

Cottam Solar Project

Environmental Statement

Non-Technical Summary

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Issue Sheet

**Report Prepared for: Cottam Solar Project Ltd.
DCO Submission**

Environmental Statement: Non-Technical Summary

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1 Introduction

1.1 Background

1.1.1 This document has been prepared on behalf of Cottam Solar Project Ltd. (the 'Applicant') and provides a Non-Technical Summary (NTS) of the Environmental Statement (ES) for the proposed Cottam Solar Project.

1.1.2 The Applicant has submitted an application for a Development Consent Order (DCO) to the Secretary of State for Business, Energy, and Industrial Strategy for the construction, operation (including maintenance), and decommissioning of a photovoltaic (PV) solar array electricity generating facility exceeding 50 megawatts (MW) capacity, with an Energy Storage Facility and connection to the UK electricity transmission system (hereafter referred to as the 'Scheme').

1.2 The Order Limits

1.2.1 The extent of land for which DCO consent is being sought, is referred to as the 'Order limits' and comprises 1,451.23 ha of land.

1.2.2 Cottam 1 is made up of a number of sites / fields clustered within an area of countryside centred around the village of Coates in the District of West Lindsey, Lincolnshire. Cottam 2 sits to the north of Cottam 1 and is located to the east of the village of Corringham, also in the District of West Lindsey in Lincolnshire. Cottam 3 (also within West Lindsley, Lincolnshire) is located to the north of Cottam 2 and is divided into two areas:

- Cottam 3a, to the north-east and south-east of the village of Blyton; and
- Cottam 3b, to the east of Pilham.

1.2.3 The Sites are connected to each other and to the Point of Connection (POC) at Cottam Power Station located on the western side of the River Trent in Nottinghamshire by some 27.5km of high voltage cable circuits. These cables are proposed to be constructed within the Cable Route Corridor as identified in the application. Separate cables run from Cottam 2, 3a and 3b into Cottam 1 where a new 400kV substation will be located. From there a combined 400kV cable runs to the POC at the Cottam Power Station substation. Part of the Cable Route Corridor and the POC are situated within Bassetlaw District Council's area, which is within Nottinghamshire.

1.2.4 The Scheme Order limits is shown on **Figure 1.1** included at the end of this NTS.

1.2.5 A description of the physical characteristics of the Scheme and the land-use during the construction, operational, and decommissioning phases is presented in Section 4: Scheme Description, of this NTS.

1.3 The Applicant and Author of the ES

- 1.3.1 The Scheme is being developed by Cottam Solar Project Limited (the 'Applicant'). The Applicant is part of Island Green Power Limited (IGP), who is a leading international developer of renewable energy projects, established in 2013.
- 1.3.2 IGP has delivered 26 solar projects worldwide totalling more than 1GW of capacity. This includes 14 solar projects in the UK and Republic of Ireland.
- 1.3.3 IGP is also progressing the West Burton Solar Project, which is within the same locality as the Scheme. The DCO application for the West Burton Solar Project will be made shortly after the application for this Scheme.
- 1.3.4 The ES has been prepared by Lanpro Services. This document presents a non-technical summary of the results of the ES [EN010133/APP/C6.1 – C6.4].

1.4 The Purpose of the Environmental Statement and NTS

- 1.4.1 The ES has been produced to accompany the Application, as required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ("the EIA Regulations") (Ref 1-1), in order to ensure that the Examining Authority (who considers the Application), and the Secretary of State (who makes the ultimate decision as to whether consent should be granted for the Scheme) are aware of the likely significant effects on the environment as a result of the Scheme when taking their decision. The ES complies with all the elements of Schedule 4 of the Environmental Impact Assessment (EIA) Regulations.
- 1.4.2 The ES has 4 Volumes. Volume 1 is the main report with the various assessments contained therein; Volume 2 is the Appendices; Volume 3 contains the Figures and plans relating to the ES; Volume 4 is this NTS. In addition, a contents page, glossary and definitions document forms part of the ES.
- 1.4.3 The purpose of this NTS is to describe the Scheme and to provide a summary in non-technical language, of the key findings of the ES.

2 EIA Process and Methodology

2.1.1 Chapter 2: EIA Process and Methodology of the ES [EN010133/APP/C6.2.2] describes the approach the EIA has taken to assessing impacts associated with the Scheme, including the significance criteria against which those impacts have been assessed.

2.2 Overview

2.2.1 EIA is the process undertaken to identify and evaluate the likely significant effects of a proposed development on the environment and to identify measures to mitigate or manage any significant negative effects. The EIA should be informed by consultation with statutory consultees, other interested bodies, and members of the public. The purpose of identifying significant effects is to ensure decision makers are able to make an informed judgement on the environmental impacts of a proposal. The findings of the EIA are presented in the ES (which is summarised in this NTS).

2.2.2 The process of assessing and minimising effects involves continually feeding back environmental information obtained through surveys and consultation into the project design and re-evaluating the likely effects of the Scheme as a result.

2.2.3 All environmental assessments in the ES follow a broadly similar methodology. The likely effect that the Scheme may have on each receptor is influenced by a combination of the sensitivity of the receptor and the predicted magnitude of change from the baseline (or existing) conditions (either positive (beneficial) or negative (adverse)).

2.2.4 The environmental sensitivity, value, or importance of a receptor may be categorised by a range of factors, such as threat to rare or endangered species, transformation of natural landscapes, or changes to soil quality and land-use.

2.2.5 The overall likely effect is determined by the interaction of the above two factors (i.e., sensitivity/importance; and predicted magnitude of change from the baseline). Each chapter sets a threshold above which effects are considered to be “significant” in terms of the EIA Regulations. Where the magnitude of change is identified as “neutral”, there is no effect.

2.2.6 ‘Residual effects’ are the effects that remain after any proposed mitigation has been taken into account (mitigation measures are measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects of the development and can relate to both methods of construction, or particular design elements that are to be incorporated within the completed Scheme).

2.2.7 Cumulative effects have also been assessed, which take into account other proposed developments in the area which could lead to additional effects in combination with the Scheme. Information relating to committed developments has been collected from the appropriate source including online LPA application portals, the Planning Inspectorate (PINS) or directly from the applicant / developer. NSIP projects in close proximity to the Scheme are:

- West Burton Solar Project (currently subject to an EIA Scoping Opinion (March 2022) and Statutory Consultation Summer 2022. Following broadly the same timescales as the Scheme;
- Gate Burton Energy Park (EIA scoping opinion issued December 2021 and Statutory Consultation Summer 2022). Also, following broadly the same timescales as the Scheme;
- Tillbridge Solar (EIA Scoping opinion issued by PINS November 2022).

2.2.8 **Figure 2.1** contained at the end of this NTS document shows the location of these potential developments, and others in proximity to the Order limits of the Scheme. The ES provides the latest environmental information obtained and assessed as part of the EIA. The ES accompanies the application for the Scheme and demonstrates how a systematic approach to EIA and project design has taken place. The process of identifying environmental effects has been both iterative and cyclical, running in tandem with the iterative design process.

2.3 EIA Scoping

2.3.1 An EIA Scoping Report and a request for an EIA Scoping Opinion under Regulation 10 of the EIA Regulations was submitted to the Planning Inspectorate in January 2022.

2.3.2 The aim of the EIA Scoping process is to identify expected key environmental issues at an early stage, to determine which elements of the Scheme are likely to result in significant effects on the environment and to establish the extent of survey and assessment requirements for the EIA, including identifying which topics should be included in the EIA and the level of detail to which they should be assessed.

2.3.3 The Scoping Opinion was received on 9th March 2022 and presents the formal response from the Planning Inspectorate (on behalf of the Secretary of State) and statutory consultees.

2.3.4 The ES is based on the Scoping Opinion, with the matters raised having been reviewed and taken into consideration in the relevant technical assessments. Key issues raised in the Scoping Opinion are summarised at the start of each of the technical chapters (**Chapters 7 to 21**) of the ES [EN010133/APP/C6.2.1 – C6.2.21].

2.4 Preliminary Environmental Information Report

2.4.1 A Preliminary Environmental Information (PEIR) Report was prepared and published in June 2022 as part of the statutory consultation exercise undertaken by the Applicant. The purpose of the PEIR was to “enable the local community to understand the environmental effects of the proposed development so as to inform their responses regarding the proposed development”. It was also prepared to meet the requirements of Regulation 12(2) of the EIA Regulations.

2.4.2 The PEIR provided the preliminary findings of the environmental assessment undertaken at that time in the Scheme design development. Upon completion of the

PEIR, the various assessments were at differing stages of completion due to ongoing design work and continued collection of baseline information.

- 2.4.3 The PEIR has been further developed following completion of the design work and environmental assessment and now constitutes the ES, which this NTS summarises.

2.5 Consultation

- 2.5.1 Consultation is integral to the preparation of DCO applications and to the EIA process. The views of consultation bodies and the local community serve to focus the environmental studies and to identify specific issues that required further investigation, as well as to inform aspects of the design of the Scheme. The Planning Act (2008) requires applicants for DCOs to carry out formal (statutory) pre-application consultation on their proposals.
- 2.5.2 A two-stage approach to pre-application consultation on the Scheme was adopted. A non-statutory consultation was carried out during November 2021 to December 2021, and statutory consultation was undertaken from 15 June to 27 July 2022, following the publication of the PEIR Report . The Consultation Report submitted as part of the Application **[EN010133/APP/C5.1]** documents the pre-application and statutory consultation undertaken by the Applicant, and the regard had to the responses.
- 2.5.3 Following the statutory consultation set out above, the Applicant made a number of minor changes to the Order limits having regard to feedback from the consultation, and in light of further work on the Scheme's design and environmental impacts. The Applicant wrote to affected consultees to notify them of the changes and invite comment for a 28-day period.
- 2.5.4 The issues that have been raised through consultation and how these have been considered and addressed within the design evolution of the Scheme and the EIA are set out in each of the technical chapters (**Chapters 7 to 21**) of the ES **[EN010133/APP/C6.2]**, and in the Consultation Report **[EN010133/APP/C5.1]**.

3 Site Selection and Design

- 3.1.1 Chapter 5: Alternatives and Design Evolution of the ES **[EN010133/APP/C6.2.5]** presents an overview of the justification for selecting the Order limits, how the design has evolved since EIA Scoping, and a discussion of the reasonable alternatives considered.
- 3.1.2 A viable grid connection is an essential material consideration for proceeding with a solar development and is instrumental in defining the search area. The Applicant made a grid connection application to National Grid for connection at Cottam Power Station (POC) and an offer was made by National Grid for 600MW.
- 3.1.3 The selection of the Scheme's location has followed a five-stage process, which is a systematic step-by-step process and is described in detail in Appendix 5.1 (to Chapter 5 of the ES) Site Selection Assessment **[EN010133/APP/C6.3.5.1]**.
- 3.1.4 Based on the POC at Cottam Power Station and consideration of the maximum economically viable distance from that point for the connection, the assessment has considered potential solar development areas in a 20km area of search.
- 3.1.5 Stages 2 and 3 of the assessment have involved GIS mapping to exclude environmental and planning constraints including all Grade 1, 2, and 3 agricultural land and apply operational considerations such as development area and topography within the 20km area of search.
- 3.1.6 This resulted in the identification of 5 potential development areas (PDAs) on areas of Grade 4, 5 and unclassified land. These included the alternative location (RAF Scampton) proposed through the pre- application consultation undertaken by Cottam Solar Project Limited.
- 3.1.7 The PDAs were subject to further evaluation, using readily available information sources, against assessment indicators to consider the suitability of these areas for solar development. The conclusions of this evaluation indicate that the PDAs have a number of land use, operational and environmental constraints which would mean it would be difficult to develop solar of the scale required at these locations.
- 3.1.8 Given the assessment findings it was then necessary to consider Grade 3 agricultural land. Local agents provided information regarding potentially willing landowners with large-scale land holdings within the Grade 3 land area. This resulted in the identification of four potential development areas in addition to the Scheme land.
- 3.1.9 Similarly to the Stage 2 and 3 assessment, GIS mapping was used to exclude environmental and planning constraints from the Grade 3 land and apply operational considerations. This resulted in the choice of the Scheme's location which performed better than 3 of the other locations and equal to one (Site 9) within the RAG assessment. Site 9 is immediately adjacent to High Marnham Power Station where a grid connection was not preferred by National Grid at the time of Site Selection, but which could be the most sensible and cost effective POC in the future. In addition, a detailed ALC assessment has not been undertaken for Site 9 so it may

contain a higher proportion of BMV land than the Scheme. It should also be noted that the majority of the northern land parcel is flood zone 3 with pockets of zone 1 and 2. Approximately a third of the largest central land parcel adjacent to High Marnham POC is zone 3 with the remainder primarily in zone 1 with pockets of zone 2. The southern land parcel is primarily zone 1. Flooding is associated with the River Trent which is adjacent to the central and northern land parcels. Depth of flooding may be greater than 1m and prohibitive for solar development. It is likely that the site area would need to be reduced to avoid areas over 1m flood depth. The remaining areas may not be large enough in size to provide an alternative to the Scheme.

- 3.1.10 It is considered that there are no obviously more suitable locations within the area of search than the proposed Sites for the Scheme. The Scheme's location is therefore assessed to be suitable for the scale of solar development proposed and the basis on which the Applicant has selected the Sites accords with the approach to the consideration of alternatives set out by paragraph 4.4.3 of NPS EN-1.
- 3.1.11 The Order limits would not be suitable for alternative forms of renewable generation – onshore wind was effectively barred by changes to the planning regime in 2015 and other forms of renewable technologies rely on natural resources not available within the Order limits. Nuclear power was not considered as an alternative because of the high cost of electricity and the lengthy planning and development timeframe; circa 20 years, that such a project would involve. The Scheme will be able to start generating electricity much more quickly with a grid connection anticipated in 2029.
- 3.1.12 Alternative layouts for the solar panel areas, alternative substation locations and alternative cable routes have all been considered from the early scoping stages of the project through to submission of the DCO application. Matters raised by stakeholders in relation to alternatives at the EIA Scoping and Statutory Consultation Stages have helped to shape the development of the Scheme. This iterative design process has resulted in the Scheme delivering good design and meeting the requirements of the NPSs and Draft NPSs in the context of efficiently delivering large scale renewable energy infrastructure. It also provides a new network of environmental features which deliver a range of ecosystem services, incorporating biodiversity, heritage, landscape and access.

4 Scheme Description

4.1 The Order Limits

- 4.1.1 The Order limits are located within the District Council administrative areas of Bassetlaw and West Lindsey in the counties of Nottinghamshire and Lincolnshire respectively. The Order limits is formed by the Solar Array Sites, the Grid Connection Route and Site Access Works.
- 4.1.2 **Figure 1.1** illustrates the Scheme Order limits, which is the maximum area of land required for the construction, operation and maintenance, and decommissioning of the Scheme. It includes the Scheme infrastructure and any land set aside for landscaping, ecological and biodiversity enhancements, and recreational connectivity and access.
- 4.1.3 The current landscape within the Scheme Order limits consists predominantly of agricultural fields with some interspersed grasslands and small areas of trees. Within the Order Limits, Cottam 3a includes a former airfield with some areas of hardstanding. The surrounding habitat is mainly arable in nature. There are some individual and small clusters of residential properties located adjacent to the Order limits boundary.
- 4.1.4 Other proposed infrastructure within the Order limits and surrounding area include the Cable Route Corridor. The Sites are connected to each other and to the grid connection point by some 27.5km of high voltage cable circuits. Separate cables run from Cottam 2, 3a and 3b into Cottam 1 where a new 400kV substation will be located. From there a combined 400kV cable runs to the POC at the Cottam Power Station substation.
- 4.1.5 Each of the Sites has separate access routes, which will be used across the construction, operation, maintenance, and decommissioning phases of the development. The local highway network has been assessed as being suitable for traffic associated with the Scheme at all phases. There will be required highways improvements or alterations to some existing access in order for abnormal loads to be delivered or removed from the Sites, especially during construction and decommissioning.
- 4.1.6 The Scheme has been designed so that it does not cause a permanent diversion or closure of a Public Right of Way or make it so that the Public Right of Way is unsuitable or undesirable for use.
- 4.1.7 Where possible, the design of the Scheme has considered additional accessibility routes, such as permissive paths or links between Rights of Way to add a level of community benefit and to enhance the walking and cycling network in the locality.
- 4.1.8 The landscape features immediately surrounding the Order Limits with reference to Cottam 1 comprise of arable farmland, interspersed with a significant number of woodland blocks, adjoining and within close proximity to the eastern portion of the landholding. The settlements at Coates and Thorpe le Fallows lie closest to the Site,

whilst larger villages are found along north-south routes to the east and west of the Site, the largest of these being Sturton by Stow. The topography of the surrounding area is largely defined by the flood plains of the River Trent and River Till and is bounded to the east by a limestone escarpment known as “The Cliff”.

- 4.1.9 Cottam 2, within the Order Limits, is predominantly arable farmland, interspersed with a small number of woodland blocks, adjoining and within close proximity to the eastern portion of the landholding. The village of Corringham lies close to the southwest of the Site, whilst the hamlets of Aisby and Yawthorpe can be found to the northwest and east respectively. The topography of the surrounding area is largely defined by the hills above Gainsborough to the west, and to the east by a limestone escarpment known as “The Cliff”.
- 4.1.10 Cottam 3a is predominantly arable farmland, interspersed with a small number of tree belts along major field boundaries. The village of Blyton and Pilham lie close to the west of the Site, whilst the villages of Northorpe and Laughton can be found to the northeast and northwest respectively. The hamlet of Aisby lies to the south of Cottam 3b. The topography of the surrounding area is largely defined by the hills above Gainsborough to the southwest, and to the east by a limestone escarpment known as “The Cliff”. There is a significant area of woodland known as Laughton Forest approximately 3km to the northwest of Cottam 3a.
- 4.1.11 Cottam 3b is predominantly arable farmland, interspersed with a small number of tree belts along major field boundaries. The village of Blyton and Pilham lie close to the west of the Site, whilst the villages of Northorpe and Laughton can be found to the northeast and northwest respectively. The hamlet of Aisby lies to the south of Cottam 3b. The topography of the surrounding area is largely defined by the hills above Gainsborough to the southwest, and to the east by a limestone escarpment known as “The Cliff”. There is a significant area of woodland known as Laughton Forest approximately 3km to the northwest of Cottam 3a.
- 4.1.12 Within the Order Limits, the Cottam 1 and 2 Sites are surrounded by a small number of ecological designations, none of which are subject to national or international designations.
- 4.1.13 The Cottam 2 Site is in close proximity to the area of the Cliff around Hemswell, which is designated as an Area of Great Landscape Value by the district authority.
- 4.1.14 The Cottam 3a and 3b’s sites and surroundings are home to a small number of ecological designations. Cottam 3a lies within the impact risk zones of several SSSIs, located around the villages of Laughton and Scotton to the northwest.
- 4.1.15 There are no non-statutory sites designated for nature conservation within 2km of the Order limits.
- 4.1.16 The majority of the Order Limits lies within land at low risk of flooding (less than 1 in 1,000 annual probability). Some areas of medium to higher risk of flooding are present in areas associated with watercourses (between 1 in 1000 to 1 in 100 annual probability).

- 4.1.17 There are no scheduled monuments, listed buildings, registered parks and gardens, or conservation areas within the Order Limits. There are:
- Two Scheduled Monuments that lie to the north, two to the east, two to the south and two to the west of the Cottam 1 Site with one Scheduled Monument at the centre of the land parcels. There are additionally multiple conservation areas within nearby villages;
 - Two Scheduled Monuments to the North of the Cottam 2 Site;
 - One Scheduled Monument to the east of the Cottam 3a Site and one to the west; and
 - Two Scheduled Monuments to the south of the Cottam 3b Site and one to the east.
- 4.1.18 There are no registered parks, gardens or conservation areas within the Order Limits.
- 4.1.19 Within 2km of the Order limits, there are:
- a. No Registered Parks and Gardens; and
 - b. Two Conservation Areas.
- 4.1.20 There is an extensive network of public rights of way (PRoW) both within the Order limits and across the surrounding area, as shown in the Public Rights of Way Plan [EN010133/APP/C2.5].

4.2 Description of the Scheme

- 4.2.1 The Scheme comprises a solar energy farm with solar photovoltaic (PV) panels and Energy Storage Facility (which for the purposes of the ES is likely to be battery technology and therefore is often referred to as a Battery Energy Storage System or 'BESS' in the ES). The PV Panels will convert the sun's energy into electricity for storage on-Site and export to the national grid via an underground cable. **Figures 4.1 - 4.8** provided at the end of this NTS document, show Illustrative Site Layout Plans at each of the sites, showing one way in which the Scheme could be developed, and which have been used to inform the assessments in the ES.
- 4.2.2 The Scheme seeks an approval for a development with restrictive parameters, which restrict the aspects of the solar farm which have potential environmental impacts – such as the height of the solar panels, dimensions of infrastructure such as the BESS, and where within the Order limits solar panels would be located. These are known as the 'Design Principles'. This approach also ensures the Cottam Solar Farm will be able to generate electricity as efficiently as possible, using technology which is constantly improving and may allow greater amounts of electricity to be generated in future within the existing Design Principles. Further information about the Design Principles is presented in the sections below, and in Chapter 4: Scheme Description of the ES [EN010133/APP/C6.2.4].

Concept Design Parameters and Principles, and the Rochdale Envelope

- 4.2.3 The need for flexibility in design, layout and technology is recognised in National Policy Statement EN-1 as elements of a development may not be finalised. To accommodate flexibility, a ‘Rochdale Envelope’ approach is used, as described in the Planning Inspectorate Advice Note 9. This involves assessing the maximum (and where relevant, the minimum) parameters for the Scheme where flexibility needs to be retained. While ensuring all potentially significant effects (positive or adverse) are considered. The principles and justification for this approach are set out in Chapter 2: EIA Process and Methodology of the ES [EN010133/APP/C6.2.2].
- 4.2.4 The maximum design scenarios are identified from the range of potential options for each design parameter for the Scheme. The maximum design scenario assessed is therefore the scenario which would give rise to the greatest potential impact. The maximum design scenarios are set out in the Concept Design Parameters and Principles document [EN010133/APP/4.2] and secured by a requirement in the draft DCO.
- 4.2.5 A number of elements of detailed design for the Scheme cannot be confirmed until the tendering process for the design and construction of the Scheme has been completed. For example, due to the rapid pace of technological development in the solar PV and energy storage industry, the Scheme could utilise technology which does not currently exist and therefore sufficient flexibility needs to be incorporated into the Application.
- 4.2.6 The Concept Design parameters all fall within the bounds of the Design Principles, and in many cases, the Concept Design is the same as the Design Principles, such as the height of PV Panels. Where topics within the ES have undertaken an assessment on the basis of the Concept Design, they have also considered and confirmed that the effects predicted for the Concept Design would be no worse for any other scheme constructed within the parameters set by the Design Principles.
- 4.2.7 The Scheme elements are discussed below, and indicative images of the Scheme equipment are presented in **Plate 1**.
- 4.2.8 The Order limits is formed by the Solar Farm Site, the Grid Connection Cable Works, BESS, on-site substations, works at Cottam Power Station, and ancillary infrastructure. The location of the Scheme components within the Order limits has been carefully considered and restricted to specific areas, in order to minimise the impacts of those components (as shown on the Works Plan [EN010133/APP/C2.4]). The Scheme will comprise the following components:
- a) PV Panels (also known as modules): these convert sunlight into electrical current. Both tracker and fixed panels have been considered in the application. The maximum height of the highest part of the tracker panels is 4.5m above ground level; with the fixed being 3.5 metres. Foundations are most likely to be galvanised steel poles driven into the ground. These will either be piles rammed into a pre-drilled hole, with a pillar attaching to a steel ground screw.

Maximum depth of piled mounting structures will be 3.5m below ground level. Foundations in areas of archaeological interest will be concrete feet onto which the mounting structures will be affixed;

- b) Conversion Units incorporate the inverters, transformers and switchgear and are required to manage the electricity generated by the PV Panels. These would either be standalone equipment or they would be housed ('integrated') together within a container. The Concept Design Parameters allow for both options. Both options would sit on a concrete foundation slab, strips or footings for each of the units and a levelling layer of aggregate with a maximum depth of 0.8m; or a concrete plinth set atop the topsoil where non-ground-penetrative works are required. Inverters are required to convert the DC electricity collected by the PV Panels into alternating current (AC), which allows the electricity generated to be exported to the National Grid.
- c) The Energy Storage Facility or BESS is designed to provide grid balancing services to the electricity grid. It will do this by allowing excess electricity generated from the PV Panels to be stored in batteries and dispatched when required. The batteries will be housed within the 'BESS Containers'. The maximum dimensions of individual modular battery storage container and interconnector container within a BESS compound is 2.0m width by 3.0m length and up to 3.5m in height. The maximum dimensions of modular battery storage and interconnector container strings within a BESS compound is 24.0m by 3.0m footprint and up to 3.5m in height. This is based on strings consisting of up to 12no. modular containers;
- d) The Cottam 1 Substation's location can be viewed within the Works Plan **[EN010133/APP/C2.4]**. The maximum height of the substation at Cottam 1 will be 13.2m to the top of the busbars.
- e) The electricity generated by the Scheme will be exported to the National Grid via the Cable Route Corridor, via a connection between Cottam 1 Substation and the Cottam Power Station Substation.
- f) Other development is comprised of: (a) works including electrical cables, boundary treatment, means of access including permissive paths, security infrastructure, landscaping and biodiversity measures, earthworks, (b) works such as drainage, utility and communications connections, and site preparation works, which may be carried out across the Order limits; (c) Temporary construction compounds (or 'laydown' areas) for the Solar Farm Site, secondary temporary construction compounds within the Solar Farm Site and temporary construction laydown for the Cable Route Corridor; (d) Works to facilitate site access to the Solar Farm Site; (e) internal access roads and car parking; (f) landscaping including habitat management areas.

4.2.9 **Appendix 4.1** of the ES 'Engineering Drawings and Sections', contained at the end of this NTS, show indicatively, the types of equipment and structures that could be constructed on the Sites and within the Cable Route Corridor.

- 4.2.10 During the construction phase, several temporary construction compounds will be required as well as temporary roadways to facilitate access to all land within the Order limits.
- 4.2.11 Opportunities for landscaping, and habitat management will be delivered in areas around the solar infrastructure and on other land within the Order limits.
- 4.2.12 The Scheme has been designed to integrate with and enhance the local green infrastructure network, improving ecological and recreational connectivity across the Order limits. The proposed planting design has responded to landscape and ecological character.
- 4.2.13 Areas under the solar panels and around the perimeter of the Sites will be planted with native grassland mix, and hedgerows will be planted or augmented to provide visual screening (see Outline Landscape and Ecological Management Plan **[EN010133/APP/ APP/C7.3]** accompanying the application.

Plate 1: Images to show the type of equipment to be used within the Scheme



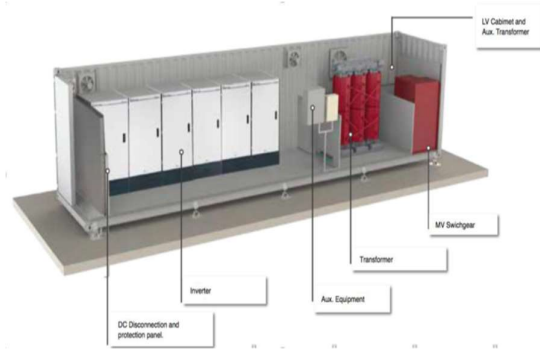
Tracker Panels



Fixed Panels



Panels with Concrete Feet



Integrated Conversion Unit



Battery Storage Compound

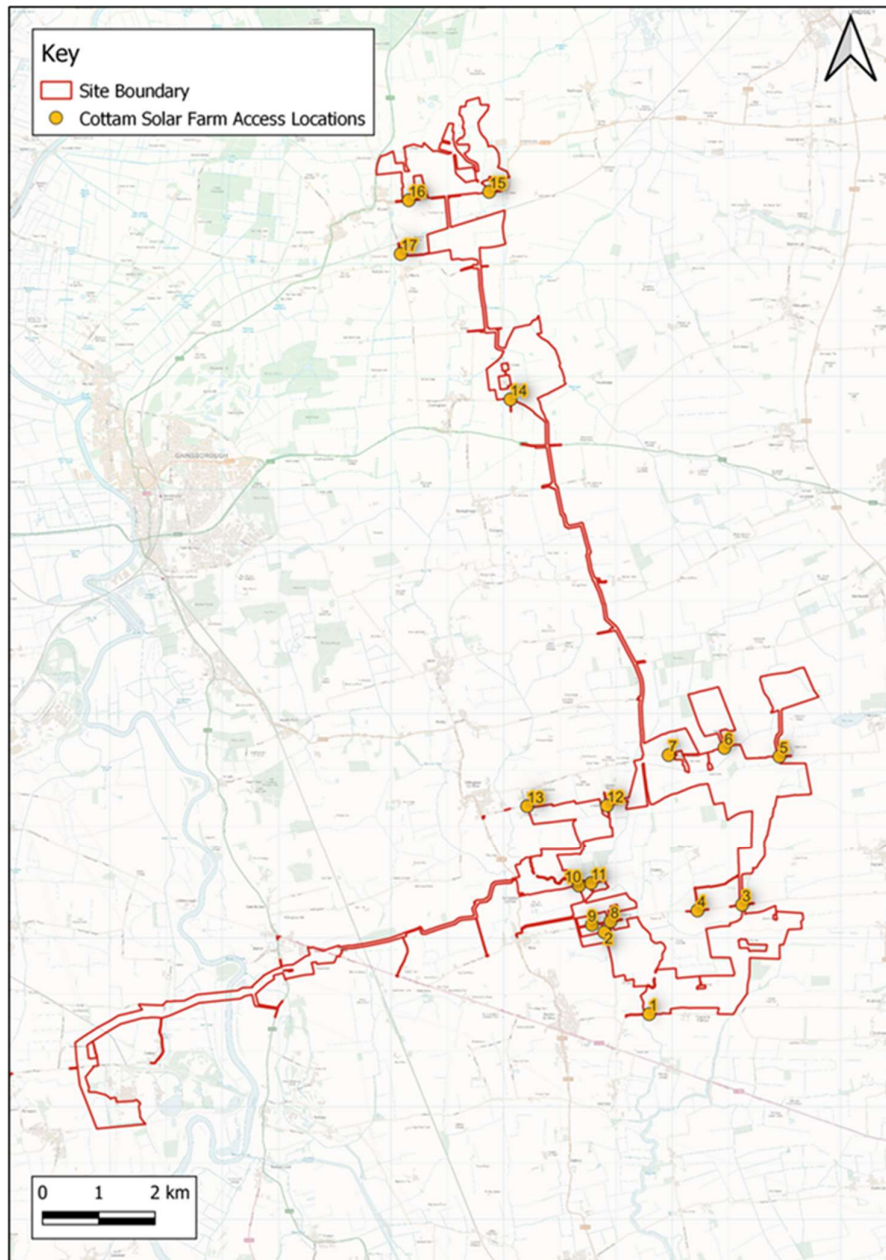


400 kV Power Transformer

Access Locations

4.2.14 Permanent and temporary access points are described and assessed in detail in the Transport Assessment [EN010133/APP/C6.3.14.1] and Outline Construction Traffic Management Plan (CTMP) [EN010133/APP/C6.3.14.1] at Appendices 14.1 and 14.2 to the Transport and Access Chapter of the ES. There will be a total of 17 access points for Cottam 1, 2 and 3a and 3b. The access locations to the Solar Farm Sites (Cottam 1, 2 and 3) are shown in Plate 1.2 below:

Plate 2 Access Locations – Cottam 1, 2 3a and 3b



4.3 Construction

Construction Programme

4.3.1 The Scheme currently has a grid connection date of 2029 although there is the potential that an earlier connection could be achieved. It is currently anticipated that construction works will commence, at the earliest, in Q4 2024 and will run to Q4 2026. As such, the construction programme for the entire Scheme is anticipated to be 24 months with the potential likelihood of overlapping construction works on the different Scheme Sites. Plate 1.3 indicates the potential construction durations across the different parts of the Scheme, showing a series of overlapping stages.

Plate 3 Indicative Construction Programme

Site/Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Cottam 1 (N)	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Cottam 1 (S)	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Cottam 1 (W)	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Cottam 2	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Cottam 3a	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Cottam3b	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
BESS	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Grid Connect	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

4.3.2 Shared Cable Route corridor’. As noted at Chapter 2 of the ES, part of the Gate Burton Energy Park cable route and West Burton Solar Project cable route will fall within the cable corridor for the Scheme, in the vicinity of Cottam Power Station. The cumulative environmental effects of the simultaneous or sequential construction of these cables have been assessed in the ES. This is in order to seek to minimise potential environmental effects and identify the benefits of combined construction activities. To accommodate the potential sequential installation of all three projects’ ducts and cables, a five-year construction duration is adopted for this and assessed in this ES. This will be over the period Q1 2024 to Q1 2029. This period has been chosen given that the grid connection dates for Cottam is 2029, West Burton 2028 and Gate Burton Energy Park 2028 and it allows for these works to take place within that period.

4.3.3 Outside of the main construction period, there will be commissioning and connection to the National Grid. The timing of these works is dependent on National Grid.

4.3.4 The different elements of the construction works shown above, mean that enabling works do not need to be complete in all areas of the construction site before solar farm construction commences in another part of the site.

4.3.5 The construction phase is expected to commence not earlier than the last quarter of 2024 and be completed not earlier than the last quarter of 2026. During the construction phase, several temporary construction laydown areas will be required as well as temporary roadways to facilitate access to all land within the Order limits.

Construction Activities

4.3.6 The following activities would be required as part of the enabling works (not necessarily in order):

- a) Construction of site entrance and construction vehicle delivery holding area;
- b) Establishment of the main temporary construction laydown areas, which includes site offices/welfare area and parking area;
- c) Upgrade, modification or improvement of highways where required for site construction;
- d) Preparation of land for construction, including localised site levelling (where required) and vegetation clearance;
- e) Import of construction materials, plant and equipment to site;
- f) Establishment of the construction area fence where required for construction works to progress (the installation of the perimeter fence will progress with site construction in each area and therefore will not be complete at the start of site construction);
- g) Establishment of the secondary temporary construction laydown areas within the Solar Farm Sites;
- h) Construction of the internal access roads; and
- i) Marking out the location of the operational infrastructure.

Cable Construction

4.3.7 Generally on-site cables will be laid underground in excavated trenches adjacent to on-site tracks where possible and between the rows of PV panels. They will be laid at a suitable depth and positioned at a distance far enough away from the PV structures to allow future repair or maintenance. Some sections of cable may be installed in ducting if required to provide additional protection or where other infrastructure such as roads and hardstandings will be built over the top.

4.3.8 Cables will be laid in trenches established using open cut methods or Horizontal Directional Drilling where open cut methods are not appropriate (i.e., under watercourses, sensitive ecological habitats or archaeology).

4.3.9 For HDD, launch and reception pits will be excavated using a suitable excavator, with any required shoring or battering installed. Plant and spoil will be placed a safe

distance away from the edge of the excavation so as to minimise the risk of the trench sides collapsing. Once the launch pit has been excavated, work will then commence on the initial drill (the 'pilot bore'). An area of up to 25m by 25m will be required at the launch pit and the reception pit. The area of hardstanding will be removed and the area reinstated following construction.

Site Access

- 4.3.10 Site entrances will include a security gate and kiosk to manage access and egress. The site entrance will allow HGVs to drive off the public road and park up before entering site without causing queues on the public highway.
- 4.3.11 Site access and routing strategies have been discussed and agreed in consultation with the Highways Authorities as set out within the Outline CTMP. There are existing surfaced tracks within the Order limits currently utilised for farm machinery, which are proposed to be upgraded for use to minimise the use of the network of minor roads around the Order limits. In order to access all of the construction sites, a network of tracks will be used:
- a) Construction and decommissioning access points. These will be a minimum of 5.0m in width for two-way movements up to a maximum of 6.5m in width where passing places are required;
 - b) Accesses required for permanent operation and maintenance access will be a minimum of 3.5m in width up to a maximum of 6.0m in width;
 - c) Existing access tracks will be widened or resurfaced for temporary accesses;
 - d) Existing tracks will be used where already suitable;
- 4.3.12 The Transport Assessment **[EN010133/APP/C6.3.14.1]** examines construction phase traffic. It is expected that there will be a relatively flat profile of deliveries throughout the construction period. Therefore, an average number of deliveries per day has been calculated based on the length of the construction period. Notwithstanding, it is acknowledged that there will be small peaks throughout the construction period, especially during Site set up. To account for this, a 50% uplift has been applied for the purposes of assessment. The assessment shows that there could be the following HGV movements.
- Average HGV Arrivals and Departures per Day – 38 (76 Movements)
 - Peak HGV Arrivals and Departures per Day – 58 (116 Movements)
- 4.3.13 The Transport Assessment also shows that there could be up to 233 construction worker arrivals by car and shuttle bus associated with Cottam 1, 2, 3a and 3b on a busy day. These are likely to arrive in the morning, with the same amount of the departures in the afternoon/evening. Shift patterns will be coordinated to avoid construction work travel during the traditional network peak hours of 08:00-09:00 and 17:00-18:00. As shown in the construction programme above there is only one month where the construction of all aspects of the development overlap (Month 11).

- 4.3.14 Temporary car parks will be provided for construction workers within the main construction laydown areas shown on the Works Plans (Work No.8) and shown indicatively on the 'Construction Compound' illustrative drawing at Appendix 4.1 of the ES.

Construction Workers and Hours of Working

- 4.3.15 On an average day, there is expected to be 450 workers spread across the Site. During the peak periods this could increase to around 600 construction workers. In addition, there will be approximately 50 workers positioned at the BESS in Cottam 1 (West).

- 4.3.16 Construction activities will be carried out Monday to Friday 07:00-18:00 and between 08:00 and 13:30 on Saturdays (this does not include for start-up and shut down works). However, some activities may be required outside of these times (such as the delivery of abnormal loads, night time working for cable construction works in public highways or HDD activities). Construction deliveries by HGV will arrive between 09:30-16:30. They will be coordinated to avoid construction vehicle movements during the traditional morning peak hour (08:00-09:00) and evening peak hour (17:00-18:00). In addition, construction worker shift patterns will be coordinated to avoid travel during the network peak hours of 08:00-09:00 and 17:00-18:00. These provisions are set out in the CTMP **[EN010133/APP/C6.3.14.1]** and will be secured via a Requirement in the DCO.

Construction Controls

- 4.3.17 The construction phase will be subject to management documents which will limit and control activities. The outline documentation includes the following documents submitted with the Application:

- a) Outline Construction Traffic Management Plan (CTMP) **[EN010133/APP/C6.3.14.2]**.
- b) Outline Construction Environmental Management Plan (OCEMP) **[EN010133/APP/C7.1]**.
- c) Outline Soil Management Plan (SMP) **[EN010133/APP/C7.18]**.

4.4 Operation

- 4.4.1 During the operational phase, activity within the Scheme will be minimal and will be restricted principally to vegetation management, equipment maintenance and servicing, replacement and renewal of any components that fail, and monitoring. It is anticipated that maintenance and servicing would include the inspection, removal, reconstruction, refurbishment or replacement of faulty or broken equipment and adjusting and altering the solar panel orientation to ensure the continued effective operation of the Scheme and improve its efficiency as set out within the Outline Operational Environmental Management Plan (OEMP) **[EN010133/APP/C7.16]**.

4.4.2 Along the Cable Route Corridor, operational activity will consist of routine inspections (schedule to be determined) and any reactive maintenance such as where a cable has been damaged.

4.4.3 It is anticipated that there will be up to 15 permanent (visiting) staff onsite during the operational phase across the whole Scheme which will lead to a very small number of daily vehicle trips, with additional staff attending when required for maintenance and cleaning activities.

4.5 Decommissioning

4.5.1 Decommissioning is expected to take between 12 and 24 months and will be undertaken in phases, and for the purposes of the assessment is expected to occur after approximately 40 years of operation of the Scheme. A Decommissioning Environmental Management Plan will be prepared prior to decommissioning and will be secured through the Outline Decommissioning Statement **[EN010133/APP/C7.2]** which is secured by a Requirement in the draft DCO.

4.5.1 The Solar PV Array Works Area and related components, substations, battery energy storage system (BESS) and all associated works (with the exception of the cable ducts) will be removed and recycled or disposed of in accordance with good practice and market conditions at that time. Where it is not possible to remove the cables without causing severe disruption, cables may be left in situ.

4.5.2 The effects of decommissioning are similar to, or often of a lesser magnitude than construction effects and will be considered in the relevant sections of this ES. However, there is a high degree of uncertainty regarding decommissioning as engineering approaches and technologies are likely to change over the operational life of the Scheme.

5 Assessing Environmental Effects

5.1 Topics Assessed

5.1.1 **Chapters 1 to 6** of the ES [EN010133/APP/C6.2.1 – C6.2.6] are the introductory Chapters and include a description of the Order limits and the Scheme, the alternatives that were considered during the design process and relevant policy.

5.1.2 The following technical chapters have been prepared within Volume 1 of the ES [EN010133/APP/C6.2]:

Chapter 7: Climate Change

Chapter 8: Landscape and Visual Impact

Chapter 9: Ecology and Biodiversity

Chapter 10: Hydrology, Flood Risk and Drainage

Chapter 11: Ground Conditions and Contamination

Chapter 12: Minerals

Chapter 13: Cultural Heritage

Chapter 14: Transport and Access

Chapter 15: Noise and Vibration

Chapter 16: Glint and Glare

Chapter 17: Air Quality

Chapter 18: Socio-Economics, Tourism and Recreation

Chapter 19: Soils and Agriculture

Chapter 20: Waste

Chapter 21: Other Environmental Matters

5.1.3 Chapters 22 and 23 of the ES provide the Mitigation Schedule and Summary of significant effects, respectively.

5.2 Terminology Used in the Environmental Statement

5.2.1 To enable comparison between technical topics and to aid understanding of the ES findings, standard terms are used wherever possible to describe the relative significance of effects throughout the ES (i.e., 'major', 'moderate', 'minor' and 'negligible'). The effects are also described as being adverse or beneficial. Where the quality standards for each technical discipline result in deviations in the standard assessment methodology, these are described in the relevant chapters as applicable within the ES.

5.2.2 Each of the technical chapters within the ES provides further description and definition of the significance criteria relevant to each topic. Where possible, this has been based upon quantitative and accepted criteria (for example, noise assessment

guidelines), together with the use of value judgement and expert interpretation to establish to what extent an effect is significant.

- 5.2.3 Typically, effects that are considered to be **negligible** or **minor** are judged to **be 'not significant'**, whereas those that are **moderate** or **major** are **'significant'**. Where the EIA predicts a significant adverse effect on one or more receptors, we have considered whether there are further mitigation measures which could avoid or reduce the effect, or to reduce the likelihood of it happening. The use of any such mitigation will be secured through the DCO, should it be granted, and this is made clear in the ES.

6 Findings of the Environmental Statement

6.1.1 An assessment of the environmental effects of the Scheme during its construction, operation (including maintenance), and eventual decommissioning has been completed for each of the topics identified in Section 5.1 above.

6.1.2 The conclusions on the likely significant environmental effects of the Scheme are described within the ES. This section of the provides a brief summary of the overall findings of each Chapter of the ES.

6.2 Climate Change

6.2.1 The Climate Change Assessment has considered the following in relation to Climate Change:

- Lifecycle greenhouse gas (GHG) impact assessment – The impact of GHG emissions arising from the Scheme on the climate over its lifetime;
- Climate Change resilience (CCR) Review – The resilience of the Scheme to climate change impacts; and
- In-combination Climate Change Impact (ICCI) – The combined impact of the Scheme and future climate change on the receiving environment.

6.2.2 The assessments make reference to the latest relevant national and local guidance and policies for completing Climate Change assessments for planning.

6.2.3 The GHG impact assessment accounted for emissions generated from the production of the products to be used at the site. This includes the photovoltaic panels, mounting, cabling, batteries and other materials associated with the development. The emissions from vehicles associated with construction and operational activities, including the transport of materials, including shipping, were also accounted for. GHG emissions from decommissioning of the development were considered.

6.2.4 The operational effect of the development in reducing GHG emissions compared to existing grid use (which includes non-renewable sources) was determined.

6.2.5 The conclusion of the GHG impact assessment showed that the development would result in a positive effect with regards to Greenhouse Gas Emissions.

6.2.6 The Climate Change Resilience Review assessed how the development would likely be able to respond to the increased frequency of severe weather events, increased summer and winter temperatures and increased precipitation and flood risk.

6.2.7 The CCR review has considered the measures which are integrated into the design. Based on the outcomes of the assessment, these measures are deemed to be an adequate response to the projected climate change impacts to which the Scheme would be exposed.

6.2.8 The in-combination effects of the scheme and cumulative effects of other solar developments in the area will be beneficial in terms of Climate Change given that

the combined effect of the increase in renewable energy provision will serve to reduce Greenhouse Gas emissions overall.

6.3 Landscape and Visual Impact

6.3.1 This Chapter of the ES has assessed the likely significant effects of the Scheme with respect to landscape and visual effects, including the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.

Consultation

6.3.2 Extensive consultation has been undertaken under Section 42 of the Planning Act 2008, including consultation with Lincolnshire County Council and Nottinghamshire County Council to commence and continue discussions on detailed matters relating to this LVIA chapter and supporting appendices. This consultation extended throughout the duration of the Scheme development and preparation of the ES Chapter, including on-going engagement at workshops held throughout April, May, June, July and August 2022. The workshops were set to introduce the project and those involved in the consultation process moving forward. Discussions then extended at later workshops to cover matters on scoping and approval on the assessment methodology, Study Area, landscape receptors, visual receptors and cumulative sites/developments. Consultation was also undertaken under Section 47 of the Planning Act during June and July 2022. Voluntary consultation with individual property owners was also carried out, including the discussion of bespoke mitigation relevant to individual properties. Cross-topic consultation also forms a key aspect of this LVIA chapter and supporting appendices.

Policy Context

6.3.3 The policy context places an emphasis on the appropriateness of the Scheme as a renewable energy development and its role as a means of mitigating climate change. Development of the Scheme has recognised the need for careful siting, design and mitigation, and the impartial assessment of landscape and visual effects, and the importance of an iterative approach to ensure the most appropriate solutions are reached, to ensure the Scheme is compliant with national and local policy. A suite of policy is set out within this section, including policy covering green infrastructure, biodiversity, geodiversity, cultural heritage and sustainable development to enable the Secretary of State to judge the balance of weight between policy considerations and the effects that the Scheme may have with respect to landscape and visual effects.

Assessment Methodology and Significance Criteria

6.3.4 The methodology for the LVIA chapter and supporting appendices is based on the general recommendations set out in Guidelines for Landscape and Visual Impact

Assessment, 3rd Edition, LI IEMA, 2013.¹The LVIA also considers relevant guidance notes, such as *Technical Guidance Note (TGN) 2/21 Assessing landscape value outside national designations* and also *Technical Information Note 01/21 GLVIA Webinar Q & As*. The understanding on landscape value is still evolving, particularly in the light of the climate and biodiversity crises. The LVIA takes into account the Landscape Institute current reflection on the subject of landscape value.

Baseline Conditions

- 6.3.5 The existing landscape and visual baseline has been considered through a combination of desktop study, site investigation and a Zone of Theoretical Visibility (ZTV) analysis. This includes the Sites and the Cable Route Corridor.
- 6.3.6 The extent of the Study Areas includes the areas of the Sites and Cable Route Corridor, and the extent of the wider landscape beyond the Order limits which the Scheme may influence in a significant manner. These Study Areas been agreed with the relevant local authorities and other stakeholders as part of the Section 42 consultation process.
- 6.3.7 Embedded and Additional Mitigation Relevant mitigation measures have been identified in the LVIA process and adopted as part of the evolution of the project design as part of an iterative approach to the Scheme development. Primary and secondary measures, namely those which are embedded into the design of the Scheme at the outset have been taken into account in the findings of this LVIA chapter and supporting appendices. These embedded and additional mitigation measures have looked to modify the scale and layout of the Scheme in order to ensure compliance with planning policy, particularly in reducing likely significant adverse effects, where possible.

Identification and Evaluation of Likely Significant Effects

- 6.3.8 The likely effects at the construction, operation (years 1 and 15) and decommissioning stages of the Scheme have been considered separately and the likely significant effects set out where positive (beneficial) and negative (adverse). Effects deemed as moderate or greater are considered to be “significant” effects, both beneficial and adverse.

Assessment of Landscape Effects

- 6.3.9 The findings take into account the effects at a broad scale on the regional landscape character types (RLCTs) set out within the East Midlands Regional Landscape Character Assessment² as set out below.
- 6.3.10 RLCT 3a Floodplain Valleys: There would be no likely significant effects for the construction, operation (Year 1) and decommissioning stages of the Scheme.

¹ Landscape Institute and Institute of Environmental Management and Assessment

² East Midlands Landscape Partnership, April 2020, *East Midlands Regional Landscape Character Assessment*. [Online] (Accessed 01/12/2022).

- 6.3.11 RLCT 4a Unwooded Vales: There would be no likely significant effects for the construction, operation (Year 1) and decommissioning stages of the Scheme. There are likely **Significant** effects.
- 6.3.12 RLCT 4b Wooded Vales: There would be no likely significant effects for the construction, operation (Year 1) and decommissioning stages of the Scheme.
- 6.3.13 The effects at a fine-grained scale are also taken into consideration and draw upon individual contributors to landscape character as set out below.
- 6.3.14 Land Use: There would be no likely significant effects for the construction, operation (Year 1) and decommissioning stages of the Scheme. There are likely **Significant** effects.
- 6.3.15 Topography and Watercourses: There would be no likely significant effects for the construction, operation (Year 1) and decommissioning stages of the Scheme. There are likely **Significant** effects.
- 6.3.16 Communications and Infrastructure: There are likely **Significant** effects. This is due to the sensitivity of the rural lanes and the appeal of the attractive east-west local routes that cut across the landscape. On balance however, the hedgerows will have been protected and managed appropriately during operation. Heavy vehicles can erode the character of rural roads, but this would be managed affectively an all hedgerows and tree cover would be retained.
- 6.3.17 Settlements, Industry, Commerce and Leisure: There would be no likely significant effects for the construction, operation (Year 1 and Year 15) and decommissioning stages of the Scheme.
- 6.3.18 Public Rights of Way and Access: There are no likely significant effects for the construction, operation (Year 1 and Year 15) and decommissioning stages of the Scheme.
- 6.3.19 Scheduled Monuments, Listed Buildings, Conservation Areas and Registered Parks and Gardens: Nationally and Locally Designated Landscape: There are no likely significant effects for the construction, operation (Year 1 and Year 15) and decommissioning stages of the Scheme.
- 6.3.20 Nationally and Locally Designated Landscape: There are no likely significant effects for the construction, operation (Year 1) and decommissioning stages of the Scheme. There are likely **Significant** effects.
- 6.3.21 Ancient Woodlands and natural Designations: There are no likely significant effects for the construction, operation (Year 1) and decommissioning stages of the Scheme. There are likely **Significant** effects.

Assessment of Visual Effects

- 6.3.22 The findings take into account the effects of change arising from the Scheme on the views available to people and their visual amenity as set out below.

Viewpoint Receptors

6.3.23 There are likely **Significant** effects for the following viewpoints:

VP04: Thorpe Lane, Local Bridge

VP05: TLFe/31/2

VP06: Thorpe Lane

VP07: Thorpe Lane Bridge TFL/32/1

VP10: Stur/73/1

VP11: TLFe/31/2

VP12: Camm/31/1

VP13: Fleets Lane, Stow Pasture

VP15: Squire's Bridge

VP19: Bridge over River Till

VP20: Normanby Road

VP21: Stow/83/1

VP32: Fill/86/1

VP36: Fill/767/1

VP37: Junction of Gypsy Lane and Willingham Road

VP39: Junction of Cot Garth Lane and Stone Pit Lane

VP49: East Lane

VP56: Pilh/20/1

VP58: Junction of Pilh/20/1 and Bonsdale Lane

VP59: Blyton Level Crossing

VP60: B1025 (Kirton Road)

VP61: B1025 (Kirton Road)

VP62: B1025 (Kirton Road)

VP63: A159 (Laughton Road)

LCC-C-D: Blackthorn Lane

LCC-C-G: PRoW Fill/85/2

LCC-C-H: PRoW Fill/767/1

LCC-C-I: Willingham Road

LCC-C-J: Fillingham Lane

LCC-C-T: Kirton Road

Residential Receptors

6.3.24 There are likely **Significant** effects for following receptors:

R33: The Cottage

R36: Corringham Grange Farm

R61: Greystones Farm

R62: Turpin Farm

R63a: North Farm

R63b: Side Farm

R67: Moor Farm

R73: East Farm

Transport Receptors

6.3.25 There are likely **Significant** effects for the following receptors:

T016: B1205 Kirton Road to C228 Monson Road, Northorpe near Scotter

T019: Kirton Road, Blyton

T021: Bonsdale Lane, Blyton

T040: Access to Corringham Grange, Corringham

T045: From East Lane to A631, Corringham

T072: Access to Fillingham Grange, Fillingham

T074: Willingham Road, Fillingham

T099: Coates Lane Stow

T110: Blackthorn Lane, Cammeringham

T119: Fleet's Lane, Sturton by Stow

T120: Unnamed Road, Stow

T021: Bonsdale Lane, Blyton

T122: Unnamed Road, Stow

T127: Thorpe Lane, Thorpe le Fallows

T163: Mainline Railway

PRoW Receptors

6.3.26 There are likely **Significant** effects for the following receptors:

Fill/86/1

Fill/767/1

Pilh/20/1

Stow/83/1

TLFe/31/2

Mitigation Measures

- 6.3.27 The LVIA process considers adverse effects for mitigation and specific measures have been put forward where practical. The mitigation measures are proposed to be established by Year 15 of the Scheme (during the operational period). This is because impacts at Year 15 of the Scheme are considered as most relevant to all other stages of mitigation under review because they are the most inherent in the context of landscape character and visual amenity of the Scheme. The position at 'Year 15' relevance is judged in terms of the effectiveness of maturation of planting and the 'time depth' of the receiving landscape. Please refer to the Construction and Environmental Management Plan (CEMP) at [EN010133/APP/C7.1] which sets out how these mitigation measures are intended to be secured.
- 6.3.28 These measure take into the potential landscape and visual effects identified at an early stage in the LVIA process and include retention and reinforcement of existing vegetation, new planting along the margins of the solar panels to assist with their integration in the immediate context, new planting within the Sites to provide a strong landscape framework and support habitat connectivity, new planting to screen the panels in their wider landscape context, and new planting to bolster the overall landscape character context of the Sites.
- 6.3.29 The project is expected to deliver a significant amount of biodiversity net gain, due to the reversion of arable to permanent grassland and ecological buffer zones. The biodiversity net gain is being delivered through the enhancement of existing habitats and this would be bought forward via the Outline Landscape and Ecology Management Plan (LEMP) [EN010133/APP/C7.3].

In-Combination Effects

- 6.3.30 The combination of different environmental effects on the same receptors is considered in Section 8.9 of the LVIA Chapter. This section also sets out the assessment of Cumulative Sites, namely the assessment of the effects on particular receptors of the different Cottam Sites in combination.

Cumulative Effects

- 6.3.31 This considers the potential cumulative effects and considers both the landscape and visual effects. The baseline includes the schemes considered within the LVIA chapter and supporting appendices, these being potential schemes that are not yet present in the landscape, but at various stages in the consenting and development process.

Assessment of Cumulative Landscape Effects

- 6.3.32 Broad Grained Receptors: RLCT 2b Planned and Drained Fen and Carrlands, RLCT 3a Floodplain Valleys, RLCT 4a Unwooded Vales, RLCT 4b Wooded Vales and RLCT 6a: There would be no likely significant effects for the construction, operation (Year 1),

operation (Year 15) and decommissioning stages of the Scheme for the Cumulative Developments.

6.3.33 Fine Grained Receptors: For Land Use, Topography and Watercourses, Communications and Infrastructure, there are likely **Significant** effects.

6.3.34 Fine Grained Receptors: For Settlements, Industry, Commerce and Leisure, Public Rights of Way and Access, Nationally and Locally Designated Landscapes, Scheduled Monuments, Listed Buildings, Conservation Areas and Registered Parks and Gardens and Ancient Woodlands and Natural Designations: There would be no likely significant effects for the construction, operation (Year 1) and decommissioning stages of the Scheme for the Cumulative Site and the Cumulative Developments.

Assessment of Cumulative Visual Effects

6.3.35 Cumulative Sites – Individual Viewpoint Receptors: With Viewpoint VP20, there would be potential combined cumulative visibility between the Cottam 1 and Cottam 2 Sites. With VP59, VP60, VP61, VP62 and LCC-C-T, there would be potential combined cumulative intervisibility between Cottam 3a and 3b Sites. With VP49 and VP56, there would be potential combined cumulative intervisibility between Cottam 2, Cottam 3a and Cottam 3b Sites. With VP58, there would be potential combined intervisibility between All Sites. There would be no likely significant effects for the construction, operation (Year 1), operation (Year 15) and decommissioning stages of the Scheme.

6.3.36 Cumulative Sites – Individual Residential Receptors: With Receptors R33 and R36, there would be potential sequential occasional visibility between Cottam 2 and Cottam 3a and 3b Sites. There would be no likely significant effects for the construction, operation (Year 1), operation (Year 15) and decommissioning stages of the Scheme.

6.3.37 Cumulative Sites – Individual Transport Receptors: With Receptors T016, T019, T021, T040, T045, T072, T074, T099, T110, T119, T120, T122, T127 and T163, there would be potential sequential frequent visibility, particularly where the routes pass directly adjacent to the boundary of the Sites. During the construction and operation stages, the effects would appear consistently and with short time lapses between instances. There would be likely **Significant** effects.

6.3.38 Cumulative Sites – Individual PRow Receptors: With Receptors Fill/86/1, Fill/767/1, Pillh/20/1, Stow/83/1 and TLFe/31/2, there would be potential sequential frequent visibility, particularly where the routes pass directly adjacent to the boundary of the Site/Sites. During the construction and operation stages, the effects would appear consistently and with short time lapses between instances. There would be likely **Significant** effects.

6.3.39 Cumulative Developments – Individual Viewpoint Receptors: There would be no likely significant effects for the construction, operation (Year 1), operation (Year 15) and decommissioning stages of the Scheme.

- 6.3.40 Cumulative Developments – Individual Residential Receptors: There would be no likely significant effects for the construction, operation (Year 1), operation (Year 15) and decommissioning stages of the Scheme.
- 6.3.41 Cumulative Developments – Individual Transport Receptors: There would be no likely significant effects for the construction, operation (Year 1), operation (Year 15) and decommissioning stages of the Scheme.
- 6.3.42 Cumulative Developments – Individual PRow Receptors: There would be no likely significant effects for the construction, operation (Year 1), operation (Year 15) and decommissioning stages of the Scheme.

Residual Effects

Assessment of Residual Landscape Effects

- 6.3.43 There are likely **Significant** effects to RLCT 4a Unwooded Vales, Land Use, Topography and Watercourses, Communications and Infrastructure, Nationally and Locally Designated Landscapes and Ancient Woodlands and Natural Designations.

Assessment of Residual Visual Effects

Viewpoint Receptors

- 6.3.44 For the Cottam 1, Cottam 2, Cottam 3a and Cottam 3b Sites, there are likely **Significant** effects for the operation (Year 15) stage of the Scheme to the following viewpoints:

VP04: Thorpe Lane, Local Bridge

VP05: TLFe/31/2

VP06: Thorpe Lane

VP07: Thorpe Lane Bridge TFL/32/1

VP10: Stur/73/1

VP11: TLFe/31/2

VP12: Camm/31/1

VP13: Fleets Lane, Stow Pasture

VP15: Squire's Bridge

VP19: Bridge over River Till

VP20: Normanby Road

VP21: Stow/83/1

VP32: Fill/86/1

VP36: Fill/767/1

VP37: Junction of Gypsy Lane and Willingham Road

VP39: Junction of Cot Garth Lane and Stone Pit Lane

VP49: East Lane

VP56: Pilh/20/1

VP58: Junction of Pilh/20/1 and Bonsdale Lane

VP59: Blyton Level Crossing

VP60: B1025 (Kirton Road)

VP61: B1025 (Kirton Road)

VP62: B1025 (Kirton Road)

VP63: A159 (Laughton Road)

LCC-C-D: Blackthorn Lane

LCC-C-G: PRoW Fill/85/2

LCC-C-H: PRoW Fill/767/1

LCC-C-I: Willingham Road

LCC-C-J: Fillingham Lane

LCC-C-T: Kirton Road

6.3.45 Residential Receptors: For the Cottam 1 Site, there are likely **Significant** effects for the operation (Year 15) stage of the Scheme to the following receptors:

R33: The Cottage

R36: Corringham Grange Farm

R61: Greystones Farm

R62: Turpin Farm

R63a: North Farm

R63b: Side Farm

R67: Moor Farm

R73: East Farm

6.3.46 Transport Receptors: For the Cottam 1, Cottam 2, Cottam 3a and Cottam 3b Sites, there are likely **Significant** effects for the operation (Year 15) stage of the Scheme to the following receptors:

T016: B1205 Kirton Road to C228 Monson Road, Northorpe near Scotter

T019: Kirton Road, Blyton

T021: Bonsdale Lane, Blyton

T040: Access to Corringham Grange, Corringham

T045: From East Lane to A631, Corringham
T072: Access to Fillingham Grange, Fillingham
T074: Willingham Road, Fillingham
T099: Coates Lane Stow
T110: Blackthorn Lane, Cammeringham
T119: Fleet's Lane, Sturton by Stow
T120: Unnamed Road, Stow
T021: Bonsdale Lane, Blyton
T122: Unnamed Road, Stow
T127: Thorpe Lane, Thorpe le Fallows
T163: Mainline Railway

6.3.47 PRoW Receptors: For the Cottam 1, and Cottam 3b Sites, there are likely **Significant** effects for the operation (Year 15) stage of the Scheme to the following receptors:

Fill/86/1
Fill/767/1
Pilh/20/1
Stow/83/1
TLFe/31/2

6.4 Ecology and Biodiversity

6.4.1 The Ecology and Biodiversity assessment in the Environmental Statement **[EN010133/APP/C6.2.9]** sets out the baseline conditions across the Scheme at the time of writing and considers the likely effects of the Scheme on ecological features during its construction, operation and decommissioning phases.

6.4.2 A comprehensive suite of ecological surveys has been undertaken within the Order limits. Specific surveys for priority habitats, bats, breeding and wintering birds, otters, water voles, badgers and great crested newts have been carried out. Habitats have been assessed for other notable species groups, including reptiles, invertebrates and small mammals. Furthermore, a desk study to examine the presence of third-party records of protected species and the whereabouts of local and statutory sites designated for nature conservation has been undertaken.

6.4.3 The Sites generally occupy arable farmland (cereals and oilseeds predominate) on level or gently undulating ground, characterised by large, open fields with a managed hedgerow and ditch network with narrow uncultivated margins. A small amount of permanent pasture is present, and this is either sheep grazed or managed as silage where present. Woodland and other habitats are generally absent within the Sites although a small number of shelter belts and copses are

situated adjacent. In terms of wetland habitats, very few ponds are present on Site, with a small number a short distance away from field boundaries, while the River Till runs adjacent to two of the Sites. Larger drains and permanently wet ditches can be found on each Site. The habitats on the Sites are considered to be very much typical of their surroundings.

- 6.4.4 An Ecological Protection and Mitigation Strategy (EPMS) will be prepared for the Scheme (an 'outline' one supports the Application) which will detail all the environmental and ecological protection measures to be followed throughout the construction of the Sites and the installation of the Cable Route Corridor. Principal measures will include the fencing and buffering of all valuable boundary features such as hedgerows, ditches and woodland edges and the adoption of methods to avoid the risk of accidental damage, pollution or contamination, as well as harmful disturbance or injury to any wildlife. The EPMS also covers the mitigation measures to be adopted during the installation of the cable, such as the presence of an Ecological Clerk of Works, sensitive seasonal timing of works and the use of Horizontal Directional Drilling to avoid unacceptable impacts on features such as the Rivers Trent and Till.
- 6.4.5 A Landscape and Ecological Management Plan (LEMP) will be prepared for the Scheme (an 'outline' one supports the Application) which will set out all the habitat creation and management prescriptions to be adopted through the life of the operational scheme. This will particularly focus on the creation of new hedgerow, woodland, and wetland habitats, as well as the favourable management of the grasslands under and surrounding the arrays so as to maximise their value to biodiversity. In addition, all habitat creation and management prescriptions required in order to mitigate for potential adverse effects of the development will be set out in the LEMP. Ecological enhancement measures will be set out, including new nesting and roosting habitat for birds and bats, and measures required to achieve a Biodiversity Net Gain through the Scheme.
- 6.4.6 Local Wildlife Sites noted for grassland, wetland and linear habitats were found to be present in proximity to most of the array Sites, while a small number were present adjacent. These valuable sites will be protected by the EPMS during the construction phase and enhanced in the long term wherever possible through the provisions of the LEMP. Similarly, protected sites such as Sites of Special Scientific Interest which were noted within 5km of the Sites for their wetland habitats will be protected from potential pollution events or disturbance during construction.
- 6.4.7 Several badger setts have been recorded within field boundaries and adjacent woodlands within the Sites. These will each be protected within the EPMS through the adoption of a development free buffer zone between 10 and 30m in radius depending on their status. Habitat connectivity for badgers will be maintained and foraging will be enhanced through reversion from arable to grassland. Perimeter fencing will remain permeable to the movement by badgers.

- 6.4.8 A reasonably diverse assemblage of bat species has been recorded using the Sites, while numerous trees located at field boundaries have roost potential, as do a number of buildings adjacent to the Sites. The arable fields themselves are of low value to bats owing to the uniformity of habitat and low productivity for night flying invertebrate prey. All hedgerows and ditches will be buffered from development as will be set out in the EPMS, and these will be managed for habitat diversity in the LEMP. Buffer widths will vary according to the potential value of the trees within the hedgerows to bats as possible roosts. Substantial planting of new trees and hedgerows will also be undertaken and new linear habitat linkages between isolated trees and nearby woodland will be created. Any trees subject to development impacts will be subject to further inspection and survey and all steps necessary to avoid impacts will be taken. Habitats post-construction on Site are likely to be improved for bat foraging, roosting and dispersal.
- 6.4.9 Several of the larger and more permanently wetted ditches and watercourses on Site support otters and water voles. These watercourses have been buffered by at least 10m, up to 30m in places, from development and enhanced through targeted ditch management. Impacts on water voles and otters are considered unlikely, with the potential for improvements post-construction.
- 6.4.10 Brown hare and harvest mouse are species associated with the open arable habitats which may be impacted by the proposals. Habitat for harvest mouse will be retained through the management of a proportion of the land under arrays and at field boundaries as tussocky grassland. Brown hare will continue to have unimpeded access to the array fields and have been seen to benefit from solar arrays at other sites, often increasing in numbers post development.
- 6.4.11 Great crested newts were recorded within ponds adjacent to the Site. The arable habitats to be impacted by development are of low habitat suitability for great crested newt and the pond has been buffered by at least 50m of habitat free of development activities. The development will not adversely impact the movement of amphibians through the landscape and the creation of new waterbodies is being explored.
- 6.4.12 Farmland birds such as skylark, yellow wagtail, grey partridge, yellowhammer and lapwing were all recorded either nesting or foraging on the Site, with several other species of conservation concern associated predominantly with the field boundary habitats. Ground nesting species which choose to nest within open arable fields, such as skylark and yellow wagtail, stand to be displaced to a degree by the development. Options for the mitigation of this impact through the favourable management of alternative open nesting habitat is being explored, with a view to being secured by the LEMP. Construction-phase impacts on birds during the nesting season will be avoided through a combination of habitat inspections by an Ecological Clerk of Works, sensitive timing of works and the imposition of exclusion buffers around known and potential nest sites. A substantial habitat enhancement package has been produced to focus on areas of the Site which are free of development,

whereby ecologically led management will produce a mosaic of grassland and other habitat types of greater foraging and nesting productivity than baseline levels for many of the species recorded.

- 6.4.13 Habitat for other species such as grass snake, common lizard, terrestrial and aquatic invertebrates, hedgehog and polecat were recorded on Sites, concentrated at field boundary hedgerows, ditches and uncultivated field margins. These habitats will all be retained and managed favourably through the provisions of the LEMP such that they remain suitable for all these species. The design of new access points and cable installation works have taken a precautionary approach and seek to minimise disturbance of habitats as far as possible. All such work would be carried out under ecological method statements and with an Ecological Clerk of Works in attendance. Any habitat removal will be reinstated or compensated for as soon as possible.
- 6.4.14 The Scheme will result in a Net Gain for biodiversity in linear, wetland and area-based habitat terms, which will be secured for the long term through the LEMP. A package of habitat and species-specific ecological enhancements will also be carried out. The predominant habitat management to be carried out within the operational Scheme will be grassland cutting, with an emphasis on the generation of a mosaic of grassland types being more diverse than the baseline habitat condition. The LEMP's habitat creation and management priorities have been in part driven by the Biodiversity Opportunities Mapping produced by Greater Lincolnshire Nature Partnership and local policies promoting the connection of Green Infrastructure and Nature Recovery Networks, such as those associated with the River Till.

6.5 Hydrology, Flood Risk and Drainage

- 6.5.1 This Chapter of the ES [EN010133/APP/C6.2.10] has assessed the likely significant effects of the Scheme with respect to Hydrology, Flood Risk and Drainage, including the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 6.5.2 In summary, the main potential significant effects at the Site revolve around managing surface water risk at the Site and the potential for silt laden runoff, spillages, leaks and pollutants during the construction / decommissioning stage and diffuse pollution contained in urban runoff during the operation phase from a water quality / resource perspective. In addition, from a flood risk perspective, the potential significant effects include mud and debris blockages and temporary increases in impermeable areas during the construction phase and the increase in permanent impermeable area and increase in discharge to local watercourses and blockages of drainage networks during the operational phase, and compaction of soils, which is identified in paragraph 10.6.9 of ES Chapter 10 to have a moderate adverse effect, which is considered significant in EIA terms.

- 6.5.3 Mitigation includes completion of a CEMP and DEMP which will include details of mitigation measures to prevent adverse impacts occurring to controlled waters and simple SuDS measures to mitigate the surface water risk. Generally, the Scheme is likely to have a very low pollution risk and so the management train should normally have one or two treatment stages to mitigate this.
- 6.5.4 Inclusion of permeable surfacing for the Site access, linear infiltration trenches around any proposed infrastructure (substations and batteries) and wildflower planting at the leeward edge of solar panels should provide sufficient treatment as well as the attenuation required to maintain existing runoff rates.
- 6.5.5 The mitigation measures described above will be embedded in the Scheme, and as such will ensure there would be no significant effects in respect of Hydrology, Flood Risk and Drainage.

6.6 Ground Conditions and Contamination

- 6.6.1 The ground conditions and contamination chapter **[EN010133/APP/C6.2.11]** provides an overview and description of the baseline conditions for the Sites and the associated Cable Route Corridor, with regards to their current and historical uses, geology, hydrogeology, hydrology and mining. Full details are included within the Preliminary Geo-Environmental Risk Assessments **[EN010133/APP/C6.3.11.1 EN010133/APP/C6.3.11.2, EN010133/APP/C6.3.11.3, EN010133/APP/C6.3.11.4]** prepared for each area.
- 6.6.2 The baseline data is then used to develop a Conceptual Site Model which assesses whether the presence of contamination could potentially lead to significant harm via migration along a pathway to affect a receptor. This model then forms the basis of a qualitative risk assessment.
- 6.6.3 Five key receptors with plausible contamination linkages have been assessed for the development Scheme including the solar array Sites and Cable Route Corridor which include.
- Construction/decommissioning/maintenance Workers – Direct contact/ingestion and inhalation of dust, vapours and asbestos fibres;
 - Adjacent site users or residents – Direct contact/ingestion and inhalation of dust, vapours and asbestos fibres;
 - Controlled waters – Leaching of contamination into groundwater and vertical/lateral migration through permeable deposits below the Site;
 - Future site users - Direct contact/ingestion and inhalation of dust, vapours and asbestos fibres; and
 - Built Environment – Direct contact between and accumulation of gas in enclosed spaces and sub-floor voids.
- 6.6.4 Based on the nature of the Cable Route Corridor comprising linear infrastructure, the works involving the ground are temporary, with the land returned to former use

following the cable being laid. As such, the receptors involved in this work are limited to construction and decommissioning groundworkers, controlled water and the built environment.

6.6.5 The history of the Sites and Cable Route Corridor largely comprises agricultural land with discrete areas of development including farmyards, railways lines and Cottam Power Station in the west. The assessment shows that with the embedded mitigation outlined in the ES and the implementation of well-established good industry practices in construction for maintaining contaminated land, the potential impact of the construction and decommissioning of the Scheme are of moderate to minor significance.

6.6.6 The Scheme includes embedded mitigation for ground conditions and contamination in the form of a Construction Environmental Management Plan (CEMP) and Decommissioning Strategy, which will include procedures for the identification and mitigation of contaminant risks associated with the construction. An Outline CEMP **[EN010133/APP/C7.1]** and Outline Decommissioning Strategy **[EN010133/APP/C7.2]** forms part of the application. Maintenance works will require similar mitigation measures.

6.6.7 In-combination effects consider climate change and its potential to modify ground conditions, in which the key variable is the future change in rainfall levels. Given the likely absence of contaminated soil or groundwater, there is unlikely to be migration of contaminants which could be exacerbated by climate change. Given modern methods of construction and the low sensitivity end use, the cumulative effects of the proposal in combination with other proposals (at West Burton Solar Project, Gate Burton Energy Park, and Tillbridge Solar) are considered to be negligible with the implementation of embedded mitigation measures such as the CEMP, which would be appropriate for all development projects.

6.6.8 In summary, no potential significant effects have been identified after the implementation of embedded well-established good industry practices in construction for managing contaminated land which will be incorporated into the CEMP and Decommissioning Strategy and utilised in all phases of the Scheme. It is considered that the potential effects of contamination or risk of contamination will not be significant.

6.7 Minerals

6.7.1 The minerals assessment set out in the Minerals Chapter of the ES **[EN010133/APP/C6.2.12]** describes the baseline geology, mineral resources planning policies, methodology, and the potential impact on identified mineral resources as a result of the development of the Scheme. This assessment is based on known and published information about the geology underlying the Scheme and the surrounding area.

6.7.2 The assessment considers national policy relating to mineral considerations. In summary, these identify minerals as being important national resources, adequate

and steady supplies of which are vital for development and sustaining the economy and society. Minerals are a finite natural resource that can only be worked where they are found. A key aspect of sustainable development is the conservation and safeguarding of non-renewable resources for future generations. As such it is important that other development does not needlessly prevent the future extraction of mineral resources.

- 6.7.3 The assessment also considers local policy relating to mineral considerations as set out in the Lincolnshire Minerals and Waste Local Plan Core Strategy and Development Management Policies and the Nottinghamshire Minerals Local Plan. These plans make provision for mineral supply in the respective counties by making allocations for future mineral extraction. These plans also make provision for safeguarding mineral resources that are of potential economic importance by identifying and mapping them. The policies contained in the Local Plans require applications for non-minerals development located within minerals safeguarding areas to be accompanied by a Minerals Assessment. Minerals Assessments need to demonstrate that mineral resources will not be needlessly sterilised as a result of the development and that the development would not pose a serious hindrance to future extraction in the vicinity or that there is a clear and demonstrable need for the non-minerals development. The Local Plans also make provision for safeguarding specific mineral allocations by protecting them against development that would unnecessarily sterilise the sites or prejudice their use by creating incompatible land uses nearby.
- 6.7.4 The mineral resources that have been assessed have been identified by the British Geological Survey and through allocations, areas of search and mineral safeguarding areas contained in the Adopted Lincolnshire Minerals and Waste Local Plan and the Nottinghamshire Minerals Local Plan. Assessment of the impacts of the Scheme on the mineral interests have considered a number of parameters including extent, magnitude, duration and reversibility of the Scheme as well as the extent, likely quality and situation of any affected mineral reserve.
- 6.7.5 The bedrock underlying the Sites is a series of sedimentary formations which are broadly aligned north south and are progressively younger moving from west to east across the Scheme. There is no evidence to suggest that any of these bedrock formations have been worked in the past as a mineral resource and none have been identified as being of potential mineral interest.
- 6.7.6 The BGS published geological information shows the bedrock formations are overlain by superficial deposits. These are the youngest geological formations and in the case of this Scheme are largely unconsolidated glacial deposits. Within the Scheme these include sedimentary sand and gravels deposits which are potential aggregate mineral resources safeguarded in the respective Minerals Local Plans.
- 6.7.7 Neither the Lincolnshire Minerals and Waste Local Plan nor the Nottinghamshire Minerals Local Plan make any allocations for future mineral extraction in the vicinity of the Site. The Scheme and immediate surroundings are not currently subject to

mineral working. There is no apparent evidence to suggest there has been any mineral working in the recent past within the area covered by the Scheme.

- 6.7.8 The Lincolnshire Minerals and Waste Local Plan does identify the sand and gravel mineral resources associated with the Trent Valley as an Area of Search for future aggregate supply. The Scheme does affect a relatively small part of this area of search, however, in view of the current policies of the Mineral Planning Authority, the current sand and gravel landbank and the extensive areas covered by the Area of Search, it has been concluded that it is highly unlikely that the sand and gravel reserve will need to be worked within the lifetime of the Scheme.
- 6.7.9 The Scheme does affect a number areas of safeguarded mineral reserves. These for the most part are isolated deposits of limited geographic extent and given existing constraints, including existing built development, it is very unlikely that these areas would be worked for minerals in the foreseeable future.
- 6.7.10 The proposed cabling connecting the individual Sites to each other and to the grid are unlikely to sterilise any significant volume of safeguarded mineral. The proposed Cable Route Corridor, particularly where it runs through the Trent Valley, however, does have the potential to result in operational issues for future mineral operations and might restrict the efficient exploitation of the resource. This impact has been mitigated wherever possible by routing the cable routes by following existing infrastructure corridors or the edges of significant landscape features.
- 6.7.11 The Scheme will be decommissioned at the end of its operational life, all above ground structures will be removed and the Sites restored. The Scheme does not require deep excavations or foundations and thus disturbance is limited to the surface layers rather than underlying deposits. Therefore, any underlying mineral deposits would not be permanently sterilised and would be available to exploit if required at a future date.
- 6.7.12 The whole of the Scheme is within a Petroleum Exploration and Development License (PEDL) area where oil and gas extraction is licensed under the Petroleum Act 1998. A PEDL allows the pursuit a range of oil and gas exploration activities, subject to necessary drilling/development consents and planning permission.
- 6.7.13 Oil and gas deposits are found at much greater depths than other minerals and therefore surface development has less potential impact in terms of exploiting the resource. Neither Lincolnshire nor Nottinghamshire have identified mineral safeguarding areas for hydrocarbons. Existing oil fields are identified and safeguarded with mineral consultation zone around each. The Scheme does not affect an existing oil field or come within a mineral consultation zone.
- 6.7.14 It is not considered that the proposed Scheme would have any implications for existing or proposed exploration and eventual exploitation of oil and gas resources.
- 6.7.15 There are no permitted or proposed mineral extraction sites within close proximity of any of the Sites that might be affected by the Scheme. In the case of Cottam 1 and 2, the Mineral Planning Authority have identified a mineral resource that requires

safeguarding. In the case of Cottam 3a the Mineral Planning Authority have identified sand and gravel mineral resources within an Area of Search and an area that requires safeguarding. Current assessments report that there is no need for new sites to come forward during the plan period up to 2031. Furthermore, on the basis that the Scheme will be decommissioned at the end of its operational life, any minerals would not be permanently sterilised and would be available to exploit if required at a future date. Thus, there is not considered to be any conflict with the relevant mineral safeguarding policies.

- 6.7.16 There are no permitted or proposed mineral extraction sites within close proximity of any of the Sites that might be affected by the Scheme. In the case of Cottam 1 and 2, the Mineral Planning Authority have identified a mineral resource that requires safeguarding. In the case of Cottam 3a the Mineral Planning Authority have identified sand and gravel mineral resources within an Area of Search and an area that requires safeguarding. Current assessments report that there is no need for new sites to come forward during the plan period up to 2031. Furthermore, on the basis that the Scheme will be decommissioned at the end of its operational life, any minerals would not be permanently sterilised and would be available to exploit if required at a future date. Thus, there is not considered to be any conflict with the relevant mineral safeguarding policies.

6.8 Cultural Heritage

Introduction

- 6.8.1 Chapter 13: Cultural Heritage of the Environmental Statement (ES) **[EN010133/APP/C6.2.13]** considers the likely significant environmental effects of the Scheme with respect to Cultural Heritage.

Baseline Conditions

- 6.8.2 The Cultural Heritage Chapter has been informed by the results of several previous stages of archaeological and heritage work, which are appended to the ES. The supporting work comprises a number of archaeological desk-based assessments (DBAs; **ES Appendix 13.1**), geophysical surveys (**ES Appendix 13.2**) a geoarchaeological DBA (**ES Appendix 13.3**), aerial photographic and LiDAR interpretation (**ES Appendix 13.4**), and reports on the extensive programme of evaluation trenching (**ES Appendix 13.6**). The indirect effects on the setting of heritage assets have been assessed within a Heritage Statement (**ES Appendix 13.5**). Comments from both statutory and non-statutory consultees have also been addressed (**ES Appendix 13.9**).

Assessment of Potential Effects

- 6.8.3 For non-designated heritage assets, a 1km study area surrounding the Order Limits of the Cottam Sites was adopted for assessment within the archaeological DBAs (**ES Appendix 13.1**) while all designated heritage assets were assessed for potential effects on their settings for within 5km of the Order Limits within the Heritage Statement (**ES Appendix 13.5**).

6.8.4 The Cultural Heritage Chapter sets out the cultural heritage baseline conditions, an assessment of the likely effects of the Scheme upon the identified cultural heritage receptors, and provides information about proposed mitigation strategies. Cumulative impacts resulting from the combined effects of the Scheme with other significant proposed developments within the vicinity of the Scheme are discussed, and finally, any identified residual effects are identified that would occur as a result of the Scheme, assuming the implementation of the proposed mitigation.

Mitigation Measures and Residual Effects

6.8.5 Embedded mitigation principles within the design of the Scheme include the following;

- Avoidance of sensitive archaeological remains;
- No siting of panels or other built development in sensitive areas;
- Set back of panels from assets; and
- Use of concrete feet for the panels which would preserve the archaeological remains in situ.

6.8.6 For buried archaeological remains, where embedded mitigation is not planned, 'preservation by record' is proposed to mitigate potential impacts, and the methodology and scope of this mitigation approach is provided in a detailed archaeological mitigation Written Scheme of Investigation (WSI; **ES Appendix 13.7**).

6.8.7 Following the implementation of both embedded mitigation and archaeological mitigation methods, residual adverse effects have been identified in relation to the following heritage assets:

1. Effect on a range of Non-Designated Archaeological Remains; and
2. Non-Designated Archaeological Remains - (RB settlement & Anglo-Saxon cemetery).

6.8.8 Effects on the following assets have been assessed as beneficial.

3. Thorpe medieval settlement (NHLE 1016978)
4. Non-Designated Archaeological Remains (possible kiln, RB settlement & Anglo-Saxon cemetery)
5. Non-Designated Historic Buildings (Turpin Farm, Fillingham)
6. Non-Designated Historic Landscape (Ancient Enclosures, Parliamentary Planned Enclosures, Military Airfield)
7. Cumulative effect on views from the Lincoln Edge that contribute to the significance of heritage assets

6.8.9 Effects relating to these assets range from slight to moderate adverse, to major adverse.

6.9 Transport and Access

- 6.9.1 The Transport and Access Chapter of the Environmental Statement **[EN010133/APP/C6.2.14]** considers the likely effects of the Scheme on Transport and Access during the construction, operational and decommissioning phases.
- 6.9.2 Solar farm developments do not generate significant traffic flows once operational. Typically, there will be only a handful of trips per month by Transit Van (or similar) for maintenance purposes (less than one vehicle trip per day per Site on average). Therefore, all operational transport and access effects will be negligible in significance. Therefore, the focus of the chapter is on the construction phase. It is not anticipated that the effects associated with decommissioning will be worse than during the construction phase.
- 6.9.3 The Scheme has been considered in the context of national and local policy, including National Policy Statements EN-1, EN-3 and EN-5, the National Planning Policy Framework, the Central Lincolnshire Local Plan and the Bassetlaw Local Plan.
- 6.9.4 A study area was identified which covers the local roads which make up the construction vehicle routes to the Site. This is the area whereby transport and access effects could occur. The study area includes a number of A-roads and given the rural nature of the Site, some more rural B-roads and unclassified roads. Traffic count surveys were undertaken to understand the baseline traffic flows of the roads within the study area.
- 6.9.5 The study area also encompasses a number of public rights of way. Surveys were undertaken to understand their usage. In addition, other local walking, cycling and public transport routes were identified.
- 6.9.6 Embedded mitigation measures will be implemented during the construction period. An outline Construction Traffic Management Plan (CTMP) has been prepared and will be secured through a DCO Requirement. The outline CTMP is located in Appendix 14.2 of the ES **[EN010133/APP/C6.3.14.2]**. The outline CTMP provides a framework for the management of construction vehicle movements to and from the Scheme, to ensure that the effects of the temporary construction phase on the local highway network are minimised.
- 6.9.7 The construction period will include the use of HGVs to bring the equipment onto the Site and this will be strictly managed to ensure that vehicle movement is controlled and kept to a minimum. On a day-to-day basis, the largest vehicle that will be used to deliver equipment to the Site will be a 16.5m articulated vehicle, although a significant proportion of movements will be by smaller vehicles. There will also be a small number of abnormal load movements to transport large transformers. Wynns, a specialist haulage company, has been appointed to coordinate the movement of these loads.
- 6.9.8 On a peak day, there could be up to 58 arrivals by HGV, spread across the Site. In addition, there is expected to be 600 construction workers. A large proportion of construction workers will arrive by shuttle bus, to reduce the number of required

vehicle trips on the local highway network. There will also be a small number of HGV and construction worker movements associated with the Cable Route Corridor.

6.9.9 The likely effects of these vehicle movements have been assessed. The following criteria has been considered in this assessment:

- Accidents and Safety;
- Severance;
- Driver Delay;
- Pedestrian (and cyclist) Delay;
- Pedestrian (and cyclist) Amenity (including Fear and Intimidation); and
- Hazardous Loads.

6.9.10 A cumulative assessment was also undertaken, to consider other committed or potential schemes in the area.

6.9.11 During the construction phase, the assessment concludes that the likely effects of the Scheme on the above criteria will either be negligible or minor adverse in nature and not significant. They will also be temporary for the duration of the construction phase only.

6.9.12 During the operational phase, the transport and access effects of the Scheme will be negligible and not significant. Therefore, there are not expected to be any significant residual effects in relation to Transport and Access as a result of the operation of the Scheme.

6.9.13 The Scheme is anticipated to have a design life of approximately 40 years. At the end of the Scheme's operational life, it will be decommissioned. The number of vehicles associated with the decommissioning phase are not anticipated to exceed the number set out for the construction phase. In light of this, the residual transport and access effects of the Scheme are expected to be the same as the construction phase, and not significant.

6.9.14 The cumulative assessment shows that traffic flows associated with the cumulative schemes will only affect links in the study area that have a low sensitivity. Therefore, the likely Transport and Access cumulative effects of the scheme will not be significant.

Conclusions

6.9.15 The Transport and Access Chapter of the ES sets out and assesses the likely effects of the Scheme in relation to transport and access. Likely effects have been assessed for the construction, operation and decommissioning phases of the Scheme. The Scheme is not likely to result in any significant Transport and Access effects during the construction, operational and decommissioning phases. An Outline Construction Traffic Management Plan [EN010133/APP/C6.3.14.2] has been prepared to manage construction vehicle movement during the construction phase.

6.10 Noise and Vibration

- 6.10.1 The noise and vibration impacts of the Scheme have been assessed within this Chapter [EN010133/APP/C6.2.15] through a combination of consultation, background noise surveys and computer modelling.
- 6.10.2 The assessment has included consideration of:
- Noise and vibration from construction activities on sensitive receptors;
 - Noise and vibration from construction traffic on sensitive receptors;
 - The effects of operational noise on sensitive receptors.
 - Decommissioning.
- 6.10.3 Vibration effects during construction activities have been identified as being below the assessment criteria, (i.e., where effects are below the lowest observed adverse effect level for the sensitive receptors and as a result no significant effects are assessed.
- 6.10.4 Noise and vibration effects during peak periods of construction traffic have been assessed and, at most, minor effects have been identified, which are not significant in EIA terms.
- 6.10.5 Noise and vibration levels during construction have been predicted at the nearest sensitive receptor locations. The predictions for construction noise along the Cable Route Corridor are marginally above the threshold criteria when undertaken at the closest point at which they take place at two of the assessed receptors. However, given that the construction activities for the Cable Route Corridor are transient, it is considered unlikely that a major impact would be experienced for any prolonged duration due to the temporary nature of construction operations. As such, the effect of construction noise on sensitive receptors is assessed as being not significant. All other construction activities are predicted to be below the threshold criteria.
- 6.10.6 To inform the assessment of operational noise, background noise monitoring was carried out at a large number of locations representing the nearest sensitive existing receptors surrounding the potential development areas.
- 6.10.7 The noise emissions of plant associated with the Scheme, including the solar PV arrays, energy storage and electrical substations have been predicted at the nearest sensitive receptors.
- 6.10.8 Advice has been sought from the relevant local planning authorities on the appropriateness of the methodology adopted to assess operational noise, however, this feedback has not been forthcoming. It is considered that the approach described above represents a reflection of industry best practice in such circumstances where existing background levels surrounding a development of this kind are very low.
- 6.10.9 When the predicted noise levels are compared against the existing background noise levels at most of the sensitive receptors, the assessment results in significant

adverse effects at the receptors, depending on the context. However, the existing measured background noise levels at these receptors, particularly during the night-time period are considered to be very low. For very low existing background noise levels, the best practice guidance has been considered for a development of this nature contains a clause that states that alternative guidance should be considered and used to inform the assessment.

- 6.10.10 The alternative guidance sets noise limits which should not be exceeded internally at each nearby sensitive receptor due to noise emissions from the proposed development. When assessed against these criteria, including recommended mitigation measures, noise emissions during the operational phase do not result in significant impacts at any sensitive receptors.
- 6.10.11 A further assessment of operational noise has been utilised to assess the impact of noise emissions from the Scheme, which considers the likely change in noise level due to the contribution of noise emissions from the development at each receptor. When the predicted contribution of noise from the Scheme is combined with the existing noise climate at each receptor, the change in noise level is assessed as being below the threshold of 'unlikely to be perceptible' and therefore insignificant in terms of EIA.

6.11 Glint and Glare

- 6.11.1 Chapter 16 of the ES **[EN010133/APP/C6.2.16]** assesses the likely significant effects of the Scheme with respect to glint and glare. Specifically, this chapter has considered the effects upon residential amenity, road users, train drivers and aviation activity. Public Rights of Way (PRoW) have not been included within the assessment because they are receptors with "low" sensitivity which means the receptor is tolerant of change without detrimental effect, and is of low or local importance.
- 6.11.2 The Chapter provides reference to the relevant independent studies regarding glint and glare issues from solar panels. An overview of the methodology of the assessment is provided including how effects are assessed and quantified. A review of the baseline and assessment of effects is provided including detail on mitigation that has been identified within the Glint and Glare Report. Residual impacts are then outlined in the summary.
- 6.11.3 Without mitigation, a Moderate Adverse effect upon some of the nearby receptors is predicted. The Applicant will put in place mitigation in the form of vegetation (and opaque fencing if required), which is predicted to significantly reduce the visibility of the reflective area and result in a Minor/Negligible adverse effect.
- 6.11.4 Cumulative effects upon shared receptors between Sites of the Scheme have been considered. The assessment has shown that cumulative glint and glare effects are predicted to have a Minor/Negligible Adverse impact, which is not significant.
- 6.11.5 Cumulative effects are not predicted to arise from the Scheme and "West Burton Solar Project" and "Gate Burton Energy Park" due to lack of visibility of multiple sites

from identified receptors. Cumulative effects from the Scheme and “Tillbridge Solar” are predicted, however, they are predicted to have a Minor/Negligible Adverse impact due to the presence of mitigating factors such as: presence of partial screening reducing views of multiple developments, large separation distance between the receptors and the developments, and the sun being low at the horizon at the time of solar reflections.

- 6.11.6 Once the proposed mitigation strategy is put in place, the overall impact of the Scheme upon the nearby identified receptors is predicted to Minor/Negligible Adverse, which is not significant.

6.12 Air Quality

- 6.12.1 The effects of the Scheme on air quality at nearby sensitive receptors during construction, operation and decommissioning phases have been assessed within this Chapter [EN010133/APP/C6.2.17]. The assessment predicts the levels of air quality pollutants and assesses them to determine whether there are any likely significant effects, taking account of relevant policy, guidelines and best practice.

- 6.12.2 Following the implementation of the appropriate site-specific mitigation measures set out in the ES, the significance of the effects from dust and PM₁₀ emissions associated with the construction works is considered to be negligible on all receptors which is not significant in EIA terms. This is based on the IAQM Guidance. All effects are considered to be temporary, direct, adverse and short term.

- 6.12.3 Given that a fire could occur at any location within the development during the Site construction, operational and decommissioning phases, generic receptor locations have been used in the assessment. In case of a fire, a site manager/fire safety representative will need to assess the fire locations, wind direction and surrounding receptors. The site manager/fire safety representative will take appropriate actions accordingly. The actions to be taken include (1) to inform any potential affected residents within the zones and to advise public about health effects of smoke, related symptoms, and ways to reduce exposure; (2) to cancel outdoor events and/or (3) to have populations go to a cleaner air area. Following the implementation of these measures (which will be secured via a Requirement on the DCO) during an occurrence of fire incident, the effects are determined to be negligible which is not significant in EIA terms.

6.13 Socio-Economics, Tourism and Recreation

- 6.13.1 This chapter of the ES has considered environmental effects arising as a result of the Scheme, in relation to:

- Population demography;
- Population health;
- Population skill level and qualification attainment;
- Indices of deprivation;

- Economic activity and performance;
- Business profiles, sector shares and classification;
- Tourism as an economic sector; and
- Accessibility to and desirability of tourism and recreational facilities.

6.13.2 Regulation 5(2) of the EIA Regulations 2017 requires the direct and indirect significant effects of the proposed development on population and human health factors to be identified, described, and assessed. As such, this chapter of the ES has assessed the potential impacts of the Scheme on the population and socio-economic environment, during the construction, operational and maintenance, and decommissioning phases.

Baseline and Context

Population Demography and Health

6.13.3 The Local Impact Area, which comprises Bassetlaw and West Lindsey Districts has a population of 213,000 as measured in the 2021 Census. The Regional Impact Area, comprising the entirety of the East Midlands, was measured to have a population of 4,880,200.

6.13.4 The Local Impact Area is found to have a more ageing population than regionally, as demonstrated by ONS Population Projections for 2021 and 2031, which show the ages 50-74 comprising a total of 35.4% of the population. A significant proportion of the population is therefore likely to reach retirement age over the course of the Schemes construction and delivery. The age group 20-24 years old is notable as being the smallest group below the age of 80 years old.

6.13.5 According to the ONS Census 2011, the Local Impact Area has a greater rate of long-term disability (at 21.0%) than the regional (18.6%) or national (18.1%) averages, and a higher proportion of the population awarded Personal Independence Payment (PIP) (5.3% in November 2021 compared to 4.7% regionally and nationally). The Local Impact Area furthermore has a higher instance of self-assessed “bad” or “very bad” health than regionally or nationally. Although some parts of the Local Impact Area have some limitations in their access to healthcare as measured by the Multiple Deprivation Index 2019, Bassetlaw has notably good overall general practice healthcare provision, with 48.0 GPs per 100,000 population, compared to 44.5 nationally, and 44.0 in West Lindsey.

6.13.6 The December 2021 Annual Population Survey indicates that the Local Impact Area has a lower-than-average attainment of NVQ Level 4 and higher qualification rates, at about 32.5%, compared to 35.7% in the East Midlands, and 43.5% across the UK. However, the Local Impact Area does contain a far greater (than regional or national) proportion of the population attaining “other qualifications”, such as apprenticeships.

- 6.13.7 The West Lindsey council's Local Plan and Five-Year Land Supply documents demonstrate that the Local Impact Area has a significant housing supply and thus has limited issues with accommodating additional workers. The existing population is shown by the Multiple Deprivation 2019 Index to be at greatest risk of being deprived of access to employment, education and skills, and suitable incomes.

Employment and Economy

- 6.13.8 The Annual Population Survey demonstrates that unemployment in the Local Impact Area has roughly kept in line with regional and national trends, albeit with greater year-to-year fluctuation, falling from 8.0% to 4.3% from 2011 to 2019. The March 2022 Annual Population Survey indicates that the Local Impact Area has an economic activity rate of 76.5%. This figure is slightly lower than the regional (77.7%) and national rates (both 78.4%), although has recovered from a significant low of 67.6% during the COVID-19 pandemic.

- 6.13.9 The workplace population of the Local Impact Area was 65,605 as determined in the 2011 Census. The construction industry accounts for 5.6% (approximately 3,700 people) of this, a slightly higher rate than regional or national levels. Accommodation and food services account for 4.9% of the Local Impact Area working population, far lower than regionally (6.3%) and nationally (7.1%). The wider arts, entertainment, recreation and other services sector makes up 4.3% of the local workforce, which is equivalent to both regional and national rates.

- 6.13.10 The size of the local economy can be measured using Gross Value Added (GVA), which measures the value of goods and services in a given area. The most recent data for GVA at local authority level is from 2020. The Local Impact Area had a GVA (balanced) of £3.6 billion, forming part of the Regional Impact Area's GVA of £104.4 billion, with Great Britain having a GVA of £1.77 trillion.

Tourism Economy

- 6.13.11 The Local Impact Area sits within the wider context of the Nottinghamshire and Greater Lincolnshire strategic tourism areas. Prior to the coronavirus pandemic, the tourism economy across these areas was estimated to be worth £4.25 billion, supporting 45,000 jobs. The Local Impact Area host a number of key attractions, such as: Pilgrims Gallery, Clumber Park, Sundown Adventureland, the Harley Gallery at the Welbeck Estate, the Hemswell Antiques Centre, RAF Scampton Heritage Centre, Woodside Wildlife Park, and the Blyton Park motorsports venue.

- 6.13.12 Total expenditure from both domestic and international visitors in the Local Impact Area was estimated to be £24 million in 2019. In the same year, total visitor expenditure within the Regional Impact Area was estimated to be £1.60 billion.

Local Attractions and Recreation Sites

- 6.13.13 The Local Impact Area hosts a number of local recreation centres, including outdoor venues such as golf courses and fishing lakes and waterways. The areas immediately surrounding the Scheme host a good network of Public Rights of Way, including

some of national and regional importance. These include the Trent Valley Way and Plogsland Round walking routes, and the National Byways cycle route. The River Trent and Fossdyke Navigation Canal waterways are both used for recreational use.

Mitigation

Embedded Mitigation

- 6.13.14 Embedded mitigation incorporated in the Scheme is set out in detail in the following documents:
- ES Chapter 4: Scheme Description **[EN010133/APP/C6.2.4];**
 - ES Appendix 14.1: Construction Traffic Management Plan (CTMP) **[EN010133/APP/C6.3.14.1];**
 - ES Appendix 14.3: Public Rights of Way Management Plan (PRoWMP) **[EN010133/APP/C6.3.14.3]; and**
 - Outline Construction Environmental Management Plan (CEMP) **[EN010133/APP/C7.1].**
- 6.13.15 Together, the CTMP and CEMP seek to provide embedded mitigation to limit construction impacts from the Scheme on socio-economic receptors.
- 6.13.16 Construction is anticipated to take place across an approximate 24-month period. Key mitigation and enhancement measures for the Scheme's construction across all EIA topics are set out in the CEMP **[EN010133/APP/C7.1]**. An all-encompassing mitigatory measure is for the construction schedule for the Scheme to retain flexibility to be staggered across the Sites to reduce impacts on environmental receptors.
- 6.13.17 With specific regard to socio-economic, tourism and recreation receptors, the embedded flexibility in the construction timescale of the Scheme could be utilised to reduce, or alter when, peak construction workers and movements will occur. This will help to moderate the level of temporary accommodation demand, to the benefit of both the accommodation and tourism employment and economic sectors.
- 6.13.18 Measures to mitigate visual impacts from construction operations, lighting, and the location of construction equipment, as set out in the CEMP will have a secondary benefit to the tourism economy through reducing the level of impact on the desirability of the Local Impact Area. These measures are likely to decrease the level of adverse effects across all recreational receptors.
- 6.13.19 In co-ordination with the CTMP and PRoWMP, the phasing of the Scheme will help to control construction traffic movements, to the benefit of accessibility and desirability of public rights of way; recreational use of highways; use, accessibility and desirability of recreation centres and facilities; and on the accessibility and desirability of local tourist attractions. Of greatest effect is the impact of fear and intimidation from construction traffic on vulnerable shared road users such as

walkers, cyclists, and horse riders, and thus the mitigation measures in place will help to protect these users.

- 6.13.20 Where recreational receptors, principally public rights of way and regionally and nationally important walking and cycling routes are likely to be directly affected by the construction of the Scheme, the CEMP, CTMP and PRoWMP together set out mitigatory measures to ensure impacts on these receptors are minimised. Recreational routes crossing or within the Order limits will be sought to be kept open during construction, with any crossing or traffic conflict points overseen by spotters or banksmen for HGVs. Where closures are deemed to be necessary, these will be temporary in nature and supported by appropriate amount of notice and suitable diversions. Any diversions to routes will be appropriately signed, and the duration and length of diversions will be optimised to minimise impacts on accessibility and desirability.

Additional Mitigation and Enhancement

- 6.13.21 Where significant or other mitigable adverse effects are anticipated from the Scheme, mitigation measures are secured to ensure that the design, construction, operation, and management of the Scheme can be adapted where feasible to ensure these impacts are minimised. Similarly, where beneficial effects are anticipated, a series of enhancement measures can be introduced where feasible to ensure the greatest beneficial effects can be generated and secured.
- 6.13.22 These reference documents, all of which are secured by Requirements under the draft DCO, are:
- Outline Decommissioning Statement (ODS) **[EN010133/APP/C7.2];**
 - Outline Skills Supply Chain and Employment Plan (OSSCEP) **[EN010133/APP/C7.10];** and
 - Outline Operational Environment Management Plan (OOEMP) **[EN010133/APP/C7.16].**
- 6.13.23 Additional (also referred to as secondary) mitigation in the form of landscape screening planting has been provided across much of the Sites to ensure visual impacts on other tourist and recreational attractions are minimised during the Scheme's operational lifetime. Full assessment of visual impact on important receptors, and details of the provided landscape mitigation can be found in the following documents:
- ES Chapter 8: Landscape and Visual Impact Assessment **[EN010133/APP/C6.2.8];**
 - ES Figures 8.16.1-11: Detailed Landscape Mitigation Plans **[EN010133/APP/C6.4.8.16.1-11];** and
 - Outline Landscape and Ecological Management Plan (LEMP) **[EN010133/APP/C7.3].**
- 6.13.24 Practicable opportunities to promote local apprenticeship and training schemes for construction, manufacturing, and the energy industry are explored through the

OSSCEP. This will seek to have a positive impact on education and skills attainment in fields such as construction, engineering, and energy technology throughout the operational lifetime of the Scheme. Further enhancement of the Scheme's employment and economic benefit will be achieved through focussing on local recruitment and procurement, and supporting local education and skills uplifting. Options to find ways to support agricultural workers in moving to diversified agricultural practices (such as sheep rearing and grazing) that can be continued alongside the operation of the Scheme are also set out in the OSSCEP.

6.13.25 Key mitigation and enhancement measures for the Scheme's operation and maintenance across all EIA topics are set out in the OEMP, helping to control impacts on amenity, visual, accessibility, and traffic impacts from the Scheme. These directly or indirectly mitigate adverse effects from the Scheme on socio-economic, tourism and recreation receptors, through limiting adverse impacts on residents' health and wellbeing, operation of and accessibility to local businesses, and impacts to the desirability of the area for tourism and recreation. Visual impacts from the Scheme are mitigated against in co-ordination with the measures set out in the OLEMP, which include planting and screening around the Sites.

6.13.26 Decommissioning will see the return of impacts to socio-economic, tourism and recreation receptors in a similar magnitude to those experienced during construction. Whilst a detailed assessment on the anticipated effects cannot be reliably made due to uncertainty of future baseline conditions, mitigatory measures can still be implemented through the Application via the ODS. Specifically, adverse effects on recreational walking and cycling routes, fear and intimidation to recreational road users from decommissioning noise, traffic, and views on desirability, accessibility and use in-combination with landscape and heritage impacts are to be mitigated against through the implementation of the measures set out in the ODS. Furthermore, the ODS secures that flexibility within the decommissioning schedule can be utilised to minimise the peak impacts from decommissioning activities on tourism and recreation receptors, and the local accommodation sector.

Assessment of Effects

6.13.27 The socio-economic, tourism and recreation ES chapter assesses the impacts on the following receptors for the construction, operation, and decommissioning of the Scheme. The effects for socio-economic receptors are measured across the Local and Regional Impact Areas. Those receptors are:

- Construction sector employment and economic value
- Energy sector employment and economic value
- Agriculture, forestry & fishing sector employment and economic value
- Accommodation sector employment and economic value
- Tourism and recreation sector employment and economic value
- Local and Regional economic activity and employment
- Resident population and age demographics

- Health and wellbeing receptors including access to primary healthcare, general population health and wellbeing, disability and long-term health conditions, and accessibility to recreational routes
- Accommodation stock including temporary worker accommodation, visitor accommodation, and permanent housing
- Access to employment and education as indices of multiple deprivation
- Skills and qualification attainment
- Working and commuting patterns
- Economic prosperity including resident and working population income
- Impacts on regional, local landscape and local heritage tourist attractions
- Impacts on Public Rights of Way, long distance recreation routes, and other walking and cycling routes
- Impacts on recreational use of waterways for navigation or fishing, formal recreation centres, informal and youth recreation centres
- Secondary impacts on other tourism and recreation receptors

6.13.28 The table below summarises the identified residual, post-mitigation effects that are significant:

Table 6.1 Summary of Significant Residual Post-Mitigation Effects

Receptor	Description of Impact	Significant Residual Post-Mitigation Effects
Construction		
Accommodation sector employment (Local Impact Area)	Increase in demand for temporary accommodation units	Medium-term temporary major-moderate beneficial
Economic activity and employment (Local Impact Area)	Increase in labour and employment opportunity	Medium-term temporary moderate beneficial
Accommodation stock for construction	Increase in accommodation occupancy for temporary or short-term workers	Medium-term temporary major-moderate beneficial
Access to employment (IMD)	Changes in overall employment opportunities generated from Scheme construction	Medium-term temporary major-moderate beneficial
Access to education (IMD)	Increase in sector-based skills training and qualification opportunities	Medium-term temporary moderate beneficial
Economic prosperity	Total GVA and GVA/head change associated with construction of Scheme	Medium-term temporary moderate beneficial
Resident and working population income	Changes in overall employment opportunities and personal income from Scheme construction	Medium-term temporary moderate beneficial
Local tourist attractions (landscape)	Impacts from construction noise, traffic, and views on desirability and use	Peak medium-term temporary moderate adverse

Receptor	Description of Impact	Significant Residual Post-Mitigation Effects
Operation		
No significant effects anticipated		
Decommissioning		
Accommodation sector employment (Local Impact Area)	Increase in demand for temporary accommodation units	Medium-term temporary major-moderate beneficial

Cumulative Effects

6.13.29 The residual effects of the development of the Scheme assuming the implementation of the proposed mitigation has been presented above. When assessed against the cumulative impacts of the identified projects, the resultant significant cumulative residual effects are those summarised below:

Table 6.2 Summary of Significant Cumulative Residual Effects

Receptor	Description of Impact	Significant Residual Post-Mitigation Effects
Construction		
Construction sector employment (Local Impact Area)	Increase in construction employment opportunities	Peak cumulative medium-term temporary moderate beneficial
Accommodation sector employment (Local Impact Area)	Increase in demand for temporary accommodation units	Peak cumulative medium-term temporary major-moderate beneficial
Economic activity and employment (Local Impact Area)	Increase in labour and employment opportunity	Peak cumulative medium-term temporary moderate beneficial
Accommodation stock for construction	Increase in accommodation occupancy for temporary or short-term workers	Peak cumulative medium-term temporary major-moderate beneficial
Accommodation stock (housing)	Increase in accommodation requirement for workers and families	Peak cumulative medium-term temporary moderate beneficial
Access to employment (IMD)	Changes in overall employment opportunities	Peak cumulative medium-term temporary major-moderate beneficial
Access to education (IMD)	Increase in sector-based skills training and qualification opportunities	Peak cumulative medium-term temporary moderate beneficial
Construction economy (Local Impact Area)	Economic impacts on existing construction economy	Peak cumulative medium-term temporary moderate beneficial
Accommodation economy (Local Impact Area)	Economic impacts on existing accommodation economy	Peak cumulative medium-term temporary moderate beneficial

Receptor	Description of Impact	Significant Residual Post-Mitigation Effects
Economic prosperity	Total GVA and GVA/head change associated with construction	Peak cumulative medium-term temporary moderate beneficial
Resident and working population income	Changes in overall employment opportunities and personal income from construction	Peak cumulative medium-term temporary moderate beneficial
Local tourist attractions (landscape)	Impacts from construction noise, traffic, and views on desirability and use	Peak cumulative medium-term temporary moderate adverse
Long distance recreation routes	Impacts from construction noise, traffic, views, and diversions and closures of routes on route desirability and use	Peak cumulative short to medium-term temporary moderate adverse (Trent Valley Way)
Operation		
Energy sector employment (Local Impact Area)	Change in energy-based employment (including the decommissioning of West Burton A Power Station)	Cumulative long-term moderate adverse
Decommissioning		
Construction sector employment (Local Impact Area)	Increase in sector employment opportunities generated from decommissioning works	Peak cumulative medium-term temporary moderate beneficial
Energy sector employment (Local Impact Area)	Conclusion of energy sector employment	Peak cumulative medium-term temporary moderate adverse
Accommodation sector employment (Local Impact Area)	Increase in demand for temporary accommodation units	Peak cumulative medium-term temporary major-moderate beneficial
Economic activity and employment (Local Impact Area)	Changes in overall employment opportunities generated from decommissioning works	Peak cumulative medium-term temporary moderate beneficial
Construction sector economy (Local Impact Area)	Economic impacts on existing construction economy	Peak cumulative medium-term temporary moderate beneficial
Economic prosperity	Total GVA and GVA/head change associated with decommissioning works	Peak cumulative medium-term temporary moderate beneficial
Resident and working population income	Changes in overall employment opportunities and personal income from decommissioning works	Peak cumulative medium-term temporary moderate beneficial

6.13.30 Local tourist attractions that rely on their landscape value, such as viewpoints, public rights of way, or the landscape context of rural villages are likely to be cumulatively impacted during the construction of the cumulatively assessed projects. These impacts are as result of construction noise, traffic, and views that reduce the desirability and use of these attractions. The assessed peak cumulative effect is medium-term temporary moderate adverse. It should be noted that this applies only to a small number of receptors as identified in ES Chapter 8: Landscape and Visual

Impact Assessment. The majority of receptors within the study areas will not experience significant cumulative effects.

- 6.13.31 The Trent Valley Way, which is a regionally important long distance recreational walking route, is likely to experience cumulative effects from the cumulatively assessed projects.
- 6.13.32 The energy sector in the Local Impact Area is likely to experience a cumulative long-term moderate adverse effect on the level of employment as a result of the loss of energy sector employment as a result of the anticipated decommissioning of West Burton A Power Station. Indicative public reports estimate the decommissioning of this power station will cause the loss of 125 energy sector jobs in the Local Impact Area. This is likely to be partially recuperated by the cumulative energy sector employment across the other identified projects, however, the net change to energy sector employment is still a long-term moderate adverse effect. This effect will be exacerbated (albeit the level of significance will remain unchanged) upon the decommissioning of the other cumulatively assessed projects from the late 2060s onwards.

6.14 Soils and Agriculture

- 6.14.1 Chapter 19: Soils and Agriculture of the ES [EN010133/APP/C6.2.219] considers impacts on Agricultural Land Quality (including Best and Most Versatile Agricultural (BMV) Land), Soil Resources and Farming circumstances.
- 6.14.2 As embedded mitigation, the assessment proposes an Outline Soil Management Plan (SMP) to be agreed as a requirement of a Development Consent Order, the purpose of which is the preservation of the soil resource at the site - avoiding both the loss of soil material from the site and the loss of soil functional capacity at the site. The SMP provides guidance to achieve this aim through the construction, operational and decommissioning phases of the development, covering the appropriate selection of plant, physical characteristics of the soil and safe removal of all below ground features (including piles and cables) at decommissioning that could interfere with subsequent cultivation. This guidance can be incorporated into the agreed Construction, Operational and Decommissioning Environmental Management Plan documents.
- 6.14.3 In terms of any residual environmental effects (i.e., taking into account in the assessment any mitigation) the assessment concludes:
- Agricultural Land Resource* - There is no effective mitigation for the loss of BMV agricultural land, and there is no actual loss of agricultural land resource. Therefore, the residual effect of the construction of the Scheme will remain minor, not significant. During operation, there is no loss of agricultural land. The residual effect remains a negligible Impact, not significant. No agricultural land will be lost to the decommissioning works, and no mitigation is proposed. The residual effect remains a Negligible Impact, not significant.

Soil Resource - The Outline SMP is an embedded mitigation that aims to conserve the soil resource through construction activity. No additional mitigation is proposed. Therefore, the residual effect of the construction phase remains minor, not significant. During operation, the Outline SMP aims to conserve the soil resource. No additional mitigation is proposed and the residual effect remains a Moderate Impact, and significant beneficial effect. The Outline Soil Management Plan measures also apply to decommissioning and land restoration works, with advice specific to the decommissioning phase covering the appropriate handling of stored soil material as it is returned, appropriate aftercare of the land, and the identification and remediation of any areas of compacted subsoils. The Soil Management plan is however an embedded mitigation and no further mitigation is proposed. The residual effect will remain a Minor Impact, not significant.

Farming Circumstances - There are no mitigation measures specific to the farm businesses for the Construction Phase of the Scheme, so the impact will remain minor, not significant. Opportunities for farm enterprises to utilize the land within the sites will be limited to periods of grazing small livestock. No further mitigation is proposed. The residual effect will remain a moderate impact, a significant beneficial effect. The decommissioning stage will return agricultural land in the Sites to the arable enterprises of the occupying farm businesses. No further mitigation is proposed. The residual effect will remain a Minor Impact, beneficial and not significant.

- 6.14.4 In respect of cumulative impacts. Figure 5 within the Soils and Agriculture Chapter of the ES shows the extent of the Order Limits superimposed on an extract of the regional plan of Predictive BMV Land Assessment. This series of 1:250,000 scale maps display the likelihood of BMV agricultural land in three broad categories, alongside non-agricultural land urban land. These categories are High Likelihood of BMV (> 60% area BMV), Moderate Likelihood of BMV (20% to 60% area BMV) and Low Likelihood of BMV (< 20% area BMV). As can be seen the Order Limits occupy an area mapped as Moderate Likelihood of BMV.
- 6.14.5 Figure 5 also shows the approximate extent of six NSIP scale solar renewable energy sites where planning applications have either been submitted or are at the pre-application stage. These sites are Tillbridge Solar, Gate Burton Energy Park, West Burton Solar, Heckington Fen Solar, Temple Oaks Renewable Energy Park and Mallard Pass Solar. The Heckington Fen site is shown within an area of High Likelihood of BMV land. Mallard Pass predominantly occupies an area of Low Likelihood of BMV land. The four remaining sites occupy predominantly Moderate Likelihood of BMV land as for the Cottam Solar Project Order Limits.
- 6.14.6 The explanatory note that accompanies the map series notes that the plans are not suitable for site specific assessment. Site specific assessment is required to determine ALC Grade for an individual site. However, in the absence of such assessment results in the public domain, these plans indicate the general

- disposition of land quality within a region, and provide the best published reference to assess likely cumulative impact on the agricultural land resource.
- 6.14.7 No meaningful data is available to appraise farming circumstances for these six cumulative sites. Limited soils data is available at the 1:250,000 scale on the national soil map. However, detail of soil information available from this national soil map is insufficient to justify any variation between the cumulative sites in predicted effect of a solar farm development on the Soil Resource.
- 6.14.8 For the Loss of Agricultural Land Resource, all six cumulative effect sites will be temporary and time limited development, with any actual loss of agricultural land limited to the small extent of switchgear housings and substations. Therefore, the residual effect of each of these six sites on the agricultural land resource is predicted to be negligible, as for Cottam.
- 6.14.9 The soil resource present at each of the six cumulative sites will experience little disturbance, and the risk of compaction from trafficking reduced (lower frequency, lower weight and able to avoid wet conditions) when compared to annual arable crop management. Therefore, the residual effect of each of these six sites on the soil resource is predicted to be negligible, as for Cottam.
- 6.14.10 Some farm businesses occupying land within the six cumulative sites may have elevated sensitivity to a solar farm development in comparison to the four farm businesses at Cottam. For instance, a farm business may have a full agricultural tenancy providing security of tenure which if obliged to vacate, would be very difficult to replace. However, without any published detail on the occupancy of the six cumulative sites, there is no justification to claim any greater significance of effect than at Cottam. Therefore, the residual effect of each of these six sites on farm businesses is predicted to be negligible, as for Cottam.
- 6.14.11 The only plausible interaction between the six cumulative sites and Cottam is agricultural occupancy by a farm business across multiple different sites. If this does occur it is likely to not be a significant adverse effect for that farm business, but an assessment would not be possible without the farming circumstances baseline for the affected unit. There will be no interaction of impact for soils or agricultural land resource between any of the sites. There is therefore no significant cumulative effect identified for soils and agriculture for the six cumulative sites.
- 6.14.12 This Soils and Agriculture Chapter concludes in stating that, with regards to all potential effects across all stages of the Scheme, there is to be no site-specific mitigation measures required. Of the anticipated adverse effects, it is considered that the severity of these range from Negligible to Minor in significance which in itself is not significant in EIA terms. Those effects which are considered to be adverse are chiefly to be expected within the construction and decommissioning phases of the project. An Outline Soil Resource Management Plan has been developed in order to embed mitigation measures during the construction and decommissioning phases of the Scheme.

6.14.13 During operation, the health of the soil is expected improve under fallow and it is anticipated that the period for which the Solar Farm is operational will result in a moderate beneficial effect to the soil. As for the potential loss of the Agricultural Land resource, this is considered a negligible adverse effect given that post-operation, the decommissioning of the Scheme will result in the full return of the land to its agricultural use.

6.15 Waste

6.15.1 A description of the potential streams of construction waste and estimated volumes are included within Chapter 20: Waste of the ES [EN010133/APP/C6.2.20]. In addition to this, the Construction Environmental Management Plan (CEMP), which would be produced following receipt of a DCO, will set out how waste will be managed on-site, and opportunities to recycle waste will be explored. An Outline CEMP, which accompanies this submission, has been prepared and outlines the recycling and management of waste.

6.15.1 When considered both in isolation and cumulatively with the identified projects in the Local Impact Area, the residual environmental effects from waste (i.e., following consideration of the CEMP measures) generated by the Scheme, and cumulative projects are as follows:

- The overall effects on waste handling facilities in the Local Impact Area are not likely to be significant at any stage of the assessed timeframe;
- No waste handling facilities in Lincolnshire are likely to see significant effects at any stage of the assessed timeframe;
- No waste handling facilities in Nottinghamshire are likely to see significant effects during the construction or operational lifetime of the development;
- Waste recycling and recovery handling facilities in Nottinghamshire are not likely to see significant effects during the construction or operational lifetime of the development;
- Waste handling facilities for landfill waste handling in Nottinghamshire are likely to see a significant adverse effect during the decommissioning of the Scheme and cumulative decommissioning phase, as a result of the lack of landfill capacity from the year 2030; and

6.15.2 The anticipated impacts from the Scheme can be sufficiently mitigated through adherence to the measures set out in the Outline CEMP and Outline OEMP and the Outline Decommissioning Statement. These, along with their full counterparts to be provided post-consent will ensure that the Scheme is developed with good practices towards use of materials and water, and management of waste in keeping with the principles of the Waste Hierarchy

6.16 Other Environmental Matters

6.16.1 **Chapter 21: Other Environmental Matters** of the ES [EN010133/APP/C6.2.21] considers Human health; Major accidents and disasters; Electromagnetic fields; Telecommunications, utilities and television; and light pollution.

6.16.2 None of these warrant individual chapters in the ES, either due to the brevity of the assessment or the small impact associated with the Scheme.

6.16.3 Notably, Electromagnetic fields; Telecommunications, Utilities and Television; and Light Pollution were confirmed to be scoped out of the ES by PINS in the scoping opinion, subject to a number of matters which are addressed below.

Electromagnetic Fields

6.16.4 The electrical infrastructure to be developed as part of the Scheme is described in Chapter 4 of the ES, consisting of substations, BESS, other equipment and underground cables.

6.16.5 The BESS infrastructure is located some 320m to the nearest residential properties and business premises. Similarly, the substations are be located such that the nearest residential properties and business premises are no less than 400m away. At these distances. Electromagnetic field strength reduces proportionally to the separation distance squared, and as such, the expected electromagnetic field strengths of the substation and BESS at all residential and business receptors are far below the impact thresholds (1998 ICNIRP reference level). Substations are designed and sized such that electromagnetic fields from substation infrastructure are below the 1998 ICNIRP reference levels at the point of the perimeter fencing, and located such that no publicly accessible spaces, such as highways or public rights of way are in near proximity to substation perimeter fencing.

6.16.6 In respect of the Shared Cable Route Corridor, where three 400kV circuits are to run in parallel with average separations of 10m and 10m between circuits, there could be a small exceedance of impact thresholds. However, as the Shared Cable Corridor is to be built no less than 25m from residential or business premises, this will not give rise to significant impacts. Members of the public may be exposed to the estimated peak magnetic field strength where public rights of way cross over the three 400kV circuits running in parallel in the Shared Cable Corridor. However, members of the public are not anticipated to remain in locations where impact thresholds are exceeded, for significant amounts of time, due to the transient nature of public rights of way.

Telecommunications, Utilities and Television

6.16.7 Above-ground infrastructure on the Sites has been located so as to retain required offsets to existing telecommunications and utility infrastructure to provide clear access and to minimise potential conflicts, such as damage from piling, excavation, or compaction. Where these pieces of infrastructure are connected by low to mid-voltage cabling (up to 33kV), this will be routed to minimise the number of crossings of existing services. Trenching for low-mid voltage cabling will be shallow, with a depth of up to 0.4m below surface. Installation of cabling up to 33kV will be undertaken in accordance with the mitigation measures set out in the Outline Construction Environmental Management Plan [EN010133/APP/C7.1].

- 6.16.8 High voltage cabling, consisting of 132kV cable circuits between the substations at Cottam 2, 3a and 3b and at Cottam 1, and the 400kV grid connection cable circuit from Cottam 1 substation to the National Grid substation at Cottam Power Station, is required to be laid over a distance of up to 27.5km. Trenching and horizontal directional drilling activities to lay these cables will therefore have to take account of the significant number of existing telecommunications and utilities services that interact with the cable route corridor. Where set in surface-dug trench with no constraints, the maximum depth of the dug cable trench is 1.5m below ground level. Where crossing existing buried utilities or apparatus, the maximum depth of the dug cable trench is 1.5m below the level of the existing apparatus.
- 6.16.9 The Crossing Schedule **[EN010133/APP/C7.17]** identifies a significant number of telecommunication and utilities services that are required to be crossed by the cable route. Each crossing has the intended crossing technique options included. Any interaction with existing apparatus above or below ground should be undertaken in accordance with the required level of safety measures as directed by the apparatus owner or operator. With these measures in place, the risk of damage to telecommunications and utilities will be managed.
- 6.16.10 In summary, the survey and agreed off-set distance information will be fed into the Outline Construction Environmental Management Plan **[EN010133/APP/C7.1]** and resultant full Construction Environmental Management Plan, to ensure construction work is carried out such that impacts on services are minimised. Where direct conflict is anticipated, such as is of greater likelihood along the Scheme's Cable Route Corridor, the crossing of utilities will be carried out in direct collaboration with the relevant utilities provider.

Light Pollution

- 6.16.11 Assessment of the environmental impacts of light pollution from the Scheme has been undertaken within **Chapter 8: Landscape and Visual Impact Assessment [EN010133/APP/C6.2.8]**, where regarding landscape and human receptors, and in **Chapter 9: Ecology and Biodiversity [EN010133/APP/C6.2.9]**, where regarding ecological receptors. These assessments cover the construction phase of the development, where lighting impacts are most likely to occur. Light pollution impacts during operation were scoped out of the ES assessment in anticipation that no permanent visible lighting structures will be used on the Scheme. Security lighting would be infrared, and the limited lighting associated with the substations and within the Energy Storage site would be used for occasional maintenance/emergency use only.

Human Health

- 6.16.12 Baseline conditions relating to human health and wellbeing have been explored in **ES Chapter 18: Socio-Economics, Tourism and Recreation [EN010133/APP/C6.2.18]**, wherein a desk-based review of key health receptors has been undertaken. This assessment has been undertaken for the area covered by Bassetlaw District and West Lindsey District, and draws on data from the 2021

Census, 2011 Census for detailed population characteristics, and public data from the NHS and the Department for Work and Pensions (DWP).

- 6.16.13 Mitigation measures are embedded within the Scheme, as set out in the respective ES chapters and associated Application documents, to reduce other operational effects (such as noise, air quality and transport) which in turn will mitigate the effects on the local community and existing facilities from a human health perspective.

Human Health: Assessment of Effects and Mitigation Measures

- 6.16.14 The assessment has considered: Flooding; Ground Conditions; Noise and Vibrations; Glint and Glare; Socio-Economic; Waste and Major Accidents as identified areas of potential conflict with human health.
- 6.16.15 The flooding assessment identifies that the main period for anticipated effects is during the construction and decommissioning phases where blockages, the compaction of soil and the creation of impermeable surfaces is likely to generate medium to low adverse effects. Through mitigation measures secured within the Outline CEMP **[EN010133/APP/C7.1]** and Outline Decommissioning Strategy **[EN010133/APP/C7.2]**, the residual effects post-mitigation measures are minor adverse.
- 6.16.16 Ground contamination impacts upon human health include the ingestion and inhalation of dust and vapours. Given the nature of the development, low to negligible adverse effects are anticipated. In order to mitigate potential risks, employees will be made aware of the possibility of encountering localised contamination whilst the enforcement of and adherence to health, safety and environmental precautions will be secured. The appropriate storage and bunding of potential on-site contamination sources will also serve to mitigate such risks.
- 6.16.17 Noise and Vibration impacts are to produce negligible to high adverse impacts upon human health. Construction and operational activities are expected to produce the greatest adverse impact with regards to noise and vibration. In order to mitigate for these impacts, the hours of work and the monitoring of construction noise has been captured within the Outline CEMP **[EN010133/APP/C7.1]**. A Construction Traffic Management Plan has also been produced to direct construction-related traffic onto the best possible routes **[EN010133/APP/C6.3.14.2]**.
- 6.16.18 The impacts upon human health arising from glint and glare relate to the impacts upon residential amenity, for which the impact is medium adverse. Mitigation has been secured by way of the Outline Landscape and Ecological Mitigation Plan **[EN010133/APP/C7.3]** in which proposed planting and screening has been optimally placed to minimise the impacts of glint and glare.
- 6.16.19 Socio-Economic impacts on human health arise principally from the access to services such as schools, healthcare facilities and the road network. These impacts generate low adverse effects. Mitigation of these effects is secured through the phasing of construction which serves to reduce the concentration of workers at any one time, resulting in negligible adverse effects.

- 6.16.20 The Scheme is to have a moderate beneficial socio-economic impact upon access to employment and education. In order to enhance local recruitment and support local education, an Outline Skills Supply Chain and Employment Plan **[EN010133/APP/C7.10]** has been produced in order to maximise the potential of the local economy and its educational services.
- 6.16.21 With regards to waste impacts upon human health, the exposure of waste handlers to contaminated soils and hazardous materials produces a medium adverse impact. Through the minimisation of waste materials generated and the assurance that all contaminated or hazardous waste is handled, recycled, or discarded by competent licensed hazardous waste operator, these mitigation measures result in minor adverse impacts.
- 6.16.22 Human health can also be impacted by fires and explosions should catastrophic technological failure occur. The potential risk of fires and explosions to onsite workers, residents, the general public and railway workers is generally considered to be a medium adverse impact with the greatest impacts faced by onsite workers. In order to mitigate for the risk of fires and explosions, the containers will be prefabricated off-site to ensure quality assurance checks can be taken in their fullest. Where risks still remain, technology considered to be of a higher risk of failure, and resulting in a potential explosion, have been placed at a minimum of 50m away from public access.

Major Accidents and Disasters

- 6.16.1 For this assessment, major accidents and disasters as they relate to the Scheme, fall into three categories:
- Events that could not realistically occur, due to the nature of the Scheme or its location;
 - Events that could realistically occur, but for which the Scheme, is no more vulnerable than any other development; and
 - Events that could occur, and to which the Scheme is particularly vulnerable, or which the Scheme has a particular capacity to exacerbate. These events are considered within this assessment.
- 6.16.2 A number of receptors present in the vicinity of the Scheme have been assessed in relation to their vulnerability to major accidents and disasters. These include:
- Towns, villages, farms and residential homes;
 - Commercial sites and buildings;
 - Roads;
 - Railways;
 - Designated ecological sites, woodland, farmland, and waterbodies; and

- Underground infrastructure services including electricity, water, communications, and gas.
- 6.16.3 With regards to flooding, the anticipated impacts of increased rainfall events, winter precipitation, and increased probability of extreme weather events are not severe and are not significant.
- 6.16.4 As for flooding pertaining to construction activities, these are explored in detail within Chapter 10 of the ES **[EN010133/APP/C6.2.10]**. In summary, it is concluded that should all mitigation measures be implemented (e.g., temporary drainage networks, minimized compaction of soil etc.) there are to be negligible adverse effects.
- 6.16.5 The impacts arising from potential fire and explosions relating to the BESS are considered minor adverse given the containerised nature of the BESS. The effect is therefore considered not significant.
- 6.16.6 During operation however, when the batteries are under load, there is an expected moderate-minor adverse risk. Batteries under load pose inherent risks as a technological failure can increase the probability of fire. Through the mitigation measures proposed and the appropriate placement of battery cells, this impact is reduced and is not considered significant.
- 6.16.7 Should an unconfined explosion occur it is anticipated that it would be felt up to 50m. As a result, no PRoW, public access, or properties are within this distance such as to ensure that the public's exposure to this potential risk is mitigated against. The effect on public health post-mitigation is therefore considered not significant.
- 6.16.8 The anticipated impacts of other fires, beyond electrical, to human health and infrastructure resilience are no greater than minor adverse and therefore not significant.
- 6.16.9 The Scheme is considered to be of a no greater than low risk of containing unexploded ordinance. The impact of an explosion from buried ordinance is to have a medium to high adverse effect on human health and safety. Measures have therefore been included to ensure that sufficient procedures are in place should an unexploded ordinance be discovered.
- 6.16.10 The assessment of road accidents and safety presented in ES Chapter 14: Transport and Access **[EN010133/APP/C6.2.14]** concludes that subject to embedded mitigation measures being implemented, the effects of construction traffic to the Sites and to the Cable Route Corridor on highway safety are no greater than minor adverse, whilst the effects of transportation of hazardous loads are deemed to be no greater than negligible adverse.
- 6.16.11 Impacts relating to glint and glare on highways safety during the operational lifetime of the Scheme demonstrate that there are up to moderate adverse effects upon certain roads (specifically along the B1205 Kirton Road). This is therefore considered significant as planting mitigation measures will be of limited effectiveness until

mature. The potential to provide opaque fencing as an interim measure would help to mitigate this. At the point of maturity, residual effects on road users are estimated to be neutral.

- 6.16.12 Impacts related to glint and glare on railway safety during the operational lifetime of the Scheme demonstrate that there are up to moderate adverse effects to train drivers. This, however, is mitigated for through embedded design measures which are to provide opaque screening along sensitive railway boundaries. As such, the residual effects on rail users are estimated to be neutral, and therefore are not significant.
- 6.16.13 Aviation accidents are considered within ES Chapter 16: Glint and Glare **[EN010133/APP/C6.2.16]**. This chapter states that no significant effects are predicted in respect of aviation activities during the operational lifetime of the Scheme. As such, there are no significant effects relating to major accidents and disasters with regard to aviation accidents.
- 6.16.14 The nature of the Scheme, being a solar project, is considered to be of low sensitivity to ground contamination and is therefore assumed as such for ground stability. The Scheme, its infrastructure and its workforce has been duly mitigated for within the Outline CEMP **[EN010133/APP/C7.1]** as well as more broadly throughout the ES **[EN010133/APP/C6.2]**. The residual effects on the workforce, users, residents and the general public is therefore not anticipated to be significant.
- 6.16.15 The greatest level of impact relating to vegetation, pests and diseases is anticipated from the potential spread of invasive species during construction, operation and decommissioning. Although not identified within the Scheme, precautionary measures to avoid the accidental spread of invasive species have been set out in the Ecological Protection and Mitigation Strategy **[EN010133/APP/APP/C6.3.9.13]**. As a result of the mitigation measures within this strategy, the residual effect of the spread of invasive species is a neutral effect and is therefore not significant.

Major Accidents and Disasters: Mitigation Measures

- 6.16.16 Minimising the risk of major accidents during construction, operation, and decommissioning will be addressed through appropriate risk assessments as required in the Outline CEMP, OEMP, and Outline Decommissioning Statement. The implementation of those plans will be secured via a requirement of the DCO.
- 6.16.17 An Outline Battery Storage Safety Management Plan (OBSSMP) has been produced for the Scheme and will be updated and maintained as a 'live document' throughout the operational phase of the Scheme. The implementation of the strategy will be secured via a requirement of the DCO.

7 Summary of Conclusions

- 7.1.1 The ES explains the findings of the EIA process that has been undertaken for the Scheme.
- 7.1.2 A number of environmental impact avoidance, design and mitigation measures have been identified to mitigate and control environmental effects during construction, operation (including maintenance) and decommissioning of the Scheme. It is proposed that these will be secured through appropriate requirements and other controls within the DCO for the Scheme, should this be granted.
- 7.1.3 Feedback from the formal consultation process has been taken into account when preparing the Application and in undertaking the EIA process.

NTS Figures

Figure 1.1 Location Plan

Figure 2.1 Cumulative Site Plan

Figure 4.1 Illustrative Site Layout Plan (CO1 N)

Figure 4.2 Illustrative Site Layout Plan (CO1 S)

Figure 4.3 Illustrative Site Layout Plan (CO1 West A)

Figure 4.4 Illustrative Site Layout Plan (CO1 West B)

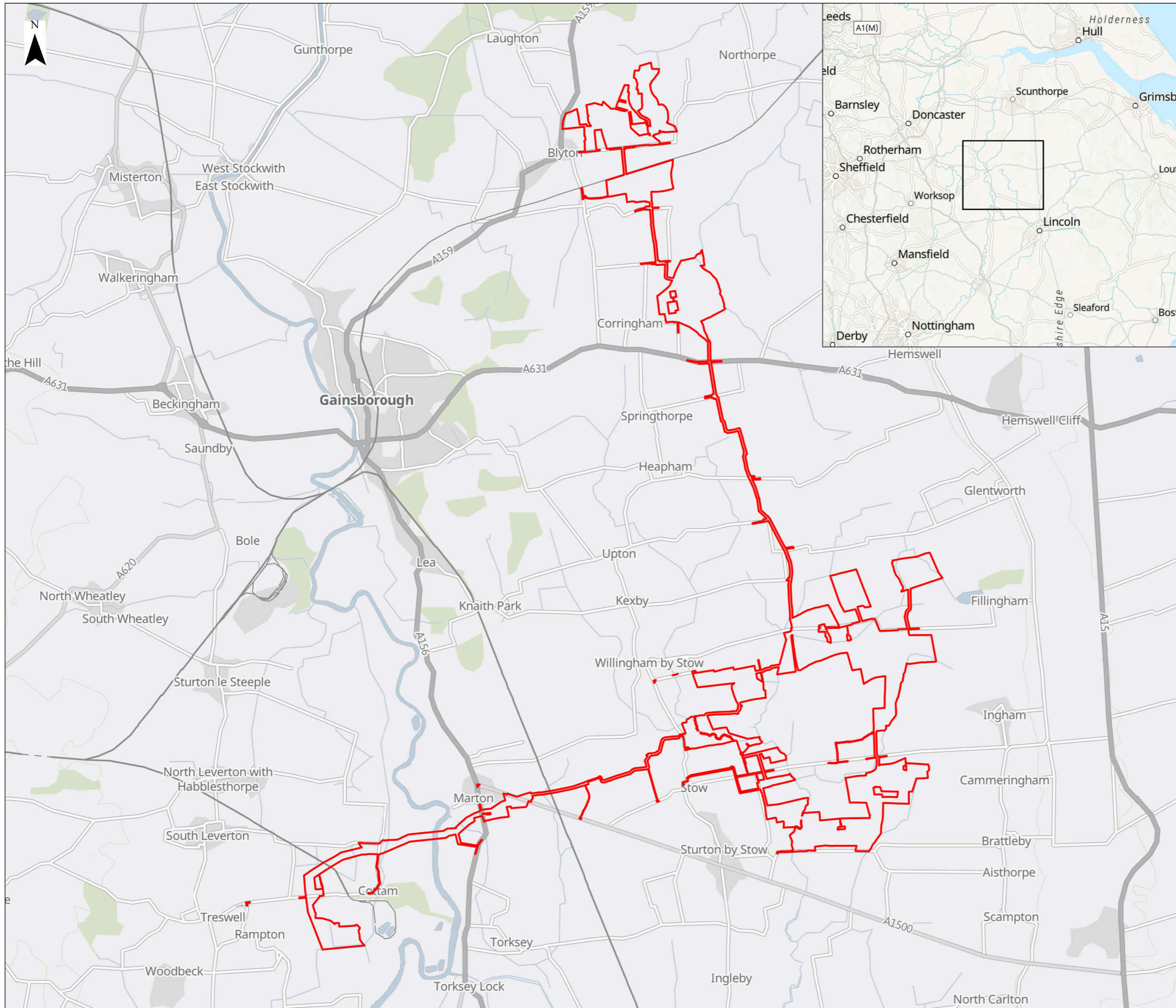
Figure 4.5 Illustrative Site Layout Plan (CO2)

Figure 4.6 Illustrative Site Layout Plan (CO3A)


Figure 4.7 Illustrative Site Layout Plan (CO3B)

Figure 4.8 Cottam Energy Storage, Illustrative Layout Plan

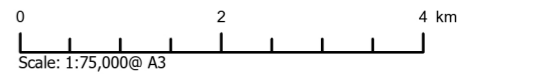
ES Appendix 4.1 Engineering Drawings and Sections



Key

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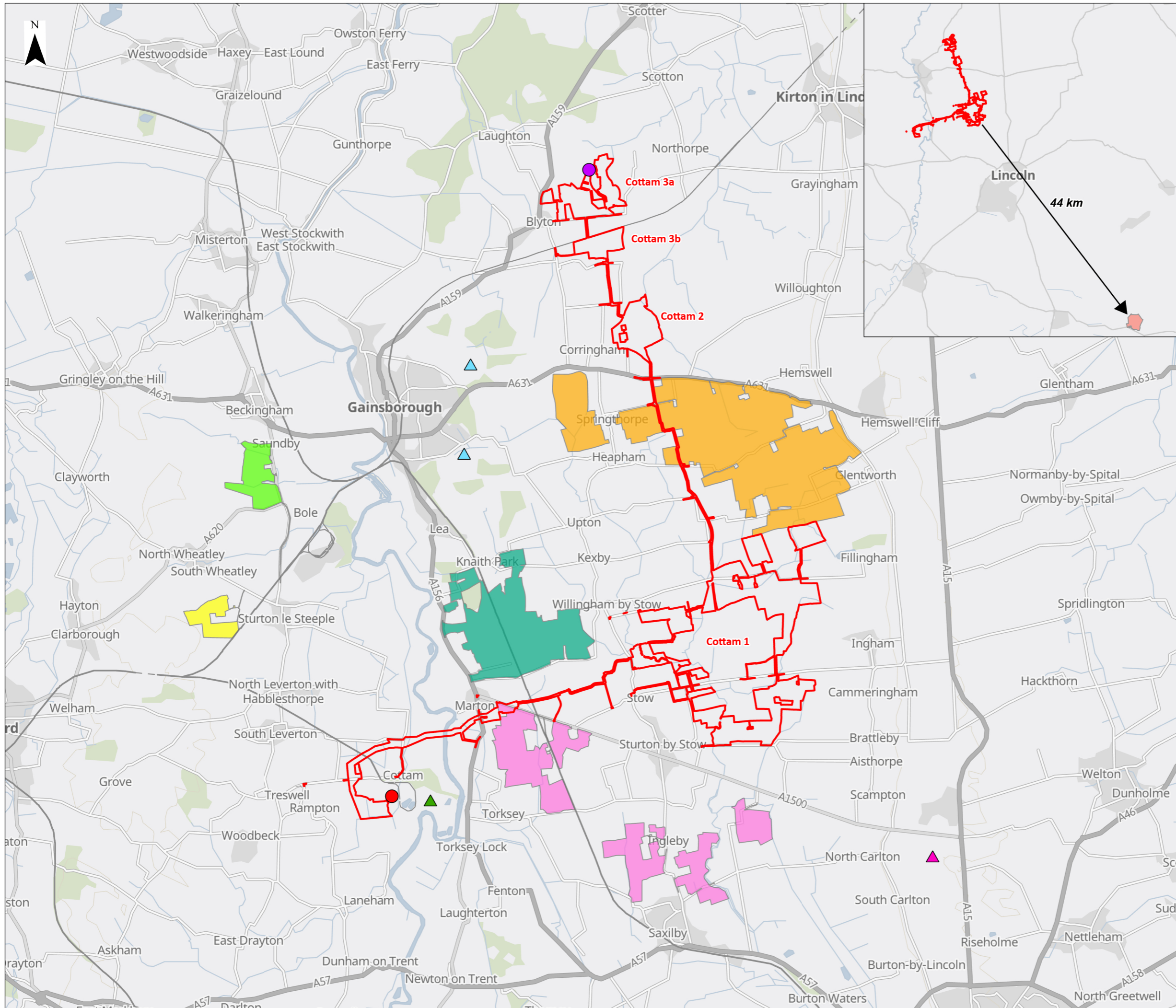
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APFP Regulation: 5(2)(a)	Application Doc No. C6.4.1.1
Ref: P2981_LPR_ZZ_ON_DR_Z_0158	Date: 03/12/2022
Drawn by: AZ	Checked by: ID

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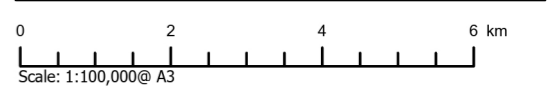
COTTAM SOLAR PROJECT
 Introduction
 Environmental Statement (ES)



Key

- Order Limits
- Current and Emerging Policy**
 - ▲ Emerging Policy ST6: Cottam Priority Regeneration Area
 - ▲ Policy 48 Gainsborough Northern Neighbourhood SUE Allocation
 - ▲ Policy LP8 Employment Site Land at Lincolnshire Showground
- Cumulative Developments**
 - Decommissioning of Cottam Power Station
 - Automotive Research and Development Centre
 - Bumble Bee Farm
 - Field Farm
 - Gate Burton Energy Park
 - Heckington Fen Solar
 - High Marnham Solar
 - Tillbridge Solar
 - West Burton Solar

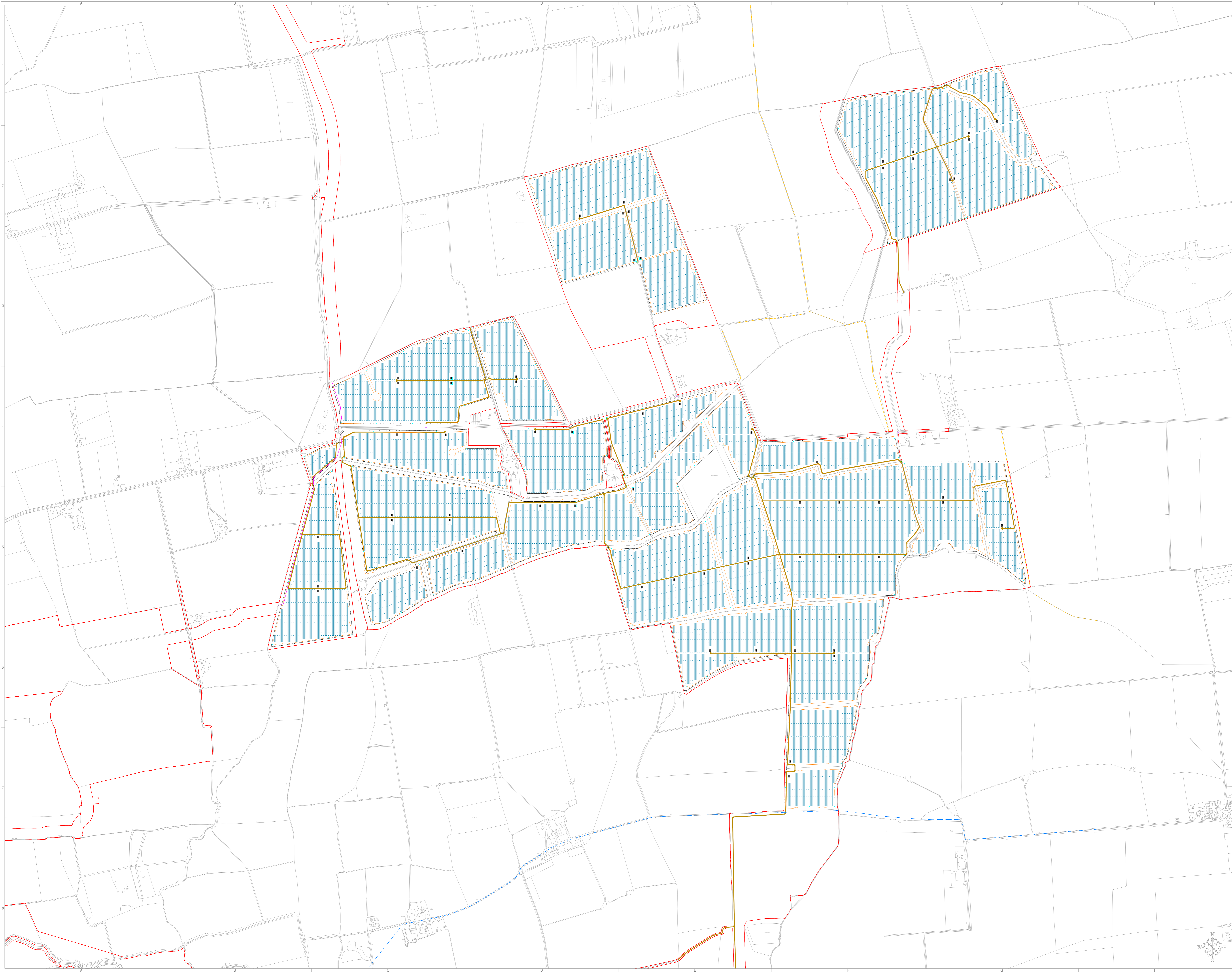
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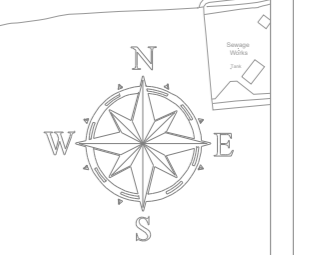
Figure 2.1
 Cottam
 Cumulative Developments

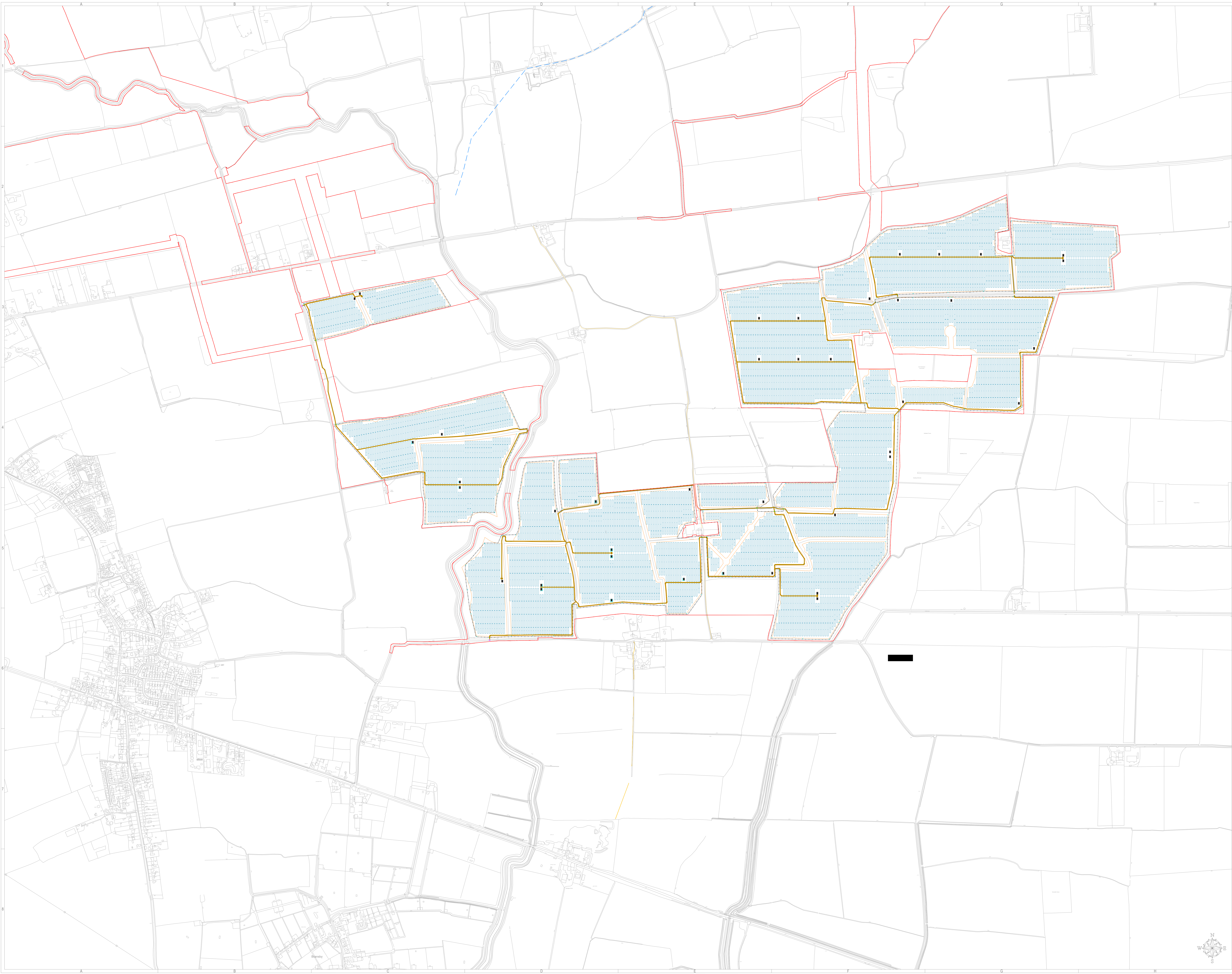
COTTAM SOLAR PROJECT
 EIA Process and Methodology
 Environmental Statement (ES)



General Legend:	
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	Potential Development Area
	High Voltage Electrical Cable
	Mounting Structures and Solar PV Modules
	Conversion Units
	Maintenance Tracks
	Site Access
	Gates
	Paved Footpath
	Paved Bridleway
	Acoustic Barrier
	CCTV

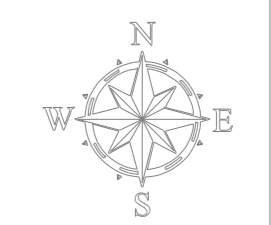
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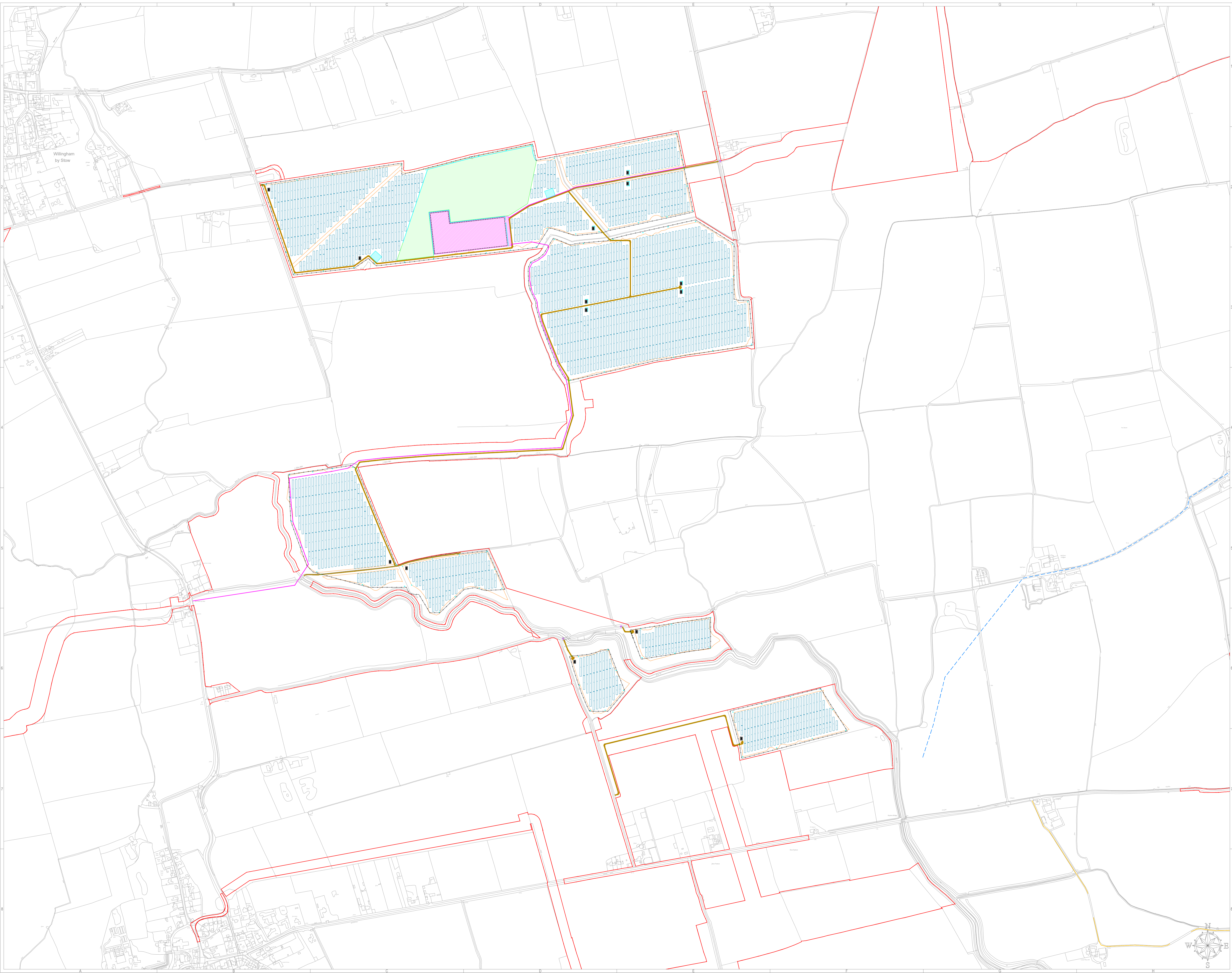




General Legend:	
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	Maintenance Tracks
	Gates
	Site Access
	PRoW Footpath
	PRoW Brideway
	Acoustic Barrier
	CCTV

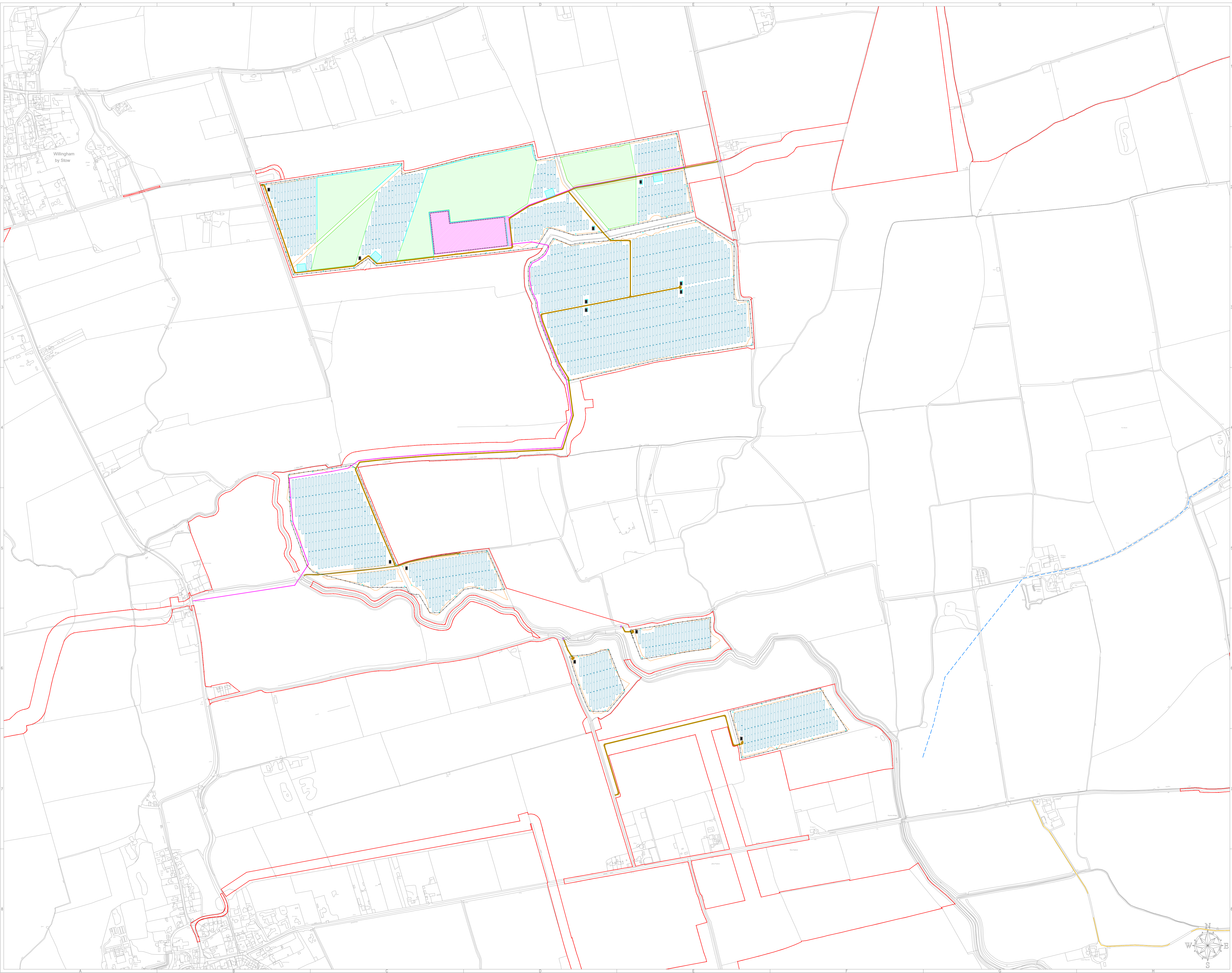
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	Electrical Substation
	High Voltage Electricity Cable
	Energy Storage Area
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	Gates
	Site Access
	PRoW Footpath
	PRoW Bridleway
	Acoustic Barrier
	CCTV
	Firefighting Water Supply

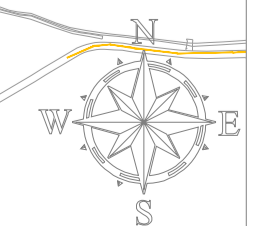
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Company:	Island Green Power UK Limited Unit 20.2, Coda Studios 189 Munster Road, London SW6 6AW																								

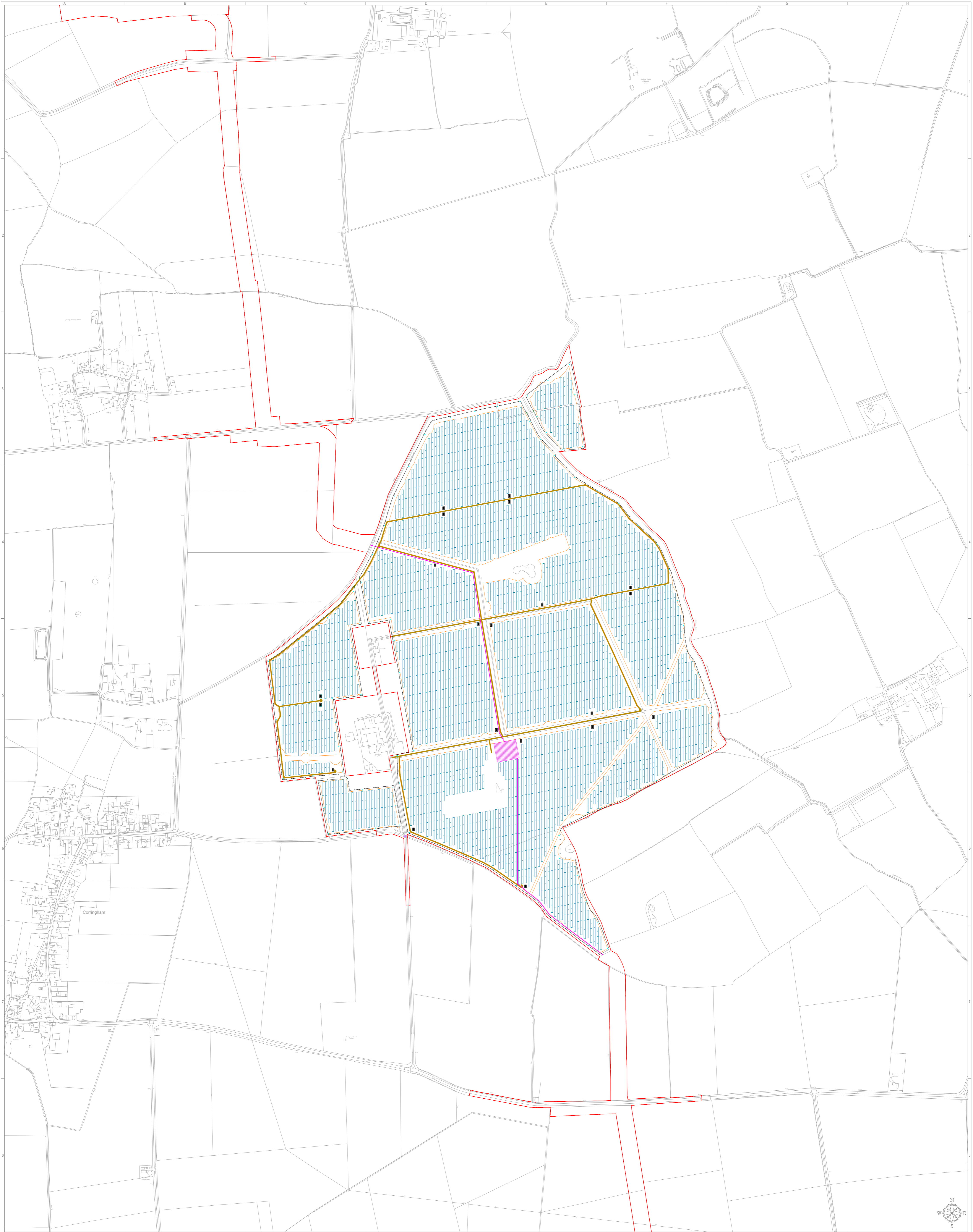


General Legend:	
	Order Limits
	Fence
	Potential Development Area
	Mounting Structures and Solar PV Modules
	Conversion Units
	Electrical Substation
	High Voltage Electricity Cable
	Energy Storage Area
	Maintenance Tracks
	Site Access
	Gates
	PRoW Footpath
	PRoW Bridleway
	Acoustic Barrier
	CCTV
	Firefighting Water Supply

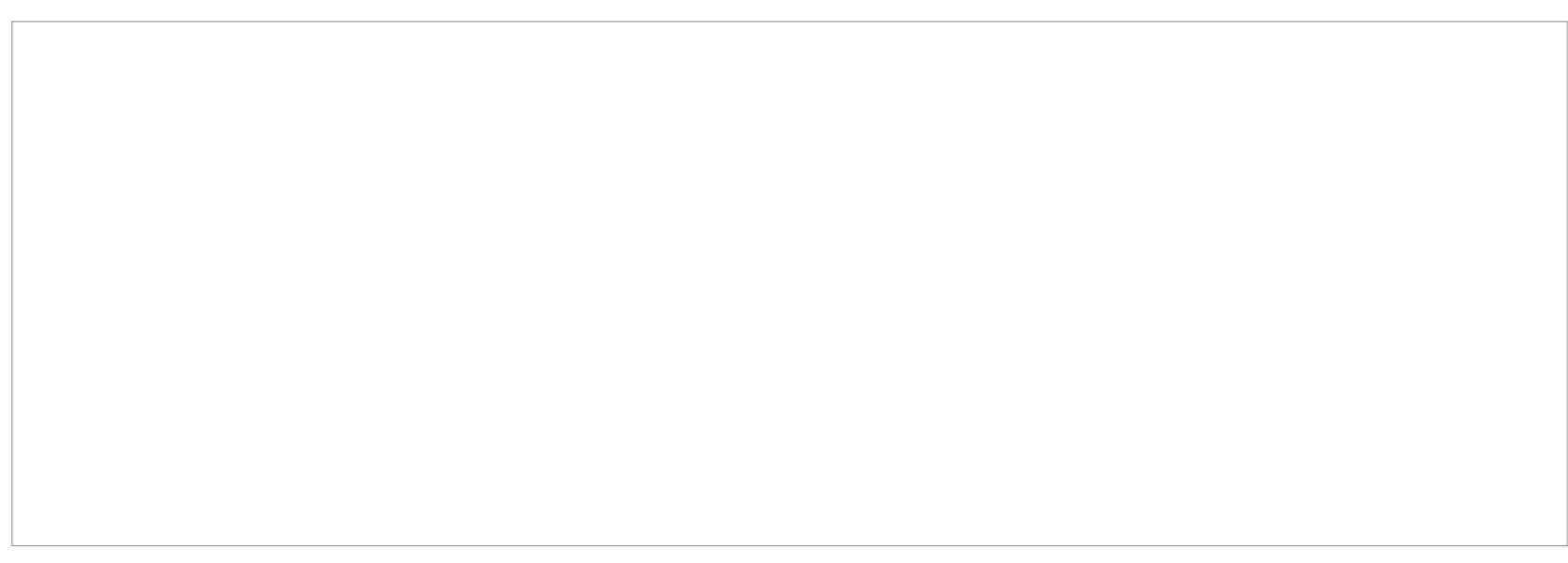
Project:	Cottam 1 West B Solar Project																								
Project Location:	Land near Coates, Lincoln Lincolnshire, LN1 2DW, England																								
Ownership:	Cottam Solar Project Limited																								
Document Title:	Figure 4.4 Illustrative Site Layout Plan Cottam 1 West B (APP/C6.4.4.4) (APPF Regulation 5(2)(a))																								
Sheet format:	A1 "841 x 594" Scale: 1:5000																								
Document amendments:	<table border="1"> <thead> <tr> <th>Version</th> <th>Date</th> <th>Author</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>v.4</td> <td>18/02/2022</td> <td>A.A.</td> <td>Final Layout</td> </tr> <tr> <td>v.5</td> <td>14/10/2022</td> <td>A.A.</td> <td>Updated Application Boundary</td> </tr> <tr> <td>v.6</td> <td>28/11/2022</td> <td>A.A.</td> <td>Updated Access</td> </tr> <tr> <td>v.7</td> <td>20/12/2022</td> <td>A.A.</td> <td>Layout for Submission</td> </tr> <tr> <td>v.8</td> <td>03/01/2023</td> <td>A.A.</td> <td>Layout for Submission</td> </tr> </tbody> </table>	Version	Date	Author	Comments	v.4	18/02/2022	A.A.	Final Layout	v.5	14/10/2022	A.A.	Updated Application Boundary	v.6	28/11/2022	A.A.	Updated Access	v.7	20/12/2022	A.A.	Layout for Submission	v.8	03/01/2023	A.A.	Layout for Submission
Version	Date	Author	Comments																						
v.4	18/02/2022	A.A.	Final Layout																						
v.5	14/10/2022	A.A.	Updated Application Boundary																						
v.6	28/11/2022	A.A.	Updated Access																						
v.7	20/12/2022	A.A.	Layout for Submission																						
v.8	03/01/2023	A.A.	Layout for Submission																						

Company: Island Green Power UK Limited
 Unit 20.2, Coda Studios
 189 Munster Road, London SW6 6AW





General Legend	
	Order Limits
	Fence
	Potential Development Area
	Mounting Structures and Solar PV Modules
	Conversion Units
	Electrical Substation
	High Voltage Electricity Cable
	Maintenance Tracks
	Gates
	Site Access
	Acoustic Barrier
	CCTV



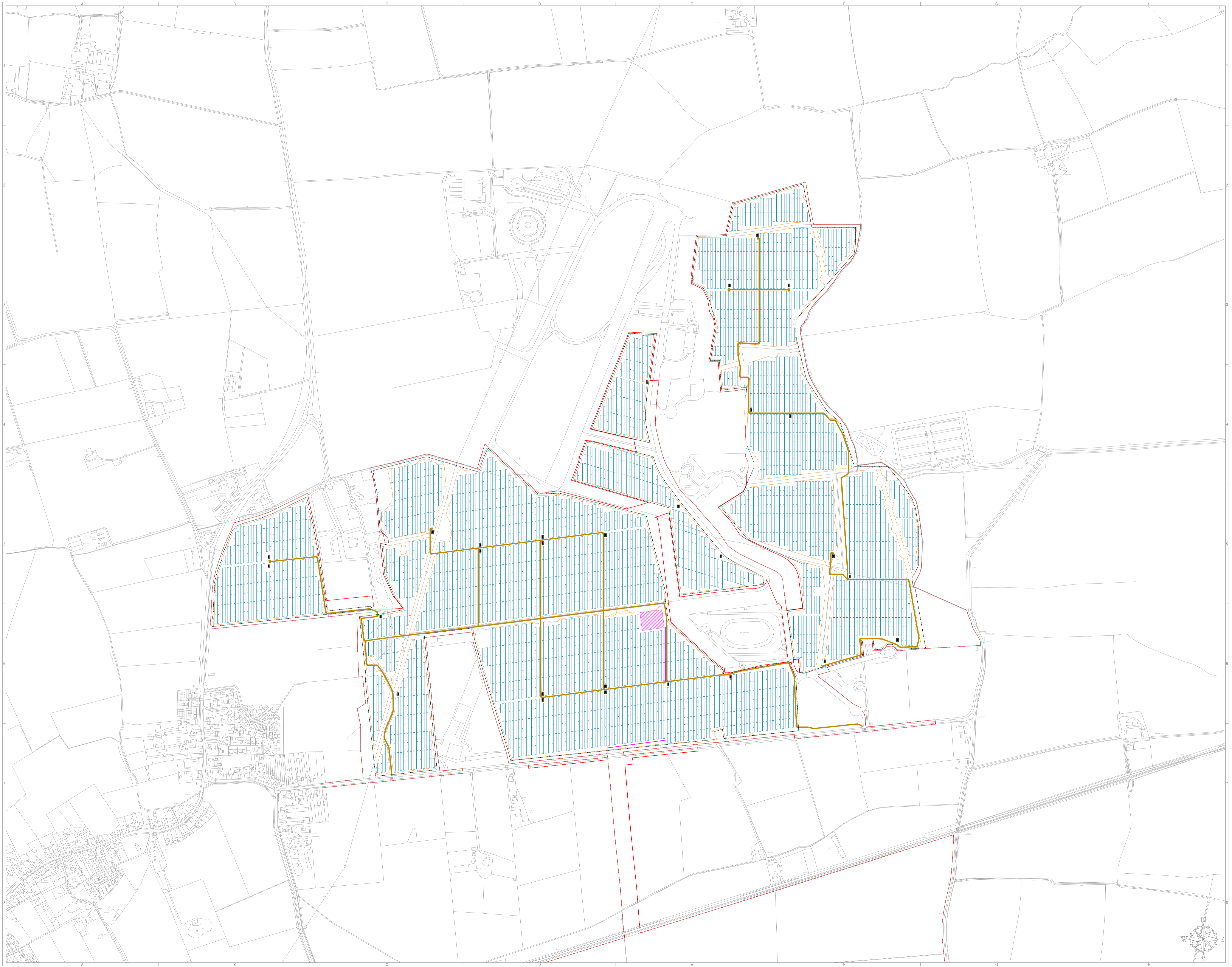
Project:	Cottam 2 Solar Project
Project Location:	Land at Corringham, Gainsborough, by Lincolnshire DN21 5RG
Project Ownership:	Cottam Solar Project Ltd
Document Title:	Figure 4.5 Illustrative Site Layout Plan Cottam 2 (APP/C6.4.4.5) (APPF Regulation 5(2)(a))

0 50 100 200 500

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Sheet Contact:	A1 "841 x 894"	Scale:	1:5000
Document Version:	v.3 08/08/2022 A.A.	Comments:	Final Layout
	v.4 01/09/2022 A.A.		Updated Red Line
	v.5 27/09/2022 A.A.		Revised Layout - Details
	v.6 20/12/2022 A.A.		Layout for Submission
	v.7 03/01/2023 A.A.		Layout for Submission

Company: Island GREEN Power
Island Green Power UK Limited
Unit 20.2, Coda Studios
189 Munster Road, London SW6 6AW

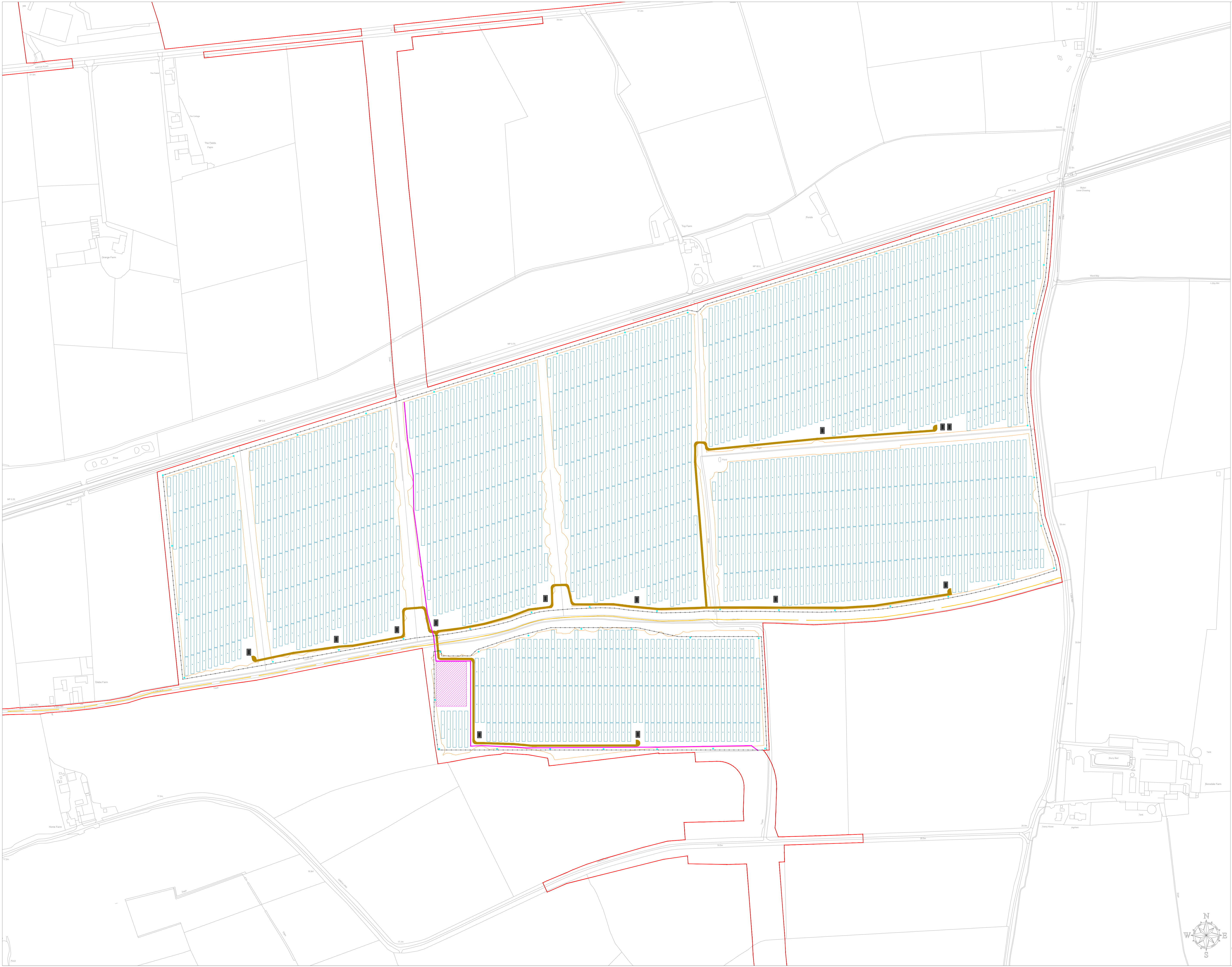


General Legend:	
	Order Limits
	Fence
	Potential Development Area
	Mounting Structures and Solar PV Modules
	Conversion Units
	Electrical Substation
	High Voltage Electricity Cable
	Maintenance Tracks
	Gates
	Site Access
	CCTV

Project:	Cottam 3A Solar Project																								
Project Location:	Land at Kirton Road, Blyton, Gainsborough Lincolnshire, DN21 3QA, England																								
Ownership:	Cottam Solar Project Ltd																								
Document Title:	Figure 4.6 Illustrative Site Layout Plan Cottam 3a (APP/IC6.4.4.6) (AFPP Regulation 5(2)(a))																								
Sheet format:	A1 "841 x 594"																								
Scale:	1:5000																								
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Version	Date	Author	Comments																						
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v.3	04/05/2022	A.A.	Final Layout																						
v.4	14/10/2022	A.A.	Updated Application Boundary																						
v.5	20/12/2022	A.A.	Layout for Submission																						
v.6	03/01/2023	A.A.	Layout for Submission																						

Company: Island GREEN POWER
 Island Green Power UK Limited
 Unit 20.2, Coda Studios
 189 Munster Road, London SW6 6AW

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General Legend:

	Order Limits
	Fence
	Potential Development Area
	Mounting Structures and Solar PV Modules
	Conversion Units
	Electrical Substation
	High Voltage Electricity Cable
	Maintenance Tracks
	Gates
	Site Access
	PRoW
	CCTV

Project: Cottam 3B PV Solar Farm

Project Location: Land by Station Rd, Blyton, Gainsborough, Lincolnshire, DN21 3LE, England

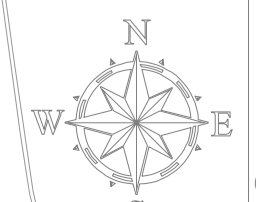
Ownership: Cottam Solar Project

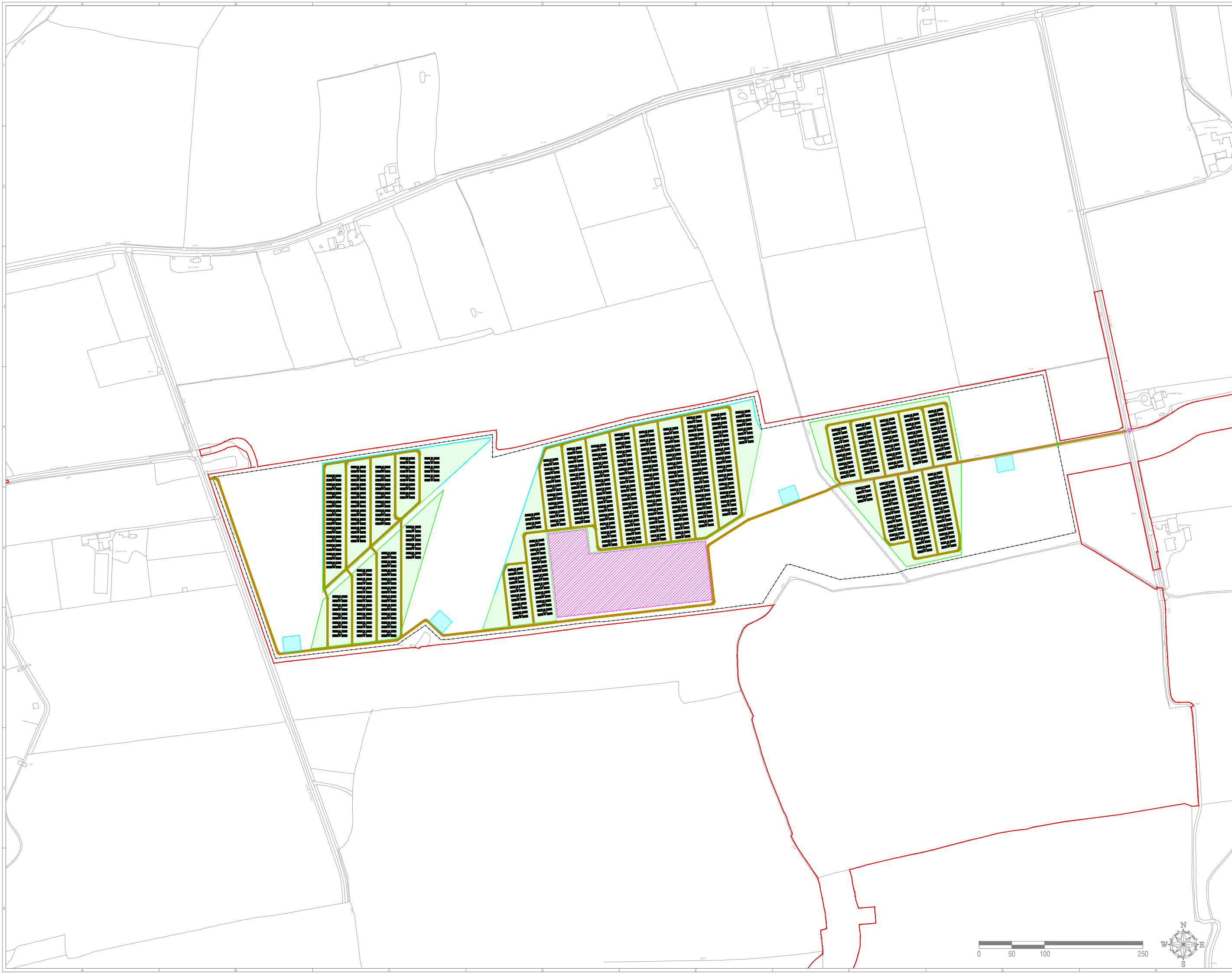
Document Title: Figure 4.7 Illustrative Site Layout Plan Cottam 3b (APP/IC6.4.4.7) (APPP Regulation 5(2)(a))

Sheet Format: A1 "841 x 594" **Scale:** 1:2500

Document Amendments	Comments
v.2 12/05/2022 A.A.	Updated layout
v.3 05/08/2022 A.A.	Final layout
v.4 31/08/2022 A.A.	Updated Red Line
v.5 20/12/2022 A.A.	Layout for Submission
v.6 03/01/2023 A.A.	Layout for Submission

Company: Island Green Power UK Limited
 Unit 20.2, Coda Studios
 189 Munster Road, London SW6 6AW





General Legend:

	Order Limits
	Fence
	Battery Energy Storage Area
	Battery Energy Storage Unit
	Conversion Unit
	Electrical Substation
	Maintenance Track
	Gates
	Site Access
	Acoustic Barrier
	Firefighting Water Supply

Project: Cottam Battery Energy Storage Project

Project Location: Land near Coates, Lincoln, Lincolnshire, LN1 2DW, England

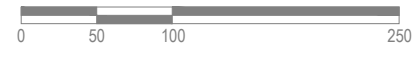
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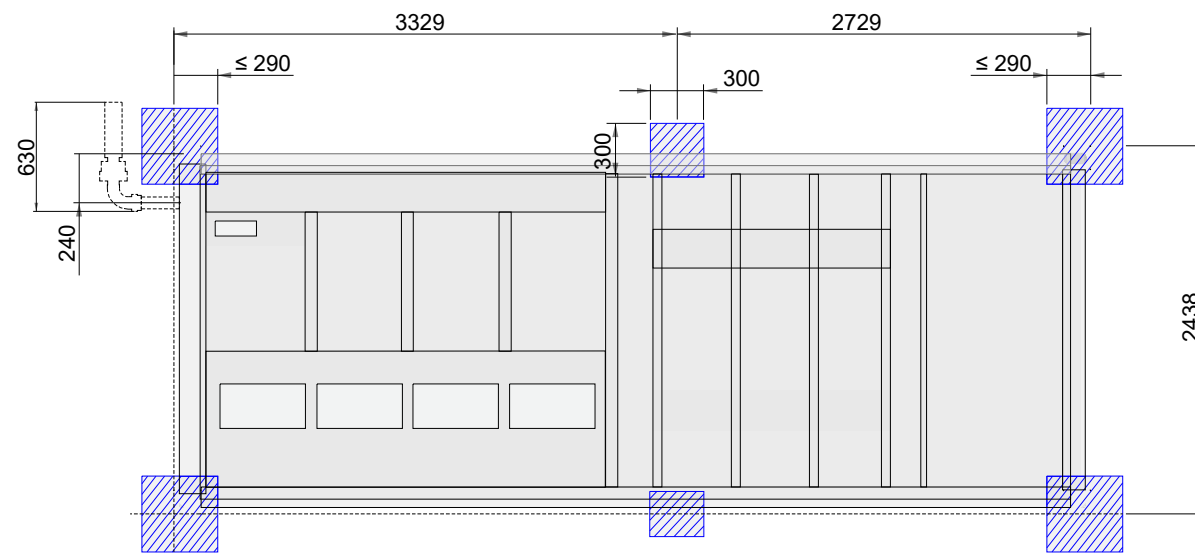
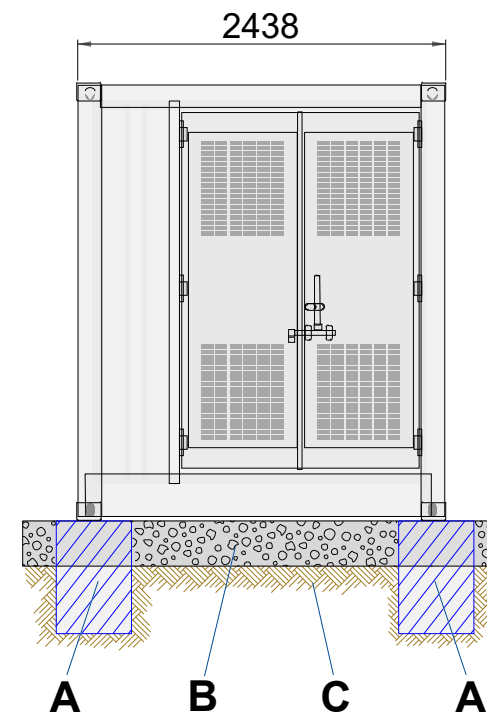
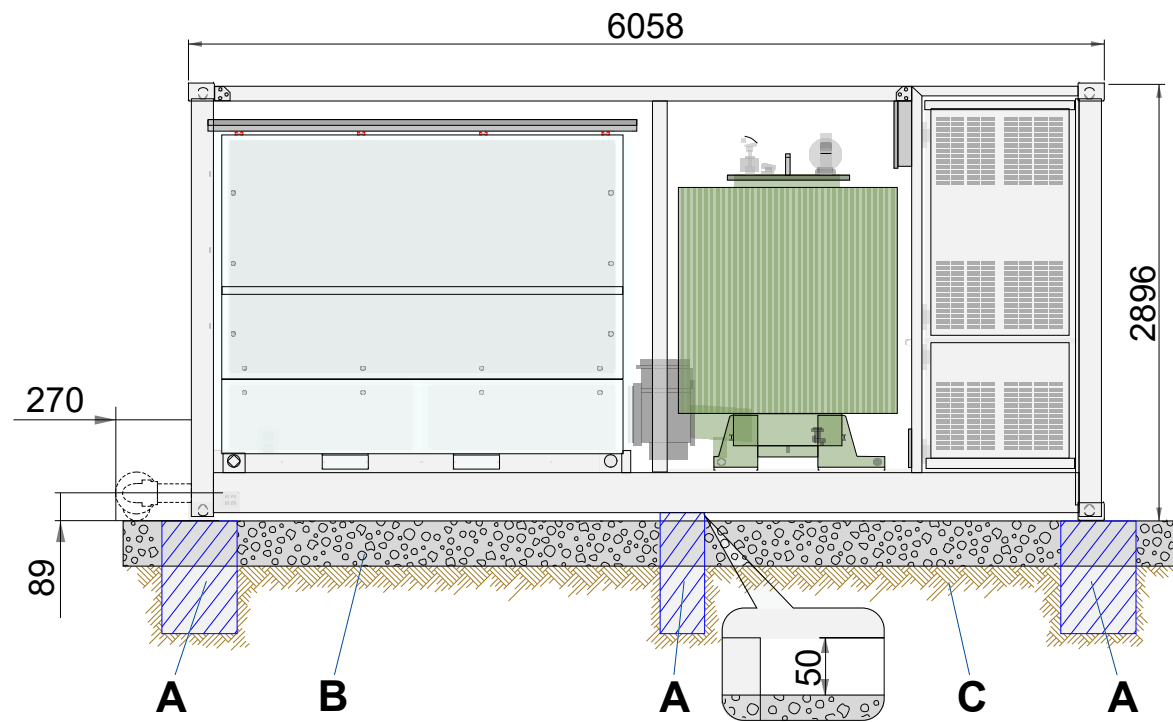
Document Title: Figure 4.8 Cottam Energy Storage, Illustrative Layout Plan (APP/C6.4.4.8) (APPF Regulation 5(2)(a))

Sheet Format: A3 420 x 297" Scale: 1:5000

Document Revisions	Comments

Company: Island GREEN
 Island Green Power UK Limited
 Unit 20.2, Coda Studios
 189 Munster Road, London SW6 6AW





General Legend:

A	Support Point Foundation
B	Pea Gravel Ground
C	Solid Ground, e.g. Gravel



Project: Cottam Solar Project

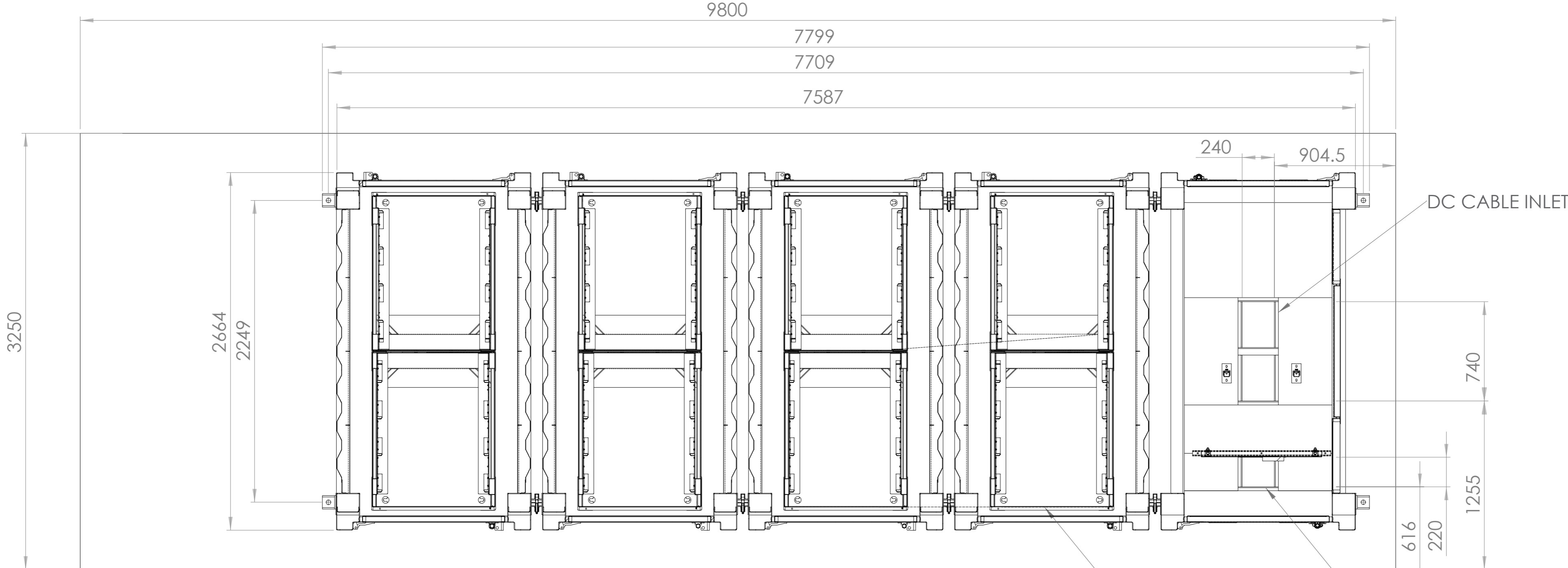
Project Location: Land near Gainsborough, Lincolnshire, United Kingdom

Ownership: Cottam Solar Project Limited

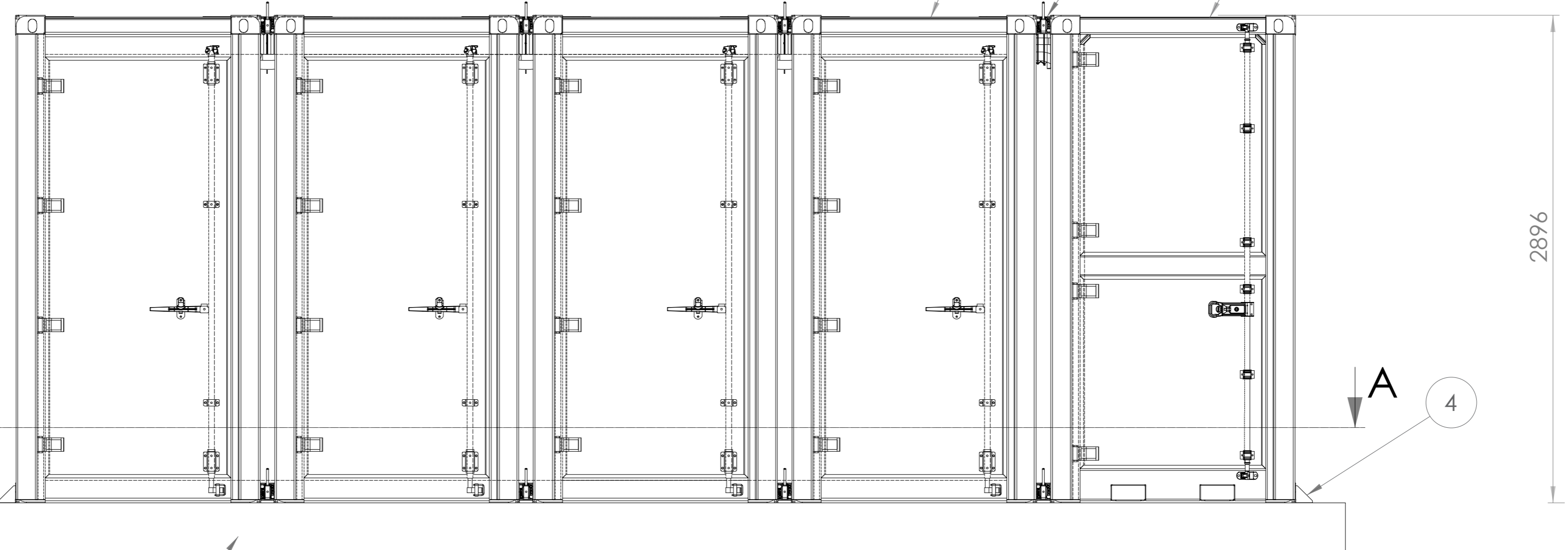
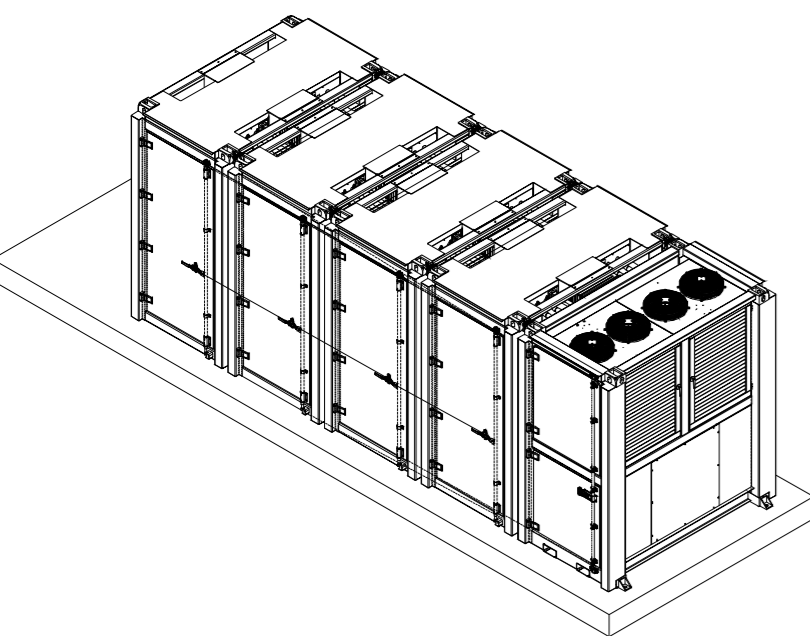
Document Title: Solar Inverter

Sheet format: A3 420 x 297" Scale: 1:50

Document amendments: v.1 12/10/2022 M.N. Comments:



SECTION A-A



FOUNDATION THICKNESS TO BE DETERMINED FROM GROUND STUDY AT THE SITE.

General Legend:

Pos.	Description	Qty
1	COMBI BLOCK	1
2	BATTERY BLOCK	4
3	INTERCONNECT HOSE - COMBI TO BATT	4
4	INTERCONNECT HOSE - BATT TO BATT	12
16	INTERCONNECT HARNESS - TERMINATING	1
20	FOUNDATION	1



Project:	Cottam Solar Project								
Project Location:	Land near Gainsborough, Lincolnshire, United Kingdom								
Ownership:	Cottam Solar Project Limited								
Document Title:	Battery Side View and A-A Section								
Sheet format:	A2 "594 x 420"								
Scale:	1:30								
Document amendments:	<table border="1"> <thead> <tr> <th>v.</th> <th>date</th> <th>M.A.</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>v.1</td> <td>11/10/2022</td> <td>M.A.</td> <td></td> </tr> </tbody> </table>	v.	date	M.A.	Comments	v.1	11/10/2022	M.A.	
v.	date	M.A.	Comments						
v.1	11/10/2022	M.A.							
Company:	<table border="0"> <tr> <td>Island GREEN POWER</td> <td>Island Green Power UK Limited Unit 20.2, Coda Studios 189 Munster Road, London SW6 6AW</td> </tr> </table>	Island GREEN POWER	Island Green Power UK Limited Unit 20.2, Coda Studios 189 Munster Road, London SW6 6AW						
Island GREEN POWER	Island Green Power UK Limited Unit 20.2, Coda Studios 189 Munster Road, London SW6 6AW								

400kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	3.6
PHASE TO EARTH CLEARANCE	2.8
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D ₉₀	5.5
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{90H}	4.6
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	3.1
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{90V}	7.5
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{90H}	6.6

132kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	1.4
PHASE TO EARTH CLEARANCE	1.1
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D ₉₀	3.8
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{90H}	2.9
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	1.4
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{90V}	5.8
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{90H}	4.9

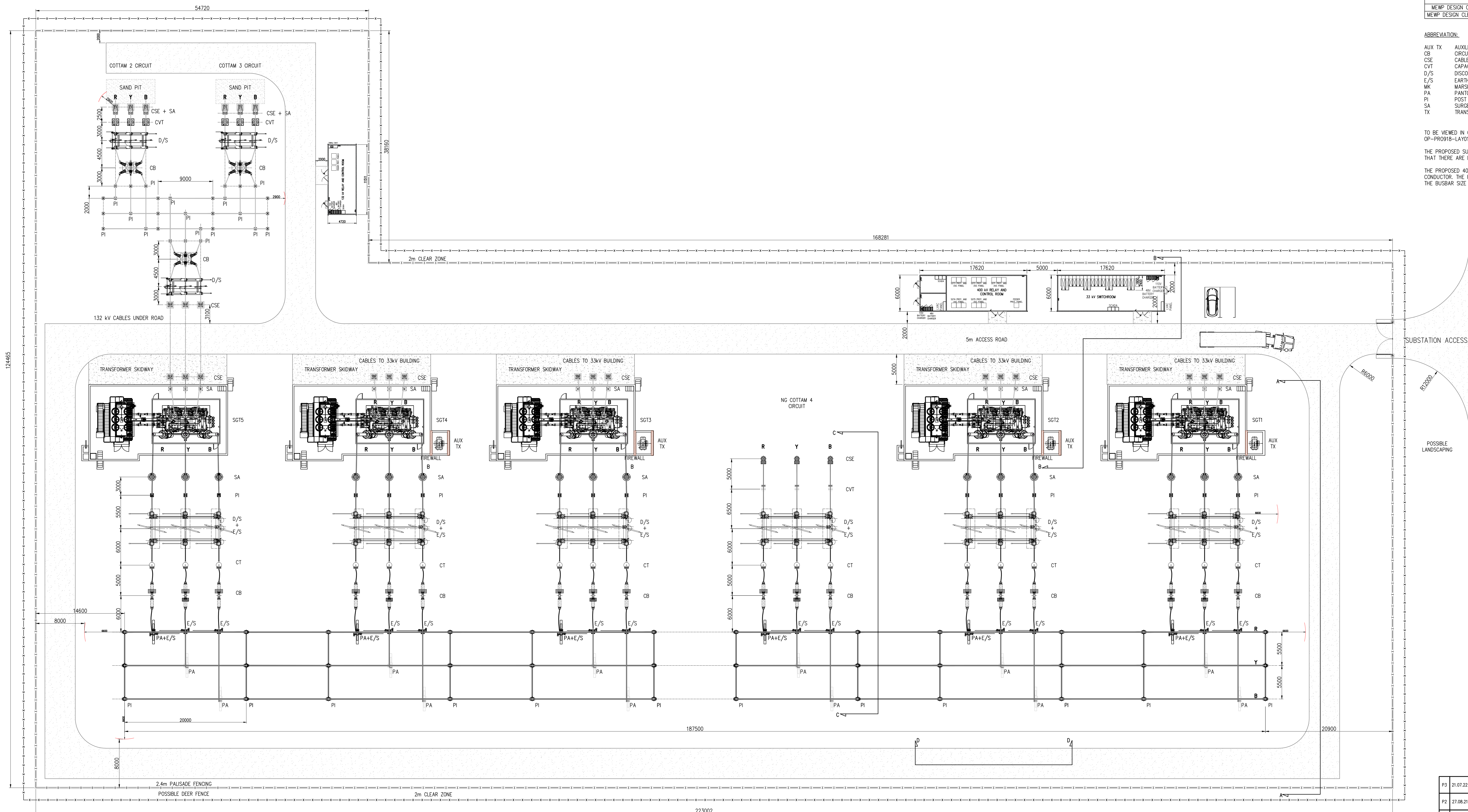
ABBREVIATION:

AUX TX	AUXILIARY TRANSFORMER
CB	CIRCUIT BREAKER
CSE	CABLE SEALING END
CVT	CAPACITIVE VOLTAGE TRANSFORMER
D/S	DISCONNECTOR
E/S	EARTH SWITCH
MC	MARSHALLING KIOSK
PA	PANTOGRAPH
PI	POST INSULATOR
SA	SURGE ARRESTER
TX	TRANSFORMER

TO BE VIEWED IN CONJUNCTION WITH ELEVATIONS DRAWING OP-PRO918-LAY10.

THE PROPOSED SUBSTATION LAYOUT IS BASED ON ASSUMPTION THAT THERE ARE NO SITE RESTRICTIONS.

THE PROPOSED 400kV MAIN BUSBAR SIZE IS 300mm x 8mm AL CONDUCTOR. THE PROPOSED 132kV MAIN BUSBAR SIZE IS 160mm x 7mm. THE BUSBAR SIZE SHALL BE CONFIRMED DURING DETAILED DESIGN.

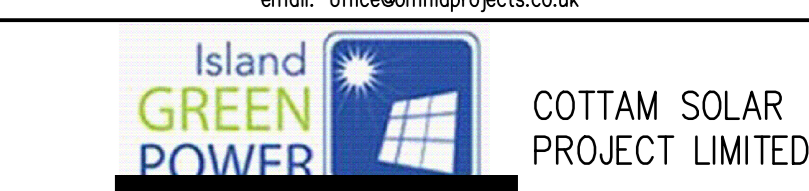


SUBSTATION ACCESS

POSSIBLE LANDSCAPING

P3	21.07.22	AMENDED TO INCLUDE 132kV CIRCUITS	EC	EC	MG
P2	27.08.21	SITE NAME CHANGED	DOP	EC	PD
P1	13.08.21	PRELIMINARY	DOP	EC	PD
REV	DATE	DESCRIPTION	DRN	DES	REV'S APP

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COTTAM SOLAR PROJECT LIMITED
COTTAM 1 SOLAR AND BATTERY STORAGE PARK
400/33kV SUBSTATION COMPOUND
(AIS OPTION)

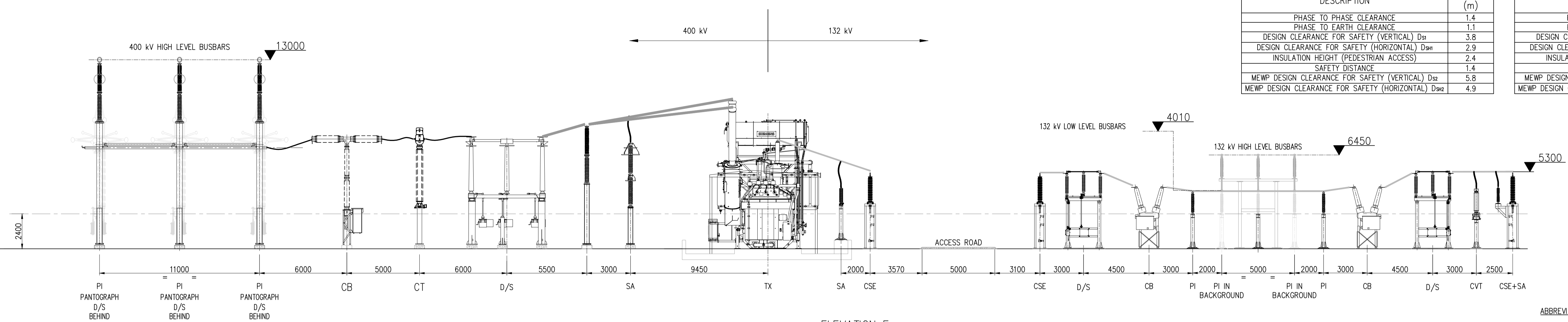
PROJECT NAME
NATIONAL GRID COTTAM CONNECTION
CUSTOMER
ISLAND GREEN POWER

CUSTOMER DRAWING NUMBER	STATUS		
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DRAWING NUMBER	SCALE	SIZE	REVISION
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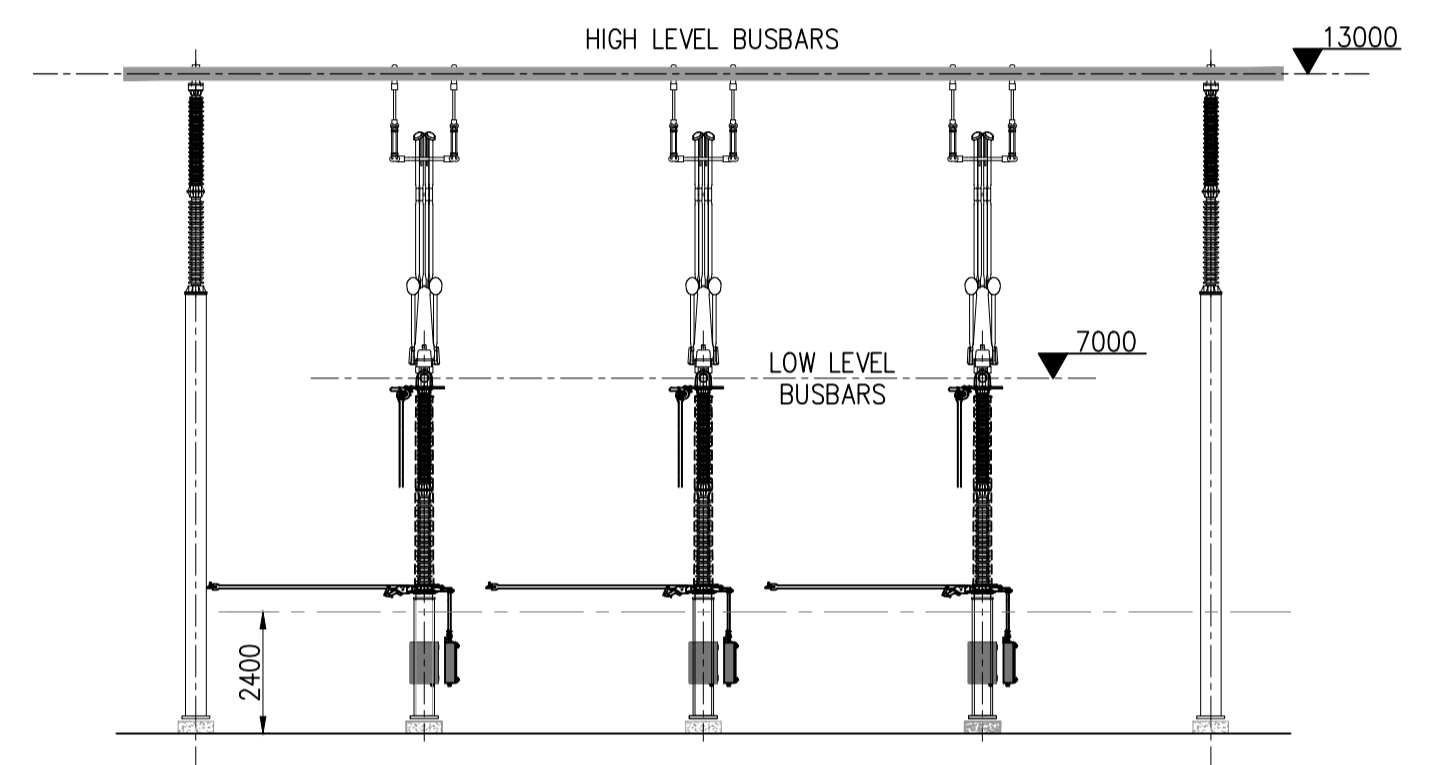
PRELIMINARY
NOT FOR SITE USE

132kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	1.4
PHASE TO EARTH CLEARANCE	1.1
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{st}	3.8
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh}	2.9
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	1.4
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{sz}	5.8
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sz2}	4.9

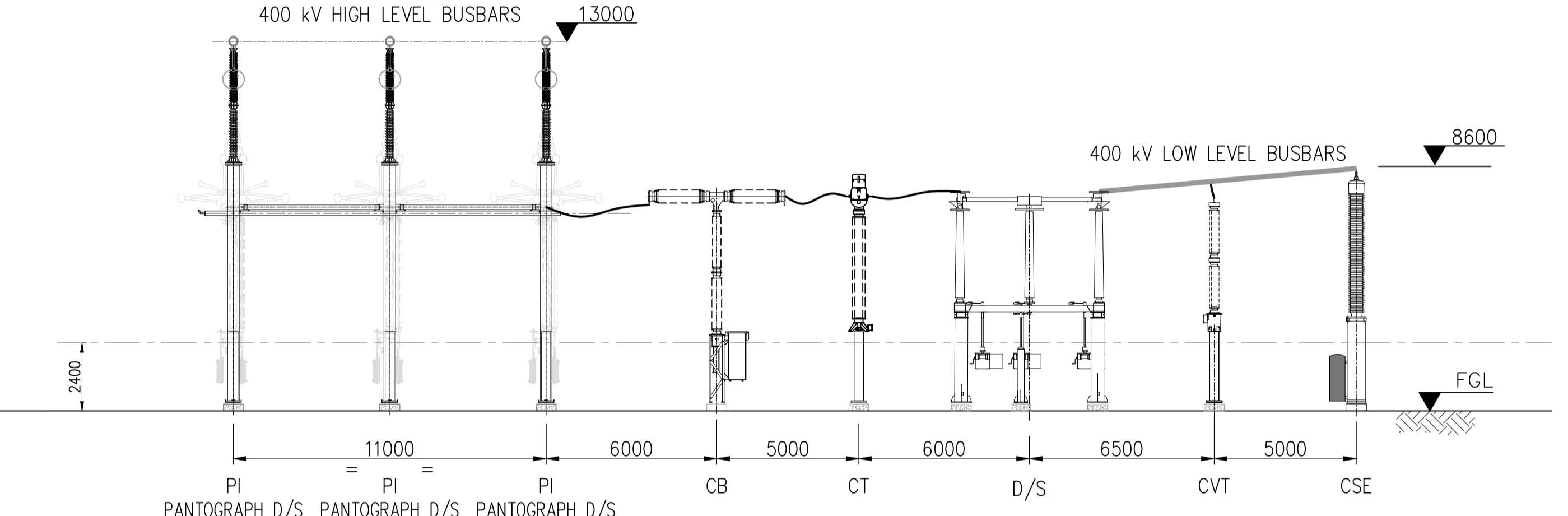
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DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	3.6
PHASE TO EARTH CLEARANCE	2.8
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{st}	5.5
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh}	4.6
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	3.1
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{sz}	7.5
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sz2}	6.6



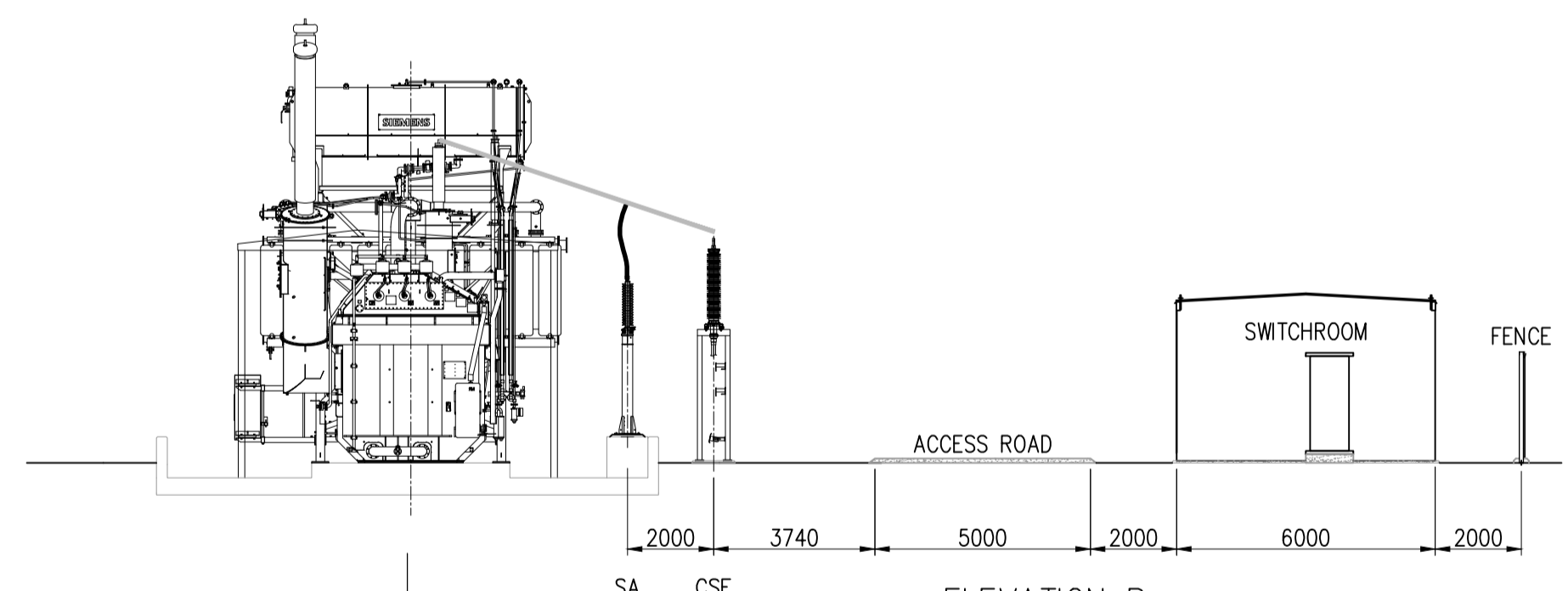
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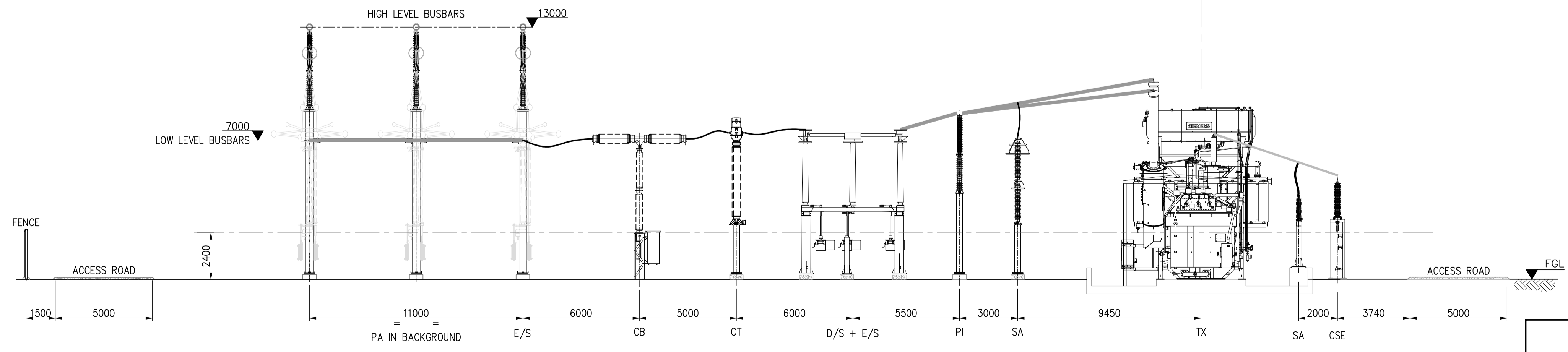
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SCALE 1:150



ELEVATION C
SCALE 1:150



ELEVATION B
SCALE 1:150



ELEVATION A
SCALE 1:150

- ABBREVIATION:
- AUX TX AUXILIARY TRANSFORMER
 - CB CIRCUIT BREAKER
 - CSE CABLE SEALING END
 - CVT CAPACITIVE VOLTAGE TRANSFORMER
 - D/S DISCONNECTOR
 - E/S EARTH SWITCH
 - MK MARSHALLING KIOSK
 - PA PANTOGRAPH
 - PI POST INSULATOR
 - SA SURGE ARRESTER
 - TX TRANSFORMER

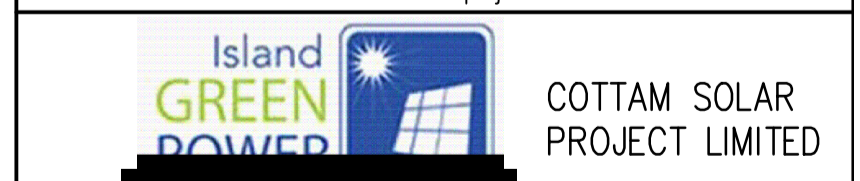
TO BE VIEWED IN CONJUNCTION WITH SUBSTATION LAYOUT DRAWING OP-PRO918-LAY009.

THE PROPOSED SUBSTATION LAYOUT IS BASED ON ASSUMPTION THAT THERE ARE NO SITE RESTRICTIONS.

THE PROPOSED 400kV MAIN BUSBAR SIZE IS 300mm x 8mm AL CONDUCTOR. THE PROPOSED BAY BUSBAR SIZE IS 160mm x 7mm. THE BUSBAR SIZE SHALL BE CONFIRMED DURING DETAILED DESIGN.

REV	DATE	DESCRIPTION	DRN	DES	REV & APP
P3	21.07.22	AMENDED TO INCLUDE 132kV CIRCUITS	EC	EC	MG
P2	27.08.21	SITE NAME CHANGED	DCP	EC	PD
P1	13.08.21	PRELIMINARY	DCP	EC	PD

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COTTAM 1 SOLAR AND BATTERY STORAGE PARK
400/33kV SUBSTATION COMPOUND
(AIS OPTION)

PROJECT NAME
NATIONAL GRID COTTAM CONNECTION
CUSTOMER
ISLAND GREEN POWER

CUSTOMER DRAWING NUMBER	STATUS		
****	PRELIMINARY		
DRAWING NUMBER	SCALE	SIZE	REVISION
OP-PRO918-LAY010	1:150	A1	P3

PRELIMINARY
NOT FOR SITE USE

132kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	1.4
PHASE TO EARTH CLEARANCE	1.1
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{st}	3.8
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh}	2.9
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	1.4
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{s2}	5.8
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh2}	4.9

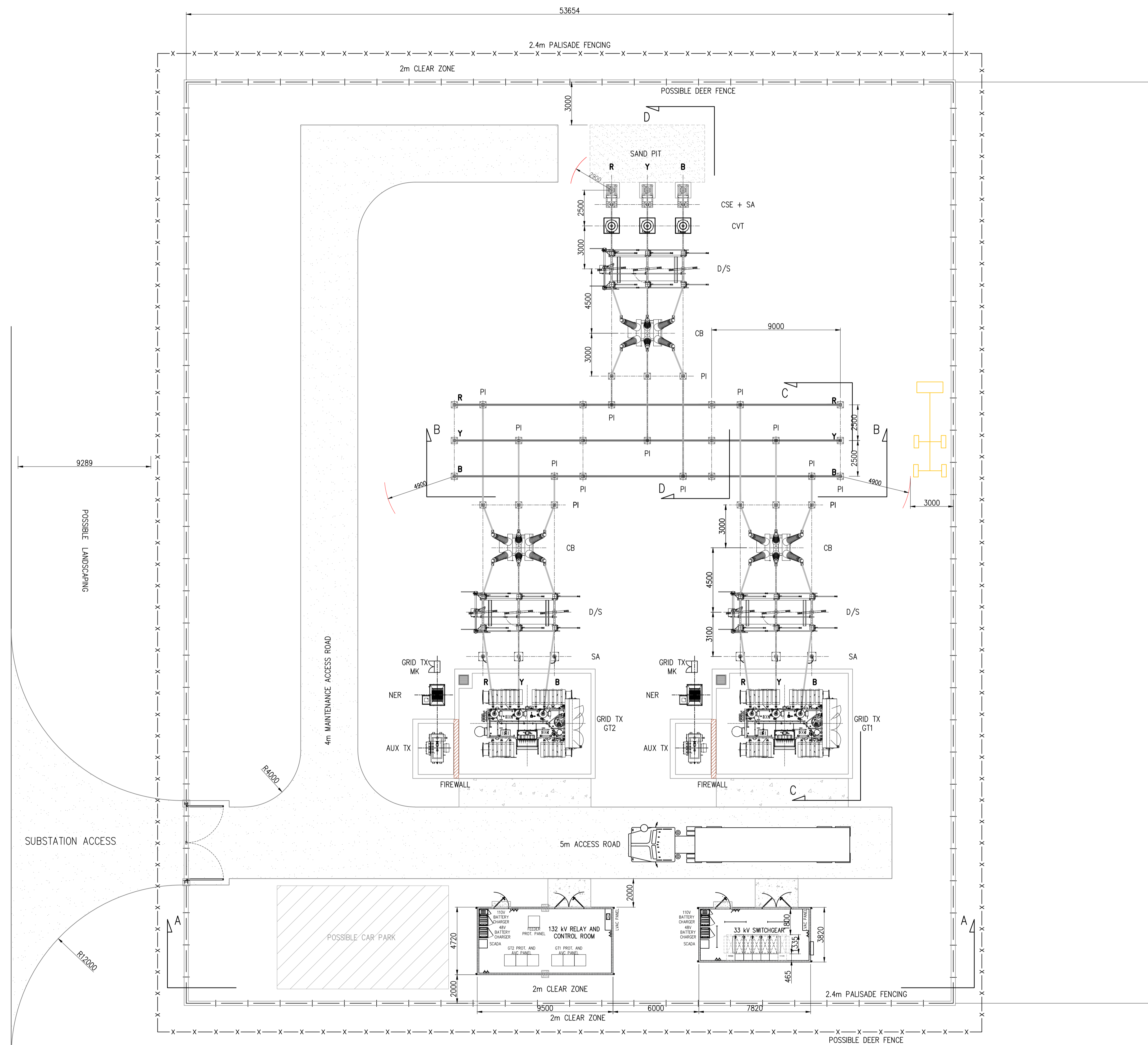
ABBREVIATION:

AUX TX	AUXILIARY TRANSFORMER
CB	CIRCUIT BREAKER
CSE	CABLE SEALING END
CVT	CAPACITIVE VOLTAGE TRANSFORMER
D/S	DISCONNECTOR
MK	MARSHALLING KIOSK
NER	NEUTRAL EARTHING RESISTOR
PI	POST INSULATOR
SA	SURGE ARRESTER
TX	TRANSFORMER

TO BE VIEWED IN CONJUNCTION WITH ELEVATIONS DRAWING OP-PRO918-LAY018.

THE PROPOSED SUBSTATION LAYOUT IS BASED ON ASSUMPTION THAT THERE IS NO SITE RESTRICTIONS.

THE PROPOSED BUSBAR SIZE IS 90mm x 6mm Al CONDUCTOR (2000A RATING). THE BUSBAR SIZED SHALL BE CONFIRMED DURING DETAILED DESIGN.



P1	11.07.22	PRELIMINARY	EC	EC	MG
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REV	DATE	DESCRIPTION	DRN	DES	REV & APP
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OMNIAProjects
 The Catalyst, York Science Park, Baird Lane, Heslington, York YO10 5GA
 email: office@omniaprojects.co.uk

Island GREEN POWER COTTAM SOLAR PROJECT LIMITED

COTTAM 2 132/33kV SUBSTATION FOR SOLAR PARK
 SUBSTATION COMPOUND

PROJECT NAME
 NATIONAL GRID COTTAM CONNECTION
 CUSTOMER
 ISLAND GREEN POWER

CUSTOMER DRAWING NUMBER	STATUS
****	PRELIMINARY
DRAWING NUMBER	SCALE
OP-PRO918-LAY017	1:150
SIZE	REVISION
A1	P1

PRELIMINARY
 NOT FOR SITE USE

132kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	1.4
PHASE TO EARTH CLEARANCE	1.1
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{st}	3.8
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh}	2.9
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	1.4
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{s2}	5.8
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh2}	4.9

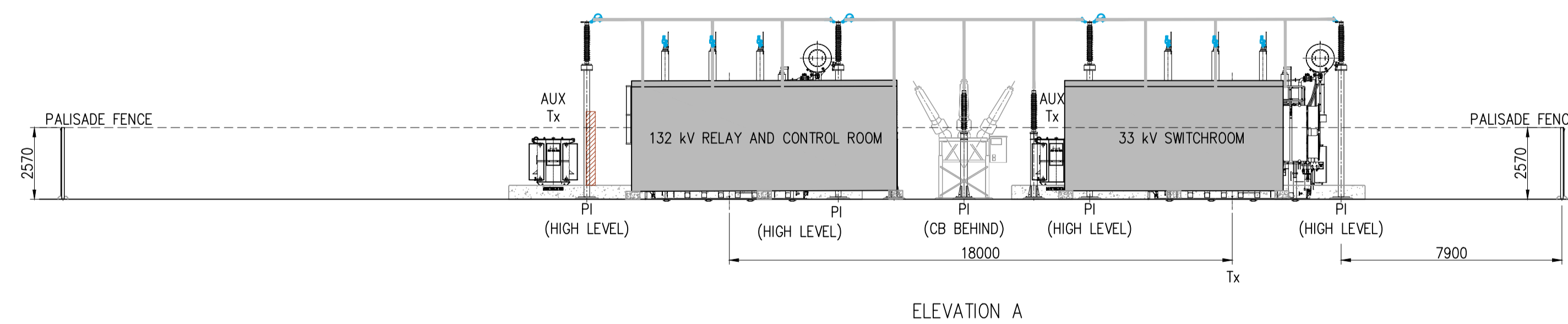
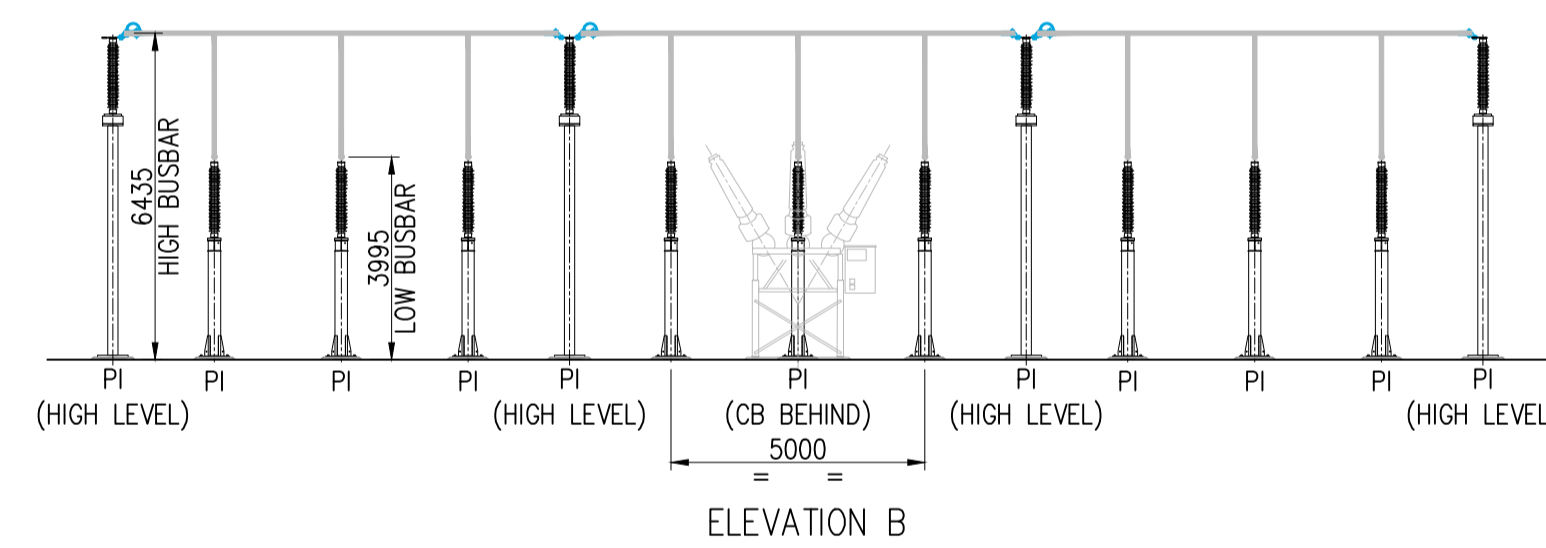
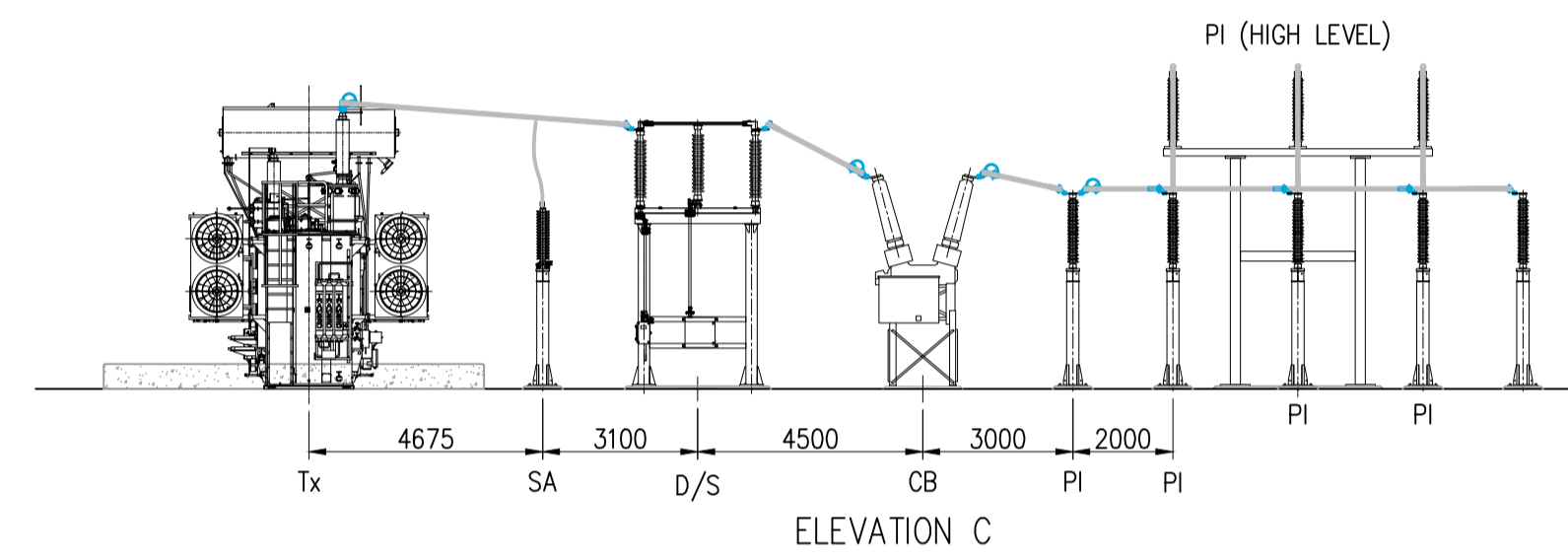
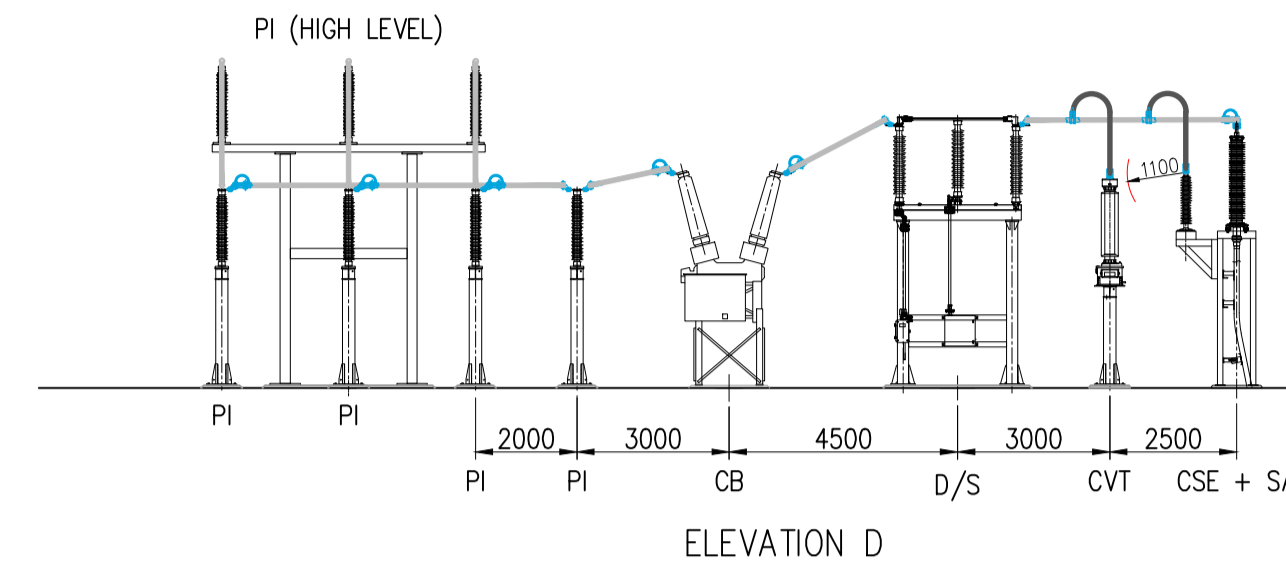
ANNOTATION:

- AUX TX AUXILIARY TRANSFORMER
- CB CIRCUIT BREAKER
- CSE CABLE SEALING END
- CVT CAPACITIVE VOLTAGE TRANSFORMER
- D/S DISCONNECTOR
- PI POST INSULATOR
- SA SURGE ARRESTER
- TX TRANSFORMER

TO BE VIEWED IN CONJUNCTION WITH LAYOUT DRAWING OP-PRO918-LAY017.

THE PROPOSED SUBSTATION LAYOUT IS BASED ON THE ASSUMPTION THAT THERE ARE NO SITE RESTRICTIONS.

THE PROPOSED BUSBAR SIZE IS 90mm x 6mm AL CONDUCTOR (2000A RATING). THE BUSBAR SIZE SHALL BE CONFIRMED DURING DETAILED DESIGN.



P1	11.07.22	PRELIMINARY	EC	EC	MG
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Island GREEN POWER COTTAM SOLAR PROJECT LIMITED

COTTAM 2 132/33kV SUBSTATION FOR SOLAR PARK
 SIDE ELEVATIONS

PROJECT NAME
 NATIONAL GRID COTTAM CONNECTION
 CUSTOMER
 ISLAND GREEN POWER

PRELIMINARY NOT FOR SITE USE	CUSTOMER DRAWING NUMBER ****	STATUS PRELIMINARY
	DRAWING NUMBER OP-PRO918-LAY018	SCALE SIZE REVISION 1:150 A1 P1

132kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	1.4
PHASE TO EARTH CLEARANCE	1.1
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{st}	3.8
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh}	2.9
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	1.4
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{s2}	5.8
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh2}	4.9

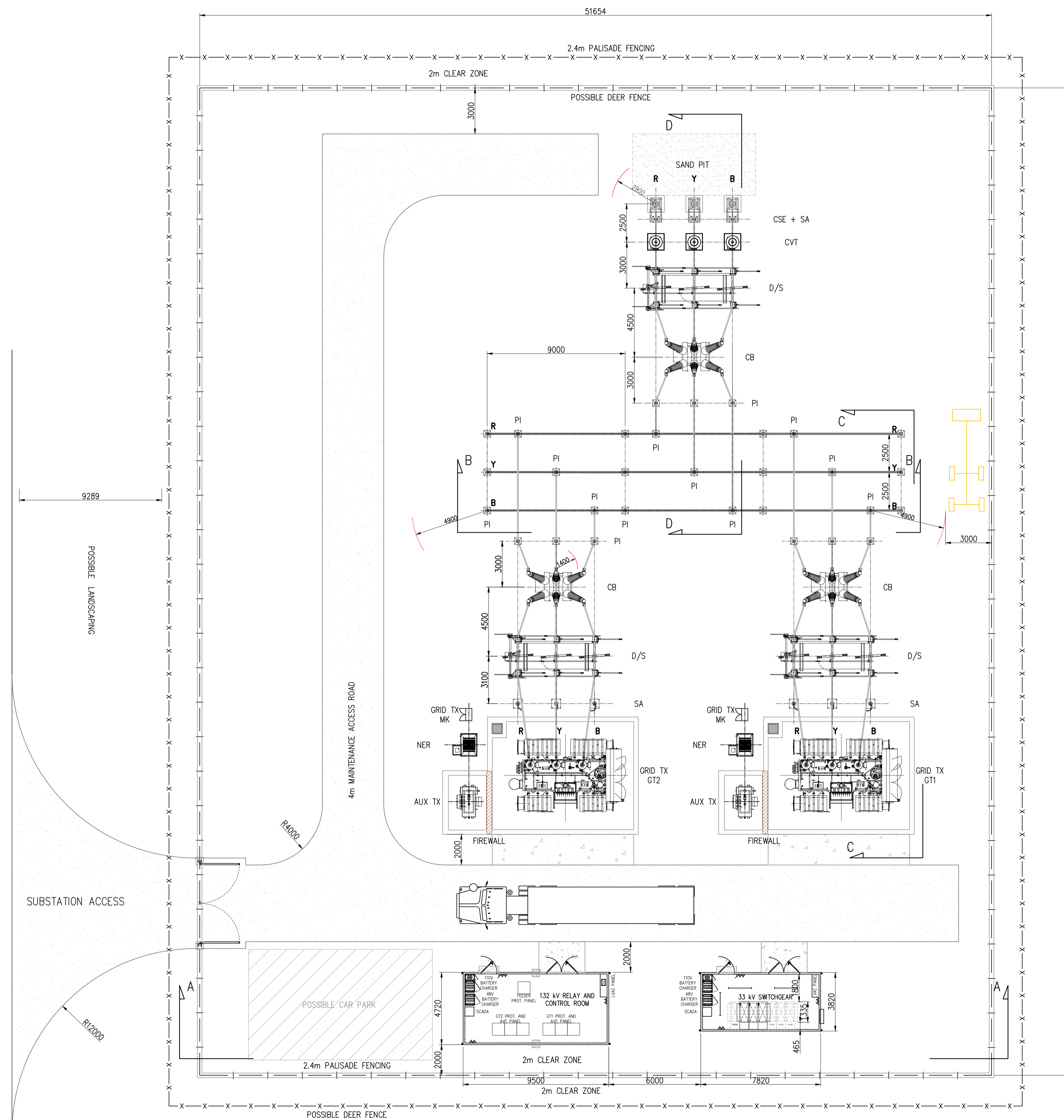
ABBREVIATION:

AUX TX	AUXILIARY TRANSFORMER
CB	CIRCUIT BREAKER
CSE	CABLE SEALING END
CVT	CAPACITIVE VOLTAGE TRANSFORMER
D/S	DISCONNECTOR
MK	MARSHALLING KIOSK
NER	NEUTRAL EARTHING RESISTOR
PI	POST INSULATOR
SA	SURGE ARRESTER
TX	TRANSFORMER

TO BE VIEWED IN CONJUNCTION WITH ELEVATIONS DRAWING OP-PRO918-LAY020.

THE PROPOSED SUBSTATION LAYOUT IS BASED ON ASSUMPTION THAT THERE IS NO SITE RESTRICTIONS.

THE PROPOSED BUSBAR SIZE IS 90mm x 6mm Al CONDUCTOR (2000A RATING). THE BUSBAR SIZED SHALL BE CONFIRMED DURING DETAILED DESIGN.



P1	11.07.22	PRELIMINARY	EC	EC	MG
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REV	DATE	DESCRIPTION	DRN	DES	REV & APP
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Island GREEN POWER COTTAM SOLAR PROJECT LIMITED

COTTAM 3 132/33kV SUBSTATION FOR SOLAR PARK
 SUBSTATION COMPOUND

PROJECT NAME
 NATIONAL GRID COTTAM CONNECTION
 CUSTOMER
 ISLAND GREEN POWER

CUSTOMER DRAWING NUMBER	STATUS
****	PRELIMINARY
DRAWING NUMBER	SCALE
OP-PRO918-LAY019	1:150
SIZE	REVISION
A1	P1

PRELIMINARY
 NOT FOR SITE USE

132kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	1.4
PHASE TO EARTH CLEARANCE	1.1
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{st}	3.8
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh}	2.9
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	1.4
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{s2}	5.8
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh2}	4.9

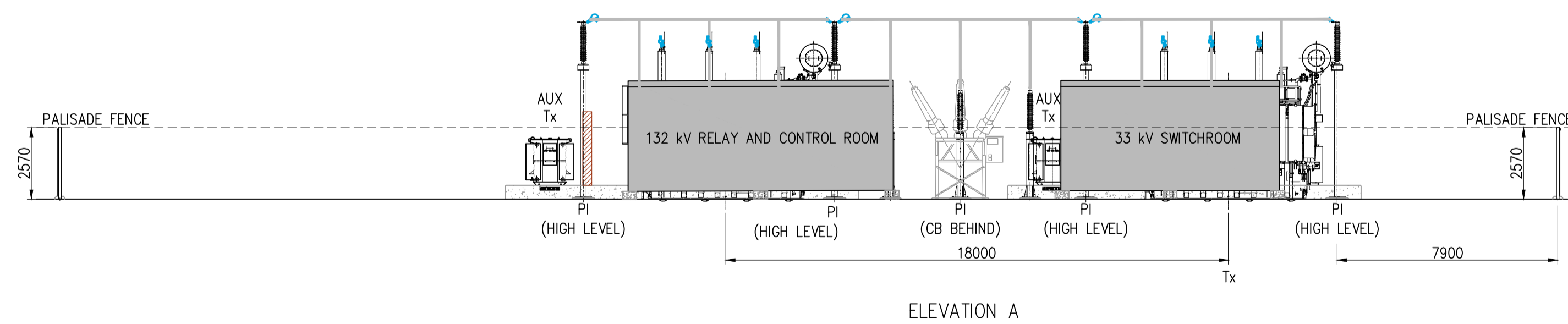
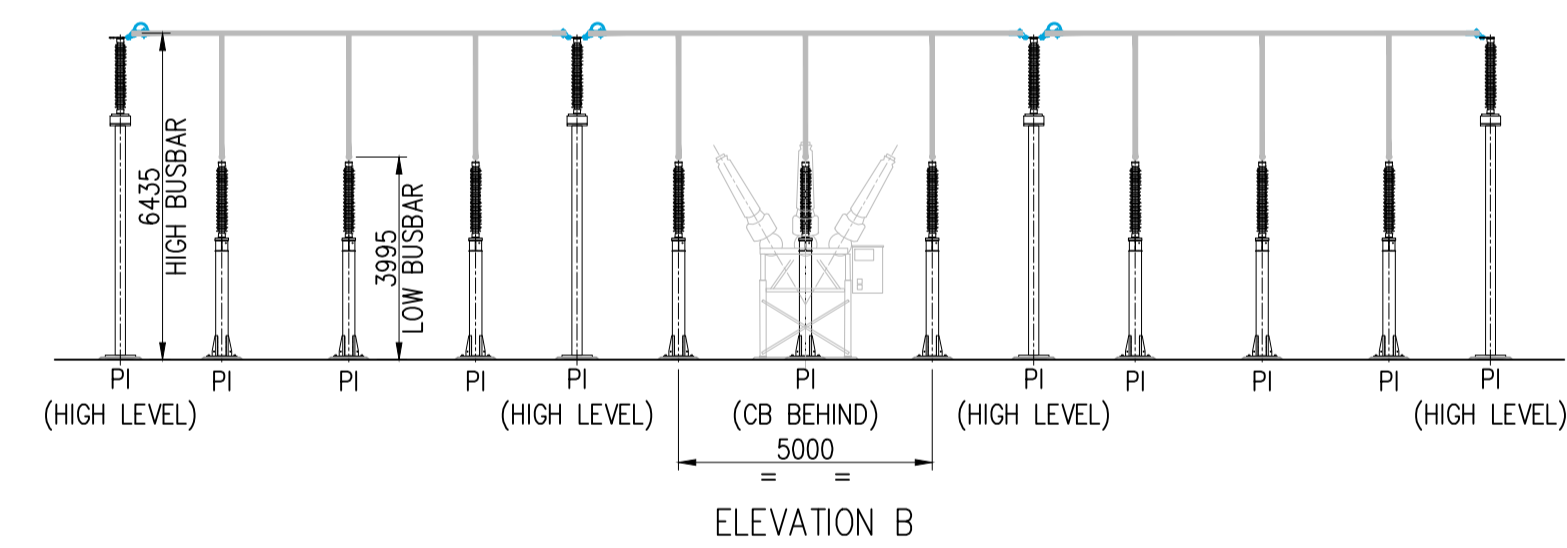
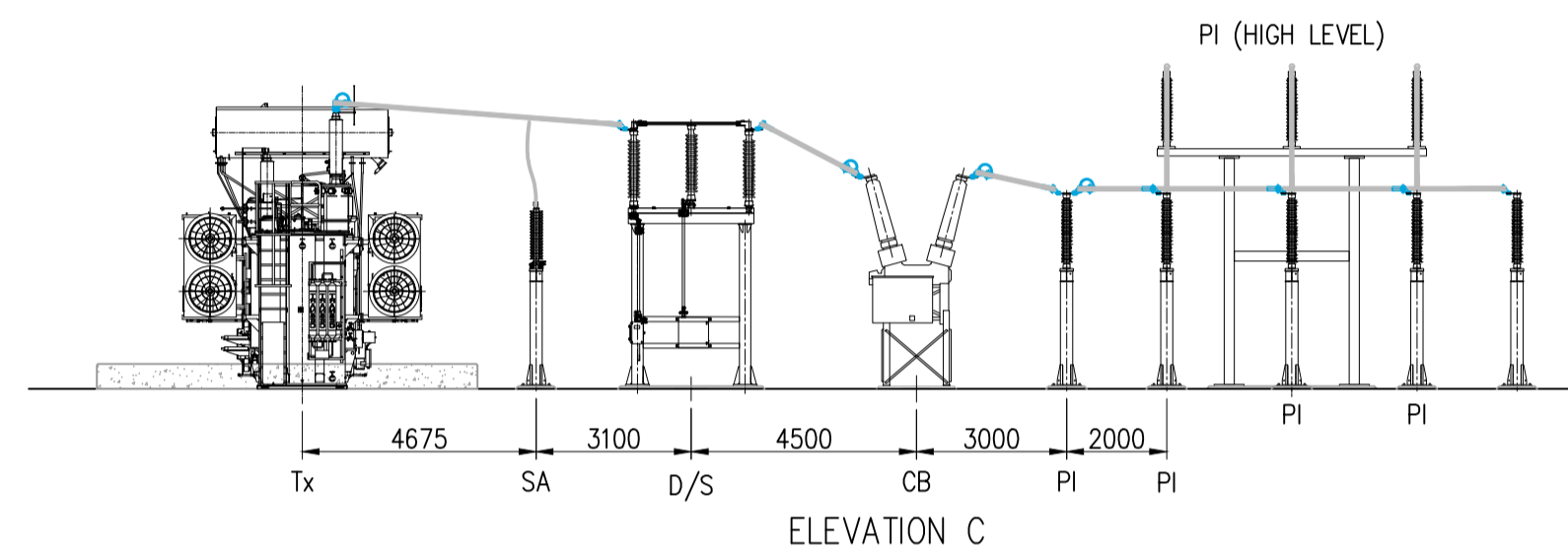
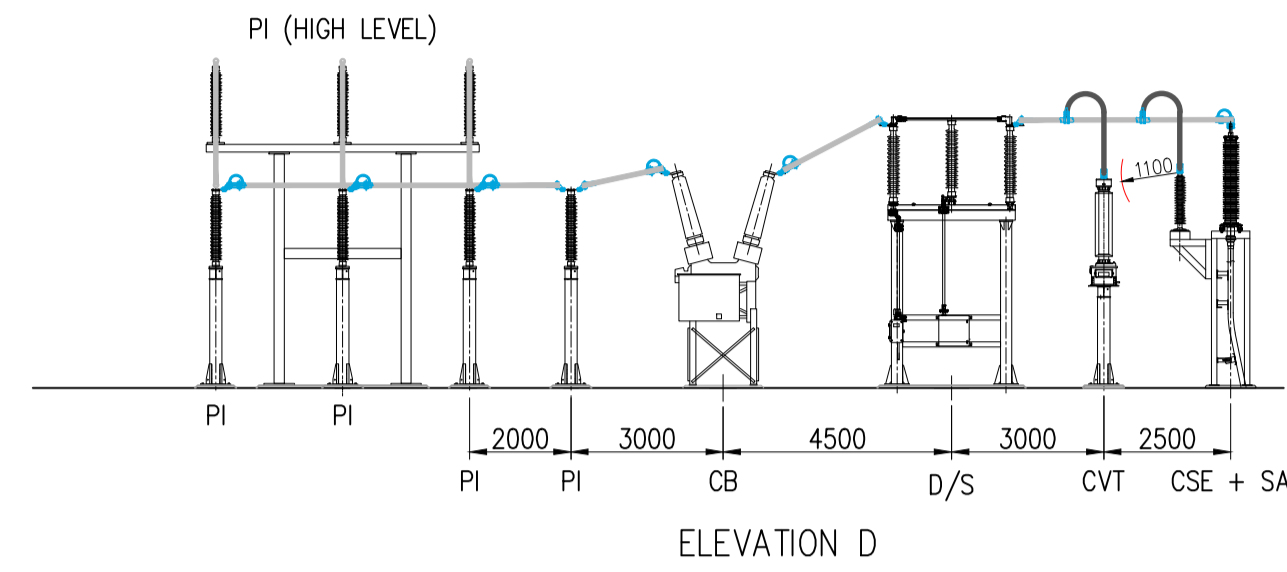
ANNOTATION:

AUX TX	AUXILIARY TRANSFORMER
CB	CIRCUIT BREAKER
CSE	CABLE SEALING END
CVT	CAPACITIVE VOLTAGE TRANSFORMER
D/S	DISCONNECTOR
PI	POST INSULATOR
SA	SURGE ARRESTER
TX	TRANSFORMER

TO BE VIEWED IN CONJUNCTION WITH LAYOUT DRAWING OP-PRO918-LAY019.

THE PROPOSED SUBSTATION LAYOUT IS BASED ON THE ASSUMPTION THAT THERE ARE NO SITE RESTRICTIONS.

THE PROPOSED BUSBAR SIZE IS 90mm x 6mm AL CONDUCTOR (2000A RATING). THE BUSBAR SIZE SHALL BE CONFIRMED DURING DETAILED DESIGN.



REV	DATE	DESCRIPTION	DRN	DES	REV & APP
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Island GREEN POWER COTTAM SOLAR PROJECT LIMITED

COTTAM 3 132/33kV SUBSTATION FOR SOLAR PARK
 SIDE ELEVATIONS

PROJECT NAME
 NATIONAL GRID COTTAM CONNECTION
 CUSTOMER
 ISLAND GREEN POWER

PRELIMINARY		STATUS	
NOT FOR SITE USE		PRELIMINARY	
CUSTOMER DRAWING NUMBER	****	SCALE	SIZE
DRAWING NUMBER	OP-PRO918-LAY020	1:150	A1
		REVISION	P1

132kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	1.4
PHASE TO EARTH CLEARANCE	1.1
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{st}	3.8
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh}	2.9
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	1.4
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{s2}	5.8
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh2}	4.9

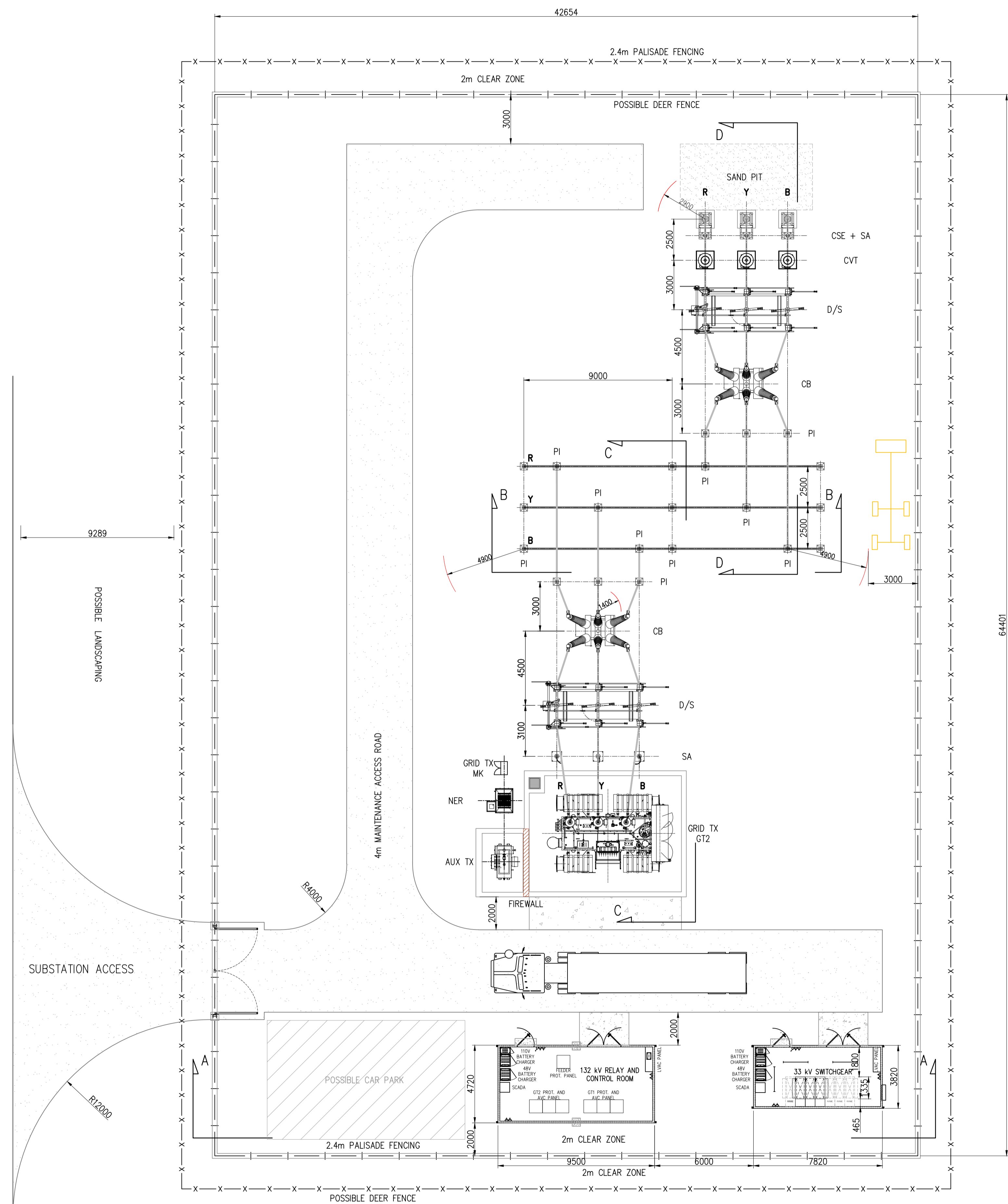
ABBREVIATION:

AUX TX	AUXILIARY TRANSFORMER
CB	CIRCUIT BREAKER
CSE	CABLE SEALING END
CVT	CAPACITIVE VOLTAGE TRANSFORMER
D/S	DISCONNECTOR
MK	MARSHALLING KIOSK
NER	NEUTRAL EARTHING RESISTOR
PI	POST INSULATOR
SA	SURGE ARRESTER
TX	TRANSFORMER

TO BE VIEWED IN CONJUNCTION WITH ELEVATIONS DRAWING OP-PRO918-LAY022.

THE PROPOSED SUBSTATION LAYOUT IS BASED ON ASSUMPTION THAT THERE IS NO SITE RESTRICTIONS.

THE PROPOSED BUSBAR SIZE IS 90mm x 6mm Al CONDUCTOR (2000A RATING). THE BUSBAR SIZED SHALL BE CONFIRMED DURING DETAILED DESIGN.



P1	11.07.22	PRELIMINARY	EC	EC	MG
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REV	DATE	DESCRIPTION	DRN	DES	REV & APP
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Island GREEN POWER COTTAM SOLAR PROJECT LIMITED

COTTAM 3B 132/33kV SUBSTATION FOR SOLAR PARK
 SUBSTATION COMPOUND

PROJECT NAME
 NATIONAL GRID COTTAM CONNECTION
 CUSTOMER
 ISLAND GREEN POWER

CUSTOMER DRAWING NUMBER ****	STATUS PRELIMINARY
DRAWING NUMBER OP-PRO918-LAY021	SCALE 1:150
SIZE A1	REVISION P1

PRELIMINARY
NOT FOR SITE USE

132kV MINIMUM ELECTRICAL CLEARANCES	
DESCRIPTION	DISTANCE (m)
PHASE TO PHASE CLEARANCE	1.4
PHASE TO EARTH CLEARANCE	1.1
DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{st}	3.8
DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh}	2.9
INSULATION HEIGHT (PEDESTRIAN ACCESS)	2.4
SAFETY DISTANCE	1.4
MEWP DESIGN CLEARANCE FOR SAFETY (VERTICAL) D _{s2}	5.8
MEWP DESIGN CLEARANCE FOR SAFETY (HORIZONTAL) D _{sh2}	4.9

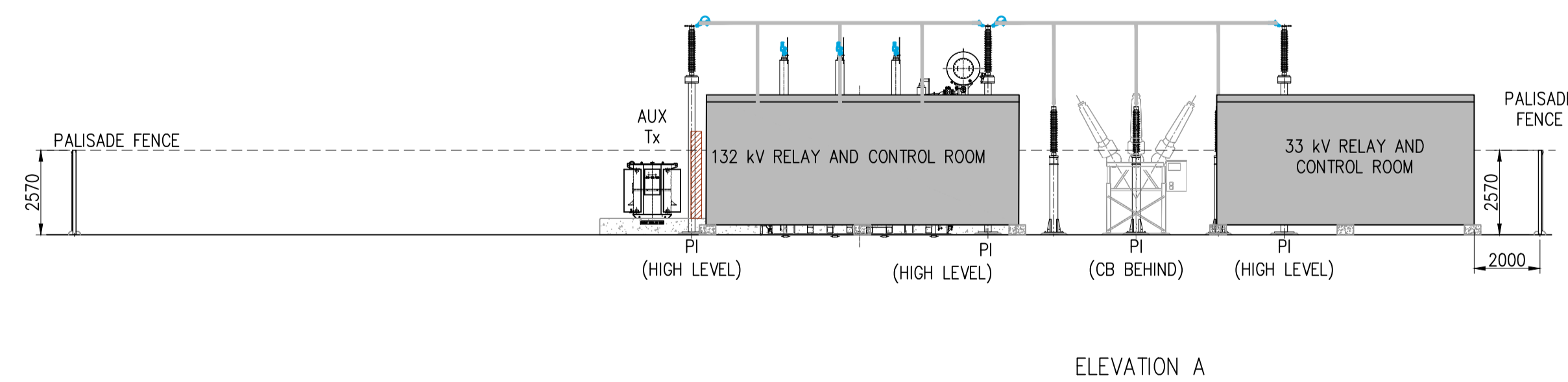
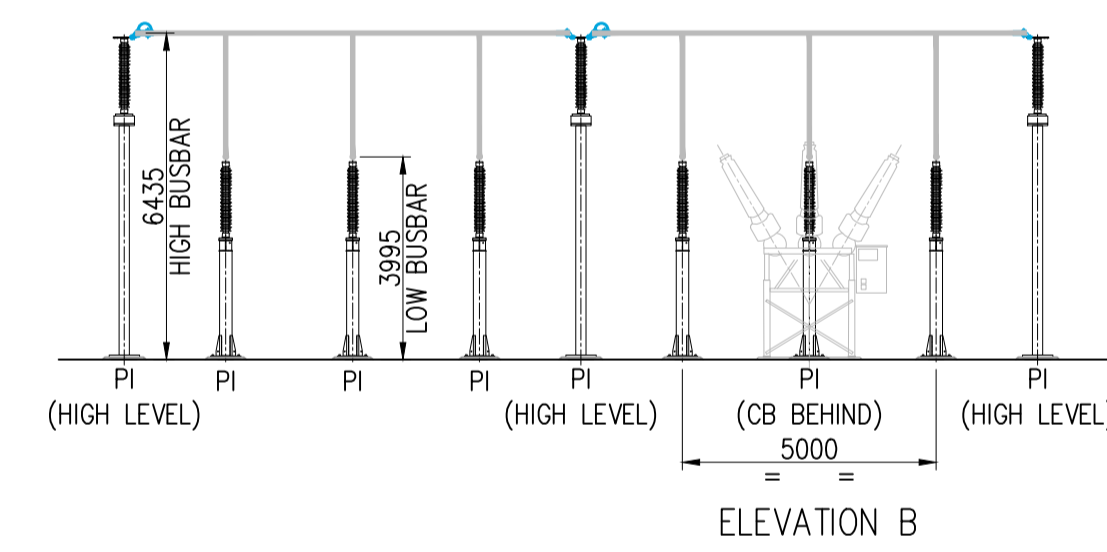
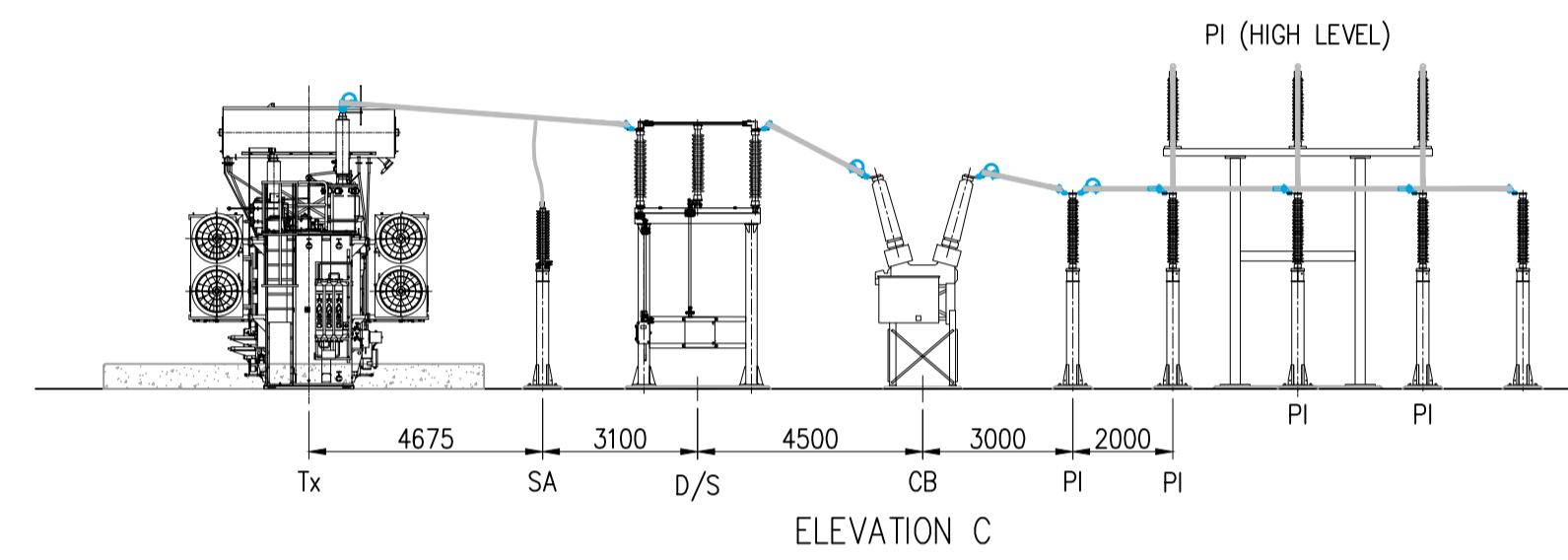
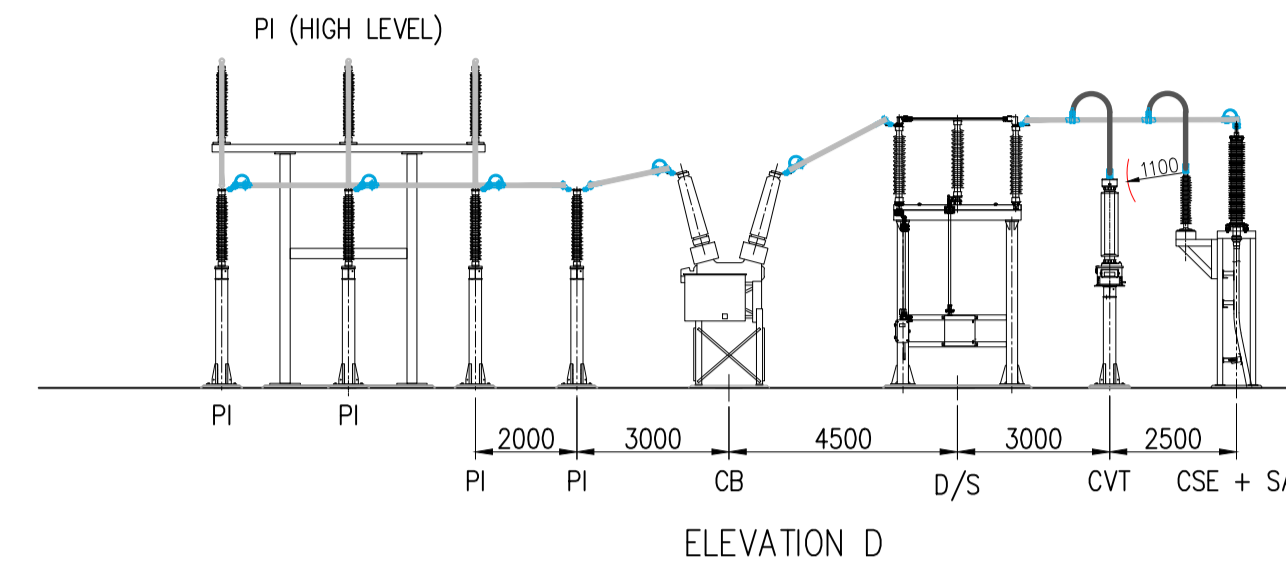
ANNOTATION:

AUX TX	AUXILIARY TRANSFORMER
CB	CIRCUIT BREAKER
CSE	CABLE SEALING END
CVT	CAPACITIVE VOLTAGE TRANSFORMER
D/S	DISCONNECTOR
PI	POST INSULATOR
SA	SURGE ARRESTER
TX	TRANSFORMER

TO BE VIEWED IN CONJUNCTION WITH LAYOUT DRAWING OP-PRO918-LAY021.

THE PROPOSED SUBSTATION LAYOUT IS BASED ON THE ASSUMPTION THAT THERE ARE NO SITE RESTRICTIONS.

THE PROPOSED BUSBAR SIZE IS 90mm x 6mm AL CONDUCTOR (2000A RATING). THE BUSBAR SIZE SHALL BE CONFIRMED DURING DETAILED DESIGN.



P1	11.07.22	PRELIMINARY	EC	EC	MG
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REV	DATE	DESCRIPTION	DRN	DES	REV & APP
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Island GREEN POWER COTTAM SOLAR PROJECT LIMITED

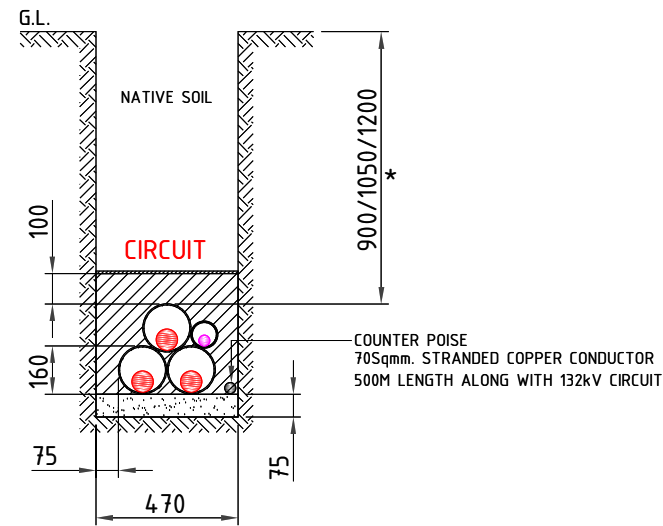
COTTAM 3B 132/33kV SUBSTATION FOR SOLAR PARK
 SUBSTATION COMPOUND

PROJECT NAME
 NATIONAL GRID COTTAM CONNECTION
 CUSTOMER
 ISLAND GREEN POWER

CUSTOMER DRAWING NUMBER	STATUS		
****	PRELIMINARY		
DRAWING NUMBER	SCALE	SIZE	REVISION
OP-PRO918-LAY022	1:150	A1	P1

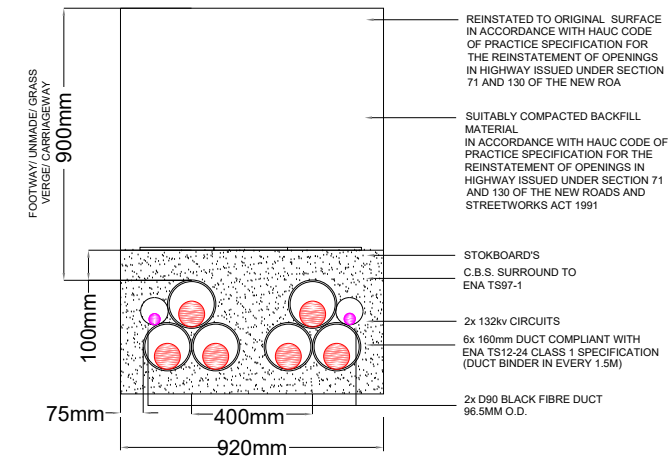
PRELIMINARY
 NOT FOR SITE USE

TRENCH SECTIONS FOR 132kV CABLES



SOLIDLY OR CROSS BONDING SYSTEM TO BE USED

132kV DOUBLE CIRCUIT WITH FIBRE DUCTS TYPICAL SECTION



TYPE A

STOKBORD (1000x244x9mm)

G.L. - GROUND LEVEL

132KV CABLE

FIBRE CABLE

BEDDING

A CEMENT BOUND SAND BED COMPLYING WITH THE REQUIREMENTS OF ENA TS 97-01 SHALL BE INSTALLED, EXCEPT WHERE CABLE RATING CALCULATIONS PROVE THAT STABILISED MATERIAL IS NOT REQUIRED. ALL BEDDING LAYERS SHALL BE COMPACTED TO A DEPTH OF 75mm.

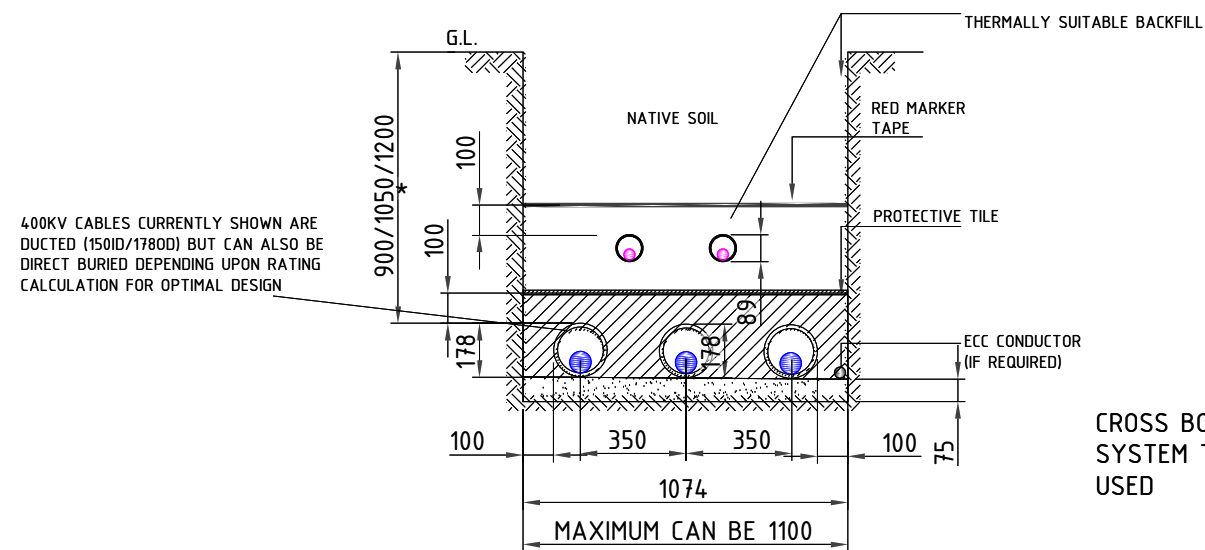
BLINDING

CABLES SHALL BE BLINDED WITH CEMENT BOUND SAND COMPLYING WITH THE REQUIREMENTS OF ENA TS 97-01, EXCEPT WHERE CABLE RATING CALCULATIONS PROVE THAT A STABILISED MATERIAL IS NOT REQUIRED, TO A COMPACTED DEPTH OF 100mm ABOVE THE CABLE.

INSTALLATION DEPTH DEPENDANT ON LOCATION:

900mm	FOOTWAYS/GRASS VERGES/PRIVATE PROPERTY & CARRIAGEWAYS (INCLUDING ROAD CROSSINGS)
* 1050mm	NORMAL AGRICULTURAL LAND
1200mm	AGRICULTURAL LAND SUBJECT TO DEEP PLOUGH

TRENCH SECTIONS FOR 400KV CABLES



CROSS BONDING SYSTEM TO BE USED

TYPE A

STOKBORD (1000x244x9mm)

G.L. - GROUND LEVEL

400KV CABLE

FIBRE CABLE

BEDDING

A CEMENT BOUND SAND BED COMPLYING WITH THE REQUIREMENTS OF ENA TS 97-01 SHALL BE INSTALLED, EXCEPT WHERE CABLE RATING CALCULATIONS PROVE THAT STABILISED MATERIAL IS NOT REQUIRED. ALL BEDDING LAYERS SHALL BE COMPACTED TO A DEPTH OF 75mm.

BLINDING

CABLES SHALL BE BLINDED WITH CEMENT BOUND SAND COMPLYING WITH THE REQUIREMENTS OF ENA TS 97-01, EXCEPT WHERE CABLE RATING CALCULATIONS PROVE THAT DEPTH OF 100mm ABOVE THE CABLE.

INSTALLATION DEPTH DEPENDANT ON LOCATION:

900mm	FOOTWAYS/GRASS VERGES/PRIVATE PROPERTY & CARRIAGEWAYS (INCLUDING ROAD CROSSINGS)
* 1050mm	NORMAL AGRICULTURAL LAND
1200mm	AGRICULTURAL LAND SUBJECT TO DEEP PLOUGH

General Legend:

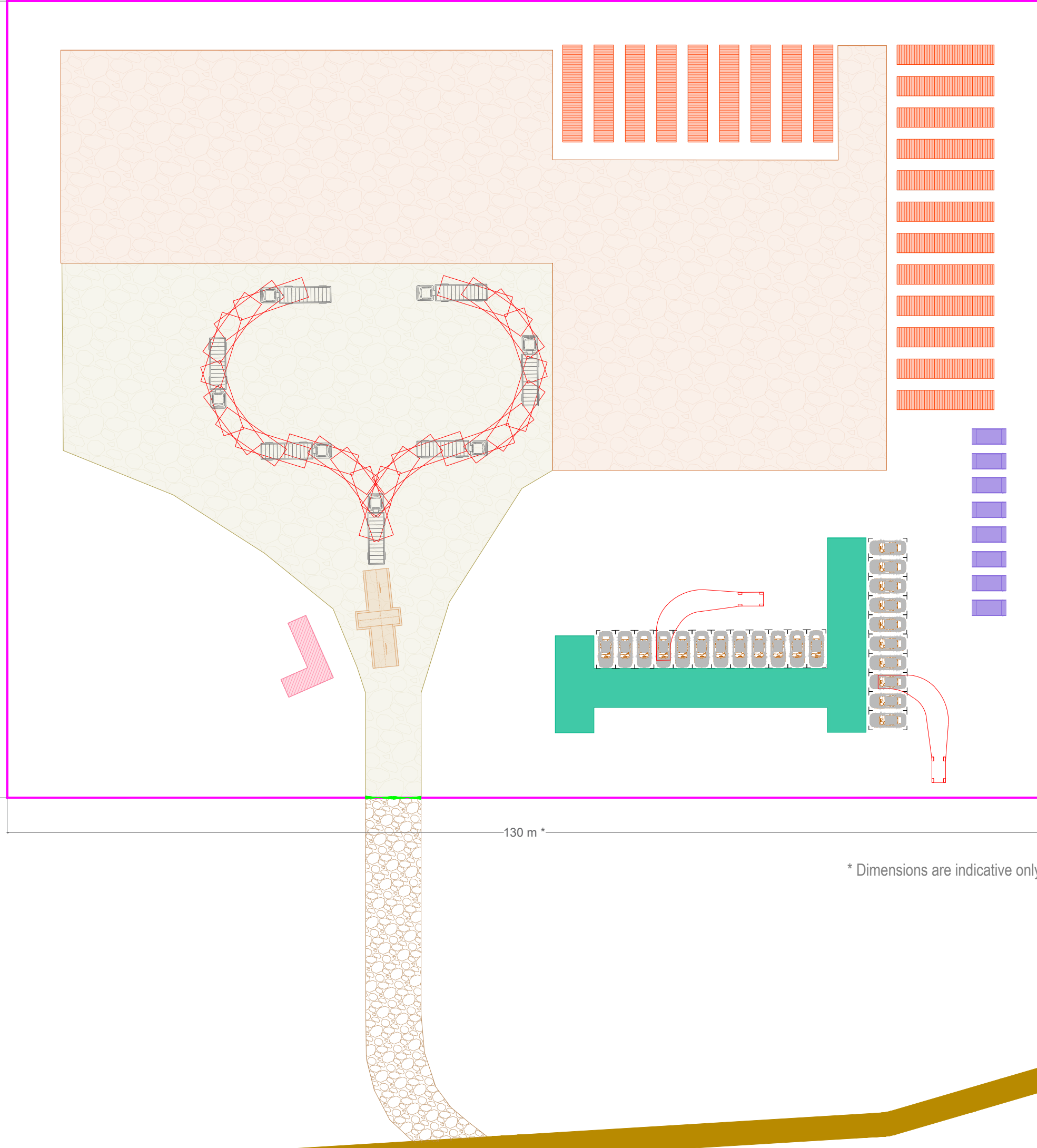


Project:	Cottam Solar Project
Project Location:	Land near Gainsborough, Lincolnshire, United Kingdom
Ownership:	Cottam Solar Project Limited
Document Title:	Cable Trench Cross Section
Sheet Format:	A3 *420 x 297*
Scale:	1:25
Document Version:	v-1 04/11/2022 M.N.
Document Version:	v-2 21/12/2022 M.N.
Company:	Island Green Power Island Green Power UK Limited Unit 20.2, Coda Studios 189 Munster Road, London SW6 6AW

100 m *

130 m *

* Dimensions are indicative only



General Legend:	
	Construction Compound Boundary
	Gates
	Reception Area
	Turning Area for Delivery Vehicles
	Laydown Area
	Office and Welfare Unit
	Skip / Water Area
	Storage Containers
	Vehicle Wheel Washers
	Vehicle Swept Path
	Parking Area
	Temporary Track
	Internal Track

Project:	Cottam Solar Project											
Project Location:	Land near Gainsborough, Lincolnshire, United Kingdom											
Overship:	Cottam Solar Project Limited											
Document Title:	Temporary Construction and Decommissioning Laydown Area											
Sheet format:	A3 '420 x 297'	Scale:	1:500									
Document amendments:	<table border="1"> <tr> <td>v.1</td> <td>07/11/2022</td> <td>M.N.</td> </tr> <tr> <td>v.2</td> <td>21/12/2022</td> <td>M.N.</td> </tr> <tr> <td>v.3</td> <td>04/01/2023</td> <td>M.N.</td> </tr> </table>	v.1	07/11/2022	M.N.	v.2	21/12/2022	M.N.	v.3	04/01/2023	M.N.	Comments:	
v.1	07/11/2022	M.N.										
v.2	21/12/2022	M.N.										
v.3	04/01/2023	M.N.										
Company:		Island Green Power UK Limited Unit 20 Z, Coda Studios 189 Munster Road, London SW6 6AW										