SUNNICA ENERGY FARM

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Volume 7

7.3 Design and Access Statement

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Sunnica Energy Farm

7.3 Design and Access Statement

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Executive summary

This Design and Access Statement (DAS) has been prepared on behalf of Sunnica Limited (the Applicant) in relation to an application for a Development Consent Order (DCO) submitted to the Planning Inspectorate, with the decision whether to grant a DCO being made by the Secretary of State for Business, Energy and Industrial Strategy (Secretary of State) pursuant to the Planning Act 2008.

The Applicant is seeking development consent for the construction, operation (including maintenance) and decommissioning of Sunnica Energy Farm (the Scheme), which will deliver electricity to the national electricity transmission network. The Applicant is proposing to install ground mounted solar photovoltaic (PV) panel arrays to generate electrical energy from the sun and combine these with a Battery Energy Storage System (BESS). Electricity will be generated at four sites: Sunnica East Site A, near Isleham in Cambridgeshire; Sunnica East Site B, near Worlington and Freckenham in Suffolk; Sunnica West Site A near Chippenham and Kennett in Cambridgeshire; and Sunnica West Site B, near Snailwell in Cambridgeshire (together referred to as the Sites). The Sites will connect to Burwell National Grid Substation, near Burwell in Cambridgeshire and an extension to the substation is proposed to provide this connection.

The Scheme is defined as a Nationally Significant Infrastructure Project (NSIP) and will require a DCO from the Secretary of State for Business, Energy and Industrial Strategy, due to its generating capacity exceeding 50 megawatts (MW).

This DAS provides information regarding the context of the Scheme's location; how the design has evolved, including how it has been influenced by planning policy and stakeholder engagement; and the proposed outline design solution, including access.

The design team has worked collaboratively to provide an integrated and responsive design which has been informed by stakeholder engagement.

The design has evolved over seven years, from Initial Feasibility Stage in 2015 to post DCO application submission design in 2022 to meet the Scheme's objectives. Key design and access features of the Scheme demonstrate good design and would deliver sustainable development that is adapted to future climate change in accordance with NPS EN-1, NPS EN-3, NPS EN-5, and the NPPF. In summary the key features of the design include:

a. The area of land required for the Sites has been reduced by 189ha since the Scheme's inception to address the concerns of the scale of the Scheme and as a result of landowner discussions.

b. The layout of the principal components of the Scheme have had appropriate regard to flood risk ensuring resilience to future climate change impacts.

c. The landscape and ecological design proposed has been refined to provide over 30%[1] of the area of the Sites as green infrastructure, utilising existing landscape and ecological features and habitats and providing mitigation for the landscape and visual impacts and ecological impacts of the Scheme. The Applicant committed to provide a biodiversity net gain as part of the Scheme and to increase the range of habitats and species. The Scheme will provide an approximate net gain in biodiversity of 83% for

1 The 30% does not include the grassland planting under the PV modules, and only relates to the dedicated landscape and ecology areas proposed for the Scheme.

habitat units, 16% for hedgerow units and 1% for river units, see Biodiversity Net Gain Assessment **[APP-259]** for further information.

d. The design of the proposed green infrastructure has been refined to reduce visual impact of the Scheme in relation to nearby settlements by providing offsets and buffer zones.

e. The siting of infrastructure has been adapted to, where possible, avoid below ground archaeological features. In addition, visual screening has been refined to minimise the visual intrusion of the Scheme on the setting of heritage assets while avoiding obscuring or intruding upon views and relationships between heritage assets.

f. The inclusion and subsequent refinement of proposed permissive routes to provide linkages across the Sites and between settlements and provide greater access across the local landscape.

g. Consideration of public safety by designing appropriate measures to mitigate risk posed by fire at the BESS compounds.

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1 Introduction

1.1 Scheme Update

1.1.1 To facilitate the grid connection at Burwell National Grid Substation, the Scheme needs to provide a substation or transformer capable of upgrading the voltage of the electricity generated by the Scheme to 400 kilovolts (kV). Within the application submitted in November 2021, the Scheme included two options for extending the Burwell National Grid Substation to do this. Within the application, these are called Option 1 and Option 2.

1.1.2 Through the relevant representations process, the Applicant was made aware of the representation made by National Grid Electricity Transmission (NGET). This representation stated that one of the two grid connection options, Option 1, is considered 'not technically feasible' by NGET. Option 1 has therefore been removed from the Application.

1.1.3 Following NGET's representation, the Applicant has revisited the technical solutions available to connect the Scheme into the NGET infrastructure at Burwell to seek to minimise compulsory acquisition requirements and environmental effects.

1.1.4 This design work has resulted in the identification of an additional option for the grid connection, referred to as 'Option 3'. Option 3 involves transforming the 33 kV received from the solar stations within the PV Sites directly to 400 kV within the onsite substations at Sunnica West Site A, Sunnica East Site A and Sunnica East Site B for export to the Burwell National Grid Substation.

1.1.5 Option 2 has not been discounted at this stage and is retained in the application whilst discussions continue with NGET about Option 3. Once NGET have confirmed that they are content with Option 3, the Applicant would seek to remove Option 2 from the application.

1.1.6 As a result of the above changes, the Design and Access Statement has been updated to reflect the updated Scheme Description.

1.2 Background

1.2.1 Sunnica Energy Farm (the Scheme) is a new solar energy farm proposal that will deliver electricity to the national electricity transmission network. Sunnica Limited is proposing to install ground mounted solar photovoltaic (PV) panel arrays to generate electrical energy from the sun and combine these with a Battery Energy Storage System (BESS) which will connect to Burwell National Grid Substation in Cambridgeshire.

1.2.2 Electricity will be generated at Sunnica East Site A, near Isleham in Cambridgeshire; Sunnica East Site B, near Worlington and Freckenham in Suffolk; Sunnica West Site A near Chippenham and Kennett in Cambridgeshire; and Sunnica West Site B, near Snailwell in Cambridgeshire. All locations will comprise ground mounted solar PV panel arrays, supporting electrical infrastructure and, with the exception of Sunnica West Site B, a BESS and onsite substation.

1.2.3 Supporting electrical infrastructure will include on-site substations on Sunnica East Site A and Sunnica East Site B and Sunnica West Site A, and on-site cabling between the different electrical elements across the Scheme. The generating equipment of the Scheme will be fenced and protected via security measures such as Closed Circuit Television. Inside the fenced areas, in addition to the generating equipment will be, internal access tracks, and drainage. It is not proposed for any area to be continuously lit.

1.2.4 Visual, ecological and archaeological mitigation is proposed which includes proposed grassland planting and new woodland; retention of existing woodland, wetlands and other vegetation; provision of replacement habitat; and offsetting areas, where there will be no development. The BESSs will consist of a compound and battery array to allow for the importation, storage and exportation of energy to the National Grid. There will also be areas at Sunnica East Site A and Sunnica East Site B for office and storage facilities for use during the Scheme's operation.

1.2.5 There are two options for upgrading the electricity generated by the Scheme to 400 kV:

a. Burwell National Grid Extension – Option 2: will be located north of the existing substation approximately 450m from Burwell, on the opposite side of Newham Drove. This option will convert the 132kV generated at the onsite substations within Sunnica West Site A, Sunnica East Site A and Sunnica East Site B to 400 kV and a 400 kV cable will connect Option 2 to the existing Burwell National Grid Substation; and

b. Option 3 – 400 kV onsite substation: will be located within the proposed onsite substations within Sunnica West Site A, Sunnica East Site A and Sunnica East Site B. This option will convert 33 kV generated by the solar stations directly to 400 kV which will connect directly to the existing Burwell National Grid Substation.

1.2.6 The cables will run between Sunnica East Site A, Sunnica East Site B and Sunnica West Site A (Grid Connection Route A), and then from Sunnica West Site A to Sunnica West B and onwards to the Burwell National Grid Substation (Grid Connection Route B).

1.2.7 The Scheme will have two main access points, one north of Elms Road at Sunnica East Site B and one south of La Hogue Road at Sunnica West Site A. The main access route to Sunnica West Site A will be via the Chippenham junction of the A11, to the north of junction 38 of the A14. Sunnica East Site B will be accessed via the A11 and B1085. A number of secondary access points are proposed to access the individual land parcels through construction, operation, and decommissioning phases.

1.2.8 The Scheme is defined as a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO) from the Secretary of State for Business, Energy and Industrial Strategy (Secretary of State), due to its generating capacity exceeding 50 megawatts (MW).

1.2.9 The overarching objective of the Scheme is to generate low-carbon renewable energy and ensure security of supply, for an operational period of 40 years, to

address the urgent need to decarbonise the UK's energy supply. The details of the need for the Scheme are presented in the **Statement of Need [APP-260]**.

1.2.10 This Design and Access Statement (DAS) accompanies an application for a DCO for the Scheme, submitted in accordance with the Planning Act 2008 (PA 2008). Whilst there is no statutory requirement for a DAS to accompany a DCO application, the Planning Inspectorate's Advice Note 6 advises that 'other documents' may include information that the applicant would normally wish to submit for the development proposal or that which has been requested or suggested by respondents to pre-application consultation.

1.2.11 This DAS therefore seeks to provide, in accordance with Section 4.5 of the Overarching National Policy for Energy EN-1 (2011) (NPS EN-1), information regarding the context of the Scheme's location; how the design has evolved, including how it has been influenced by planning policy and stakeholder engagement; and the proposed outline design solution including access.

1.3 Flexibility of the design

1.3.1 The DCO will consent the design shown on the **Works Plans [REP2-005]** and will be bound by the limits of deviation presented in the **Works Plans [REP2-005]** and as secured by Article 3 of the Draft DCO. The environmental impact assessment presented in the Environment Statement **[APP-032 to APP-255]** has been undertaken on the basis of the works proposed in the **Works Plans [REP2-005]**, and the maximum area of land anticipated as likely to be required (hereafter referred to as the Order limits) for the Scheme. This approach is known as the use of the 'Rochdale Envelope' which is described in footnote 78 to paragraph 4.2.8 of NPS EN-1 whereby the assessment is based on a "*series of maximum extents of a project for which the significant effects are established. The detailed design of the project can then vary within this 'envelope' without rendering the environmental impact assessment inadequate"*.

1.3.2 Solar PV and BESS are rapidly evolving infrastructure and therefore to allow the latest technology to be utilised at the time of construction design parameters have been developed. Further work will therefore be required to develop the Scheme's detailed design so that it can be constructed. This is to occur post consent and the draft DCO **[REP2-012]** proposes at Schedule 2 a requirement to manage the detailed design process. That requirement would ensure that the detailed design of the Scheme conforms to the Design Principles contained in Appendix B of this document. These Design Principles have been assessed within the Environmental Statement.

1.4 Structure of this Design and Access Statement

1.4.1 This DAS is structured as follows:

a. Section two provides an overview of the Scheme's location and the context within which the design of the Scheme has evolved. In addition, the design policy context is explained.

b. Section three summarises the design process and how the Scheme design has evolved through various stages, including how the design has been informed by the stakeholder engagement process.

c. Section four describes the outline design for the various components of the Scheme.

d. Section five explains the proposals for access to the Scheme.

e. Section six concludes the design and access considerations of the Scheme.

f. Appendix A provides supporting figures to illustrate the context and design.

g. Appendix B sets out the design parameters referred to as the Outline Design Principles and Parameters which is to be referred to in the Draft DCO **[REP2-012]** as a certified document for reference to the detailed design approval required in accordance with the detailed design requirement contained within Schedule 2.

1.5 The design team

1.5.1 The design team is comprised of qualified and experienced professionals, including: solar energy, highway and drainage engineers; planners; landscape professionals; heritage specialists; ecologists; and other environmental professionals. The contributions of all disciplines have been crucial to informing the design approach to the Scheme. The design team has also worked collaboratively with stakeholders to allow the design to be informed by local knowledge and expertise.

2 Context and Analysis

2.1 Scheme Location and Order limits

2.1.1 The Scheme is located within the East of England and falls within the administrative areas of Cambridgeshire County Council (CCC); Suffolk County Council (SCC); East Cambridgeshire District Council (ECDC) and West Suffolk Council (WSC).

2.1.2 It is proposed that electricity will be generated at four sites:

a. Sunnica East Site A which is located approximately, 0.5 kilometres (km) south-east of the village of Isleham; 0.6km south-west of the village of West Row and 3.5 km east of the town of Mildenhall;

b. Sunnica East Site B which is located immediately south of the village of Worlington; approximately 1.5km east of the village of Freckenham and 1.5km south-east of the town of Mildenhall;

c. Sunnica West Site A which is located immediately north of the A14 at Newmarket and approximately 0.3km east of the village of Snailwell;1km south of the village of Chippenham; and 1.5km west of the village of Kennett.

d. Sunnica West Site B which is approximately 0.5km north of the village of Snailwell; 1.4km south of the village of Fordham and 2km south west of the village of Chippenham.

2.1.3 Collectively, these are referred to as the Sites and have a combined area of 981 hectares (ha).

2.1.4 There are two options for upgrading the voltage to 400 kV to facilitate connection with the National Transmission Network:

a. Burwell National Grid Extension – Option 2: will be located north of the existing substation approximately 450m from Burwell, on the opposite side of Newham Drove. This option will convert the 132kV generated at the onsite substations within Sunnica West Site A, Sunnica East Site A and Sunnica East Site B to 400 kV and a 400 kV cable will connect Option 2 to the existing Burwell National Grid Substation; and

b. Option 3 – 400 kV onsite substation: will be located within the proposed onsite substations within Sunnica West Site A, Sunnica East Site A and Sunnica East Site B. This option will convert 33 kV generated by the solar stations directly to 400 kV which will connect directly to the existing Burwell National Grid Substation.

2.1.5 **Figure 2-1** shows the Order limits of the Scheme within its administrative context. The Order limits show the limits of land required temporarily and permanently for the construction, operation (including maintenance) and decommissioning of the Scheme.

2.1.6 The Order limits include land for the associated electrical infrastructure for connection to the national electricity transmission network. This includes land for

Grid Connection Route A linking Sunnica East Site A, Sunnica East Site B and Sunnica West Site A; and land for Grid Connection Route B linking Sunnica West Site A with Sunnica West Site B and onto to the extension proposed at the Burwell National Grid Substation, west of the village of Burwell in Cambridgeshire. In addition, there are a number of isolated pockets of land required for temporary traffic management requirements. The **Land Plans [REP2-003]** show the Order limits and land required for the Scheme

2.2 Characteristics of the Order Limits and its surroundings

Land use context

2.2.1 **Table 2-1** below provides the land use context regarding the Sites; the Grid Connection Routes A and B; and the locations of the Burwell National Grid Substation Extension and their surroundings including the nearest residential receptors.

Table 2-1 Land uses within and surrounding the Order limits

Order limits location and area (ha)	Local district	Existing land uses	Surrounding land uses	Nearest residential receptors
Sunnica East Site A 223 ha	ECDC and WSC	Land use across Sunnica East Site A is agricultural, a mix of pig and arable farming based around Lee Farm.	The surrounding area comprises several small rural villages including Isleham to the north west and West Row to the north east. There are also some industrial/commercial land uses within the immediate vicinity and agricultural uses to the south and east.	Residential receptors are located 500m west of Sunnica East Site A along Beck Road, Isleham.
Sunnica East Site B 319ha	WSC	Land use across Sunnica East Site B is predominantly agricultural with a mix of pig and arable farming.	The surrounding area comprises several small villages including Worlington, Barton Mills, Red Lodge and Freckenham and the A11 to the east. Industrial land uses adjoin the A11 to the south of the Site and a 7.5 MW peak capacity solar farm is situated 400m to the south-east. The Bay Farm Power Ltd Anaerobic Digestion plant is also located to the south. The operational area of Worlington Quarry is also adjacent to the south east and a kennels and cattery is located to the west, north of Elms Road.	The nearest residential receptors are adjacent to the north of Sunnica East Site B off Freckenham Road, Worlington, 250m south west of the Site at Badlingham Road, Chippenham; there are properties located at Acacia Close, Red Lodge which is approximately 450m east of Sunnica East Site B beyond the A11.
Sunnica West Site A 373ha	ECDC	The land use across Sunnica West Site A is agricultural, consisting of arable farming.	The surrounding area includes the A11 east of the majority of the Site and the A14 to the south of the Site. The village of Chippenham is 1km to the north with Snailwell 300m west. Leisure and retail uses nearby include The Wild Tracks Outdoor Activity Park which is	There is one property on Dane Hill Road located approximately 100m away from Sunnica West Site A, as well as some residential properties adjacent to the La Hogue Farm shop approximately 180m from Sunnica West Site A.

Order limits location and area (ha)	Local district	Existing land uses	Surrounding land uses	Nearest residential receptors
			immediately west of the A11 350m north of Sunnica West Site A and the La Hogue Farm Shop is also approximately 330m to the north of Sunnica West Site A. Chippenham Hall Registered Park and Garden (RPG) is located to the north with a former carriageway for the RPG bisecting Sunnica West Site A. A horse training ground known as the Gallops extends from the north of the A14 to border Snailwell and is adjacent to the southern boundary of Sunnica West Site A. Other equestrian uses include the Limekilns, consisting of a triangular parcel of land between the A1304 and Well Bottom road, approximately 450m south of Sunnica West Site A.	Approximately 300m west of Sunnica West Site A is The Green, Snailwell as well as the RF Tillbrook & Sons Farmhouse approximately 250m east of Sunnica West Site A. In addition the Arran House Stud Bed & Breakfast, Kennett is 100m east of Sunnica West Site A.
Sunnica West Site B 66ha	ECDC	Land use across Sunnica West Site B is agricultural consisting of arable farming	The River Snail adjoins Sunnica West Site B to the west. To the west of Sunnica West Site B there are also commercial and industrial land uses along the A142(Newmarket Road / Fordham Road) and to the south of Snailwell Road. Snailwell village is located approximately 0.5m south of Sunnica West Site B.	There are residential receptors along the Street within Snailwell which are within 500m of Sunnica West Site B.
Grid Connection Route A	WSC	Mainly agricultural uses. The Cable Corridor crosses the B1102 between Sunnica East Site A and Sunnica East Site B, the River Kennett and Haveacre Meadows and Deal Nook County Wildlife Site (CWS) to the south of Sunnica East Site B.	The northern section of the Grid Connection Route A is surrounded by agricultural land uses. The southern section of Grid Connection Route A is located 250m west of the A11 at its closest point and 300m west of the village of Red Lodge. The Wild Tracks Outdoor Activity Park is also adjacent to the east of Grid Connection Route A.	The closest residential receptors are adjacent to the La Hogue Farm shop approximately 280m from Grid Connection Route A.

Order limits location and area (ha)	Local district	Existing land uses	Surrounding land uses	Nearest residential receptors
Grid Connection Route B	ECDC	Mainly agricultural but it also crosses Chippenham Road, B1102 and A142 and various Public Rights of Way. South of Fordham it crosses employment developments and west of Fordham the national rail network.	The villages of Snailwell and Fordham are close to Grid Connection Route B. Burwell Waste Water Treatment Works is adjacent to the south as the Cable Corridor where it passes under Broads Road and First Drove. Goosehall solar farm is north west of the village of Burwell and Grid Connection Route B would pass to the east of this development.	The closest residential receptors are associated with Willow Farm, approximately 100m north of the Cable Corridor, approximately 260m west of the A142.
Burwell National Grid Substation Extension	ECDC	The land use within the two proposed sites is agricultural.	The existing Burwell National Grid Substation is south of Newnham Drove and the village of Burwell is located to the west.	The closest residential receptors to Burwell National Grid Substation Extension Option 2 are located 350m to the east in the village of Burwell.

Landform, topography and landscape character

2.2.2 An appreciation of the landscape context of the Sites is an important aspect of the design due to the Applicants desire for the Scheme to be designed in such a way as to minimise, so far as practicable, adverse effects on the landscape in which it sits. **Figure 2-2** shows the topography of the Sites and shows that, overall, the majority of the Scheme is located in areas with lower land elevations, with low slope gradients making it very flat.

2.2.3 The topography of Sunnica East Site A is low, lying between 5-15m Above Ordnance Datum (AOD). Landscape features within Sunnica East Site A include agricultural fields interspersed with individual trees, hedgerow, linear tree belts and farm access tracks. The Lee Brook flows from West Row to Freckenham and crosses through the central section of Sunnica East Site A.

2.2.4 **Plate 2-1** illustrates the typical landform at Sunnica East Site A.

Plate 2-1. Typical landform and landscape at Sunnica East Site A

2.2.5 The topography of Sunnica East Site B is relatively flat. It varies between 40m AOD and 10m AOD towards the east, south-east of Worlington, to 10-15m AOD in

the remainder of the Site. The landscape features within Sunnica East Site B consist of agricultural fields interspersed with individual trees, hedgerow, linear tree belts, small woodland blocks, farm access tracks, and local transport roads (including the B1085). **Plates 2-2** and **2-3** illustrate the landform at Sunnica East Site B.

Plate 2-2. Landscape features at Sunnica East Site B

Plate 2-3. Flat agricultural land within Sunnica East Site B

2.2.6 The topography of Sunnica West Site A is generally flat. At the western edge of Sunnica West Site A the landform rises from the A14, at 30m AOD, to 40m AOD before falling back to Chippenham Road at 35m AOD. In contrast, the landform falls very gradually across the central part of Sunnica West Site A, from the junction of the A14 and A11 at 25m AOD, to the edge of Chippenham Park, at 20m AOD. Similarly, in the eastern part of Sunnica West Site A, the landform falls from La Hogue Farm, at 30m AOD, northwards towards the unnamed stream bordering Chippenham Park at 20m AOD, whilst remaining generally flat across Dane Hill and Halfmoon Plantation to the south, at 30m AOD.

2.2.7 A straight tree-lined avenue bisects the agricultural fields within the central section of Sunnica West Site A and forms part of a former carriageway to Chippenham Hall RPG, which is located to the north. This forms part of Chippenham Hall which includes a parkland landscape with mature individual trees.

2.2.8 Landscape features within Sunnica West Site A consist of agricultural fields bound by trees, managed hedgerows, linear tree shelter belts; small woodland and copses, and farm access tracks as shown in **Plates 2-4** and **2-5.**

2.2.9 The southern boundary of Sunnica West Site A, adjacent to the A14 / A11, is formed by a post and rail fence and sporadic sparse vegetation. Sounds Plantation is a deciduous copse and is located towards the eastern extent of Sunnica West Site A.

Plate 2-4. View of the land within Sunnica West Site A from the north-eastern boundary

Plate 2-5. View of the land within Sunnica West Site A from the south-western boundary

2.2.10 At Sunnica West Site B, the Site's landform is influenced by its proximity to the River Snail. The River Snail flows along the western and southern edges of Sunnica West Site B, and under Snailwell Road (see **Plate 2-6**). The landform rises from the River Snail to the eastern edge of Sunnica West Site B, at 15m AOD.

2.2.11 Mature trees are also present with newer tree planting evident along the Chippenham Road.

Plate 2-6. Landscape within Sunnica West Site B

2.2.12 There are no statutory landscape designations such as Areas of Outstanding Natural Beauty, National Parks or locally important landscape areas designated in local development plans within the Order limits or within the Zone of Theoretical Visibility used for the Landscape and Visual Impact Assessment presented at **Chapter 10** of the Environmental Statement **[APP-042]**.

2.2.13 The agricultural land across much of the Order limits results in a generally 'open' character to the landscape. There are notable areas of vegetation, in terms of field boundaries, roadside and residential garden vegetation and woodland blocks, such that the vegetation patterns are varied across the area.

2.2.14 The ‘pine lines’, which are former pine shelterbelts and plantations which were planted in the 18th and 19th centuries to divide and enclose fields, have established successfully in the poor soils and are now features of the local landscape. The ‘pine lines’ are linear rows of tall pine trees which are present along Chippenham Road close to Sunnica West Site A and Sunnica West Site B (see **Plate 2-7**).

Plate 2-7. Example of Pine Lines

2.2.15 The Order limits fall within three National Character Areas (NCAs) defined by Natural England: NCA 46 The Fens, NCA 85 The Brecks and NCA 87 East Anglian Chalk.

2.2.16 The north-west edge of Sunnica East Site A is in NCA 46 The Fens. This is a flat, expansive and low-lying wetland landscape, with extensive vistas to horizons and huge skies. Sunnica East Site B and the Grid Connection Route A are in NCA 85: The Brecks. The land is largely open, gently undulating and low-lying landscape, which is predominantly arable land, consisting of regular field layouts, often defined by Scots pine or hedgerows.

2.2.17 The southern part of the Grid Connection Route A, most of Sunnica East Site A as well as all of Sunnica West Site A, Sunnica West Site B, Grid Connection Route B and Burwell National Grid Substation locations are within NCA 87: East Anglian Chalk. This is a rolling landscape, mostly in arable production and with sparse tree cover. The dykes are key archaeological features, with settlement focused in small towns and villages.

2.2.18 The land within Order limits is also characterised by a number of Landscape Character Types (LCT) defined by the East of England Landscape Framework: LCT Lowland Village Chalklands, LCT Forested Estate Sandlands and LCT Planned Peat Fen.

2.2.19 The majority of the Sites and a small part of Grid Connection Route B are LCT Lowland Village Chalklands. This is an open landscape with long distance views and has been described as “*Low lying, but gently rolling arable landscape, dissected by small streams, with a distinctive pattern of nucleated villages and a*

patchwork of woodlands and shelterbelts…" within the East of England Landscape Framework.

2.2.20 The central part of Sunnica East Site B, Grid Connection Route A and the northern part of Sunnica West Site A are LCT Forested Estates Sandlands. This landscape has a 'blocky' structure as a result of the mix of conifer plantations and open land. The East of England Landscape Framework describes it as a "*relatively simple landscape comprising extensive areas of conifer plantations, arable land and some remnant heaths, reflecting the underlying sandy soils*."

2.2.21 The northern edge of Sunnica East Site A, the majority of the Grid Connection Route B and the Burwell National Grid Substation Extension locations are LCT Planned Peat Fen. This is a flat , low lying and sparsely populated landscape with a grid like pattern of large arable fields bounded by drainage ditches

2.2.22 A number of county and local landscape character typologies have also been identified and are further detailed in **Chapter 10: Landscape and Visual Effects** of the Environmental Statement **[APP-042]**.

Agricultural context

2.2.23 The agricultural context of the Scheme was an important consideration to the design due to the Applicants desire to limit the amount of Best and Most Versatile land (Grades 1 to 3b) within the Order limits. **Appendix 12B: Soils and Agriculture Baseline Report** of the ES **[APP-115]** identifies the various grades of agricultural land across the Sites as a result of soil surveys undertaken. Approximately 96% of the land within the Sites consists of low-lying farmland of agricultural Grades 3b and 4 or is in non-agricultural use. There is no agricultural land of Grade 1 and 2 classification within the Sites, **Table 2-2** below shows the total areas of the various ALC grades.

Table 2-2 Agricultural land classification across the Sites

Agricultural Land Class	Total Area (Ha)	Percentage of the 'Sites' (%)
1	0.0	0.0
2	0.0	0.0
3a	37.3	3.8
3b	493.3	50.3
Grade 4	393.4	40.1
Non-Agricultural	57.0	5.8

2.2.24 Grade 3a land which is defined (along with Grades 1 and 2) as best and most versatile agricultural land is at three locations within the Sites, covering a total area of 37.9ha. The largest block of Grade 3a land is found to the east of the A11 at Sunnica West Site A. Two more small areas of Grade 3a land located within Sunnica East Site B, to the north of the Site, near Worlington and within Sunnica West Site A, in the south western area of the Site.

2.2.25 Crops grown across the Sites include cereals, onion, sugar beet and potato. With the exception of cereals, the crops are heavily reliant on irrigation for yield and quality. Pig farming is also within the Sites.

2.2.26 Non-agricultural land within the Sites comprises of farm buildings and hard standing as well as woodland, tree belts and a reservoir.

Transport and Access

Road network

2.2.27 The Order limits are located in close proximity to the Strategic Road Network (SRN) as shown on **Figure 2-3**. This was an important consideration in the design as the proximity to the SRN reduces the amount of traffic required to use the local road network and the disruption to local traffic, as far as practical. The A11 runs in a northeast-southwest direction between London and Norwich to the east of the majority of Sunnica West Site A, with a small section of Sunnica West Site A located to the east of the A11 accessed from Dane Hill Road. The A11 is a dual carriageway with two lanes in each direction to the north of A14 Junction 38.

2.2.28 There are three junctions along the A11 between the A11/A14 J38 and Red Lodge. The junction closest to the A11/A14 J38 provides a northbound on-slip and off-slip to/from the A11 providing access to La Hogue Road which is north of Sunnica West Site A. At Red Lodge, there is a two-lane northbound off-slip from the A11 that connects to Elms Road. The A11 northbound can be accessed via a slip road from the B1085/Newmarket Road Roundabout, whereas the A11 southbound off-slip and southbound on-slip are accessed via the Newmarket Road/Warren Road roundabout.

2.2.29 The A14 has three lanes in each direction to the south of Junction 38 along the Newmarket Bypass, with no hard shoulder and the national speed limit applies. The A14/A11 J38 provides connections between A14 eastbound to the A11 northbound and A11 southbound to the A14 westbound. To the south of Junction 38 the A11 becomes the A1304 providing a route into Newmarket.

2.2.30 To the west of the Sites the A142 is a single carriageway that runs in the north-south direction where the national speed limit applies. This is to be crossed by Grid Connection Route B.

2.2.31 The local road network comprises of several local roads connecting the local villages in the area surrounding the Sites.

2.2.32 Beck Road bisects Sunnica East Site A and runs south from Isleham joining Isleham Road. Sheldricks Road runs parallel to the western boundary of Sunnica East Site A.

2.2.33 Within to vicinity of Sunnica East Site B the local transport network comprises relatively narrow local roads including Elms Road (which bisects the Site to the south); Newmarket Road (which runs from Worlington to Red Lodge and bisects Sunnica East Site B to the east); Golf Links Road to the north-east of the Sunnica East Site B; and B1102 Freckenham Road which runs along the north-west of Sunnica East Site B.

2.2.34 At Sunnica West Site A the local road network includes Chippenham Road to the west and La Hogue Road along the northern boundary. To the east of the A11 part of the Site is located south of the B1085 Dane Hill Road.

2.2.35 At Sunnica West Site B the A142 is located approximately 370m to the west and Snailwell / Fordham Road to the south-west. The railway line connecting Newmarket to Ely runs in a north-west direction from Newmarket, approximately 600m to the south-west of Sunnica West Site B.

2.2.36 Existing access onto the Sites within the Order limits consists of gated access to fields and entrances to farm holdings.

2.2.37 Along the Grid Connection Route A and Grid Connection Route B there are intermittent points where the cable corridors are located near to the local highway network and existing farm tracks. Grid Connection Route A crosses the B1102 (Freckenham Road), Elms Road and the B1085. Grid Connection Route B crosses Chippenham Road between Sunnica West Site A and Sunnica West Site B; Fordham Road and A142 and railway line at this location; B1102/Ness Road and Broads Road.

2.2.38 Burwell National Grid Substation will be accessed off Weirs Drove utilising the existing Burwell National Grid Substation access. Burwell National Grid Substation. Burwell Substation National Grid Substation - Option 2 will be accessed off Newnham Drove.

Public Rights of Way

2.2.39 The Scheme is located in a rural area with limited footways and pedestrian and cycle facilities. This is due to the rural nature of the surrounding local roads; which are lightly trafficked. The existing Public Rights of Ways (PRoW) network is illustrated in **Figure 2-4**.

2.2.40 Three PRoW are located within the boundary of Sunnica East Site A. PRoWs W-257/007/0, W-257/002/X and W-257/002/0 cross the south-west part of the site between Beck Road and Mortimer Lane.

2.2.41 One PRoW is located within the boundary of Sunnica East Site B. PRoW W257/003/0 runs along the south-western boundary of the site from Turnpike Road at Red Lodge in the south-east to Badlingham Manor in the north-west. An unclassified road (U6006), which is a publicly accessible route, including for equestrians, extends northwards from Elms Road to Worlington. To the west of Sunnica East Site B the B1102 provides a footway for a section along the northern carriageway, alongside vehicles travelling eastbound, which is approximately 2m wide between North Street and East View. To the north, on Newmarket Road, footways are provided on both sides of the carriageway between the B1102 and The Paddocks.

2.2.42 Grid Connection Route A crosses the Chippenham footpath 49/7 before passing approximately 20m west of the Chippenham Gravel Pit CWS and crossing the B1085.

2.2.43 No PRoWs are situated within the boundary of Sunnica West Site A or Sunnica West Site B. Snailwell 5 bridleway (PRoW) runs along the south-west boundary of Sunnica West Site A.

2.2.44 There are six PRoWs that intersect Grid Connection Route B. Towards Snailwell, footpath PRoW 204/1 connects Snailwell with Chippenham Park. Heading west

from Sunnica West Site B, footpath 92/19 runs through agricultural fields between Fordham and Snailwell. Footpath 35/10 and 35/11 run between Wicken and Burwell passing through several agricultural fields. There are also two PRoWs 35/6 and 35/7 running between Burwell and Reach, again through agricultural land.

2.2.45 There are no on or off-road cycling facilities in the vicinity of the Order limits.

Public transport

2.2.46 Given the relatively rural location of the Order limits public transport services and infrastructure are limited within the Order limits and provide infrequent services.

2.2.47 The nearest stops to Sunnica East Site A are located over a 1km to the north east in Isleham. The bus stop nearest to Sunnica East Site B is located on B1085 Turnpike Road in Red Lodge approximately 500m to the south-east. To the north Worlington is served by the bus service 16/16A as well as bus services 357 and 956. A pair of bus stops are located in Freckenham to the west of Sunnica East Site B and are located at the junction of B1102/The Street.

2.2.48 The closest bus stops to Sunnica West Site A and B are located in Snailwell on Newmarket Road, where a pair of bus stops are provided. These are approximately 600m to the west of Sunnica West Site A and 750m to the south of Sunnica West Site B.

2.2.49 The two closest train stations are located in Kennett and Newmarket, and both stations are on the line between Ipswich and Cambridge.

Flood Risk and Water Resources

2.2.50 The majority of the land within the Order limits lies within Environment Agency Flood Zone 1 which is at low risk of flooding. The flood risk of the Order limits is an important design consideration to allow siting of critical infrastructure. In addition, locating the Sites in predominantly Flood Zone 1 it reduces the potential to impact on the flood risk and flood storage within and surrounding the Sites. Three main rivers, the River Lark, the Lee Brook and the River Snail, and one ordinary watercourse (a tributary of the Lee Brook) do however intersect with the Sites and therefore small areas of the Sites adjacent to these rivers and the watercourse lie within Environment Agency Flood Zones 2, 3a and 3b. Grid Connection Route B also crosses a number of watercourses including the Burwell Lode, New River, and the River Snail, as well as a number of drainage ditches associated with Burwell Fen, Little Fen. It therefore passing through multiple areas of Flood Zones 2 and 3 associated with these watercourses.

2.2.51 The areas for the location of the extension to Burwell National Grid Substation, also lie within Environment Agency defended Flood Zone 3a however more recent mapping undertaken for the East Cambridgeshire Strategic Flood Risk Assessment in 2017 show that the majority of this area is now Flood Zone 1.

2.2.52 The Order limits are underlain by chalk, classified as a Principal aquifer. The chalk aquifer is overlain by River Terrace deposits which is classified as a Secondary A aquifer. Groundwater flow in the chalk aquifer flows to the north west towards the River Great Ouse at an elevation of approximately 5-20m AOD

from Sunnica East Site A in the north to Sunnica West Site A in the south. **Figures 2-5** and **2-6** show the flood zones across the Sites.

Heritage

2.2.53 The Order limits are located within an area with a variety of heritage assets of varying type; significance; and value. Heritage has been critical to the design of the Scheme with a desire from the Applicant to reduce the impact on archaeological and heritage assets within and surrounding the Scheme, as far as practical.

2.2.54 Within the Order limits, at Sunnica West Site A, there are two designated heritage assets – a Scheduled Monument known as the Four Bowl Barrows north of the A11/ A14 Junction A, adjacent to the A11 and a section of the Chippenham Hall Grade II Registered Park and Garden (RPG) known as the Avenue.

2.2.55 Designated assets within the surrounding area of the Order limits which the Scheme could affect the setting of include other Scheduled Monuments; Listed Buildings (of all grades); and Conservation Areas. There are no World Heritage Sites; Protected Wreck Sites; Protected Military Remains, Registered Battlefields within or close to the Order limits.

2.2.56 The nearest designated heritage assets to the Sites are shown on **Figure 2-7** and **Figure 2-8**.

2.2.57 Two Scheduled Monuments are within 1km of the boundary of Sunnica East Site A: these are 'Lime kilns on east side of High Street' in Isleham which is located approximately 850m to the north-west; and the remains of Freckenham Castle which is located approximately 1km south of Sunnica East Site A. The Grade I Church of St Andrews in Isleham is approximately 950m north west of the Sunnica East Site A boundary. Grade II Listed buildings are also concentrated in the villages of Freckenham, Isleham and West Row. Conservation Areas within 1km of the boundary of Sunnica East Site A include Freckenham and Isleham.

2.2.58 At Sunnica East Site B the 'Bowl barrow on Chalk Hill, 380m north-west of Chalkhill Cottages' Scheduled Monument is located immediately south of the eastern boundary of the site. The Grade I Church of All Saints in Worlington, is approximately 570m north of the boundary of Sunnica East Site B. The remaining listed buildings are Grade II and are concentrated in the village of Worlington to the north of Sunnica East Site B and the hamlet of Badlingham to the south.

2.2.59 In addition to the 'Four bowl barrows north of the A11/A14 junction, part of the Chippenham barrow cemetery' Scheduled Monument within the Sunnica West Site A boundary, there are other Scheduled Monuments within 200m of the site boundary. 'The Rookery bowl barrow, part of the Chippenham barrow cemetery, 250m south of Waterhall Farm' Scheduled Monument is within 200m, to the south of the A11; and the 'Hilly Plantation bowl barrow, part of the Chippenham barrow cemetery, 500m south-west of Waterhall Farm' Scheduled Monument, is also within 200m, to the south of the A11.

2.2.60 The Grade II Chippenham Hall is located to the north of Sunnica West Site A within the walled boundary of the park along with Grade II* lodges and gateway and Grade II* stable block. A Grade II Listed Building Waterhall Farmhouse is

approximately 120m east of the site on the southern side of the A11 to the west. Conservation areas within 1km of Sunnica West Site A include Snailwell to the west and Newmarket to the south.

2.2.61 At Sunnica West Site B, a Scheduled Monument which is the 'Roman villa south of Snailwell Fen' is located along the western boundary of Sunnica West Site B, on the western side of the River Snail.

2.2.62 Two Grade II* listed buildings within Snailwell are approximately 600m to the south of Sunnica West Site B - the Church of St Peter and the Old Rectory - and the Grade II listed building of Fordham Abbey is approximately 750m north west of Sunnica West Site B. Snailwell Conservation Area is located to the south of Sunnica West Site B.

2.2.63 The character of the historic landscape has been eroded and influenced by later developments associated with mineral workings; industrial and leisure uses and the A11 and A14 which are located to the east of the Sites.

2.2.64 The Applicant has undertaken a search of the Historic Environment Record; and undertaken geophysical surveys and field evaluation of the land within the Order limits. This has identified various below ground archaeological assets of varying significance within the Sites, Grid Connection Route A and Grid Connection Route B, including assets of high value.

Ecology

2.2.65 Ecology has been a key consideration in design development of the Scheme with a desire from the Applicant to reduce the impact on ecology receptors within and surrounding the Scheme, as far as practical. Within a 10km radius of the Sites there are seven statutory designated nature conservation sites of international importance. These include the Fenland Special Areas of Conservation (SAC) which is comprised of three individual sites: Wicken Fen, Woodwalton Fen, and Chippenham Fen, with the latter being adjacent to the Order limits at Sunnica West Site B. Chippenham Fen is also designated as a Ramsar site and National Nature Reserve (NNR). The Breckland Special Protection Areas (SPA) is located approximately 1.4km to the north-east of Sunnica East Site B.

2.2.66 Eight Site of Special Scientific Interest (SSSIs) are within 2km of the Order limits, these being Chippenham Fen and Snailwell Poor's Fen SSSI (which is part of the Fenland SAC); Snailwell Meadows SSSI; Brackland Rough SSSI; Red Lodge Heath SSSI; Cherry Hill and The Gallops, Barton Mills SSSI; Newmarket Heath SSSI; Devil's Dyke SSSI; and Breckland Forest SSSI.

2.2.67 Of these SSSIs those nearest to the Sites include Snailwell Meadows SSSI which is located directly to the south of Sunnica West Site B; Red Lodge Heath SSSI which is located approximately 750m to the south-east of Sunnica East Site B and approximately 740m east of Grid Connection Route A; and Cherry Hill and The Gallops, Barton Mills SSSI is located approximately 1km east of Sunnica East Site B. Newmarket Heath SSSI is also located approximately 1.1km to the south of Sunnica West Site A, beyond the A14.

2.2.68 In terms of locally designated sites, within 2km of the Order limits there are no local statutorily designated sites. These are, however, local non statutory

designated sites which includes 26 County Wildlife Sites (CWS); two sites designated as Protected Road Verge for their ecological importance and one Roadside Nature Reserve. Seven CWS are located within 100m of the Order limits and four CWS are within the Order limits. These are:

a. Worlington Heath County Wildlife Site (CWS) and Badlingham Lane CWS which are within the north-west part of Sunnica East Site B;

b. Part of the Snailwell Grasslands and Woods CWS which is along the River Snail is within the western part of Sunnica West Site B; and

c. Havacre Meadows and Deal Nook CWS which is crossed by Grid Connection Route A.

2.2.69 **Figures 2-5 and 2-6** show the designated biodiversity sites closest to the Sites and existing vegetation.

2.2.70 There is no ancient woodland or veteran trees within the Order limits.

2.2.71 A desk study and ecological surveys have also been undertaken to gather baseline information on protected and notable species and habitats within and in the vicinity of the Order limits. This has included surveys of aquatic species; terrestrial habitats and flora; hedgerows; terrestrial invertebrates; Great Crested Newt; reptiles; wintering (non breeding birds); breeding birds; bats; and riparian mammals. The results of the surveys are presented in **Appendix 8B to 8L** of the Environmental Statement **[APP-078 to APP-091]**. Of note is the presence of stone curlew birds and their habitat within the Sites which are functionally linked with the Breckland SPA.

Existing infrastructure

2.2.72 Existing infrastructure has been a key consideration in design development to ensure that conflicts between existing infrastructure and the Scheme is avoided. Utilities including two high-pressure gas pipelines managed by Cadent Gas and a pipeline managed by Anglian Water run beneath Sunnica East Site A and Sunnica East Site B.

2.2.73 In addition, the Environment Agency operates a groundwater support scheme (GWSS) in the area. The GWSS is used to support flows in tributaries of the River Granta and the Lodes at times of low flow. It consists of a network of six boreholes and associated pipelines and outfalls. A pipeline associated with the GWSS crosses Sunnica West Site A, transporting groundwater abstracted to the south of the Site to discharge points around Chippenham Fen to the north.

Minerals and waste context

2.2.74 The land uses within the vicinity of Sunnica East Site B and Sunnica West Site A include mineral extraction and waste management uses. The mineral and waste context has been considered within the design development to avoid conflicts within the Scheme and mineral and waste management uses.

2.2.75 The operational quarry covers approximately 70ha of land which can be accessed from Elms Road, approximately 700m north of the A11 Red Lodge

junction. The consent for quarry extraction expires on 30 October 2025, after which it will be restored in accordance with an approved restoration plan. Extension areas to the quarry are allocated in the Suffolk Minerals and Waste Local Plan which was adopted in July 2020.

2.2.76 A small area of land within Order limits at the eastern edge of Sunnica East Site B coincides with the planning permission boundary for Worlington Quarry. The Quarry was originally consented under planning permission reference F/04/227 (9 August 2004), which is for the extraction of sand and gravel and the importation of material for restoration. Various amendments have been approved since that original planning permission was granted. These include F/15/1386, which made amendments to the phasing of the Quarry.

2.2.77 The area where the land within the Sunnica Order limits and the Worlington Quarry planning permission boundary coincide is within 'phase 5' of the quarry. In its Planning Statement that forms part of Planning Permission F/09/0752/CC, the quarry owner and operator, Frimstone Ltd, states that: *"Recent geological investigations in phase 5 of the operation have concluded that the majority of the phase is either barren or contains mineral not of sufficient quality or quantity to be economically viable. A small triangular area of phase 5 adjoining phase 4 is currently being worked but it is intended to move working to phase 6 in September of this year as identified on the enclosed phasing plan."*

2.2.78 The small triangular section that the quarry owner intended to work is located outside of the Sunnica Order limits, on the opposite (eastern) corner of quarry phase 5. Therefore, although the western part of phase 5 of the quarry is within Sunnica Order limits, there appears to be little prospect of mineral being extracted from this land as the quarry owner has found it to be not of sufficient quantity and quality to be viable to work. This was also stated by Frimstone in a meeting held between the Applicant and Frimstone in July 2019. The Scheme is therefore not likely to result in the loss of any mineral that would otherwise be extracted from the quarry. It would also not affect the restoration of areas of the quarry that are to be worked for mineral.

2.2.79 In order to provide clarity on the future of the land within Order limits that also forms part of the Worlington Quarry planning permission, the DCO seeks powers to disapply restoration planning conditions in this area given the land would form part of the Scheme proposals.

2.2.80 The Suffolk Minerals and Waste Local Plan (adopted 2020) identifies 250m safeguarding zones around existing and proposed minerals and waste sites. Sunnica East Site B is within this zone for the existing infrastructure at Worlington Quarry and also for an existing metal recycling facility adjacent to the southeast as well as Barton Mills Chalk Quarry to the east.

2.2.81 The Sites, Grid Connection Route A, and Grid Connection Route B are also within consultation areas for safeguarded minerals and waste sites identified in the Cambridgeshire and Peterborough Minerals and Waste Local Plan (adopted July 2021). This includes Kennett landfill; a waste management site at Kennett Plantation Farm; and a Transport infrastructure Area off Snailwell Road and Burwell Waste Water Treatment Works.

2.2.82 The Order limits also fall within the safeguarded areas for mineral resources of sand and gravel and chalk within the Suffolk Minerals and Waste Local Plan (adopted 2020) and the Cambridgeshire and Peterborough Minerals and Waste Local Plan (adopted July 2021)

Other existing and future land uses

2.2.83 Other existing and future land uses are located within and close to the Order limits. These include other energy developments and residential and employment planning permissions and development allocations. These have been considered within the design development to avoid conflicts within the Scheme.

2.2.84 Sections 2 and 6.13 of the Planning Statement **[APP-261 to APP-263]** discusses the status of these.

2.2.85 Of note is the proposed Anglian Water pipeline running between Bexwell and Bury St Edmunds. Although this has not yet received planning permission, Anglian Water has confirmed that the proposed pipeline crosses Grid Connection Route A between Sunnica East Site B and Sunnica West Site A at Badlingham Farm. Its route also passes to the west of Sunnica East Site A.

2.3 Opportunities and constraints of the Scheme Location and Context

2.3.1 The Scheme's location and its context presents a number of opportunities and constraints which the design team have considered carefully in the development of the Scheme's design. In summary these opportunities and constraints have included:

a. The excellent topographical and landform characteristics of the Sites which meet the requirements of the Scheme to generate significant amounts of electricity and be able to store it;

b. The majority of the land being low grade, non best and most versatile (BMV) agricultural land.

c. The Sites being predominantly within Environment Agency Flood Zone 1 with only small areas of the Sites within Flood Zones 2 and 3.

d. The Scheme location being predominantly rural and open in character but with industrial uses and the Strategic Road Network influencing the landscape character

e. The lack of internationally and nationally designated biodiversity sites within the Order limits but the presence of such sites within close proximity.

f. The presence of stone curlew birds linked to the Breckland SPA and locally designated biodiversity sites within the Sites.

g. The presence of existing PRoW within and in close proximity to the Order limits.

h. The absence of any nationally or locally designated landscapes.

i. The presence of existing vegetation within the Sites which can be retained and used to screen the Scheme.

j. The presence of heritage assets within and surrounding the Order limits and the design needing to respond to impacts on the setting of these assets and, also where possible, limit direct impacts on below ground archaeology.

k. The good transport access for construction, operational maintenance and decommissioning, with the Sites being adjacent to or in close proximity of A14 and A11 part of the Strategic Road Network.

l. Residential receptors being within 500m of the Sites with the exception of Sunnica West Site B.

m. The limited land use conflicts with respect to local development plan allocations and displacement of existing uses.

n. The need to avoid existing infrastructure and provide appropriate easements.

2.4 Design Policy Context

Overview

2.4.1 The following sections provide a summary of the planning policy context and other supporting guidance in relation to design. This includes policies set out in the National Policy Statements for Energy, the National Planning Policy Framework (NPPF) and relevant local planning policy considered important and relevant to the Secretary of State's decisions. Other sections of the DAS and supporting plans demonstrate how the Scheme complies with these policies. The Planning Statement **[APP-261 to APP-263]** presents compliance with all planning policy considered relevant to the Scheme.

National Policy Framework

Overarching National Policy Statement for Energy (EN-1) (NPS EN-1)

2.4.2 NPS EN-1 was published in July 2011. The document sets out national policy for nationally significant energy infrastructure.

2.4.3 Section 4.5 of NPS EN-1 sets out the principles of good design that should be applied to all energy infrastructure. NPS EN-1 expects that by applying good design, "*sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible"* will be produced (Paragraph 4.5.1). Paragraph 4.5.1 does however acknowledge that energy infrastructure "will often limit the extent to which *it can contribute to the enhancement of the area"* Paragraph 4.5.4 also expects the Secretary of State to consider the *"ultimate purpose of the infrastructure"* and its *"operational, safety and security requirements which the design has to satisfy"* in considering whether good design can be demonstrated.

2.4.4 Paragraph 4.5.3 expects energy infrastructure developments to be sustainable and be as "*attractive, durable and adaptable (including taking account of natural hazards such as flooding) as they can be"* taking into consideration regulatory

requirements and other constraints. Applicants are required to consider "*both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located) as far as possible*". Paragraph 4.5.3 also adds that "*siting of developments relative to existing landscape character, landform and vegetation"* may be an opportunity for applicants to demonstrate good design given some energy infrastructure is limited in terms of physical appearance. It also states that the "*design and sensitive use of materials in any associated development such as electricity substations will assist in ensuring that such development contributes to the quality of the area*".

2.4.5 NPS EN-1, paragraph 4.5.4, requires applicants to explain how the design process was conducted and how the design has evolved, including the reasons for selecting the preferred option where options have been considered.

2.4.6 Adapting to climate change is also identified by NPS EN-1 at section 4.8 as a key consideration of design. Specifically, paragraph 4.8.5 expects Applicants to consider the impacts of climate change "*when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure*".

National Policy Statement for Renewable Energy Infrastructure (EN-3))(NPS EN-3)

2.4.7 NPS EN-3 was published in July 2011. Together with NPS EN-1 this document provides the primary basis for decision making on applications for nationally significant renewable energy infrastructure.

2.4.8 Although solar is not specified as a particular technology covered by NPS-EN3, the policy does identify the need for renewable energy generation and is therefore considered relevant to the Scheme.

2.4.9 NPS EN-3, paragraph 2.4.1, refers back to section 4.5 of NPS EN-1 for setting out the principles of good design that should be applied to all energy infrastructure. Paragraph 2.4.2 does state that proposals for renewable energy infrastructure should specifically "*demonstrate good design in respect to landscape and visual amenity, and in the design of the project to mitigate impacts such as noise and effects on ecology"*.

National Policy Statement for Electricity Networks Infrastructure (EN-5) (NPS EN-5)

2.4.10 NPS EN-5 was published in July 2011. Together with NPS EN-1 this document provides the primary basis for decisions taken with respect to electricity networks infrastructure. This is considered relevant to the Grid Connection Routes proposed and the substations proposed as part of the Scheme.

2.4.11 Paragraph 2.4.1 and 2.4.2 of NPS EN-5 advise that with regard to electricity infrastructure the resilience of this infrastructure to climate change, for example how it would be resilient to flooding should be demonstrated.

National Planning Policy Framework (NPPF)

2.4.12 The latest version of the NPPF was published in July 2021. The document sets out the government's planning policies for England and how these are expected to be applied. Chapter 12 of the NPPF explains how development can achieve well-designed places. It should however be noted that these policy requirements are aimed at regionally and locally significant development rather than NSIPs.

2.4.13 Paragraph 126 highlights that "*the creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve"* and that a key aspect of achieving sustainable development is good design.

2.4.14 Paragraph 130 expects the planning system to permit new development which:

a. will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development;

b. are visually attractive as a result of good architecture, layout and appropriate and effective landscaping;

c. are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities);

d. establish or maintain a strong sense of place, using the arrangement of streets, spaces, building types and materials to create attractive, welcoming and distinctive places to live, work and visit;

e. optimise the potential of the site to accommodate and sustain an appropriate amount and mix of development (including green and other public space) and support local facilities and transport networks; and

f. create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion and resilience.

2.4.15 Paragraph 132 of the NPPF expects applicants to discuss early design proposals with local planning authorities and local communities. The views of the local community should be taken into account in the evolution of design. Applications which can *"demonstrate early, proactive and effective engagement with the community"* are also to be considered more favourably.

2.4.16 Paragraph 134 requires the refusal of planning permission where development is not well designed "*especially where it fails to reflect local design policies and government guidance on design, taking into account any local design guidance and supplementary planning documents such as design guides and codes."* It requires significant weight to be given to:

a) development which reflects local design policies and government guidance on design, taking into account any local design guidance and supplementary planning documents such as design guides and codes; and/or

b) outstanding or innovative designs which promote high levels of sustainability, or help raise the standard of design more generally in an area, so long as they fit in with the overall form and layout of their surroundings.

2.4.17 Paragraph 152 expects the planning system to help to *"shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources"*. At paragraph 131 trees are also recognised as helping to mitigate and adapt to climate change. It expects trees to be incorporated into developments; that there are measures to maintain them in the long term and that wherever possible existing trees are retained.

2.4.18 The NPPF at paragraph 154 also requires new development to be planned for in ways that avoid increased vulnerability to the range of impacts arising from climate change. Relevant local planning policies also expect new developments to demonstrate climate change adaptation

Draft National Policy Statements

2.4.19 The Government is currently reviewing and updating the Energy NPSs. It is doing this in order to reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the Energy NPS review process, the Government published a suite of Draft Energy NPSs for consultation on 6 September 2021. Section 4.6 of Draft Overarching National Policy Statement for Energy (EN-1) (Draft NPS EN-1) sets out the principles of good design that should be applied to all energy infrastructure. This largely mirrors Section 4.5 of NPS EN-1, with the exception of the below modifications.

2.4.20 Paragraph 4.6.2 of Draft NPS EN-1 suggests applicants consider how 'good design' can be applied to a project during early stages of project, including development of design principles at the outset.

2.4.21 Paragraph 4.6.3 of Draft NPS EN-1 recommends that applicants embed opportunities for nature inclusive design in the design process.

2.4.22 Paragraph 4.6.4 of Draft NPS EN-1 emphasises that wider impacts such as landscape and environmental impacts will be important factors in the design process, and that assessment of impacts must be for the whole design life of the project.

Local planning policy framework

2.4.23 **Table 2-3** below provides an overview of the design related policies identified in the relevant local development plans.

Table 2-3 Relevant design related local planning policy

Policy Document	Policy	Summary
East Cambridgeshire Local Plan 2015	Policy ENV 2: Design	This policy expects development to be designed to a high quality which enhances and complements local distinctiveness and public amenity relating well to existing features. Planning permission is to be refused where design fails to have regard to local contact and does not take advantage of opportunities to preserve, enhance or enrich the character; appearance and quality of an area. Design principles are set out in the policy and include making efficient use of land; retaining existing important landscaping and natural and historic features and include landscape enhancement; protecting residential amenity from significant detrimental effects; the location, layout, scale, form, massing, materials and colour of buildings should relate sympathetically to the surrounding area and each other; protection of public rights of way; and incorporating sustainable construction principles and methods. All proposals for new development should aim for reduced or zero carbon development in accordance with the zero carbon hierarchy: first maximising energy efficiency and then incorporating renewable or low carbon energy sources on-site as far as practicable.
	Policy ENV4: Energy and Water Efficiency and Renewable Energy in Construction	
Forest Heath Local Development Framework: Core Strategy Development Plan Document 2001-2026	Policy CS4 Reduce Emissions, Mitigate and Adapt to future Climate Change	This policy promotes and encourages all development proposals to deliver high levels of building sustainability in order to avoid expansion of the districts ecological footprint and to mitigate against and adapt to climate change. All new development proposals will be required to demonstrate how it minimises resource consumption, minimises energy consumption compared to the current national and regional minimum requirements and how it is located and designed to withstand the longer term impacts of climate change. This policy expects high quality design that reinforces local distinctiveness. Will not accept design that does not demonstrate it has regard to local context and fails to enhance the character, appearance and environmental quality of an area. Encourages innovative design addressing sustainable design principles.
	Policy CS 5: Design Quality and Local Distinctiveness	
Forest Heath and St Edmundsbury Local Plan: Joint Development Management	Policy DM2: Creating Places - Development Principles and Local Distinctiveness	This policy expects proposals to recognise and address the key features, characteristics, landscape/townscape character, local distinctiveness and special qualities of the area and/or building. It sets out principles which require development design to preserve or enhance views in and out of Conservation Areas, provide open space recreation and leisure facilities as appropriate; maintain or create a sense of place and/or local character; not adversely affect the natural and historic environment and local amenity; produce

Policy Document	Policy	Summary
Policies Document 2019	Policy DM7: Sustainable Design and Construction Policy DM8: Low and Zero Carbon Energy Generation Policy DM44 Rights of Way	designs which are safe and prevent crime and protect public health; produce designs that respect the character, scale, density and massing of the locality; and produce designs, in accordance with standards, that maintain or enhance the safety of the highway network. This policy expects all developments to adhere to the principles of sustainable design and construction and optimise energy efficiency through the use of design, layout, orientation, materials, insulation and construction techniques. This policy expects renewable energy development to be designed and sited to minimise intrusion and visual impact. This policy protects existing and proposed rights of way unless diversions can be arranged and seeks improvements to rights of way to enable new or improved links to be created within and between settlements and provide access to the countryside or green infrastructure.
Fordham Neighbourhood Plan	Policy 2: Character & Design	This relates to new development within the Parish of Fordham which Grid Connection Route B crosses to the south. The policy sets out design principles which include expecting the design of developments to include a robust green landscaping scheme that links well with surrounding green infrastructure and not result in unacceptable impacts on the amenity of occupants of neighbouring or nearby properties;.

Design Guidance

2.4.24 The following sets out the design guidance which is considered relevant to the design of the Scheme.

East Cambridgeshire Supplementary Planning Documents

East Cambridgeshire District Council Climate Change Supplementary Planning Document

2.4.25 East Cambridgeshire District Council Climate Change Supplementary Planning Document (SPD) was adopted in February 2021 and provides guidance for its local plan policies relating to Environment and Climate Change. The SPD under its policy CC1: Reducing carbon dioxide emissions and maximising all aspects of sustainable design and construction expects developments to outline the approach to minimising energy through design; maximising energy efficiency through design and through site waste management and use of materials. SPD policy CC3: Resilient and adaptable design expects development to design proposals to be adaptable to future social, economic, technological and environmental requirements including being resilient to flood risk from all forms of flooding.

East Cambridgeshire District Council Renewable Energy (Commercial Scale) SPD

2.4.26 This SPD was adopted in 2015 and provides guidance for renewable energy proposals including solar. It expects proposals to justify their location and design and for consideration to be given to the design of associated buildings and infrastructure on the landscape and neighbouring land. Detail relating to the design of associated infrastructure including any access roads/tracks and security fencing is also expected.

East Cambridgeshire District Council Design Guide SPD

2.4.27 This SPD was adopted in 2012 and provides design guidance for development within East Cambridgeshire. It sets out design principles which relate principally to buildings but does include advice relating to the implementation of sensitive landscaping.

National Infrastructure Commission: Design Principles for National Infrastructure

2.4.28 Design Principles for National Infrastructure are a set of key design principles developed by the National Infrastructure Commission's (NIC) design group guide the planning and delivery of major infrastructure projects.

2.4.29 The design principles are focussed on the following themes:

a. Climate: Mitigate greenhouse gas emissions and adapt to climate change

b. People: Reflect what society wants and share benefits widely

c. Places: Provide a sense of identity and improve our environment

d. Value: Achieve multiple benefits and solve problems as well

2.4.30 In terms of climate, design principles include helping to achieve net zero greenhouse gas emissions by 2050 or sooner and support an environmentally sustainable society. Good design also incorporates flexibility, to enable development to adapt over time and be resilient to climate change.

2.4.31 Under the theme of People, the NIC expects infrastructure to be designed for people to easily navigate and use helping to improve the quality of life of everyone who may encounter the infrastructure. This can mean accessible, enjoyable and safe spaces. In achieving this the NIC values engagement with the local community affected by projects and expects their views to be taken into account.

2.4.32 Design principles for the theme 'Places' include proposing well-designed infrastructure which makes a positive contribution to local landscapes; supports local ecology; and providing active interventions to enrich ecosystems. A net biodiversity gain should be delivered, contributing to the restoration of wildlife on a large scale while protecting irreplaceable natural assets and habitats.

2.4.33 For the theme 'Value', this expects the implementation of a good design process by "*defining issues clearly from the outset and providing overall direction for*

everyone working on a project". Rigorous opportunities to secure economic, environmental and social benefits should be identified as part of the process and value added to projects which goes beyond the main purpose of the infrastructure.

BRE: Planning guidance for the development of large scale ground mounted solar PV systems published in 2014 by BRE National Solar Centre

2.4.34 BRE's national guidance on large scale ground mounted solar provides best practice planning guidance in respect of how large ground mounted arrays are developed setting out planning considerations and requirements. Although aimed at developments which are of a smaller scale compared to the Scheme requiring planning permission under the Town and Country Planning Act 1990, the guidance sets out key design principles for ground mounted solar development.

2.4.35 These principles include designing schemes which minimise landscape and visual impact; proposing sensitive design with regard to security such as fencing and lighting and using natural existing features where possible; designing schemes on agricultural land which are reversible; increasing the biodiversity value of solar sites; and sensitive planning of developments to avoid heritage and flood risk impacts.

Solar Trade Association: 10 commitments for solar energy developers (2013)

2.4.36 In 2013 the Solar Trade Association published 10 commitments for solar energy developers. The following commitments are related to land use and design:

a. We will focus on non-agricultural land or land which is of lower agricultural quality.

b. We will be sensitive to nationally and locally protected landscapes and nature conservation areas, and we welcome opportunities to enhance the ecological value of the land.

c. We will minimise visual impact where possible and maintain appropriate screening throughout the lifetime of the project managed through a Land Management and/or Ecology plan.

d. We will encourage land diversification by proposing continued agricultural use or incorporating biodiversity measures within our projects.

3 Design Evolution

3.1 Overview

3.1.1 The outline design framework for the Scheme is the result of an iterative design development process which addresses the key opportunities and challenges of the Scheme and the context and setting within which it is located.

3.1.2 The design team has worked collaboratively to provide an integrated and responsive design which has been informed by stakeholder engagement. This engagement has been carried out in accordance with the following principles:

a. seeking feedback from a wide range of stakeholders to inform each stage of the design process and ensuring that comments received have been taken into consideration, in accordance with requirements of the PA 2008 and Ministry of Housing, Communities and Local Government (MHCLG) guidance; and

b. building long-term relationships with key stakeholders to better understand their views.

3.1.3 Paragraph 4.5.4 of NPS EN-1 requires applicants to demonstrate in their application how the design process was conducted and how the proposed design evolved. The Secretary of State should, however, take into account the "*ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements, which the design has to satisfy"*.

3.1.4 To address this policy requirement this chapter of the DAS explains the process and how the design has evolved through extensive engagement. The key stages of the Scheme's design are summarised in **Figure 3.1** below. The design process at each stage is then set out in the following sections of this chapter.

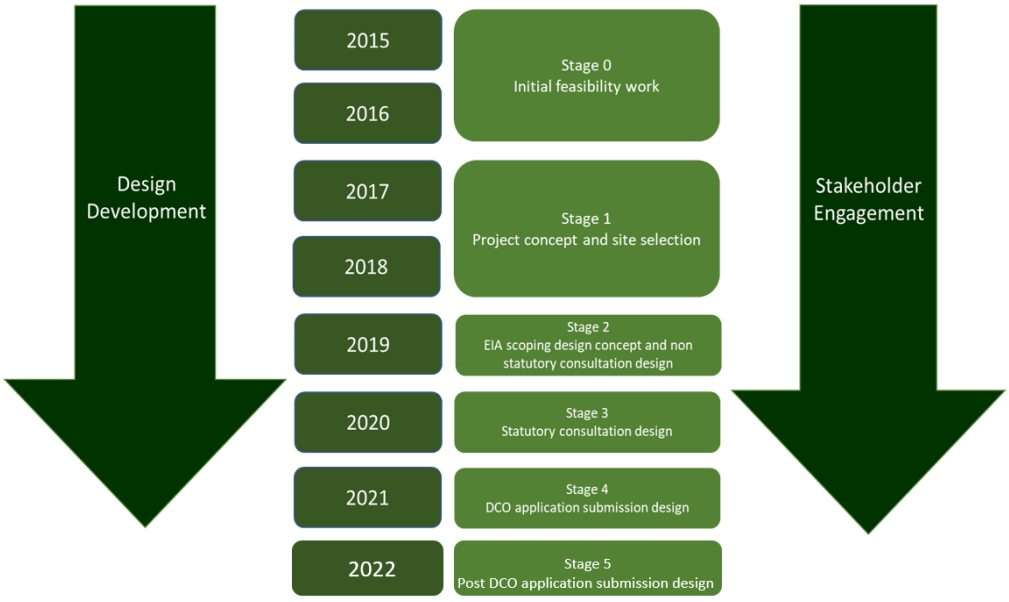

Figure 3-1 Scheme design stages

3.1.5 Details of the consultation process and how feedback has been considered is presented in the **Consultation Report [APP-026]** which accompanies the DCO application.

3.2 Stage 0 Initial feasibility work

3.2.1 The aim of the initial feasibility work was to identify possible optimal locations for large scale solar development with available transmission network capacity and a point of connection that, if necessary, could be reinforced. During this stage the Applicant identified East Anglia to be an optimal region within the UK to locate a large scale solar farm given its high levels of irradiation compared to other parts of the UK and its topography which is predominantly made up of and characterised by large flat open land.

3.2.2 Discussions took place with UK Power Networks, Eastern Power Networks and National Grid to identify available capacity in the region which led to confirmation that there was available capacity on the National Electricity Transmission Network at Burwell National Grid Substation, in Cambridgeshire. It was identified that this location could undergo reinforcement which could be completed within a reasonable timeframe and cost and the Applicant secured a connection agreement with National Grid. From the Burwell National Grid Substation a 15km radius area of search was considered by the Applicant to be the maximum viable distance for a large scale solar development to be located. Further details of the search area for determining the Scheme's location are set out in **Appendix 4A Alternative Sites Assessment [APP-036]** of the Environmental Statement (ES).

3.3 Stage 1 Initial concept and site identification

3.3.1 The initial concept of the Scheme was determined by the Scheme's functional requirements which have been driven by the Government's key legislative and policy aims for the energy sector. These are

a. decarbonisation (the importance of deploying zero-carbon generation assets at scale);
b. security of supply (geographically and technologically diverse supplies); and
c. affordability.

3.3.2 In addition, the physical characteristics of the land and the need to protect and conserve its environmentally sensitive features were key considerations for the identification of land for the Scheme. This included identifying areas of land that had optimal topography within which to locate a large scale solar development maximise energy generation but which could be screened to reduce landscape and visual impact; minimising the loss of best and most versatile agricultural land; minimising land use conflict; and avoiding energy infrastructure being sited within sensitive environmentally designated areas.

3.3.3 The Scheme's key objectives are therefore to:

a. provide a large scale solar farm to address the urgent need to reduce carbon emissions and decarbonise the UK's electricity supply thereby making a significant contribution to the UK's legal requirements as well as providing low cost energy for consumers (in accordance with parts 2 and 3 of NPS EN-1); and

b. provide secure and sustainable energy infrastructure that utilises the topographical benefits of existing landform (in accordance with NPS EN-1 paragraph 4.5.3) to maximise energy generation.

3.3.4 Further details regarding the need for the Scheme are provided in the **Statement of Need [APP-260]** and details of the site selection process are provided in **Chapter 4: Alternatives and Design Evolution** of the ES **[APP-036]** and the **Appendix 4A: Alternative Sites Assessment** of the ES **[APP-054].**

3.3.5 Addressing the objective of security of supply and maximising energy generation, the Scheme's initial design proposed that the Scheme would generate but also store at least 500MW of electricity. A battery energy storage system was therefore proposed as part of the Scheme, giving the ability to provide peak generation and grid balancing services to the electricity grid by allowing excess electricity generated either from the solar PV panels, or imported from the electricity grid, to be stored in batteries and dispatched when required.

3.3.6 Constraints mapping was undertaken to determine the key spatial environmental constraints in the 15km area of search. Discussions with local landowners within the area of search also took place.

3.3.7 Following this, the land area initially identified for the Scheme was approximately 1172 hectares and covered two areas; the 780ha Sunnica East Site; and 392ha Sunnica West Site. At this stage the Sunnica East Site consisted of five parcels of land separated by minor roads. Sunnica West was split across two areas; Sunnica West Site (north) and Sunnica West Site (south). **Figure 3-2** illustrates the land area initially identified. The land area required was based on the need to generate and store at least 500MW of electricity.

3.3.8 At this stage three cable route corridors were also identified to connect the land identified for the solar development with the Burwell National Grid Substation (See **Figure 3-3**). A high level evaluation of these options was undertaken on the basis of technical and engineering requirements; planning and environmental constraints; and land use and ownership constraints. Further details of this evaluation are provided in **Chapter 4: Alternatives and Design Evolution** of the ES **[APP-036]**. The evaluation confirmed that the preferred Cable Corridor, Option 1, performed better than Options 2 and 3 in terms of planning and environmental constraints and land use and ownership constraints. The two discounted options had a greater likelihood of directly impacting ecological and heritage designations and affecting more landowners and the strategic highway network. One Cable Corridor was therefore presented for consultation at Stage 2 but with two options for crossing the railway. See **Figure 3-4** and discussion in section 3.4 below.

3.4 Stage 2 EIA Scoping design concept and non statutory consultation design

3.4.1 In March 2019 the project team submitted a request to the Secretary of State for an Environmental Impact Assessment (EIA) scoping opinion under regulation 10(1) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. The design concept presented in the EIA scoping report, which accompanied that request, was developed following initial environmental surveys; initial consultation with statutory consultees; and was informed by the project team's experience working on a number of other solar farm projects in the UK. Detailed environmental masterplanning at this stage had not yet commenced due to ongoing survey work and early engagement.

3.4.2 Design options associated with the functional aspects of the Scheme were considered at this stage and discussed in the EIA scoping report:

a. **Panel orientation** – solar PV panels facing to the south, which is commonly seen on existing UK solar farms or alternatively solar PV panels orientated east and west, which is less commonly seen on existing UK solar farms.

b. **Battery storage connection** - Two types of connection were under consideration: Alternating Current (AC) coupling connection and Direct Current (DC) coupling connection.

3.4.3 The preferred cable route corridor was presented at the EIA Scoping stage as two parts as shown on **Figures 3-4** and **3-5** and described below:

a. **Grid Connection Route A –** connecting the Sunnica East Site to Sunnica West Site A; and

b. **Grid Connection Route B –** connecting Sunnica West Site A to Sunnica West Site B; and connecting Sunnica West Site B to Burwell National Grid Substation. The route connecting Sunnica West Site B to Burwell National Grid Substation presented two options for crossing the railway line west of Sunnica West Site B, named Railway Crossing 1 and Railway Crossing 2.

3.4.4 Following the receipt of the EIA scoping opinion in April 2019, the design was developed further taking into account feedback received and ongoing landowner and other stakeholder discussions.

3.4.5 Refinements were made to Grid Connection Route A. This was as a result of more land at Sunnica West Site A being incorporated. Grid Connection Route B was also amended in response to the EIA Scoping process to avoid the sewage treatment works to the north of Burwell.

3.4.6 During the EIA Scoping process and prior to the commencement of non-statutory consultation, the project team held various meetings with the local planning authorities, local highway authorities, Highways England (now National Highways) and Historic England prior to the non statutory consultation to introduce the Scheme concept and explore issues such as highway impacts and access and the historic context.

3.4.7 The Applicant conducted its non-statutory consultation between 17 June 2019 to 28 July 2019. This presented information including:

a. the background to the Scheme;
b. the land proposed for the Scheme including the Cable Corridors;
c. technology to be used in the Scheme and need for development; and
d. information regarding the consenting process; Scheme timeline and EIA process.

3.4.8 The Applicant presented an indicative Scheme boundary to show the maximum extent of the Scheme including the preferred Cable Corridor (see **Figure 3-5**). Three sites covering approximately 1,373ha: Sunnica East Site (approximately 809ha) Sunnica West Site A (formerly Sunnica West Site (south)) (approximately 503 ha Sunnica West Site B (formerly Sunnica West Site (north)) (approximately 61 ha) were shown at this stage.

3.4.9 Discussions with the operators of Worlington Quarry identified the need to reduce the eastern area of Sunnica East due to the removal of the existing operational area of Worlington Quarry and other areas close to the A11 with conflicting land uses following discussions with West Suffolk Council.

3.4.10 As a result of the outcome of ecological surveys and the need for additional solar PV, land to the north-west of Sunnica East (now Sunnica East Site A) was added for habitat mitigation, if required, and to compensate for the loss of the eastern area of Sunnica East. Land to the east of Sunnica West Site A around La Hogue Farm shop and to the south of the A11 was added to provide environmental mitigation and deliver the Scheme's objectives regarding electricity generation.

3.4.11 The Applicant sought feedback on the potential considerations relevant to the design of Sunnica East, the design of Sunnica West, the design of the Cable Corridor presented, environmental impacts; the proposed undergrounding of cable and the indicative route; whether the BESS should be concentrated at a single location or distributed across several locations; and any local enhancements that could be included in the Scheme.

3.4.12 During the non-statutory consultation period the Applicant held further meetings with key stakeholders. This included workshops with relevant local authority officers; Natural England, the Suffolk Wildlife Trust; Bedfordshire, Cambridgeshire and Northampton Wildlife Trust, RSPB; and Historic England in relation to landscape and built heritage; ecology; public rights of way; and archaeology. These discussions primarily focussed on the approaches to assessments and further survey work, including the scope of viewpoints for the landscape and visual impact assessment.

3.5 Stage 3 Statutory consultation design

3.5.1 This stage of the design process involved moving from a design concept to the development of a draft strategic environmental masterplan for the Scheme, taking into consideration feedback received during the non-statutory consultation.

3.5.2 The following key concerns relating to design were raised by consultees at the non-statutory consultation stage:

a. The scale of the proposed Sunnica Energy Farm with feedback suggesting it was too large;

b. The proximity of parts of the Scheme to nearby homes;

c. The visual impact of the Scheme and need for the Scheme to include extensive screening/mitigation; and

d. The impact on wildlife.

3.5.3 The feedback also highlighted support for undergrounding the cables required for the Scheme and that the Scheme should deliver biodiversity net gain and retain and enhance PRoW. Further details of the feedback received and how the Applicant responded to this are presented in the **Consultation Report [APP-026]**.

3.5.4 The Design team considered this feedback and began the development of the strategic environmental masterplan. The design principles which influenced the masterplanning process included:

a. consideration of scaling of the Sites and the need to reduce visual impact for development in relation to nearby settlements by providing offsets and buffer zones and using the existing landform;

b. a sequential approach to siting the principal components of the Scheme with regard to flood risk – firstly avoiding development in Flood Zones 2 and 3, then, if this was not possible avoiding vulnerable components being located within Flood Zones 2 and 3 and also ensuring no above ground permanent development in the functional floodplain (Flood Zone 3b);

c. careful siting of the Scheme in the landscape by the structures being offset from pine lines, vegetation patterns and road networks;

d. conserving existing landscape, ecology and archaeological features (including below ground) across the Sites; and

e. the development of new green infrastructure within the Sites and creation of permissive routes to provide linkages between the Sites and settlements.

3.5.5 A vision for the environmental design of the Scheme was introduced in meetings held during late 2019 with local authority landscape, ecology and rights of way officers; and Natural England, the Suffolk Wildlife Trust; and Bedfordshire, Cambridgeshire and Northampton Wildlife Trust. This set out that the Scheme would aim to deliver a new network of environmental features which would also deliver a range of ecosystem services, incorporating biodiversity, heritage, landscape and access.

3.5.6 In terms of ecological enhancement, the Applicant committed at this stage to provide a minimum of 10% biodiversity net gain as part of the Scheme and to increase the range of habitats and species.

3.5.7 Key objectives of the landscape design strategy were developed at this stage. These included that the landscape design should:

a. help to integrate the Scheme and provide positive contributions to the landscape, by contributing to climate change mitigation and adaptation (see **Plate 3-1**);

b. deliver a green infrastructure approach to consider the multiple benefits that the Scheme can deliver, in line with the Cambridgeshire and Suffolk green infrastructure strategies;

c. respond to and aim to enhance the landscape character, amenity, cultural and natural heritage aspects;

d. take into consideration the landscape character and assist in the delivery of landscape guidelines and recommendations within Natural England's Statements of Environmental Opportunity and local planning policy; and

e. reinforce and create new connections through the landscape to be used and enjoyed by local communities.

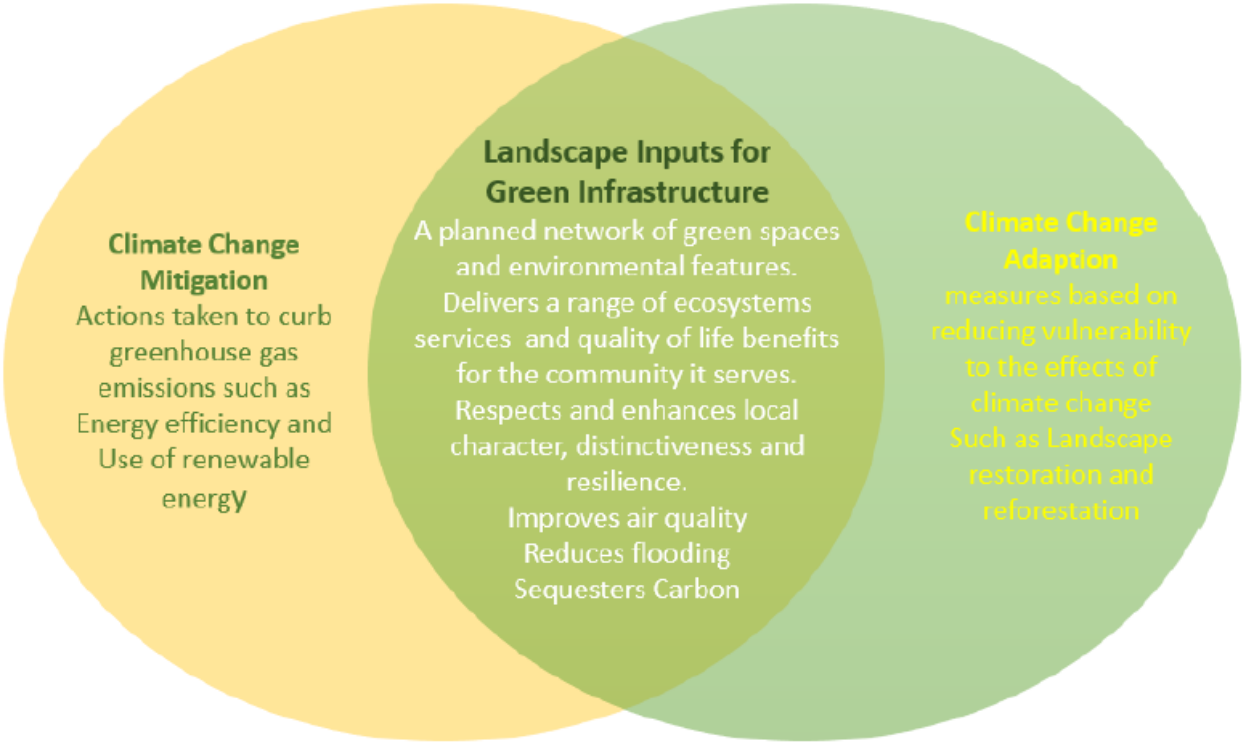

Plate 3-1. Green Infrastructure Strategy

3.5.8 Other design changes were identified following further survey work; ongoing engagement; and feedback from the non-statutory consultation. These included changes to Sunnica East to remove land use conflicts such as the existing Worlington Quarry operations and sites proposed for extensions to Worlington Quarry following discussions with the mineral operator regarding the programme for mineral extraction and thus impact on its mineral operations.

3.5.9 The Scheduled Monument (Bowl barrow on Chalk Hill) within Sunnica East was removed from the Order limits. This had originally been retained as land for ecological mitigation, but it was decided that this would be removed in response to feedback from the EIA scoping and non-statutory consultation.

3.5.10 Land to the north-west of Sunnica East (now Sunnica East Site A) was added for habitat mitigation, if required, and to compensate for the loss of habitat in the eastern area of Sunnica East to address changes as a result of landowner discussions. Land was retained to accommodate a cable route crossing linking what is now Sunnica East Site A and Sunnica East Site B. Additional land was included to the north west of Sunnica East (now Sunnica East A) within the land holding already within the Order limits presented at this stage. These changes were to accommodate environmental mitigation areas particularly for stone curlew and deliver the Scheme's objectives regarding maximising electricity generation.

3.5.11 Changes were also made to Sunnica West Site A to the south of the A11 and around the La Hogue Farm shop. The latter providing additional environmental mitigation and additional electricity generation in line with the Scheme's objectives. **Figure 3-5** shows the changes in terms of land area from EIA scoping to the non-statutory consultation.

3.5.12 During this stage, the options associated with solar PV orientation and battery storage connection were evaluated and preferred options chosen.

3.5.13 The east-west configuration was discounted based on operational and biodiversity constraints. For east-west configuration there is a 14.8% less yield in terms of electricity generation using east-west compared to south-facing. Less biodiversity benefits would be generated because there is more land take with east-west whereas south-facing would allow greater amounts of land between the solar PV arrays such that grass will be able to grow and provide ecological benefits for the lifetime of the Scheme. It was also considered likely that there would potentially be more Heavy Goods Vehicle (HGV) movements per square metre than a south facing configuration due to more PV per square metre.

3.5.14 Regarding the battery storage connection, the Applicant considered that, although similar in terms of costs, DC-coupling was identified as having far greater potential landscape and visual impacts than AC coupling. Therefore, having regard to the potential landscape and visual impacts of DC coupling, and having regard to the non-statutory consultation responses received regarding visual impact, AC-coupled was selected.

3.5.15 Further functional design options for the Scheme were considered during this stage:

a. **Heights for battery storage** – the Applicant originally proposed the height of the battery storage at 10m to allow for the containers which house the batteries to be mounted on top of each other. To reduce landscape and visual impacts the height has now been reduced to six metres. Six metres still allows for the height of a standardised battery storage container, which most technologies use, with some headroom to accommodate all potential technology providers. This height also retains flexibility to enable the containers to be mounted on some form of raised structure or foundations to enable cables to enter from the underside. Heating and cooling infrastructure could also be installed on the top of the containers if necessary.

b. **Solar PV array height** - the proposed solar module racking height was originally 3.5m to accommodate three panels in portrait; however, this was

reduced to two panels in portrait meaning the racking height could reduce to up to 2.5m in height. This minimises the potential visual impact of the Scheme.

3.5.16 Regarding the Cable Route Corridor, following the non-statutory consultation, meetings were held with Network Rail and other stakeholders to discuss Grid Connection Route B and particularly the two options crossing the railway. This resulted in the removal of the southern of the two options presented during the non-statutory pre-application consultation and an increase in land area for the northern crossing to allow for different crossing point options to the north. This was in response to feedback regarding the proximity of the route to the existing level crossing and potential conflict with existing land uses to the south of Fordham. West of the railway crossing the Grid Connection Route B was widened to provide options for crossing agricultural land at this location which was also in response to discussions with landowners.

3.5.17 Options for the siting of the extension to the Burwell National Grid Substation was also considered at this stage. The extension is required to provide a transformer compound to transform the 132kV export voltage from the Sites to the National Grid 400kV connection voltage. Therefore, the location needed to be in close proximity to the existing substation to reduce the disturbance of land; cost and, in terms of design engineering feasibility, for ease of connection to the existing infrastructure. Following discussions with National Grid, three options for the location of this extension were presented and assessed in the Preliminary Environmental Information (PEI) Report. These are shown on **Figure 3-6**.

3.5.18 The draft strategic environmental masterplan shown in **Figures 3-7** and **3-8** illustrates the Design team's response to the feedback and further analysis of the context of the Sites and the design principles discussed at paragraph 3.5.3. The overarching design decisions made included:

Sunnica East Site A and Sunnica East Site B

a. Siting the primary construction compound, BESS and substation in E33 adjacent to reservoirs and Lee Farm, so that their massing and land uses are perceived in the context of existing infrastructure features and built structures in the landscape. In terms of appearance, the Applicant committed, at this stage, to proposing tonal rendering using shades which would integrate the structures within the surrounding landscape and so help to reduce their perceived overall mass, which will be secured through the Design Principles in Appendix B.

b. Siting the BESS and substation in E18 so that it is enclosed and screened by existing woodland along its northern edges and in part by roadside vegetation adjacent to Elms Road to its south-east. In terms of appearance, the Applicant committed, at this stage, to proposing tonal rendering using shades which would integrate the structures within the surrounding landscape this will be secured through the Design Principles in Appendix B. Additionally, these land uses and proposed structures are consolidated in proximity to Worlington Quarry and Bay Farm solar farm, so that the cumulative impact of these land uses are localised within the landscape;

c. Siting the solar PV with offsets from Freckenham, Isleham and Worlington to avoid the Scheme resulting in the physical coalescence of settlements, and offsets from local roads including to the west of Beck Road and Freckenham Road. These road offsets retain views along the road corridor of the churches in Isleham and Freckenham and retain a perception of travelling through the landscape that separates the settlements;

d. Offsets proposed from existing PRoW and recreational routes through the Sites.

e. Providing ecological offset areas principally to provide habitat for stone curlew birds but also to protect below ground archaeology. Retaining existing ecological features and habitats where possible including the retention of all County Wildlife Sites within the Order limits.

f. Conserving the field boundaries and the vegetation patterns, including the pine lines, overall by offsetting the solar panels from the field edges and locating solar PV in smaller field parcels. This would also retain views across the landscape to valued features including the pine lines in long distance views and vegetation adjacent to the Lee Brook;

g. Implementing new woodland and hedgerows to aid in visually screening the Scheme and improving the landscape structure, as well as new native grassland mixes beneath the solar panels to improve the range of fauna and increase the biodiversity across the Sites in comparison to intensive agriculture, including pig farming.

h. Siting vulnerable infrastructure such as substations and BESS outside Flood Zones 2 and 3 and avoiding permanent above ground infrastructure in Flood Zone 3b. Limited solar PV are proposed to be within zones 2 and 3a with panel heights designed to be above flood level in zone 3a.

i. Avoiding infrastructure within high value archaeological mitigation areas identified through geophysical surveys.

j. Proposing a new permissive route between Freckenham and along Beck road and to the south of Worlington connecting with U6006, to enable increased public access across the landscape and respond positively to published Green Infrastructure strategies.

Sunnica West Site A and Sunnica West Site B

a. Siting the primary construction compound and the BESS and substation within W17 at Sunnica West Site A, so that it is in part adjacent to existing structures (agricultural barns which are to be retained) and bordered by the existing mature woodland which aids in screening the structures from the west and in views from the east. In terms of appearance, the Applicant committed, at this stage, to proposing tonal rendering using shades which would integrate the structures in the context of the woodland, to aid in reducing the perceived overall massing of the structures.

b. Conserving the field boundaries and the vegetation patterns by locating the solar panels within the fields and offsetting them from the existing hedgerows

and trees. This also retains views across the landscape to valued features including the Avenue of Chippenham Hall RPG and existing plantations.

c. Implementing new woodland and hedgerows to aid in visually screening the Scheme and reflect the existing vegetation patterns, as well as new grassland mixes beneath the solar panels to improve the range of fauna and increase the biodiversity across the Site in comparison to intensive agriculture.

d. Implementation of appropriate and sensitive screening to also minimise the visual intrusion of the Scheme, while avoiding obscuring or intruding upon views and relationships between heritage assets. This included siting the solar panels away from the Avenue of Chippenham Hall RPG so that new woodland can be implemented.

e. Siting vulnerable infrastructure such as substations and BESS outside flood zones 2 and 3 and avoiding infrastructure in flood zone 3b. Limited solar PV are proposed to be within zones 2 and 3a with panel heights designed to be above flood level in zone 3a.

f. Avoiding infrastructure within high value archaeological mitigation areas identified through geophysical surveys and avoiding any direct impacts on the Scheduled monument within the Order limits with appropriate offsets and screening from this asset.

g. Providing native wetland offsets from Chippenham Fen SSSI and Ramsar and an ecology corridor at Sunnica West Site B to provide continuity of habitat along the River Snail between Chippenham Fen and Snailwell Meadows.

h. Proposing new permissive routes along the Avenue of Chippenham Hall RPG and in the western area of Sunnica West Site A

3.5.19 The Applicant conducted a period of statutory consultation on the Scheme from 22 September 2020 until 18 December 2020.

3.5.20 The purpose of the consultation was to seek the views of statutory consultees and the public on the Scheme including the Sites, Grid Connection Routes and the proposed extension to Burwell National Grid Substation and on the potential impacts of the Scheme during construction, operations, and decommissioning.

3.5.21 The indicative Scheme boundary consulted upon as part of the statutory consultation included four sites covering approximately 1,074 ha; Sunnica East Site A (approximately 222.4ha); Sunnica East Site B (approximately 322.7ha); Sunnica West Site A (approximately 459.8ha); and Sunnica West Site B (approximately 68.8ha).

3.5.22 The draft strategic environmental masterplan for these Sites was presented and referred to as parameter plans which supported the Preliminary Environmental Report provided. An Outline Landscape and Ecological Management Plan (OLEMP) was also provided at this stage. This set out the measures to be implemented for the successful establishment and future management of biodiversity and landscaping works for the Scheme incorporating the design principles and decisions referred to above.

3.6 Stage 4 DCO application submission design

3.6.1 Stage 4 of the design development of the Scheme has been to consider feedback from the statutory consultation stage and subsequent continued consultation with key stakeholders and update the strategic environmental masterplan for the submission of the DCO application.

3.6.2 Feedback received during the statutory consultation from the local community consisted of the following key concerns relating to design:

a. Concern at the scale and the potential that this has to cause impacts on the local landscape;

b. The safety of the BESS component of the Scheme;

c. Proximity of solar PV and BESS to people's homes; and

d. The need to protect local wildlife both during construction and operations.

3.6.3 Specifically in relation to Sunnica East Site A and Sunnica East Site B the following key concerns relating to design were raised by the local planning authorities, parish councils and technical stakeholders:

a. Opposition to field E07 (as shown on the Parameter Plans published during the statutory consultation) being used for solar development and that the developable area for solar development encroaches too close to Isleham

b. The ecological mitigation identified in the non-developed areas does not appear to fit together and should be designed to form a coherent network of habitats.

c. There is a need to incorporate additional woodland to southern and eastern boundaries of the sites and screening needs to be well designed.

d. Field E23 should be removed from the Scheme to avoid habitats and the Scheme should avoid existing habitats more widely.

e. Fencing should be set away from the U6006 recreational route.

f. The scale of these Sites makes it difficult to integrate into the existing landscape.

3.6.4 Specifically in relation to Sunnica West Site A and Sunnica West Site B the following key concerns relating to design were raised by the local planning authorities, parish councils and technical stakeholders:

a. The Scheme encroaches too close to the Avenue at Chippenham Park and more buffer zones should be incorporated between the Scheme and the Chippenham Park Registered Park and Garden;

b. Adjacent areas of county wildlife importance should be retained in full;

c. Sunnica West Site A is a large uninterrupted area of solar development and too large to integrate into the landscape.

3.6.5 Other issues included the use of lighting during operation; the proposed permissive paths in Sunnica East Site B not being considered to be appropriate and the need to avoid impacts on existing infrastructure. Further details of the feedback received and how the Applicant responded to this are presented in the **Consultation Report [APP-026]** and its supporting appendices **[APP-027 to APP-031]**).

3.6.6 Following the statutory consultation period, the Applicant held further meetings with key stakeholders to discuss their feedback. This included with landscape and ecology local authority officers; Natural England, the Suffolk Wildlife Trust; Bedfordshire, Cambridgeshire and Northampton Wildlife Trust, RSPB; and Historic England covering landscape and visual; ecology; and archaeology. Meetings were also held with the Lead Local Flood Authorities; Swaffham Drainage Board; Environment Agency regarding flood risk, drainage and impacts on water resources; Suffolk Fire and Rescue (acting also on behalf of Cambridgeshire Fire and Rescue) regarding BESS safety; and the local highway authorities and National Highways in relation to access. Discussions with landowners within and adjacent to the Order limits also took place.

3.6.7 The Design team considered the feedback from the statutory consultation and subsequent meetings and further developed the Scheme design. The following changes have been made and are shown on **Figures 3-9** and **3-10** illustrating the DCO submission parameters.

a. To address concerns and retain the open character of the landscape between Freckenham and Isleham to the west of Beck Road, solar PV has been removed from E07, so that the land to the west of Beck Road (shown as Eco 1 and Eco 2 on **Figure 3-9**) will be for ecological mitigation whilst also preserving archaeological assets in situ found at Eco1. The area of native chalk grassland to be implemented at Eco1will be via non-invasive methods. At Eco2 it is proposed to provide native chalk grassland and stone curlew plots.

b. Also at Sunnica East Site A the BESS/substation location has been realigned to be set back from Ferry Lane and provide a new archaeological offset as a result of results from an intrusive investigation of this area.

c. At Sunnica East Site B, to address the issue of proximity of the Scheme to residential properties at Worlington and along Freckenham Road and provide additional ecological mitigation, E11 and E23 shown on **Figure 3-7** have been removed and Eco3 proposed as shown on **Figure 3-9.** This will establish a substantial offset from Freckenham Road and Worlington and provide opportunities for stone curlew mitigation. These changes will also reduce the extent of panels viewed by users of the unclassified road known as U6006 which is used by recreational users to head south from Worlington through Sunnica East Site B.

d. A new permissive path has been included across Sunnica East Site B, to provide access from Red Lodge to Worlington and Golf Links Road, via U6006 (see **Figure 3-9**). The Scheme also incorporates additional landscape buffers in relation to the BESS at E18 and E33.

e. To address the issue raised in relation to scale, the extent of proposed solar PV at Sunnica West Site A has been reduced by 87 ha, with the removal of parcels W13, W14 and W16 (see **Figure 3-8**). This provides a greater offset from the formal parkland boundary of Chippenham Park Grade II RPG and the overall massing of the site. The extent of solar PV has also been reduced in W15, with increased setbacks from the local road networks.

f. In response to comments regarding impacts on the Avenue of Chippenham Park RPG, it is proposed to provide, in addition to the landscaping proposed in the solar PV areas which are adjacent, additional infill planting of the Avenue to re-establish this linear feature.

g. To reduce any glint and glare upon horses a temporary fence will also be implemented in relation to views from Godolphin Gallops in W05 at Sunnica West Site A, until the establishment of the proposed landscape planting.

h. At Sunnica West Site B amendments have been made to the layout of the solar PV in W01 to ensure a contiguous area is provided and further increase ecological buffering to the Chippenham Fen Special Area of Conservation, Ramsar and Site of Special Scientific Interest (See **Figure 3-10**).

i. Although not requiring a noticeable layout change, infrastructure including a bunded lagoon are to be included within the three BESS compound locations to mitigate any risk posed by battery fires in response to consultation feedback.

j. Removal of the permissive path along the Chippenham Hall RPG Avenue following feedback from the landowner.

3.6.8 Other feedback received relating to the Cable Route Corridor highlighted the following design related issues:

a. Avoidance of impacts on existing sewerage infrastructure;

b. Avoidance of impacts of Grid Connection Route A on Haveacre Meadows and Deal Nook County Wildlife Site (CWS) as much as possible;

c. The provision of safe methods for crossing the A142 and Burwell Lode should be incorporated into the design as mitigation

d. The cable route should be amended so that it avoids woodland and hedgerows wherever possible; and

e. The cable route must be entirely underground to minimise visual impact

3.6.9 The design team has considered the feedback raised above and undertaken further consultation with landowners; further environmental surveys and engineering reviews of the Cable Route Corridor. This has led to further refinement of the Cable Route Corridor and its width reduced. The cable will be entirely underground and the construction methodology and mitigation measures to be employed are to be included in a Construction Environmental Management Plan (CEMP), secured as a requirement of the DCO. This requires the CEMP to be in accordance with the Framework CEMP submitted with the DCO application.

3.6.10 At the time of the Application and follow discussion with National Grid, there were two proposed options for the Burwell National Grid Substation extension as shown on **Figure 3-11**. Option 1 was located within National Grid land ownership to the east of the existing substation, adjacent to Weirs Drove, approximately 200m west of Burwell. Due to proposed works to be undertaken by National Grid, the orientation for Option 1 had been changed from northwest/southeast to northeast/southwest. This resulted in additional land within the existing Order limits being required for Option 1 to the south east of the area proposed during the PEI Report. Option 2 was to the north of the existing substation approximately 450m from Burwell, adjacent to Newnham Drove. The area identified for Option 2 was larger than identified at the PEI Report stage due to the need for flexibility for micro-siting of Option 2.

3.7 Stage 5 Post-DCO application submission design

3.7.1 Within the application submitted in November 2021, the Scheme included two options for extending the Burwell National Grid Substation to do upgrade the voltage to 400 kV to facilitate connection with the existing Burwell National Grid Substation. Within the Application, these are called Option 1 and Option 2.

3.7.2 Through the relevant representations process, the Applicant was made aware of the representation made by National Grid Electricity Transmission (NGET). This representation stated that one of the two grid connection options, Option 1, is considered ‘not technically feasible’ by NGET.

3.7.3 Following NGET’s representation, the Applicant has revisited the technical solutions available to connect the Scheme into the NGET infrastructure at Burwell to seek to minimise compulsory acquisition requirements and environmental effects. This design work has resulted in the identification of an additional option for the grid connection, referred to as ‘Option 3’. Option 3 involves transforming the 33 kV received from the solar stations within the PV Sites directly to 400 kV within the onsite substation located at Sunnica West Site A, Sunnica East Site A and Sunnica East Site B for export to the Burwell National Grid Substation. These substations are within the same parameters as proposed within the Application documents.

3.7.4 Burwell National Grid Extension – Option 2 has not been discounted at this stage and is retained in the application whilst discussions continue with NGET about Option 3. Once NGET have confirmed that they are content with Option 3, the Applicant would seek to remove Option 2 from the application.

3.8 Summary of design evolution

3.8.1 **Figures 3-2** to **3-11** illustrate the evolution of the Scheme from its inception to the outline design which is proposed to be consented through the DCO. The following principal design changes have been made to refine and improve the Scheme in response to feedback from stakeholders and the local community:

a. The area of land required for the Sites has been reduced by 189ha since the Scheme’s inception to address the concerns of scale and as a result of landowner discussions.

b. The layout of the principal components of the Scheme have had appropriate regard to flood risk ensuring resilience to future climate change impacts.

c. The landscape and ecological design proposed has been refined to provide over 30% of the area of the Sites as green infrastructure, utilising existing landscape and ecological features and habitats and providing mitigation for landscape and visual impacts and impacts on ecological species of the Scheme.

d. The design of the proposed green infrastructure has been refined to reduce visual impact for development in relation to nearby settlements by providing offsets and buffer zones.

e. The siting of infrastructure has been adapted to, where possible, avoid below ground archaeological features and screening refined to minimise the visual intrusion of the Scheme on the setting of heritage assets while avoiding obscuring or intruding upon views and relationships between heritage assets.

f. The inclusion and subsequent refinement of proposed permissive routes to provide linkages across the Sites and between settlements and provide greater access across the local landscape.

g. Consideration of public safety by designing appropriate measures to mitigate risk posed by fire at the BESS compounds.

4 The Outline Design Framework

4.1 Overview

4.1.1 As discussed in section 1.2 of this DAS, solar PV and BESS are rapidly evolving infrastructure and therefore to allow the latest technology to be utilised at the time of construction an outline design has been developed based on design parameters. This section provides details of the outline design framework for the Scheme's principal components and associated development, with the design parameters listed at Appendix B. This will be the basis from which the Applicant will develop the Scheme's detailed design post consent so that it can be constructed.

4.1.2 The Scheme as a whole is proposed for energy generation over an operational lifetime of 40 years.

4.1.3 Design principles associated with scale, layout, appearance and materials of the components of the Scheme have been considered as part of developing the Outline Design Framework.

4.1.4 With regard to appearance and materials, at this outline stage, materials have been chosen for their compliance with their use, their aesthetic value and ease of maintenance, taking into consideration what is currently being used in the solar industry.

4.2 Solar PV infrastructure

4.2.1 The components of the Scheme, which form the generating station are to be located at Sunnica East Site A, Sunnica East Site B, Sunnica West Site A, and Sunnica West Site B.

4.2.2 This is the solar PV infrastructure which includes:

a. Solar PV modules and mounting structures;

b. Solar stations;

c. Solar PV control rooms;

d. Onsite cabling; and

e. Associated ancillary works.

4.2.3 The limits of deviation for the Scheme are shown on the Works Plans **[REP2-005]**. It has been determined utilising the existing field pattern; and through consultation with landowners and utilities asset owners (such as Cadent Gas). Utilities including two high-pressure gas pipelines managed by Cadent Gas and a pipeline managed by Anglian Water run beneath Sunnica East Site A and Sunnica East Site B. Appropriate offsetting from such utilities is secured via the Draft DCO in the form of "protective provisions", which also covers protection for the assets from construction activities (i.e. installing the foundations and mounting structures).

Solar PV modules and mounting structures

4.2.4 In terms of use, the purpose of the solar PV modules is to convert sunlight into electrical current (as direct current (DC)). The mounting structures provide structural support to the modules.

4.2.5 A typical solar PV module is shown in **Plate 4-1**. The modules will either be 'monofacial', meaning that they consist of a series of PV cells (typically 144 cells per module, see **Plate 4-2**) beneath a layer of toughened glass on the upper surface of the module or 'Bifacial' modules which have PV cells and toughened glass on both the upper and lower surface, allowing sunlight to be converted to electricity on both sides of the panel or the Scheme may use a combination of both types of modules. A number of modules will be combined into a string which will be mounted on a rack, see **Plate 4-3**.

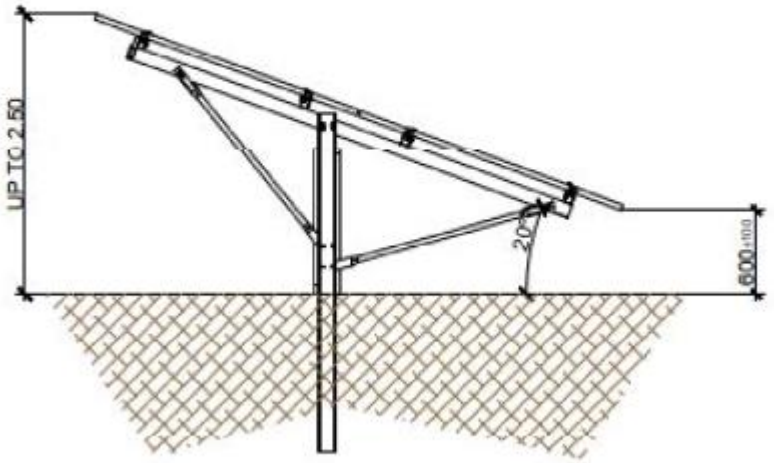

Plate 4-1. Solar Module

Plate 4-2. Illustration of a typical 144 cell solar panel

Plate 4-3. Solar panels with south facing configuration

Solar stations

4.2.6 The solar stations provide equipment to convert and control the electricity produced by the solar PV modules to transfer to the substations: The components of a solar station include:

a. Inverters – equipment required to convert the direct current (DC) electricity collected by the PV modules into alternating current (AC), which allows the electricity generated to be exported to the National Grid, see **Plate 4-4**. These will be accompanied by a weather station tower to measure solar irradiance, ambient temperature, wind direction and wind speed, see **Plate 4-5**.

b. Transformers – equipment required to control the voltage of the electricity generated across each of the Sites before it reaches the substations, see **Plate 4-6**.

c. Switchgear - which is a combination of electrical disconnect switches, fuses, or circuit breakers used to control, protect, and isolate electrical equipment. Switchgear is used both to de-energise equipment to allow work to be done and to clear faults downstream, see **Plate 4-7**.

Plate 4-4. Typical outdoor centralised inverter

Plate 4-5. Weather Station

Plate 4-6. Typical outdoor transformer

Plate 4-7. Outdoor cabin switchgear

Solar PV control room

4.2.7 The solar PV control room will include the operational and monitoring equipment for the Sites.

Onsite cabling

4.2.8 Low voltage onsite electrical cabling is required to connect the PV modules and BESS to inverters, and the inverters to the transformers onsite. Cables for the earthing system and cables for the auxiliary supplies will also form part of the onsite cabling system.

4.2.9 Higher rated (high voltage) cables, 33 kV, are required between the transformers and the switchgears and from switchgears to the onsite substation.

4.2.10 Cabling between PV modules and the inverters will typically be above ground level (along a row of racks), fixed to the mounting structure, and then underground between racks and inverters. All other onsite cabling will be underground wherever possible.

4.2.11 Data cables will also be installed, typically alongside electrical cables in order to allow for the monitoring during operation, such as the collection of solar data from pyranometers [2].

4.3 Onsite substations

4.3.1 Three onsite substations consisting of electrical infrastructure such as the transformers, switchgear and metering equipment required to facilitate the export of electricity to the National Grid are required for the Scheme. They will be located within Sunnica East Site A, Sunnica East Site B, and Sunnica West Site A as shown as Works Nos. 3A, 3B and 3C on the **Works Plans [REP2-005]**. The electrical infrastructure provided within the onsite substations will either enable the upgrade of the 33kV electricity generated by the solar station to:

a. 132kV for distribution to Burwell National Grid Substation Extension – Option 2; or

b. 400kV for distribution directly to Burwell National Grid Substation – Option 3

4.3.2 Each substation will include a control building which will include office space and welfare facilities and may also include operational monitoring and maintenance equipment. Operational monitoring equipment could be housed separately in its own container.

4.4 Burwell National Grid Substation Extension

4.4.1 If Burwell National Grid Substation Extension – Option 2 is required, it would include a transformer compound to transform the 132kV export voltage from the Sites to the National Grid 400kV connection voltage. The option for the Burwell National Grid Extension – Option 2 is to the north of the existing substation approximately 450m from Burwell, on the opposite side of Newnham Drove.

4.4.2 The Burwell National Grid Substation Extensions option is shown as Works No. 5B of the **Works Plans [REP2-005]**.

4.5 Battery Energy Storage System

4.5.1 The BESS provides peak generation and grid balancing services to the electricity grid by allowing excess electricity generated either from the solar PV panels, or imported from the electricity grid, to be stored in batteries and dispatched when required.

4.5.2 There will be three BESS compounds, one at Sunnica East Site A; one at Sunnica East Site B; and one at Sunnica West Site A as shown in Works Nos. 2A, 2B and 2C of the **Works Plans [REP2-005].** Typical battery storage compound configuration is provided in **Plate 4-8**.

[2] An instrument used for measuring solar irradiance on a planar surface.

Plate 4-8. Typical battery storage compound configuration (*image reproduced courtesy of Fluence Energy*).

4.5.3 The batteries will be provided in containers, see **Plate 4-9** for a typical battery storage unit. The containers may be modular and joined depending on equipment choice to be determined at detailed design stage. They will be supported by Battery Stations which will comprise transformer, switchgear, power conversion system (PCS) or inverter, and other ancillary equipment located within compounds. The equipment will either be located outside or housed together within a container.

Plate 4-9. Typical battery storage unit

4.5.4 A heating, ventilation air conditioning (HVAC) or liquid cooling system, to ensure the efficiency of the batteries, will be integrated into the containers or housed separately in its own container or control room. A monitoring and control system is also required to operate, isolate, and control the exported power from the BESS to be integrated with the HVAC system.

4.5.5 For internal fire suppression, an internal sprinkler or mist system will be integrated into each BESS container. The water supply will be located either internally or externally to the BESS container. If external water supply is used, it will either be decentralised and located at each container or centralised with pumping equipment and pipework at a central location(s).

4.5.6 For external fire suppression, external fire fighting water tanks will also be included in each of the BESS compounds. These will either consist of two half capacity rectangular sectional steel panel tanks or two half capacity cylindrical steel tanks.

4.5.7 For fire water containment a sump will be integrated into the BESS container and the BESS area will be bunded linked to a bunded lagoon to capture fire water run-off from external fire water.

4.6 Grid connection cabling

4.6.1 High voltage cables are required to export the electricity produced by Sunnica East Site A, Sunnica East Site B, Sunnica West Site A, and Sunnica West Site B to the Burwell National Grid Substation. The location of the grid connection works is shown as Works No. 4 of the **Works Plans [REP2-005]**.

4.6.2 Joint bays will be required to join sections of cable together. The dimensions are determined by how many circuits will be in the joint bay. Joint bays for the 132 kV cable will have two circuits each with up to three sets of three cables. Jointing bays for the 400 kV cable will have one circuit with one set of three cables.

4.6.3 Fibre bays will be provided. The STAKKAbox™[3] system or similar will be used for the 132 kV cable while the 400 kV cable will be constructed from brick or concrete. Both options will have an access hatch from the surface. The fibre bays for both options will be located in hard surface or at edges of fields with the final location to be determined at detailed design.

4.7 Fencing, Security and Lighting

4.7.1 A security fence will enclose the operational areas of Sunnica East Site A, Sunnica East Site B, Sunnica West Site A, and Sunnica West Site B. The fence will be a ‘deer fence’, up to 2.5m in height (see **Plate 4-10**).

Plate 4-10. Typical deer security fence

[3] STAKKAbox™ is a range of modular and structural preformed access chambers that provide a modern alternative to traditionally brick built chambers.

4.7.2 Pole mounted internal facing closed circuit television (CCTV) systems will be deployed around the perimeter of the operational areas of each Site. CCTV cameras will have fixed view sheds and will be aligned to face along the fence.

4.7.3 If outdoor transformers are used, they will be surrounded by a secure wire mesh fence, to comply with British Standard (BS) EN 62271-1:2017, as shown in **Plate 4-11**. This fence is will be a maximum of 2.5m in height.

Plate 4-11. Typical transformer compound fencing

4.7.4 Fencing around the BESS and the onsite substations and Burwell National Gird Substation Extension will be standard palisade fencing up to 2.5m in height, see **Plate 4-12**.

Plate 4-12. Standard palisade fencing

4.7.5 During operation, permanent lighting with motion sensors will be installed within the substations and BESS compounds, providing a maximum of 50 lux. There will

be no lighting at the perimeter of the Sites. Any night works required on the solar panels during operation will use mobile lighting towers.

4.8 Office/warehouse buildings

4.8.1 Two office/warehouse buildings will be provided for use during operation and will be located at Sunnica East Site A and Sunnica East Site B, see Work Nos. 8A and 8B shown on the **Works Plans [REP2-005].** The offices are anticipated to contain mobile welfare units, canteens, storage and waste skips, parking areas, permanent compound areas, and warehouse facilities for the storage of spare parts.

4.9 Green infrastructure strategy and biodiversity net gain

4.9.1 The Scheme's Green Infrastructure (GI) strategy has been developed following extensive surveys and appraisals of the Order limits; and consultations with relevant stakeholders. The GI strategy has been integral to the overall design for the Scheme. The Applicant committed to provide a biodiversity net gain as part of the Scheme and to increase the range of habitats and species. The Applicant committed to provide a biodiversity net gain as part of the Scheme and to increase the range of habitats and species. The Scheme will provide an approximate net gain in biodiversity of 83% for habitat units, 16% for hedgerow units and 1% for river units, see Biodiversity Net Gain Assessment **[APP-259]** for further information.

4.9.2 Notwithstanding the need to deliver energy generating infrastructure, the Scheme seeks to deliver sustainable design through the implementation of the GI Strategy. The GI Strategy responds to an understanding of the Site's existing sensitivity and interest, landscape character and context, as well as to its ecology and heritage features.

4.9.3 The GI Strategy ensures the establishment of a strong and cohesive framework of landscape, ecological and heritage areas based on the use of the existing important natural features of the Sites.

4.9.4 An Outline Landscape and Ecological Management Plan (OLEMP) has been prepared (**Appendix 10I** of the ES **[REP3-011]).** This document sets out the principles for how the proposed GI strategy will be implemented and managed throughout the operational phase, following the completion of construction. A detailed Landscape and Ecology Management Plan (LEMP) will be produced following the granting of the DCO and prior to the start of construction. The delivery of the measures outlined in the OLEMP is secured by a requirement of the DCO.

5 Access

5.1 Overview

5.1.1 An access strategy has been developed during the design process to ensure safe access and egress to the Order limits. This document sets out the parameters for the access points as well as the maximum and minimum parameters and the phase that a particularly access will be used. This section should be read in conjunction with the Framework Construction Traffic Management Plan (CTMP) and Travel Plan (TP) in Appendix 13C of the Environmental Statement **[EN010106/APP/6.2]** and the Access and Right of Way (ARoW) plans **[REP2-006]** and associated schedules of the DCO. The CTMP and TP provides further information on the proposed accesses across the Order limits and the traffic management measures proposed to ensure safe access and egress to the Order limits throughout the construction, operation and decommissioning phases; while the ARoW plans and associated schedules outlines the locations of the access points.

5.2 Vehicular access

Internal Access

5.2.1 A network of internal roads with access points to provide access during construction, operation and decommissioning will be provided. These are shown indicatively on **Figures 3-9** and **3-10**.

Access to and from the Order limits and the local highway

5.2.2 The access points to the Order limits are shown on the ARoW Plans **[REP2-003]** which accompany the Application. These are also shown indicatively on **Figure 5-1** to **5-6** of this report. There are five categories of access as outlined below and in Appendix B:

a. Access points required during all Scheme phases i.e. construction, operation and decommissioning;

b. Access points required during construction and decommissioning phases only;

c. Access points required during operation only;

d. Access points required during construction and decommissioning phases only, but retained for emergency vehicles only during operation; and

e. Access points required during construction and operation only.

5.2.3 Table B-9 in Appendix B: Design Principles provides further detail on which access are required during the different Scheme phases.

5.3 Public access – permissive paths

5.3.1 Incorporated into the Scheme design are three permissive routes which are illustrated on **Figure 3-10** (indicative location shown, the final location subject to landowner agreement) which will be secured through **Appendix 10I: OLEMP** of the Environmental Statement **[REP3-011]**.

5.3.2 The routes will be made accessible for all but 1 day a year; when they will be closed. The routes will neither be surfaced or bound to retain the existing field character.

5.3.3 These permissive paths will enable increased public access across the landscape of the local area and thus respond positively to local GI strategy and local planning policies relating to rights of way. The paths proposed are:

a. A new permissive path adjacent to Beck Road at Sunnica East Site A increasing the recreational value across Sunnica East Site A and providing increased connectivity between Freckenham and the southern edge of Isleham;

b. A new permissive path across Sunnica East Site B, to provide access from the existing unclassified road (U6006) across the north of Sunnica East Site B to connect with Golf Links Road; and

c. A new permissive path adjacent to Elms Road and around the perimeter of Sunnica East Site B, which will connect U6006 with PRoW W-257/003/0 which runs to Red Lodge.

6 Conclusions

6.1.1 This Design and Access Statement has been prepared to accompany the application for a DCO for the Scheme. It has provided information regarding the context of the Scheme's location; how the design has evolved, including how it has been influenced by planning policy and stakeholder engagement; and the proposed outline design solution including access.

6.1.2 The design team has worked collaboratively to provide an integrated and responsive design which has been informed by stakeholder engagement. This engagement has been carried out in accordance with the following principles:

a. seeking feedback from a wide range of stakeholders to inform each stage of the design process and ensuring that comments received have been taken into consideration, in accordance with requirements of the PA 2008 and MHCLG guidance; and

b. building long-term relationships with key stakeholders to better understand their views.

6.1.3 The design has evolved over seven years, from Initial Feasibility Stage in 2015 to post-DCO application submission design in 2022 to meet the Schemes objectives.

6.1.4 Key design and access features of the Scheme illustrate good design and the delivery of sustainable development including adaptation to future climate change in accordance with NPS EN-1, EN-3 and NPS EN-5 and the NPPF. In summary the key features include:

a. The area of land required for the Sites has been reduced by 189ha since the Scheme's inception to address the concerns of scale and as a result of landowner discussions.

b. The layout of the principal components of the Scheme have had appropriate regard to flood risk ensuring resilience to future climate change impacts.

c. The landscape and ecological design proposed has been refined to provide over 30% of the area of the Sites as green infrastructure, utilising existing landscape and ecological features and habitats and providing mitigation for landscape and visual impacts and impacts on ecological species of the Scheme.

d. The design of the proposed green infrastructure has been refined to reduce visual impact for development in relation to nearby settlements by providing offsets and buffer zones.

e. The siting of infrastructure has been adapted to, where possible, avoid below ground archaeological features and screening refined to minimise the visual intrusion of the Scheme on the setting of heritage assets while avoiding obscuring or intruding upon views and relationships between heritage assets.

f. The inclusion and subsequent refinement of proposed permissive routes to provide linkages across the Sites and between settlements and provide greater access across the local landscape.

g. Consideration of public safety by designing appropriate measures to mitigate risk posed by fire at the BESS compounds.

6.1.5 An access strategy has been developed during the design process to ensure safe access and egress to the Order limits. Five categories of access points have been provided as outlined below:

a. Access points required during all Scheme phases i.e. construction, operation and decommissioning;

b. Access points required during construction and operational phases only;

c. Access points required during operation only;

d. Access points required during construction and operational phases only, but retained for emergency vehicles only during operation; and

e. Access points required during construction and operation only.

Appendices

Appendix A Supporting Figures

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Grid Connection Route A

Sunnica East Site A

Sunnica East Site B

Grid Connection Route A

Grid Connection Route B

Sunnica West Site B

Grid Connection Route B

Burwell National Grid Substation Extension - Option 2

Sunnica West Site A

Burwell National Grid Substation Extension - Option 1

East Cambridgeshire District

West Suffolk District

East Cambridgeshire District

0 500 1,000 1,500 2,000m

N

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LEGEND

The Order Limits

Local Authority Boundary

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2-1
ORDER LIMITS

Drawn	Checked	Approved	Date
LL	DW	NC	21/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:52,000

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LEGEND

- The Order Limits
- Burwell National Grid Substation
- 15km Area of Search

Slope Gradient (%)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- >3

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
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Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 2-2
TOPOGRAPHY

Drawn	Checked	Approved	Date
LL	DW	NC	03/11/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:42,000

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60589004_ES_DAS_002	0

0 0.5 1 1.5 2 2.5km

N

570000 570000 560000 560000

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Grid Connection Route A

Sunnica East Site A

Sunnica East Site B

Grid Connection Route A

Grid Connection Route B

Sunnica West Site B

Grid Connection Route B

Burwell National Grid Substation Extension - Option 2

Burwell National Grid Substation Extension - Option 1

Sunnica West Site A

A11

A142

A14

A14

East Cambridgeshire District

West Suffolk District

East Cambridgeshire District

0 500 1,000 1,500 2,000m

N

560000 565000 570000

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LEGEND

- The Order Limits
- Local Authority Boundary
- Public Highway within Scheme

NOTE:
Public highways run through the Sunnica East Site, which are not part of the site boundary. These have been digitised based on the 1:1250 scale OS Mastermap.

Small areas of the Order limits are shown on some small sections of roads where works will need to be undertaken to accommodate construction traffic.

High voltage cables will be required to cross internal roads and to connect areas of the sites throughout. These are not shown on the plans.

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
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Client
SUNNICA LTD

Project Title
sunnica

Drawing Title
FIGURE 2-3
LOCAL HIGHWAY NETWORK

Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

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60589004	1:52,000

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W-398/026/0
W-398/005/0
W-398/004/0
W-398/003/0
W-398/030/0
W-398/002/0
W-398/001/0
W-398/030/0
W-398/030/0
136/3
136/2
136/4
136/18
136/19
Beck Road
W-578/001/0
W-578/004/0
W-578/002/0
W-578/003/0
W-578/007/0
W-128/002/0
W-128/001/0
W-578/006/0
W-128/007/0
W-257/007/0
W-257/002/X
B1102
W-257/002/0
W-257/001/0
W-257/008/0
W-257/010/0
Elms Road
W-585/005/0
W-257/003/0
W-257/006/0
W-585/007/0
92/21
92/16
92/19
49/3
49/2
49/1
49/7
49/9
W-257/004/0
W-312/004/0
137/3
137/2
35/10
35/4
35/3
35/11
35/6
35/6
35/12
35/14
35/7
35/15
35/13
W-411/019/0
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W-411/027/0
204/1
Chippenham Road
35/42
35/7B
35/41
35/16
W-411/025/0
35/17
35/18
35/21
35/20
35/25
35/22
W-411/022/0
204/2
204/3
35/24
35/29
204/5

0 1,000 2,000 3,000 4,000m

N

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LEGEND

- The Order Limits
- Public Highway within Scheme
- Public Right of Way

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
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Project Title

Drawing Title
FIGURE 2-4
EXISTING PUBLIC RIGHTS OF WAY

Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

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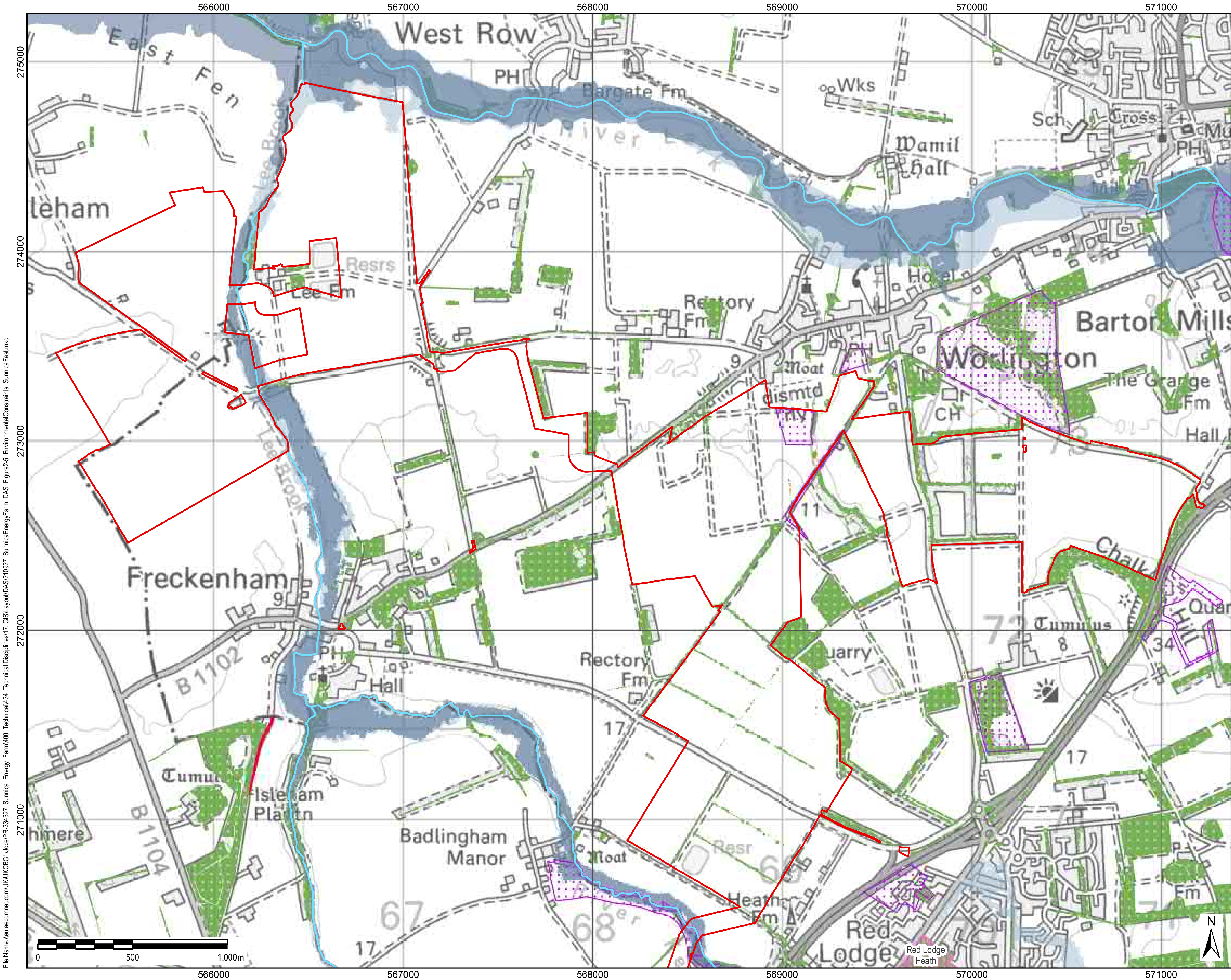

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LEGEND

- The Order Limits
- River
- Protected Road Verge
- County Wildlife Site
- Site of Special Scientific Interest
- Flood Zone 3
- Flood Zone 2
- Existing Vegetation

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2-5
SUNNICA EAST SITES A AND B
ABOVE GROUND
ENVIRONMENTAL CONSTRAINTS

Drawn	Checked	Approved	Date
LL	DW	NC	08/10/2021

AECOM Internal Project No.	Scale @ A3
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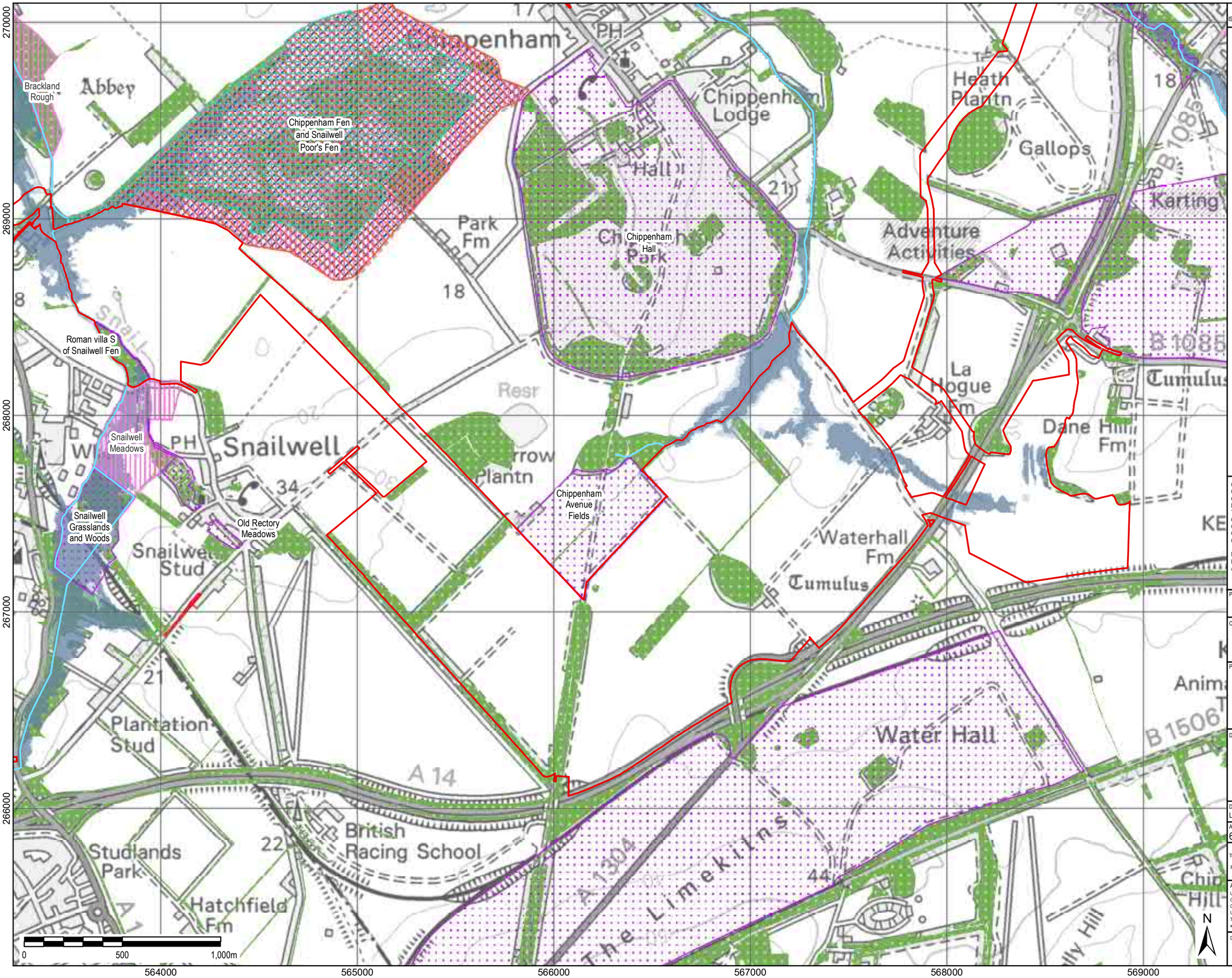

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LEGEND

- The Order Limits
- River
- Protected Road Verge
- County Wildlife Site
- National Nature Reserve
- Special Areas for Conservation
- Site of Special Scientific Interest
- Ramsar
- Flood Zone 3
- Flood Zone 2
- Existing Vegetation

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 2-6
SUNNICA WEST A AND B
ABOVE GROUND
ENVIRONMENTAL CONSTRAINTS

Drawn	Checked	Approved	Date
LL	DW	NC	08/10/2021

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LEGEND

- The Order Limits
- 1km Study Area
- Public Highway within Scheme

Designated Asset

- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Scheduled Monument
- Conservation Area
- Registered Park and Garden
- xx Listed Building Reference
- xx Conservation Area Name
- xx Scheduled Monument Reference

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Sheet Layout

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica

Drawing Title
FIGURE 2-7
DESIGNATED HERITAGE ASSETS WITHIN 1KM OF SUNNICA EAST SITES A AND B

Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

AECOM Internal Project No.	Scale @ A3
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LEGEND

- The Order Limits
- 1km Study Area
- Public Highway within Scheme

Designated Asset

- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Conservation Area
- Registered Park and Garden
- Scheduled Monument
- xx Listed Building Reference
- xx Conservation Area Name
- xx Scheduled Monument Reference

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Sheet Layout

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 2-8
DESIGNATED HERITAGE ASSETS WITHIN 1KM OF SUNNICA WEST SITES A AND B

Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:25,000

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Sunnica East

Sunnica West Site B

Sunnica West Site A

0 500 1,000m

N

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LEGEND

EIA Scoping Scheme Boundary (No Cable Route)

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 3-2
INITIAL LAND AREA IDENTIFIED

Drawn	Checked	Approved	Date
LL	DW	NC	29/09/2021

AECOM Internal Project No.: 60589004
Scale @ A3: 1:50,000

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LEGEND

- Pre-Scoping Scheme Boundary
- Cable Route 1
- Cable Route 2
- Cable Route 3

NOTE:
Public highways run through the Sunnica East Site, which are not part of the site boundary. These have been digitised based on the 1:1250 scale OS Mastermap.

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 3-3
CABLE ROUTE OPTIONS
PRE-SCOPING

Drawn	Checked	Approved	Date
LL	DW	NC	04/11/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:50,000

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560000 565000 570000

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Railway Crossing Option 1

Railway Crossing Option 2

Sunnica West Site B

Sunnica West Site A

Sunnica East

0 500 1,000m

N

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LEGEND

EIA Scoping Scheme Boundary

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
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Client
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Project Title
sunnica energy farm

Drawing Title
FIGURE 3-4
EIA SCOPING BOUNDARY

Drawn	Checked	Approved	Date
LL	DW	NC	29/09/2021

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60589004	1:50,000

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Railway Crossing Option 1

Railway Crossing Option 2

Sunnica West Site B

Sunnica West Site A

Sunnica East

0 500 1,000m

N

File Name:\\eu.aecomnet.com\UKUKCBG1\Jobs\PR-334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\DAS\210927_SunnicaEnergyFarm_DAS_Figure3-5_NonStatConsultation.mxd

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LEGEND

Non-Statutory Consultation Boundary

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 3-5
NON-STATUTORY
CONSULTATION BOUNDARY

Drawn	Checked	Approved	Date
LL	DW	NC	29/09/2021

AECOM Internal Project No.	Scale @ A3
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Drawing Number	Rev
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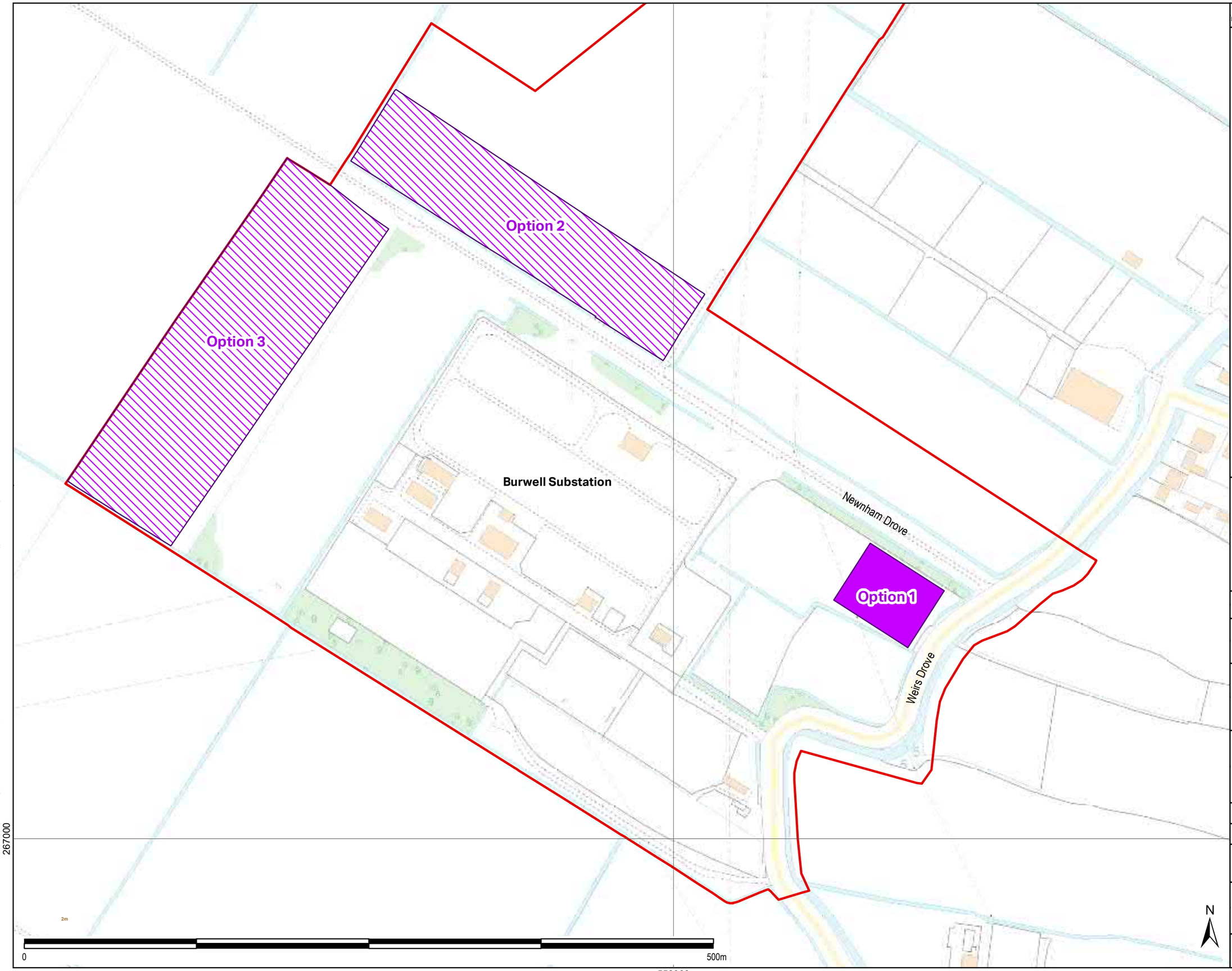

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LEGEND

- Scheme Boundary at PEIR Stage
- Maximum Area for Burwell National Grid Substation Extension
- Potential Area for Alternative Substation

Document Reference: EN010106/APP/6.3
APFP Regulation 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 3-6
BURWELL NATIONAL GRID SUBSTATION EXTENSION: LAND OPTIONS PRESENTED IN THE PEIR

Drawn	Checked	Approved	Date
LL	DW	NC	23/09/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:2,500

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E01 E02 E03 E04 E05 E07 E08 E09 E10 E11 E12 E13 E14 E15 E16 E17 E18 E19 E20 E21 E22 E23 E24 E25 E26 E27 E28 E29 E30 E31 E32 E33

Office/Warehouse

0 500 1,000m

N

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LEGEND

- Scheme Boundary at PEIR Stage
- Public Highway within Scheme

Proposed Scheme Plan

- Developable Area
- Boundary Fence
- BESS and Substation
- Compound Area (Permanent)
- Solar PV Array
- Illustrative Locations of Solar Station
- Proposed Road

Green Infrastructure

- Native Grassland Planting within Archaeological Mitigation Areas
- Native Grassland Planting
- Proposed Woodland (new planting or infilling of existing vegetation)
- Retained Woodland
- Proposed Hedgerow (new planting or infilling of existing vegetation)
- Potential Provision of Permissive Route

Document Reference: EN010106/APP/6.3
APFP Regulation 5(2)(q)

Sheet Layout

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 3-7
SUNNICA EAST SITE A AND B PARAMETER PLAN AS PRESENTED IN THE PEIR REPORT

Drawn	Checked	Approved	Date
LL	DW	NC	27/09/2021

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File Name:C:\Users\Anna.Dillieto\AECOM Directory\Sunnica Energy Farm - GIS - General\Layout\PEIR\Chapter_3_Scheme_Description\201215_SunnicaEnergyFarm_PEIR_Figure 3-1_SunnicaEastA_B_Parameter_Plan.mxd

564000 565000 566000 567000 568000 569000

270000 269000 268000 267000 266000

W01 W02 W03 W04 W05 W06 W07 W08 W09 W10 W11 W12 W13 W14 W15 W16 W17

Office/Warehouse

0 500 1,000m

N

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LEGEND

- Scheme Boundary at PEIR Stage
- Woodstore - 20m Buffer

Proposed Scheme Plan

- Developable Area
- Boundary Fence
- BESS and Substation
- Compound Area (Permanent)
- Solar PV Array
- Illustrative Locations of Solar Station
- Proposed Road

Green Infrastructure

- Native Grassland Planting within Archaeological Mitigation Areas
- Native Grassland/Wetland
- Native Grassland Planting
- Heritage Offset with additional planting along The Avenue
- Proposed Woodland (new planting or infilling of existing vegetation)
- Retained Woodland
- Proposed Hedgerow (new planting or infilling of existing vegetation)
- Potential Provision of Permissive Route

Document Reference: EN010106/APP/6.3
APFP Regulation 5(2)(q)

Sheet Layout

Ely Soham Stilbenhall Newmarket Bury St Edmund

Purpose of Issue
FOR DCO SUBMISSION

Client
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Project Title
sunnica energy farm

Drawing Title
FIGURE 3-8
SUNNICA WEST A AND B PARAMETER PLAN AS PRESENTED IN THE PEIR REPORT

Drawn	Checked	Approved	Date
LL	DW	NC	27/09/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:17,500

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566000 567000 568000 569000 570000 571000

275000 274000 273000 272000 271000

E01 E02 E03 E04 E05 E08 E09 E10 E33

Office/Warehouse

ECO1 ECO2 ECO3

E12 E13 E14 E15 E16 E17 E18 E19 E20 E21 E22

Office/Warehouse

E24 E25 E26 E27 E28 E29 E30 E31 E32

0 500 1,000m

N

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LEGEND

- The Order Limits
- Public Highway within Scheme

Proposed Scheme Plan

- Developable Area
- Boundary Fence
- BESS and Substation
- Compound Area (Permanent)
- Solar PV Array
- Illustrative Locations of Solar Stations
- Proposed Road
- Potential Provision of Permissive Route

Green Infrastructure

- Native Grassland Planting
- Native Grassland Planting within Archaeological Mitigation Areas
- Proposed Woodland (new planting or infilling of existing vegetation)
- Proposed Hedgerow (new planting or infilling of existing vegetation)

Note: Developable fields previously referred to as E06, E07, E11 and E23 are no longer being developed with solar infrastructure and now form part of the mitigation strategy; however, the field numbering for the remaining developable fields has been retained for consistency.

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Sheet Layout

Purpose of Issue
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Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 3-9
SUNNICA EAST
PARAMETER PLAN

Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:18,000

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564000 565000 566000 567000 568000 569000

270000 269000 268000 267000 266000

ECO4 W01 W02 ECO5 W03 W04 W05 W06 W07 W08 W09 W10 W11 W12 W15 W17

0 500 1,000m

N

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LEGEND

- The Order Limits
- Woodstore - 20m Buffer
- Public Highway within Scheme

Proposed Scheme Plan

- Developable Area
- Solar PV Array
- BESS and Substation
- Compound Area (Permanent)
- Boundary Fence
- Illustrative Location of Solar Stations
- Proposed Road

Green Infrastructure

- Native Grassland Planting
- Native Grassland Planting within Archaeological Mitigation Areas
- Native Grassland/Wetland
- Heritage Offset with additional planting along The Avenue
- Proposed Woodland (new planting or infilling of existing vegetation)
- Retained Woodland
- Proposed Hedgerow (new planting or infilling of existing vegetation)

Note: Developable fields previously referred to as W13, W14 and W15 are no longer within the Order limits; however, the field numbering for the remaining developable fields has been retained for consistency.

Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Sheet Layout

Purpose of Issue
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Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 3-10
SUNNICA WEST A AND B
PARAMETER PLAN

Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

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60589004	1:17,500

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60589004_ES_DAS_018	0

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558000

Option 2

Burwell Substation

Newnham Drove

Option 1

Weirs Drove

267000

2m

0

500m

558000

N

File Name:\\eu.aecomnet.com\UK\UKCBG1\Jobs\PR-334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\DAS\210927_SunnicaEnergyFarm_DAS_Figure3-11_BurwellNationalGridSubstationExtension.mxd

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LEGEND

- The Order Limits
- National Grid Substation Extension Burwell - Option 1
- National Grid Substation Extension Burwell - Option 2

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 3-11
BURWELL NATIONAL GRID SUBSTATION EXTENSION: LAND OPTIONS PRESENTED IN THE ES

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60589004	1:3,660

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566000 567000 568000 569000 570000 571000

275000 274000 273000 272000 271000

Sunnica East Site A

Sunnica East Site B

A11 North

A11 South (for the A14)

A

B

C

D

E

F

G

H

I

J

K

0 500 1,000m

N

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LEGEND

The Order Limits

Access Point

Primary Access: Construction, Operation and Decommissioning

Crane Access: Construction, Decommissioning and for Emergency Vehicles in Operation Only

Secondary Access: Construction and Decommissioning Only

Secondary Access: Construction, Operation and Decommissioning

Secondary Access: Construction, Operation and Decommissioning (Not for HGV)

Secondary Access: Construction, Decommissioning and for Emergency Vehicles in Operation Only

Secondary Access: Operation only

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 5-1
SUNNICA EAST A AND B
SITE ACCESS LOCATIONS

Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

AECOM Internal Project No. 60589004
Scale @ A3 1:850,000

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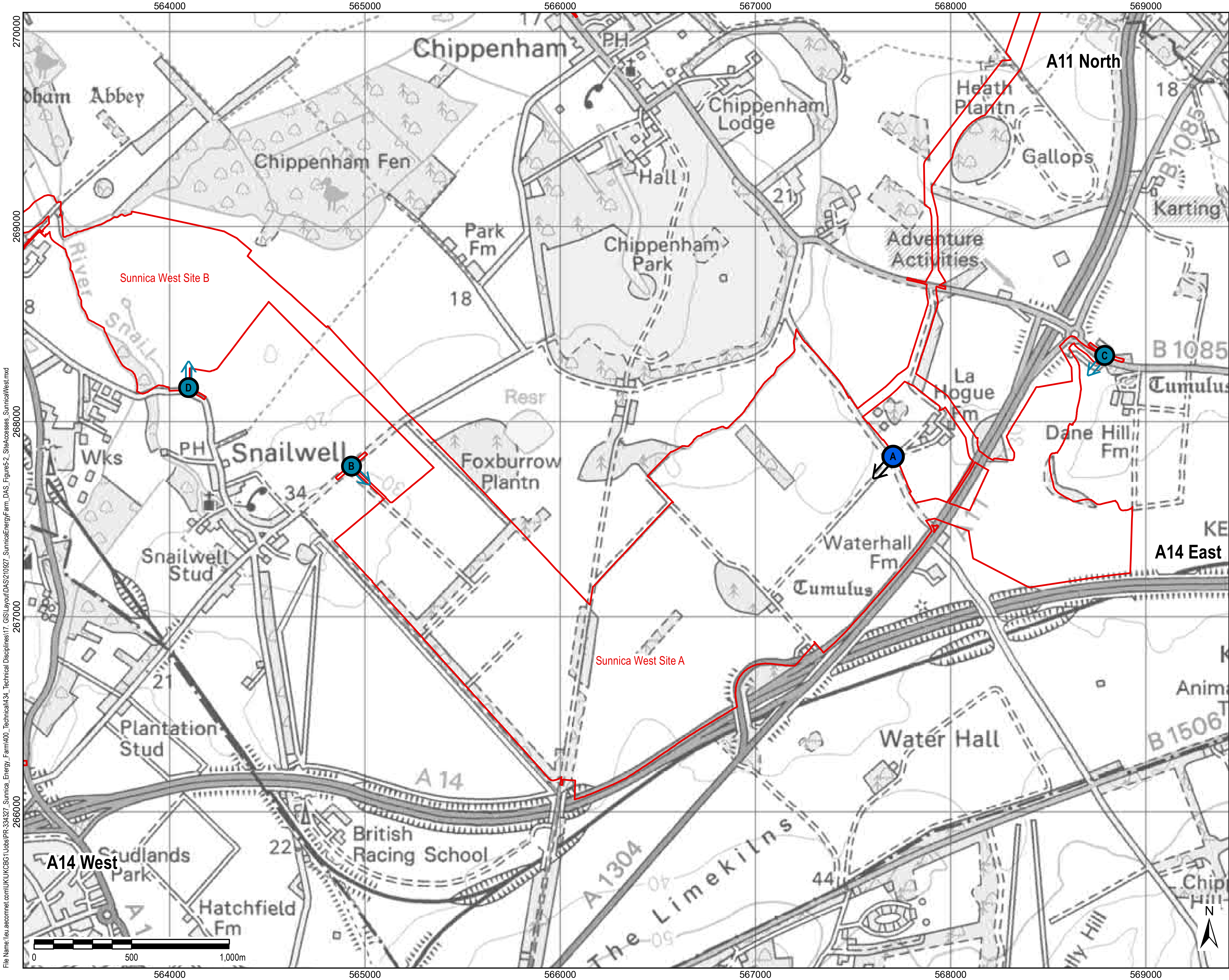
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565000
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567000
568000
569000
270000
269000
268000
267000
266000
Chippenham
Chippenham Fen
Chippenham Lodge
Hall
Chippenham Park
Park Fm
Heath Plantn
Gallops
Karting
Adventure Activities
A11 North
Sunnica West Site B
Snailwell
PH
Wks
Resr
Foxburrow Plantn
La Hogue Fm
Dane Hill Fm
B 1085
Tumulus
Snailwell Stud
Waterhall Fm
A14 East
Sunnica West Site A
Plantation Stud
A 14
Water Hall
B 1506
British Racing School
Studlands Park
A14 West
Hatchfield Fm
A 1304
The Limekilns
A
B
C
D
0
500
1,000m
N

LEGEND

The Order Limits

Access Point

Primary Access: Construction and Operation

Secondary Access: Construction and Operation

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 5-2
SUNNICA WEST A AND B
SITE ACCESS LOCATIONS

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LL	DW	NC	01/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:17,500

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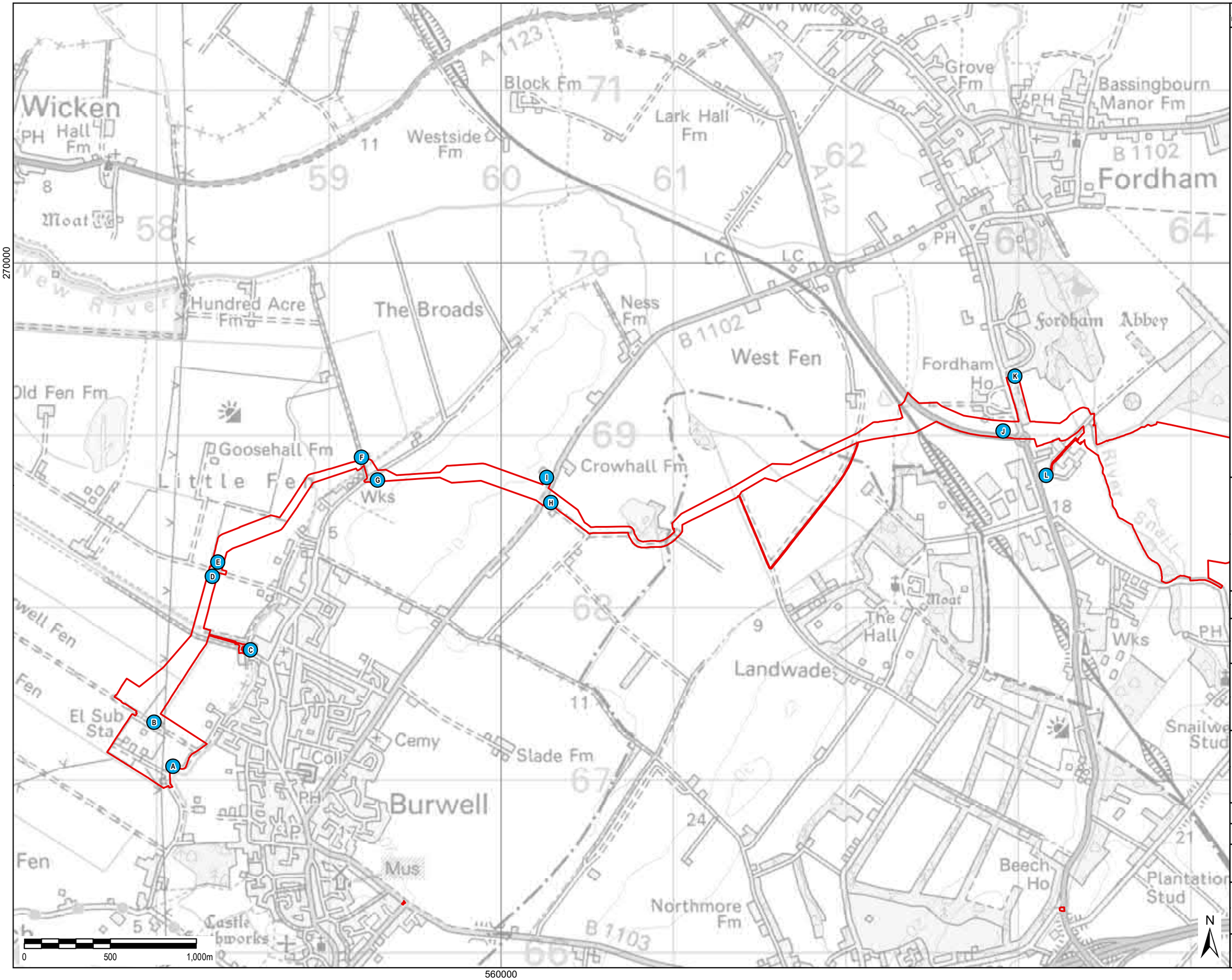
Drawing Number	Rev
60589004_ES_DAS_021	0

560000

270000



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LEGEND

- The Order Limits
- Cable Route Site Access

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 5-3
CABLE ROUTE SITE ACCESS LOCATIONS (1/4)

Drawn	Checked	Approved	Date
LL	DW	NC	03/11/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:20,000

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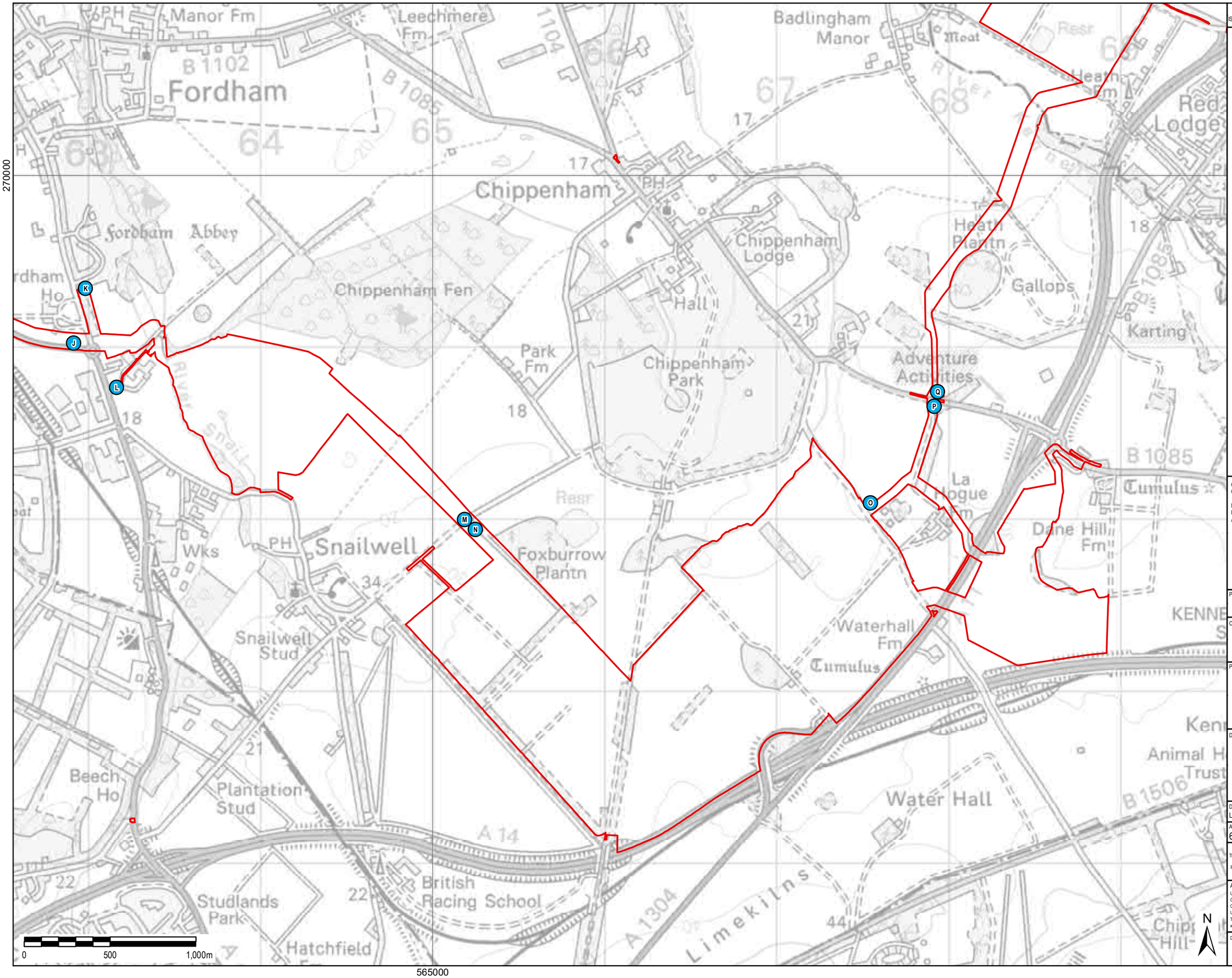
Drawing Number	Rev
60589004_ES_DAS_022	0

565000

270000



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LEGEND

- The Order Limits
- Cable Route Site Access

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 5-4
CABLE ROUTE SITE
ACCESS LOCATIONS (2/4)

Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

AECOM Internal Project No.	Scale @ A3
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565000

570000

270000

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LEGEND

The Order Limits

Cable Route Site Access

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 5-5
CABLE ROUTE SITE
ACCESS LOCATIONS (3/4)

Drawn	Checked	Approved	Date
LL	DW	NC	20/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:20,000

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Drawing Number	Rev
60589004_ES_DAS_024	0

0 500 1,000m

N

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565000

570000

275000

270000

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LEGEND

The Order Limits

Cable Route Site Access

NOTE:
Document Reference: EN/0101006/APP/7.3
APFP Regulation: 5(2)(q)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 5-6
CABLE ROUTE SITE ACCESS LOCATIONS (4/4)

Drawn	Checked	Approved	Date
LL	DW	NC	20/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:20,000

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Drawing Number	Rev
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0 500 1,000m

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Appendix B Design Principles

Introduction

This Design Principles document has been prepared to accompany the Development Consent Order (DCO) application for the Scheme. It is expected to be the subject of a Requirement of the DCO in order to prescribe the guiding principles to inform the detailed design of the Scheme. Assuming the DCO is granted and applications are made to the relevant local planning authority (LPA) for approval of detailed design, the LPA will assess those details having regard to the principles set out in Tables B-1 to Table B-10 of this document and the ES for the Scheme as certified by the Secretary of State.

It is necessary to achieve flexibility in the DCO because solar PV and battery energy storage technology is rapidly evolving. The Applicant needs to make provision in the DCO for technological innovation and improvement realised at the time of procurement and construction to ensure that it can construct the Scheme in the most appropriate manner. That flexibility has been facilitated by the adoption of the 'Rochdale Envelope' approach in the ES as outlined in **Chapter 3: Scheme Description** of the Environmental Statement **[REP3-022].** This document defines the key design principles which reflect the worst-case scenario adopted in the Environmental Impact Assessment that has been undertaken for the Scheme. Provided that the detailed design of the Scheme is in accordance with the key principles set out in this document, the conclusions of the ES will be upheld, whilst also providing for flexibility.

The Design Principles have been set out in Table B-1 to Table B-10 below organised in accordance with the descriptions of the numbered works contained Schedule 1 of the Draft DCO **[REP2-012]** the limits of deviation for which are shown on the Works Plans **[REP2-005].** Where required, the tables make reference to other documents, such as the OLEMP, which take priority over the Design Principles document in relation to the discharge of a Requirement.

For each Scheme component outlined in Tables B-1 to B-10, the parameter has been defined by its:

a. Location – the location of the Scheme component within the Scheme as assessed within the ES,

b. Scale – either a minimum or maximum parameter which has been assessed in the ES; and

c. Design – relevant design parameter which has been assessed in the ES.

All heights defined in Tables B-1 to B-10 are Above Ground Level (AGL), unless otherwise specified.

Table B-1 Work No. 1 Design Principles

Scheme component	Parameter Type	Design Principle
Work No. 1— a ground mounted solar photovoltaic generating station with a gross electrical output capacity of over 50 megawatts including— (a) **Work No. 1A**— works on the East A Site comprising— (i) solar modules; (ii) solar stations; (iii) electrical cables including electrical cables connecting to Work No. 3A; (iv) monitoring and control systems housed within a control room building or container; and (v) weather stations and direct current (DC) electrical boxes, (b) **Work No. 1B**— works on the East B Site comprising— (i) solar modules; (ii) solar stations; (iii) electrical cables including electrical cables connecting to Work No. 3B; (iv) monitoring and control systems housed within a control room building or container; and (v) weather stations and DC electrical boxes, (c) **Work No. 1C**— works on the West A Site comprising— (i) solar modules; (ii) solar stations; (iii) electrical cables including electrical cables connecting to Work No. 3C; (iv) monitoring and control systems housed within a control room building or container; and (v) weather stations and DC electrical boxes; and (d) **Work No. 1D**— works on the West B Site comprising— (i) solar modules; (ii) solar stations; (iii) electrical cables including electrical cables connecting to Work No. 3C; (iv) monitoring and control systems housed within a control room building or container; and (v) weather stations and DC electrical boxes.		
Solar PV infrastructure	Location	The solar PV infrastructure will be located within the limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the **Works Plans [REP2-005].**
	Scale	The maximum area of solar PV infrastructure, including the solar PV modules and mounting structures, solar PV control room or container, solar stations, inverters, transformers and switchgears, but excluding the full extent of the onsite cabling is: • Sunnica East Site A – 115ha • Sunnica East B – 227ha • Sunnica West Site A – 256ha • Sunnica West Site B – 23ha

Scheme component	Parameter Type	Design Principle
	Design	Solar PV infrastructure will be offset from watercourses by a minimum of 10m.
Solar PV Modules and Mounting Structures	Location	The solar PV modules will be located within limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the **Works Plans [REP2-005].**
	Scale	The maximum height of the highest part of the solar PV modules will be 2.5m AGL.
	Scale	The minimum height of the lowest part of the solar PV modules will be 0.6m AGL. In Flood Zone 3 areas, the minimum height of the lowest part of the solar PV modules will be 0.85m AGL. In swales and infiltration basins the minimum height of the lowest part of the solar PV modules will be 0.85m AGL.
	Scale	Separation distance will be 2m at the closest point and 11m at the furthest point.
	Scale	Maximum depth of mounting structure will be 3.5m below ground level.
	Design	The solar PV modules will slope towards the south, at a fixed slope of 15 to 35 degrees from horizontal.
	Design	The solar PV modules are likely to be either black or dark blue. This will be fixed during detailed design.
	Design	The frame type will be anodized aluminium alloy
	Design	The panel technology will be monofacial and/or bifacial panels.
	Design	Modules will be mounted on a rack made with galvanised steel or other suitable design material.
	Design	Foundation are most likely to be galvanised steel poles driven into the ground. These will either be piles rammed into a pre-drilled hole, a pillar attaching to a steel ground screw, pillars fixed to a concrete foundation, or a pillar set in concrete in a pre-made hole in the ground.
Solar PV control room or container	Location	The solar PV control room or container will be located within limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the Works Plans **[REP2-005]**.
	Scale	The monitoring and control system will be housed within a control room or container with dimensions of up to 7.5m by 3.5m and up to 3.5m in height.
	Scale	Maximum of 17 solar PV control rooms or containers located across the Sites.

Scheme component	Parameter Type	Design Principle
	Design	Concrete base or monolith plinth to a maximum depth of 1m.
	Design	Externally finished to be in keeping with the prevailing surrounding environment, most likely with a green, light grey or white painted finish.
Solar Station (a station comprising an inverter, a transformer and the switchgears)	Location	The Solar Stations will be located within the limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the **Works Plans [REP2-005].**
	Scale	The maximum parameter of each solar station in an outdoor configuration will be up to a 17m by 6.5m footprint, and 3.5m in height. If in an indoor configuration the indoor solar station dimensions would be 15m by 5m footprint and 3.5m in height.
	Scale	A maximum of 136 solar stations across Works No. 1.
	Design	Externally finished to be in keeping with the prevailing surrounding environment, most likely with a green, light grey or white painted finish.
	Design	Outdoor solar stations: a concrete foundation slab for each of the inverters and transformers and a levelling layer of thick sand with a maximum depth of 1m, with a concrete perimeter pavement for the switchgear. Indoor solar stations: a concrete foundation slab.
	Design	Solar stations within Flood Zone 3 are to be enclosed and raised above predicted flood levels, while conforming to the maximum parameters described above.
Inverters	Location	The inverters will be located within the limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the Works Plans **[REP2-005]** and within a solar station.
	Scale	The maximum parameters of inverter will be 9m by 6.5m in plan and 3.5m in height, sited within the dimensions of the solar station. There will be one inverter per solar station.
	Design	The inverters will be centralised.
Transformers	Location	The transformers will be located within the limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the Works Plans **[REP2-005]** and within a solar station.
	Scale	The maximum parameters of the transformer will be 5.5m by 6.5m in plan and 3.5m in height, sited within the dimensions of the solar station. There will be one transformer per solar station.
	Design	Externally finished to be in keeping with the prevailing surrounding environment, most likely with a green, light grey or white painted finish.
Switchgear	Location	The switchgear will be located within the limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the Works Plans **[REP2-005]** and within a solar station.

Scheme component	Parameter Type	Design Principle
	Scale	The maximum footprint will be 2.5m by 6.5m in plan and a maximum height of 3.5m, sited within the dimensions of the solar station. There will be one switchgear per solar station.
	Design	Externally finished to be in keeping with the prevailing surrounding environment, most likely with a green, light grey or white painted finish.
Onsite cabling	Location	The onsite cabling will be located within the limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the **Works Plans [REP2-005]**.
	Scale	Low voltage - between PV modules and inverters and from inverters to transformers: The maximum dimensions of the onsite trench will be 1.1m deep and 1m wide.
	Scale	33kV – between transformers and the switchgear and from switchgear to the onsite substation: where underground, maximum cable trench dimension will be a depth of 1.5m and 1.0m wide.
	Scale	Maximum depth of cables laid within using non-intrusive techniques is 20m BGL.
	Design	Cabling will be above ground level between the PV modules. These will be fixed to the mounting structure along the row of racks. Cabling between the PV modules, inverters, and transformers will be buried within underground trenches. Cables between transformers and the switchgear and from switchgear to the onsite substation will be buried within underground trenches.
Weather Stations	Location	The weather stations will be located within the limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the **Works Plans [REP2-005]**.
	Scale	Weather Stations will be up to 6m in height
	Scale	There will be up to a maximum of 136 weather stations across Work No. 1.
DC electrical boxes	Location	The DC boxes will be located within the limits of deviation of Work Nos. 1A, 1B, 1C and 1D as shown on the **Works Plans [REP2-005]**.
	Scale	1.5m by 0.5m by 1m in height
	Scale	Up to 20 DC boxes per inverter within Works No. 1.
	Design	DC box would sit on the back of a solar PV Module.

Table B-2 Work No. 2 Design Principles

Work No. 2— an energy storage facility including—

(a) **Work No. 2A**— a battery energy storage compound on the East A Site comprising—

(i) battery energy storage cells;

(ii) a structure protecting the battery energy storage cells comprised in Work No. 2A(i) and ancillary equipment, being either one container or multiple containers joined to each other, mounted on a reinforced concrete foundation slab or concrete piling;

(iii) heating, ventilation and air conditioning (HVAC) or liquid cooling systems either housed within the containers comprised in Work No. 2A(ii), attached to the side or top of each of the containers, or located separate from but near to each of the containers;

(iv) battery stations;

(v) monitoring and control systems housed within a container with the HVAC or liquid cooling systems in Work No. 2A(iii) or located separately in its own container or control room;

(vi) electrical cables including electrical cables connecting to Work No. 3A;

(vii) fire safety infrastructure comprising fire suppression system; and

(viii) a water storage structure for the purposes of firefighting comprising fire water tanks and fire water containment.

(b) **Work No. 2B**— works on the East B Site comprising—

(i) battery energy storage cells;

(ii) a structure protecting the battery energy storage cells comprised in Work No. 2B(i) and ancillary equipment, being either one container or multiple containers joined to each other, mounted on a reinforced concrete foundation slab or concrete piling;

(iii) heating, ventilation and air conditioning (HVAC) or liquid cooling systems either housed within the containers comprised in Work No. 2B(ii), attached to the side or top of each of the containers, or located separate from but near to each of the containers;

(iv) battery stations;

(v) monitoring and control systems housed within a container with the HVAC or liquid cooling systems in Work No. 2B(iii) or located separately in its own container or control room;

(vi) electrical cables including electrical cables connecting to Work No. 3B;

(vii) fire safety infrastructure comprising fire suppression system; and

(viii) a water storage structure for the purposes of firefighting comprising fire water tanks and fire water containment.

(c) **Work No. 2C**— works on the West A Site comprising—

(i) battery energy storage cells;

(ii) a structure protecting the battery energy storage cells comprised in Work No. 2C(i) and ancillary equipment, being either one container or multiple containers joined to each other, mounted on a reinforced concrete foundation slab or concrete piling;

(iii) heating, ventilation and air conditioning (HVAC) or liquid cooling systems either housed within the containers comprised in Work No. 2C(ii), attached to the side or top of each of the containers, or located separate from but near to each of the containers;

(iv) battery stations;

(v) monitoring and control systems housed within a container with the HVAC or liquid cooling systems in Work No. 2C(iii) or located separately in its own container or control room;

(vi) electrical cables including electrical cables connecting to Work No. 3C;

(vii) fire safety infrastructure comprising fire suppression system; and

(viii) a water storage structure for the purposes of firefighting comprising fire water tanks and fire water containment.

Battery Energy Storage (BESS) Compound	Location	The BESS compounds will be located within the limits of deviation of Work Nos. 2A, 2B and 2C as shown on the **Works Plans [REP2-005]**.
	Scale	There are three BESS Compounds, with maximum footprints of the compounds being up to: • Work No. 2A (Sunnica East Site A): 66,000m^2. • Work No. 2B (Sunnica East Site B): 162,000m^2. • Work No. 2C (Sunnica West Site A): 83,000m^2.
	Design	The BESS compounds will include battery storage containers and Battery Stations (containing battery inverters, transformers, and switchgear). Batteries will be grouped in racks, protected by structures / containers which will be located inside the BESS compounds.
	Design	The detailed design will ensure that the parameters assessed in the study presented in **Appendix 16D: Unplanned Atmospheric Emissions from Battery Storage Systems (BESS)** of the Environmental Statement **[REP2-033]** are met (i.e. 1 kg to 3 kg of hydrogen fluoride from a 5 rack fire).
	Design	The design of BESS includes a number of design elements to both prevent, detect and control a fire should one occur. These include: • The use of batteries that are sealed by design so do not vent when in normal use and have no free electrolyte. • The battery modules will contain cells separated by a thermal barrier or an air gap to prevent one cell affecting the temperature of the adjacent one, with the modules themselves also separated from one another by another thermal barrier or an air gap. The thermal barrier or an air gap is intended to ensure that should one cell/module heat up it will not impact on the adjacent cell/module so as to prevent a thermal cascade. • The batteries will be controlled by charging management systems that will detect if a cell or battery is not operating correctly and the whole BESS will be fitted with a fire monitoring system so if one cell or module were to catch fire the fire suppression system will automatically be triggered to reduce the temperate and ensure that the burning cell/module does not affect the other cells/modules in the BESS. • The expected hydrogen fluoride emissions will be checked against the assumptions in **Appendix 16D: Unplanned Atmospheric Emissions from Battery Storage Systems (BESS)** of the Environmental Statement **[REP2-033]** at detailed design stage (post-consent) once the make, model and layout of the BESS is known.

		• If necessary, consequence modelling will be undertaken to demonstrate the impacts associated with an unplanned fire would not exceed the effects outlined in **Appendix 16D: Unplanned Atmospheric Emissions from Battery Storage Systems (BESS)** of the Environmental Statement **[REP2-033]** or cause any significance adverse health effects to the local community.
BESS battery container housing the battery energy storage cells	Location	The BESS battery containers will be located within the limits of deviation of Work Nos. 2A, 2B and 2C as shown on the **Works Plans [REP2-005],** within the footprint of the BESS compound.
	Scale	The maximum dimensions of each BESS container within a BESS compound is 17m by 5m footprint and up to 6m in height.
	Design	Externally finished to be in keeping with the prevailing surrounding environment, most likely with a green, light grey or white painted finish.
	Design	HVAC or liquid cooling systems will be housed either within each of the containers, attached to the side or top of each of the containers, or located separate from but near to each of the containers.
	Design	The foundations within the BESS containers will either be a reinforced concrete base to a maximum depth of 1m, or a piling solution may be required, depending on the results of geotechnical surveys. If this is the case, piles to a maximum depth of 12m would be used.
Battery Stations	Location	The Battery Stations will be located within the limits of deviation of Work Nos. 2A, 2B and 2C as shown on the **Works Plans [REP2-005]**.
	Scale	The components of the Battery Stations will be up to a maximum of 6m.
	Design	A station comprising transformers, switchgear, power conversion system (PCS) or inverter, and other ancillary equipment. These will either be located outside or housed together in a container.
	Design	The foundations for the Battery Stations will either be with a concrete foundation slab for each of the inverters and transformers and a levelling layer of thick sand with a concrete perimeter pavement for the switch gear when located outside, or on a concrete foundation slab when housed in a container. A piling solution may also be required, for both the indoor and outdoor options ,depending on the results of geotechnical surveys. If this is the case, piles to a maximum depth of 12m would be used.
Onsite cabling	Location	The onsite cabling will be located within the limits of deviation of Work Nos. 2A, 2B and 2C as shown on the **Works Plans [REP2-005]**.
	Scale	33kV – between transformers and the switchgear and from switchgear to the onsite substation: where underground, maximum cable trench dimension will be a depth of 1.5m and 1.0m wide.

	Design	Cabling between batteries and inverters, and from inverters to transformers will be above ground in cable trays or laid in an underground trench.
Monitoring and control system	Location	The monitoring and control system will be located within the limits of deviation of Work Nos. 2A, 2B and 2C as shown on the **Works Plans [REP2-005]**.
	Scale	The monitoring and control system will be housed in a building or container within the BESS compound and, will be up to a maximum of 6m in height..
	Design	The monitoring and control system will be housed either in an adapted container or built from glass reinforced plastic (GRP). The system will be within the same container or room as the HVAC or in its own container or control room.
Internal BESS Fire Suppression System	Location	The internal BESS fire suppression system will be located within the limits of deviation of Work Nos. 2A, 2B and 2C as shown on the **Works Plans [REP2-005]**.
	Scale	The water supply container will be up to a maximum of 6m in height, if located externally to the BESS Battery Containers.
	Design	Water supply will be integrated into the design of each BESS container and will be located either within or outside the BESS container. If located outside, the water supply will either be decentralised and located at each container or centralised and located together with pumping equipment and pipework at a central location(s).
External Fire Fighting Water Tanks	Location	The external fire fighting water tanks will be located within the limits of deviation Work Nos. 2A, 2B and 2C as shown on the **Works Plans [REP2-005]**.
	Scale	Option 1: Water supply for the firefighting operations only: • Two half capacity sectional steel panel tanks with dimensions of 6m by 6m and 3m in height; or • Two half capacity cylindrical steel tanks with dimensions of 4.58m diameter and 6m in height and with a 0.3m thick concrete base. Option 2: Water supply for simultaneous operation of the water drenching system and firefighting operations: • Two half capacity sectional steel panel tanks with dimensions of 8m by 6m and 3m in height; or • Two half capacity cylindrical steel tanks with dimensions of 5.35m diameter and 6m in height and with a 0.3m thick concrete base.
	Scale	Maximum of 242.5m^3 of fire fighting water will be provided per BESS compound
	Design	Storage will either be in one or two rectangular sectional steel panel tanks or cylindrical steel tanks within each BESS compound.
Fire Fighting Water Containment	Location	The Fire Fighting Water Containment will be located within the limits of deviation of Work Nos. 2A, 2B and 2C as shown on the **Works Plans [REP2-005]**.
	Scale	A minimum of 410m^3 of bunded storage area will be provided per BESS Compound

	Design	A sump will be integrated into each BESS container for internal fire suppression.
	Design	A bunded BESS area linked to a bunded lagoon will be provided to capture fire water run-off from external fire water.

Table B-3 Work No. 3 Design Principles

Work No. 3— onsite substations including—

(a) **Work No. 3A**— works on the East A Site comprising—

(i) substation;
(ii) control building or container;
(iii) welfare facilities;
(iv) hardstanding areas; and
(v) electrical cables including electrical cables connecting to Work Nos. 1A, 2A and 4;

(b) **Work No. 3B**— works on the East B Site comprising—

(i) substation;
(ii) shunt reactor
(iii) control building or container;
(iv) welfare facilities;
(v) hardstanding areas; and
(vi) electrical cables including electrical cables connecting to Work Nos. 1B, 2B and 4; and

(c) **Work No. 3C**— works on the West A Site comprising—

(i) substation;
(ii) control building or container;
(iii) welfare facilities;
(iv) hardstanding and parking areas; and
(v) electrical cables including electrical cables connecting to Work Nos. 1C, 1D, 2C and 4.

Onsite substations	Location	The onsite substations will be located within the limits of deviation of Work Nos. 3A, 3B and 3C as shown on the **Works Plans [REP2-005]**.
	Scale	Maximum parameters for the onsite substations, control building or container, welfare facilities, hardstanding areas and hardstanding parking areas, but excluding the full extent of the cabling are outlined below: • Sunnica East Site A: 85m by 55m footprint, 10m in height. • Sunnica East Site B: 85m by 130m footprint, 10m in height. • Sunnica West Site A: 85m by 130m footprint, 10m in height.
	Design	Concrete base or monolith plinth to a maximum depth of 1m. A piling solution may be required depending on the results of geotechnical surveys. If this is the case, piles to a maximum depth of 12m would be used.
Onsite substation control building or container	Location	The substation control buildings or container will be located within the limits of deviation of Work Nos. 3A, 3B and 3C as shown on the **Works Plans [REP2-005]** within the maximum footprint of the substation areas.
	Scale	Maximum parameters for the substation control building are 25m by 12m footprint and 7m in height.

	Design	Foundation will either be concrete base or monolith plinth to a maximum depth of 1m.
	Design	The control buildings will be a painted block building with external colours and finishes to be confirmed prior to construction.
Welfare facilities	Location	The onsite cabling will be located within the limits of deviation of Work Nos. 3A, 3B and 3C as shown on the **Works Plans [REP2-005]**.
	Scale	The onsite facilities will be either be located within the onsite substation control building, or in a separate building within the onsite substation area with maximum parameters of 6m by 3m and up to 3.5m in height.
Hardstanding parking areas	Location	Hardstanding parking areas will be located within the limits of deviation of Work Nos 3C as shown on the **Works Plans [REP2-005]**.
	Scale	Up to a maximum of 20 car parking places will be provided within Work No 3C.
Onsite cabling	Location	The onsite cabling will be located within the limits of deviation of Work Nos. 3A, 3B and 3C as shown on the **Works Plans [REP2-005]**.
	Scale	Where underground, I maximum cable trench dimension will be a depth of 1.5m and 1.0m wide.
	Scale	Maximum depth of cables laid within using non-intrusive techniques is 20m BGL.
	Design	33kV cables.

Table B-4 Work No. 4 Design Principles

Work No. 4— works to lay electrical cables and temporary construction laydown areas for the electrical cables including—

(a) electrical cables connecting Work No. 3A to Work No. 3B;
(b) electrical cables connecting Work No. 3B to Work No. 5B;
(c) electrical cables connecting Work No. 3C to Work No. 5B;
(d) electrical cables connecting Work No.1D to Work No. 3C; and
(e) up to 15 temporary construction laydown areas comprising—
(i) areas of hardstanding, compacted ground or track matting;
(ii) car parking;
(iii) area to store materials and equipment;
(iv) site and welfare offices and workshops;
(v) security infrastructure, including cameras, perimeter fencing and lighting;
(vi) safety infrastructure to warn and manage traffic when crossing roads or other obstacles;
(vii) site drainage and waste management infrastructure (including sewerage); and
(viii) electricity, water, waste water and telecommunications connections.

Grid Connection Routes A and B connecting Sites to Burwell Substation	Location	The electrical cabling will be located within the limits of deviation of Work No. 4 as shown on the **Works Plans [REP2-005]**.
	Scale	The maximum width of the cable corridor per trench is 3.5m, except from where it meets the jointing bay. In which case the dimensions described for jointing bays apply.
	Scale	The maximum depth of cable corridor per trench is 2m BGL.
	Scale	Maximum depth of cables laid within the cable corridor using non-intrusive techniques is 20m BGL.
	Design	The cabling will consist of 33kV cables, 132kV cables or 400kV cables, earthing cables and optical fibre cables. Trenches will house up to two circuits. Each circuit will consist of up to three sets of cables. Sets of cables will consist of three cables.
Jointing bays within Grid Connection Routes A and B	Location	The jointing bays will be located within the limits of deviation of Work No. 4 as shown on the **Works Plans [REP2-005]**.
	Scale	The dimensions are dependent on which technical substation solution is taken forward. **Burwell National Grid Substation Extension – Option 2:** The dimensions are determined by how many circuits will be in the jointing bay. Jointing bays will have two circuits each with up to three sets of three cables: • Four sets of cables (two circuits) will sit within one bay 30m in length, by 8m in width and 2.5m in depth.

		• Six sets of cables, consisting of two bays running consecutively with three sets of cables (one circuit) in each, totalling 60m in length (30m per bay), 8m in width and 2.5m depth. **Option 3 – 400 kV onsite substations:** One set of cables (one circuit) will sit within one bay 18.5m in length, by 3m in width and 2.5m in depth.
	Scale	Jointing bays will be up to 2000m apart.
Fibre bays within Grid Connection Routes A and B	Location	The fibre bays will be located within the limits of deviation of Work No. 4 as shown on the **Works Plans [REP2-005]**.
	Scale	The dimensions are dependent on which technical substation solution is taken forward. **Burwell National Grid Substation Extension – Option 2:** Maximum dimensions of 1.5m by 1m and 2m in depth. Option 3 – 400 kV onsite substations: Maximum dimensions of 1.75m by 1.75 and 2m in depth.
	Scale	Fibre bays will be up to 2000m apart.
Construction laydown areas within Work No. 4 (e).	No design principles applicable as temporary infrastructure. The maximum extent of the construction laydown areas is defined by **Works Plans [REP2-005].**	

Table B-5 Work No. 5 Design Principles

Work No. 5— works in connection with an extension to the existing substation including—

(a) **Work No. 5B**— an extension to the existing substation including—

(i) laydown area comprising—

(aa) areas of hardstanding, compacted ground or track matting;

(bb) car parking;

(cc) area to store materials and equipment;

(dd) site and welfare offices and workshops;

(ee) security infrastructure, including cameras, perimeter fencing and lighting;

(ff) site drainage and waste management infrastructure (including sewerage); and

(gg) electricity, water, waste water and telecommunications connections.

(ii) transformer compound;

(iii) substation;

(iv) control building;

(v) underground and above ground electrical cables including electrical cables connecting to the existing substation;

(vi) electrical bays to connect into existing network within the existing substation including disconnectors and ancillary equipment;

(vii) permanent means of access;

(viii) security and site lighting infrastructure, including cameras, perimeter fencing; and

(ix) flood protection measures being either a bund, wall or structures to raise Work Nos. 5B(ii), (iii), (iv) and (vi) off the ground.

(b) **Work No. 5C—** works to enable an extension to the substation including—

(i) underground and above ground electrical cables including electrical cables connecting to the existing substation;

(ii) soft landscaping including planting; and

(iii) landscape and biodiversity mitigation measures.

Extension to existing substation (Work No.5B) – Option 2	**Location**	The Burwell National Grid Substation Extension – Option 2 will be located within the limits of deviation of Work No.5B as shown on the **Works Plans [REP2-005]**.
	Scale	The footprint for the Burwell National Grid Substation Extension – Option 2 (Work No. 5B) is: 43m by 76m footprint, 12m in height, with an associated laydown area of 43m by 30m.
	Scale	All of the infrastructure associated with the Burwell National Gird Substation Extension, including the transformer compound, substation, control building, electrical bays to connect into existing network within the existing substation including disconnectors and ancillary equipment and laydown area be within the footprint of Work No. 5B and the maximum parameters described.
	Design	Foundations: Concrete base or monolith plinth to a maximum depth of 1m. A piling solution may be required depending on the results of geotechnical surveys. If this is the case, piles to a maximum depth of 12m would be used.
	Location	The cabling will be located as within the limits of deviation of Work No. 5as shown on the **Works Plans [REP2-005]**.

Cabling (Work Nos. 5B and 5C)	**Scale**	The maximum width of the cable corridor per trench is 3.5.
	Scale	The maximum depth of cable corridor per trench is 2m BGL.
	Design	The cabling will consist of 33kV cables, 132kV or 400 kV, earthing cables and optical fibre cables. Trenches will house up to two circuits. Each circuit will consist of up to three sets of cables. Sets of cables will consist of three cables.
Access (Work Nos. 5B and 5C)	**Location**	The access will be located as shown as Work Nos. 5B and 5C on the **ARoW Plans [REP2-005]**.
	Scale	Access points will be a minimum of 6m in width.
Security and site lighting infrastructure, including cameras and perimeter fencing(Work No 5B)	**Location**	The security and site lighting infrastructure, including cameras and perimeter fencing will be located as shown as Work No. 5B on the **Works Plans [REP2-005]**.
	Scale	Pole mounted infra-red CCTV cameras are anticipated to be 5m high.
	Scale	Permanent lighting with motion sensors will be installed, providing a maximum of 50 lux.
	Scale	Palisade fencing up to a maximum of 2.5m.
Flood Protection Measures (Work 5B)	**Location**	The flood protection measures will be located within the limits of deviation of Work No. 5B as shown on the **Works Plans [REP2-005]**. These will be secured through Requirement 6 of the DCO.
	Scale	Finished floor levels set at 0.95m AGL, or other appropriate protection including a bund or wall.
Soft landscaping including planting	**Location**	The soft landscaping measures will be located within the limits of deviation of Work No. 5C as shown on the **Works Plans [REP2-005]**.
	Design	The green infrastructure will be designed as per the OLEMP contained within Appendix 10I of the ES **[REP3-011]**), in accordance with the requirements of the DCO.

Table B-6 Work No. 6 Design Principles

Work No. 6— works to create, enhance and maintain green infrastructure, including—

(a) **Work No. 6A**— works on the East A Site comprising—

(i) soft landscaping including planting;
(ii) landscape and biodiversity enhancement measures;
(iii) earth works;
(iv) permissive paths;
(v) hard standing and hard landscaping;
(vi) drainage and irrigation infrastructure and improvements or extensions to existing irrigation systems;
(vii) fencing, gates, boundary treatment and other means of enclosure; and
(viii) improvement, maintenance and use of existing private tracks;

(b) **Work No. 6B**—works on the East B Site comprising—

(i) soft landscaping including planting;
(ii) landscape and biodiversity enhancement measures;
(iii) earth works;
(iv) permissive paths;
(v) hard standing and hard landscaping;
(vi) drainage and irrigation infrastructure and improvements or extensions to existing irrigation systems;
(vii) fencing, gates, boundary treatment and other means of enclosure; and
(viii) improvement, maintenance and use of existing private tracks;

(c) **Work No. 6C**— works on the West A Site comprising—

(i) soft landscaping including planting;
(ii) landscape and biodiversity enhancement measures;
(iii) earth works;
(iv) hard standing and hard landscaping;
(v) drainage and irrigation infrastructure and improvements or extensions to existing irrigation systems;
(vi) fencing, gates, boundary treatment and other means of enclosure; and
(vii) improvement, maintenance and use of existing private tracks; and

(d) **Work No. 6D**— works on the West B Site comprising—

(i) soft landscaping including planting;
(ii) landscape and biodiversity enhancement measures;
(iii) earth works;
(iv) hard standing and hard landscaping;
(v) drainage and irrigation infrastructure and improvements or extensions to existing irrigation systems;
(vi) fencing, gates, boundary treatment and other means of enclosure; and
(vii) improvement, maintenance and use of existing private tracks.

	Location	The green infrastructure will be located within the limits of deviation of Work Nos. 6A, 6B, 6C and 6D as shown on the **Works Plans [REP3-011]**.

Green Infrastructure	Design	The green infrastructure will be designed as per the OLEMP contained within Appendix 10I of the ES **[REP2-005]**), in accordance with the requirements of the DCO.

Table B-7 Work No. 7 Design Principles

Work No. 7— temporary construction laydown areas including—

(a) **Work No. 7A**— a temporary construction laydown area on the East Site A comprising—
- (i) areas of hardstanding;
- (ii) car parking;
- (iii) site and welfare offices and workshops;
- (iv) security infrastructure, including cameras, perimeter fencing and lighting;
- (v) site drainage and waste management infrastructure (including sewerage); and
- (vi) electricity, water, waste water and telecommunications connections;

(b) **Work No. 7B**— up to five temporary construction laydown areas on the East Site B comprising—
- (i) areas of hardstanding;
- (ii) car parking;
- (iii) site and welfare offices and workshops;
- (iv) security infrastructure, including cameras, perimeter fencing and lighting;
- (v) site drainage and waste management infrastructure (including sewerage); and
- (vi) electricity, water, waste water and telecommunications connections;

(c) **Work No. 7C**— up to three temporary construction laydown areas on the West Site A comprising—
- (i) areas of hardstanding;
- (ii) car parking;
- (iii) security infrastructure, including cameras, perimeter fencing and lighting;
- (iv) site drainage and waste management infrastructure (including sewerage); and
- (v) electricity, water, waste water and telecommunications connections; and

(d) **Work No. 7D**— a temporary construction laydown areas on the West Site B comprising—
- (i) areas of hardstanding;
- (ii) car parking;
- (iii) security infrastructure, including cameras, perimeter fencing and lighting;
- (iv) site drainage and waste management infrastructure (including sewerage); and
- (v) electricity, water, waste water and telecommunications connections.

Construction laydown areas	No design principles applicable as temporary infrastructure. The maximum extent of the construction laydown areas is defined by **Works Plans [REP2-005].**

Table B-8 Work No. 8 Design Principles

Work No. 8— warehouse buildings and permanent compounds comprising—

(a) **Work No. 8A**— warehouse building and a permanent compound on the East Site A comprising—

(i) a warehouse building for the storage for spare parts and office and welfare facilities;

(ii) a canteen either located within the warehouse building within Work No. 8A(i) or in a separate container or building;

(iii) waste skips;

(iv) parking areas; and

(v) a permanent compound area; and

(b) **Work No. 8B**— warehouse building and a permanent compound area on the East Site B comprising—

(i) a warehouse building for the storage of spare parts and office and welfare facilities;

(ii) a canteen either located within the warehouse building within Work No. 8B(i) or in a separate container or building;

(iii) waste skips;

(iv) parking areas; and

(v) a permanent compound area.

Permanent Compound	Location	The permanent compounds will be located within the limits of deviation of Work Nos. 8A and 8B as shown on the **Works Plans [REP2-005]**.
	Scale	The maximum parameters for the permanent compound in Sunnica East Site A is 12,000m^2
	Scale	The maximum parameters for the permanent compound in Sunnica East Site B is 8,000m^2
	Scale	All of the works associated with Works No. 8, including the office and warehouse building, canteen, waste skips and parking areas, will be within the footprint of the permanent compounds and the maximum parameters described.
Office and warehouse building	Location	The office and warehouse buildings will be located within the permanent compound and within limits of deviation of Work Nos. 8A and 8B as shown on the **Works Plans [REP2-005]**.
	Scale	The maximum parameters for the office and warehouse building in Sunnica East Site A is 13 x 31m and 5m height
	Scale	The maximum parameters for the office and warehouse building in Sunnica East Site B is 25 x 35.5m and 8m height
	Design	Externally finished to be in keeping with the prevailing surrounding environment,

		most likely with a green, light grey or white painted finish.
	Design	The foundations will either be concrete base or monolith plinth to a maximum depth of 1m.
Parking areas	Location	The parking areas will be located within the limits of deviation of Work Nos. 8A and 8B as shown on the **Works Plans [REP2-005],** within the footprint of the permanent compound area.
	Scale	Up to a maximum of 20 car parking places will be provided within each onsite substation area

Table B-9 Work No. 9 Design Principles

Work No. 9— works to existing streets to facilitate access to Work Nos. 1 to 8.						
Works to Streets	Location	The works to streets will be located within the limits of deviation of Work No. 9 as shown on the **Works Plans [REP2-005]** as more particularly described in the relevant **Schedule** of the draft DCO **[REP2-012]** and shown on the **ARoW Plans [REP2-006]** .				
		ARoW Access Reference	**Scheme Phase**			
			Construction	**Operation**	**Decommissioning**	**Comment**
		Sunnica East Sites A and B				
		SE-A	√	√	√	Access SE-A will only be used during construction and decommissioning by cranes / Abnormal Indivisible Loads. The access will be retained during operation for use by emergency vehicles only to provide two accesses for the BESS area, in the event of a fire.
		SE-B	√	√	√	Access will be used during all phases.
		SE-C	√	√	√	Access SE-C is the primary access for Sunnica East Sites A and B and will be used during all phases.
		SE-D	√	√	√	Access will be used during all phases.
		SE-E	√	√	√	Access will be used during all phases.
		SE-F	√	√	√	Access will be used during all phases.
		SE-G	√	√	√	Access will be used during all phases.

		SE-H	√	X	√	Access SE-H will only be used during construction and decommissioning and will not be used during operation.
		SE-I	√	X	√	Access SE-I will only be used during construction and decommissioning and will not be used during operation.
		SE-J	X	√	X	Access SE-J will only be used during operation and will not be used during construction or decommissioning.
		SE-K	√	√	√	Access SE-K will only be used during construction and decommissioning by cranes / Abnormal Indivisible Loads. The access will be retained during operation for use by emergency vehicles only to provide two accesses for the BESS area, in the event of a fire.
		Sunnica West Sites A and B				
		SW-A	√	√	√	Access SW-A is the primary access for Sunnica West Sites A and B and will be used during all phases.
		SW-B	√	√	√	Access will be used during all phases.
		SW-C	√	√	√	Access will be used during all phases.
		SW-D	√	√	√	Access will be used during all phases.
		Burwell National Grid Substation Extension (Option 2)				

		CR-A	√	√	√	Access CR-A will provide access to Burwell National Grid Substation to facilitate connection to the National Electricity Transmission Network and will be used during all phases.
		Burwell National Grid Substation Extension (Option 2)				
		CR-B	√	√	√	Access will be required to the Burwell National Grid Substation Extension via CR-B for Option 2 and will be required during all phases, should this option be taken forward.
		Grid Connections Routes A and B				
		CR-B	√	√	X	The access locations across Grid Connection Routes A and B will be re-instated to their condition prior to the construction phase; however, the rights to utilise these access points will be retained during operation and secured through the DCO to allow access for maintenance, if required. Access to the Grid Connection Routes A and B is not required during decommissioning as the cable and infrastructure will remain *in-situ.*
		CR-C	√	√	X	
		CR -D	√	√	X	
		CR -E	√	√	X	
		CR -F	√	√	X	
		CR -G	√	√	X	
		CR -H	√	√	X	
		CR -I	√	√	X	
		CR -J	√	√	X	
		CR -K	√	√	X	
		CR -L	√	√	X	
		CR -M	√	√	X	
		CR -N	√	√	X	
		CR -O	√	√	X	
		CR -P	√	√	X	

		CR -Q	√	√	X	
		CR -R	√	√	X	
		CR -S	√	√	X	
		CR -T	√	√	X	
	Scale	Primary and crane / Abnormal Indivisible Loads access points will be a minimum of 6m in width.				
	Scale	Secondary accesses will be a minimum of 3.5m in width.				

Table B-10 Work No. 10 Design Principles

Work No. 10— works to create and maintain stone curlew reserve.		
Stone Curlew Reserve	Location	The stone curlew works will be located within the limits of deviation of Work No. 10 as shown on the **Works Plans [REP2-005]**.
	Design	The design of the Stone Curlew reserve will be designed as per the OLEMP contained within Appendix 10I of the ES **[REP3-011]**) in accordance with requirement 8 of the DCO.