FENWICK SOLAR FARM

Fenwick Solar Farm
EN010152

Environmental Statement

Volume III Appendix 2-2: BESS and On-Site Substation

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Regulation 5(2)(a)

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

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Revision History

Revision Number	Date	Details
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1. Battery Energy Storage System

1.1.1 The Battery Energy Storage System (BESS) allows excess energy in either the Solar PV generation or in the grid to be stored and released at times of peak demand, assisting the UK grid to become more resilient and efficient.

1.1.2 The BESS Area would comprise the following equipment:

a. Up to 432 individual BESS Containers;

b. Up to 1187 string inverters used in conjunction with 64 containerised units consisting of transformers and switchgear; or up to 64 containerised or open sided containerised units comprising inverters, transformers and switchgear;

c. Underground power and control cabling; and

d. A main control point for the supervision and management of the BESS equipment located within the Control Building.

1.1.3 Batteries and inverters would be replaced approximately every 10–15 years depending on their use and technology at the time.

1.1.4 **Framework Battery Safety Management Plan [EN010152/APP/7.16]** sets out the parameters for the management of fire risk associated with the BESS. The BESS Area contains above ground water storage tanks for firefighting purposes. The volume of water to be stored on-site, as well as access requirements for firefighting vehicles will be agreed with the relevant fire and rescue services. Any fire water runoff would be contained within the lined impermeable gravel-filled attenuation basins with penstocks to ensure no firewater is released to groundwater or to surface water without prior testing. More details on the preliminary firewater storage and containment requirements are provided in Section 9.4 of **ES Volume I Chapter 9: Water Environment [EN010152/APP/6.1]** and **ES Volume III Appendix 9-4: Framework Drainage Strategy [EN010152/APP/6.3]**.

1.1.5 Indicative layout of the BESS Area is shown in Plate 2-1.

2. On-Site Substation

2.1.1 The On-Site Substation would have a single bay and is the intermediary between the transmission network and the Scheme. It is the collector of the multiple 33 kV outputs at the Field Stations and the BESS to a single point. The separate 33 kV connectors are all independently connected, protected and monitored before being accumulated into a single transformer. This then transforms the voltage up to 400 kV ready for transmission level for the energy to be accepted by the National Electricity Transmission System (NETS). The transformer has a single output being connected to the NETS, either via underground Grid Connection Cables back to the Existing National Grid Thorpe Marsh Substation, or in the case of the Grid Connection Line Drop option via underground cables connecting to a new cable sealing end compound which then connects an existing on-site 400 kV overhead line tower within Field SE2 via a short section of above ground cables. All works to establish the cable sealing end compound, and works within the cable sealing end compound to modify the tower and connect the Scheme's cables to the NETS would remain under National Grid's control and do not form part of the Scheme.

2.1.2 The On-Site Substation would allow for the export of electricity from the Scheme as well as import of excess electricity from the grid to be stored within the BESS Area.

2.1.3 An indicative layout of the On-Site Substation is shown in Plate 2-2.

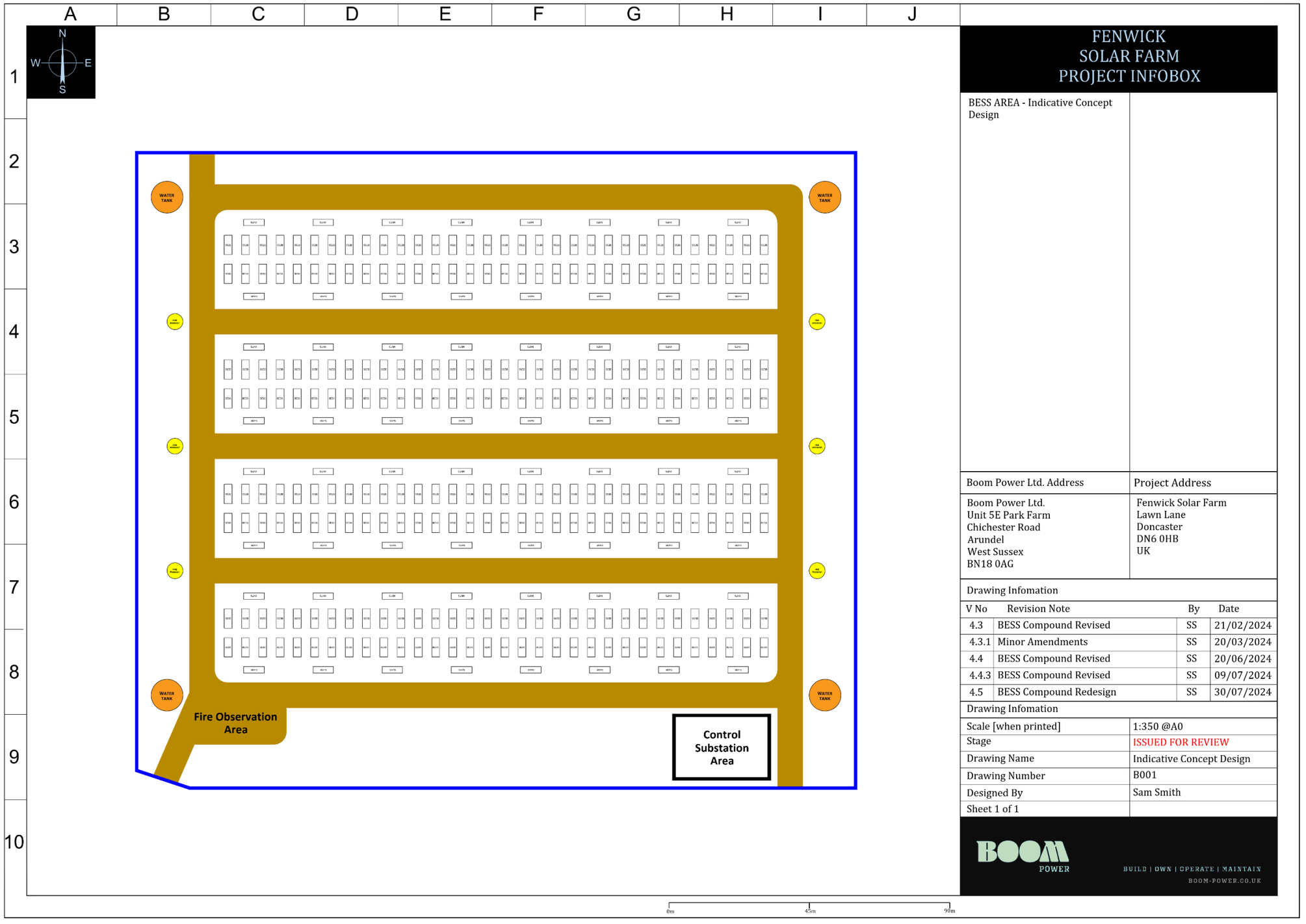

Plate 2-1: BESS Area Indicative Layout

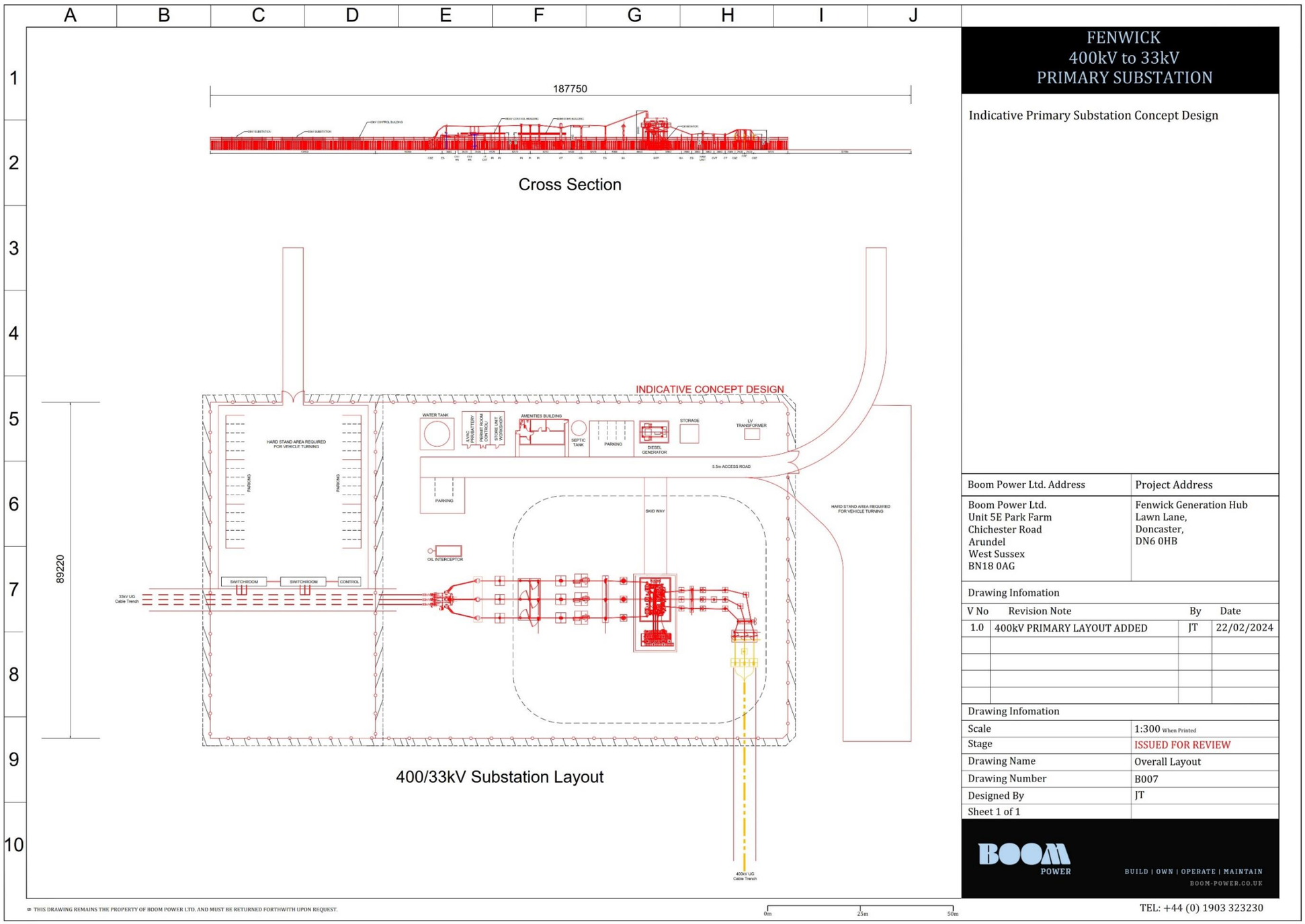

Plate 2-2: On-Site Substation Elevation and Indicative Layout

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