2.6.3 In Suffolk, along the B1119 and the public right of way, the close-up views of the proposed converter station would elevate the cladding texture. In long-range views, the rolling form could soften the appearance of the converter station within the landscape.

2.6.4 The underlying structure of the roof would be a barrel arc that can be adapted to incorporate the central dip. The cladding panels would be standard panels placed in a pattern to loosely mimic the treeline.

2.7 Kinetic

Figure 2.12 Indicative artist impression of kinetic architectural approach

2.7.1 This concept explores how the proposed converter stations present an opportunity to celebrate the building, as it has the potential to be viewed from a wide variety of angles.

Figure 2.13 Indicative elevation of kinetic architectural approach

2.7.2 Splitting the proposed converter station building(s) along the horizon line and simplifying the form begins to help it to adapt to its local context.

2.7.3 This approach may lend itself better to the Kent site than the Suffolk site. Within Kent, there is potential to celebrate the proposed converter station building(s), as the local landscape has existing industrial buildings.

2.7.4 The construction of the proposal is achievable using cladding panels mounted onto the façade. The reflection of cladding would need to be explored to understand the impact.

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