

Tween Bridge Solar Farm

8.22 Design Evolution Document

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms
and Procedure) Regulations 2009

Document Reference: 8.22

Deadline 4 21 July 2026

Revision 1

Design Evolution Document

Table of Contents:

1 Introduction 3

2 Site Selection Process and Iterative Design Process..... 4

3 Design Evolution 6

1 Introduction

1.1. Purpose of this Document

- 1.1.1. This document is prepared for Deadline 4 of the Examination of the Development Consent Order (DCO) for Tween Bridge Solar Farm (the Scheme).
- 1.1.2. This document is a post-hearing document that has been prepared in response to matters raised at the second Issue Specific Hearing (ISH2) held on the 23 June 2026, the third Issue Specific Hearing (ISH3) on the 24 June 2026, the Compulsory Acquisition Hearing (CAH) on the 24 June 2026 and the second Open Floor Hearing (OFH) on the 25 June 2026. The written summaries of the four hearings listed above can be seen on the Tween Bridge Solar Farm Examination Library under the Document References **[REP3-046, REP3-047, REP3-048, REP3-049]**.
- 1.1.3. The document also provides clarity on aspects of the Scheme which have evolved in response to representations made by Interested Parties (IP) and the Examining Authority (ExA) during the course of the Examination.

2 Site Selection Process and Iterative Design Process

2.1. Site Selection Process and Iterative Design Process

2.1.1. As detailed through **ES Chapter 3 Site Description, Site Selection and Iterative Design Process [REP2-019]**, the key stages for the site selection process that shaped the layout of the Scheme comprised of four key stages summarised below. The full details of the site selection process can be found within the **ES Chapter [REP2-019]**

2.2. Stage 1: Identifying available grid connection capacity

2.2.1. The Scheme requires a connection to the national grid to export the electricity it generates and contribute to national energy supply. Grid connection capacity has therefore been a key factor in determining both the location and scale of the Scheme, ensuring that sufficient capacity is available when the solar farm becomes operational. The Applicant received a Grid Connection Offer for 340MW in 2022, which increased to 590MW in 2023 and 800MW in 2024.

2.2.2. Land assembly initially assumed that the point of connection (POC) would be adjacent to the existing 400kV overhead line. However, due to competing grid capacity applications, the likely POC was relocated in 2024 to a site east of Area E, while remaining in close proximity to both the Scheme and the existing Tween Bridge Wind Farm. The Applicant's ownership and operation of the existing wind farm supported a co-location strategy, enabling shared infrastructure, reducing potential environmental effects and building on established landowner relationships. Consequently, land assembly focused on areas close to the POC and wind farm to minimise the required cable corridor length.

2.3. Stage 2: Land assembly

2.3.1. The Applicant has sought to deliver the Scheme through voluntary agreements with landowners rather than compulsory acquisition. Initially, approximately 1,500ha of land was identified to support a 600MW scheme. Following the increase in available grid capacity to around 800MW, the land requirement increased to approximately 1,831ha, and additional land was identified accordingly.

2.3.2. The Applicant's existing relationships with landowners around the existing wind farm and originally anticipated point of connection enabled early engagement to

assess the feasibility of co-locating the Scheme in this area. As further grid capacity became available, landowner engagement expanded southwards, reflecting constraints to the west, north and east of the original site and informing the Scheme's ongoing design evolution.

2.4. **Stage 3: Consideration of environmental and planning constraints**

2.4.1. A 10km search corridor around the anticipated POC was assessed to identify potential alternative sites. The extent of the search area reflected the practical and economic constraints associated with underground cabling for a solar farm of this scale. The assessment considered a wide range of environmental and planning constraints, including residential proximity, topography, accessibility, agricultural land quality, ecological and heritage designations, flood risk, landscape designations and public rights of way.

2.4.2. The review concluded that no alternative site within the search area would result in lower potential environmental effects. This finding was reinforced by the advantages of the proposed location, including its proximity to the POC, opportunities for co-location with the existing wind farm, and the efficient use of land for renewable energy generation.

2.5. **Stage 4: Initial identification of panel areas**

2.5.1. Stages 2 and 3 of the site selection process confirmed that sufficient land could be secured within the search corridor, outside major environmental and planning constraints, to deliver a viable solar farm. This enabled the development of an initial layout for the Scheme.

2.5.2. The Scheme layout evolved in response to increases in grid connection capacity. The initial layout, based on a 600MW connection, informed the Scoping Report and non-statutory consultation. Additional land was subsequently identified to accommodate the increase to 800MW, while other areas were removed following consultation feedback and ongoing environmental assessment. The revised layout formed the basis of the statutory consultation.

2.6. **Iterative Design Process**

2.6.1. As detailed within the **Consultation Report [APP-022]** and **ES Chapter 3 Site Description, Site Selection and Iterative Design Process [REP2-019]**, the Applicant further refined the Scheme through two phases of consultation; EIA

Scoping and non-statutory consultation to the Preliminary Information Report (PEIR) phase and the PEIR to the submission of the DCO Application. The full details of the changes made to the Scheme can be found within the documents list above as well as within **ES Figure 3.2 Design (PEIR) [APP-141]** and **ES Figure 3.3 Design (ES) [APP-142]**.

- 2.6.2. Some aspects of the Scheme require flexibility to accommodate the detailed design and construction phases following the grant of development consent. This flexibility has been incorporated into the EIA through the application of the Rochdale Envelope approach and the use of defined design principles and parameters, as set out in the **Appendix A: Parameters Document [REP3-014]**. These measures ensure that the effects of the Scheme remain within the scope of the environmental assessments undertaken and deliver a high-quality development.

3 Design Evolution

3.1. Design Evolution

- 3.1.1. The Applicant has been keeping the design of the Scheme under review since submission and, following the Examination hearings and discussions with the North Lincs Council, has decided to modify it as follows::
- Removal of solar panels from Fields E19 and E20 in response to matters raised at the Open Floor Hearing 2
 - Refinement of 132kV Substation and 100MW BESS within Flood Zone 3b in response to matters raised at Issue Specific Hearing 3
 - Reconfiguration of Solar Panels from Field E5 in response to matters raised through engagement North Lincolnshire Council

The relevant landowners have been notified of these changes.

3.2. Removal of Solar Panels from Fields E19 and E20

- 3.2.1. As detailed within the **Written Summary of Oral Submissions at the Open Floor Hearing 2 [REP3-050]**, the Applicant noted under Action 5 to agree to review the panel layout in the vicinity of property 44 as shown on **Environmental Statement**

Figure 6.5 Residential Properties [APP-149] and consider whether amendments could be made to reduce the visual impacts of the Scheme.

- 3.2.2. The Applicant has reviewed the Scheme layout in this area of the Order Limits and can confirm that the proposed extent of panels in fields E19 and E20 has been reduced to reduce the visual impact of the Scheme from property 44. Solar PV Modules have been removed from the Scheme in the northern section of Field E19 and the entirety of Field E20. The Applicant has reflected this development in submissions made at Deadline 4 including **ES Figure 6.4.2.2a Indicative Operational Layout Plan (Fixed Solar Panels) [Document Reference 6.4.2.2a Revision 3]** and **ES Figure 6.4.2.2a Indicative Operational Layout Plan (Fixed and Tracker Solar Panels) [Document Reference 6.4.2.2b Revision 3]** as well as within the **Works Plans [Document Reference 2.2 Revision 4]**. It has also been reflected within the residential visual amenity assessment **ES Appendix 6.2 Residential Visual Amenity Assessment [Document Reference 6.3.6.2 Revision 2]** which conclude that following the design changes to residential property 44, the impacts have been reduced at Year 1 from Moderate (Significant) to Moderate (Not Significant) .
- 3.3. **Refinement of 132kV Substation and 100MW BESS within Flood Zone 3b**
- 3.3.1. As detailed within the **Written Summary of Oral Submissions at the Issue Specific Hearing 3 [REP3-048]**, the Applicant noted under Action 6 that consideration would be given to whether further amendments could be provided to the location of certain elements of the Scheme's design to reduce the extent which lay within Flood Zone 3b. These two elements comprised a 132kV Substation and 100MW Battery Energy Storage System (BESS) both of which are located within Field A20.
- 3.3.2. The Applicant has reviewed the location of both elements and has adjusted the configuration of the 132kV Substation in Field A20 as detailed within **ES Figure 6.4.2.2a Indicative Operational Layout Plan (Fixed Solar Panels) [Document Reference 6.4.2.2a Revision 3]** and **ES Figure 6.4.2.2a Indicative Operational Layout Plan (Fixed and Tracker Solar Panels) [Document Reference 6.4.2.2b Revision 3]**. The 132kV Substation has been shifted approximately 6.5m in an eastern direction, as a result of which the substation now entirely avoids Flood Zone 3b. The visual representation of the 132kV Substation and the extent of the Flood Zone 3b area can be seen below in **Figure 1**.

- 3.3.3. The Applicant has also reviewed the specific location of the 100MW BESS which also lies within Field A20 within the Order Limits to determine whether a similar reconfiguration would be possible. There are a number of technical constraints close to the proposed 100MW BESS location as shown in **Figure 2**: the extent of the Flood Zone 3b encroaches into the western extent of the 100MW BESS layout; it is also bound by the topple zone of an existing wind turbine (part of the existing Tween Bridge Wind Farm); the Applicant has sought to avoid placing substations and BESS on peaty soils, and this location avoids those peaty soils which are immediately to the eastern extent of the 100MW BESS layout.
- 3.3.4. As such, the Applicant has been unable to move the location of the 100MW BESS from its current position. The Applicant has provided evidence from a design perspective for the operational need of the 100MW BESS being located in Area A and as such partially within the Flood Zone 3b:

Residential Amenity:

- 3.3.5. A significant benefit of locating the 100MW BESS compounds within Parcel A is that it reduces the noise impact they might otherwise have on nearby residential properties (as detailed within **Table 1-1** below). The existence of the Tween Bridge Wind Farm means that the baseline noise level in the area is higher than it otherwise would be, reducing the additional impact of the proposed 100MW BESS compounds. These parcels are also the furthest from residential dwellings – the 100MW BESS compound in field A20 is 2800m from residential dwellings, representing an appropriate solution possible in terms of residential amenity.

Capacity:

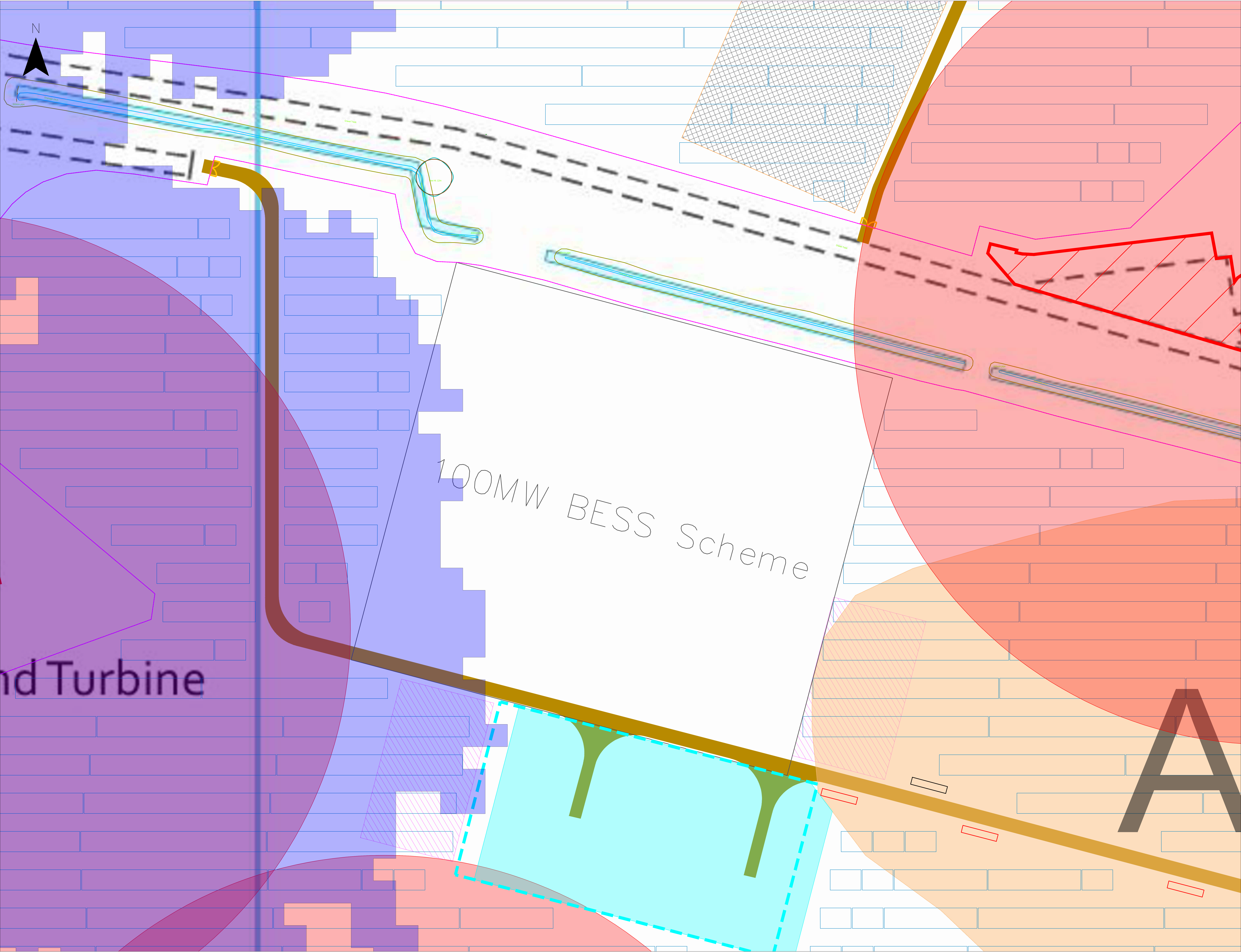
- 3.3.6. The capacity of the 132kV Substation plays a role in the siting of the 100MW BESS compounds. Though having the same overall capacity, some 132kV substations are larger than others and include further capacity to accommodate more 33kV cables inputting to them from the solar PV areas. The ability to place a BESS compound is limited to the 132kV Substations that are a larger size, which is itself determined by the solar PV areas they are serving and siting subject to environmental constraints.
- 3.3.7. The 132kV substation in Parcel A is one of the four substations in the Scheme that have the larger capacity to accommodate a BESS compound.

Flooding:

- 3.3.8. As explained above, for capacity reasons, the 100MW BESS has to be located next to one of the Scheme's four 132kV substations. While these 132kV substations are largely free from flood risk, none have sufficient adjacent land outside Flood Zone 3a or 3b to make them a preferable location to Parcel A.
- 3.4. **Reconfiguration of Solar Panels from Field E5**
- 3.4.1. Following further engagement with North Lincolnshire conservation officer, detailed within the **North Lincolnshire Statement of Common Ground [Document Reference 9.3 Revision 3]**, the Applicant has given further consideration to the local visual impacts on Dirtness Pumping Station (a Grade II Listed Building) of the Scheme's proposed Solar PV modules within Field E5, particularly when viewed from Idle Bank. In response, the Applicant has reconfigured to a limited extent the PV Modules within Field E5 and made a corresponding adjustment to the extent of the species rich neutral grassland to be provided. The revised solar panel layout can be seen in **ES Figure 6.4.2.2a Indicative Operational Layout Plan (Fixed Solar Panels) [Document Reference 6.4.2.2a Revision 3]** and **ES Figure 6.4.2.2a Indicative Operational Layout Plan (Fixed and Tracker Solar Panels) [Document Reference 6.4.2.2b Revision 3]** whilst the revised landscape visual mitigation strategy can be seen in **ES Figure 6.4.6.4 Landscape and Visual Mitigation Strategy [Document Reference 6.4.6.4 Revision 5]**. The Applicant notes that the overall areas of land reserved for Solar PV Modules and species rich neutral grassland mix does not change following these design amendments, but the reconfiguration ensures that open views are maintained toward the Grade II Listed Dirtness Pumping Station.
- 3.4.2. This reconfiguration of solar PV panel arrangement in Field E5 has allowed for improved opportunities for filtered and partial views of Dirtness Pumping Station that would otherwise have been more restricted. However, the changes do not alter the conclusions drawn, in Environmental Statement Chapter 8 Cultural Heritage and Archaeology **[Document Reference 6.2.8 Revision 3]**, of temporary Less than Substantial Harm and no documentation is therefore updated in this regard.

Figure 1 – Extent of Flood Zone 3b adjacent to the 132kV Substation (Field A20)

Figure 2 – Technical and Environmental Constraints Surrounding the 100MW BESS (Field A20)



LEGEND:

- Draft Order Limits
- Draft Order Limits Exclusion
- Solar Farm Road
- Fixed Solar Panels
- Fence
- Inverter Container
- Spares Container
- Access Gate
- Construction Compound
- Substation
- Substation (Old Location)
- Flood Zone 3b
- Peat
- Wind Turbine Topple Zone

Notes:

- The drawing is for illustrative purposes only

Tween Bridge Solar Farm

Drawing Ref: BESS (A20) Constraints Plan

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

Scale: 1:400

Paper Size: A0

Revision: 01

Drawing Status: DCO Application

Date: 06/07/2026

© Crown copyright and
Relevant rights 2023,
Ordnance Survey. All rights reserved.

© RWE

Document Ref: J343_1300_01

PINS Number: EN010148

Drawn: MP

Checked: AD

Approved: MB

Revision: 01

Drawing Status: DCO Application

Date: 06/07/2026

C:\Users\BSP\Documents\BESS\BESS (A20) Constraints Plan.dwg