SUNNICA ENERGY FARM

EN010106

Volume 7

7.4 Grid Connection Statement

APFP Regulation 6(1)(a)(i)

Planning Act 2008

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

18 November 2021
Version number: 00

Planning Act 2008

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

Sunnica Energy Farm

7.4 Grid Connection Statement

Regulation Reference:	Regulation 6(1)(a)(i)
Planning Inspectorate Scheme Reference	EN010106
Application Document Reference	EN010106/APP/7.4
Author	Sunnica Energy Farm Project Team

Version	**Date**	**Status of Version**
Rev 00	18 November 2021	Application Version

Executive summary

Sunnica Energy Farm is a solar energy farm proposal that would deliver electricity to the national electricity transmission network (the 'Scheme'). Sunnica Limited (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) which will connect to the Burwell National Grid Substation in Cambridgeshire.

This Grid Connection Statement (the 'Statement') has been prepared by the Applicant as part of an application for a Development Consent Order (DCO). The Applicant is required to submit a statement pursuant to Regulation 6(1)(a)(i) of the APFP Regulations, stating who will be responsible for designing and building the connection to the electricity grid.

This Statement provides confirmation to the Secretary of State for Business, Energy and Industrial Strategy that a connection to the Burwell National Grid Substation will be provided via 400kV underground cables from Burwell National Grid Substation Extension. 132kV cables will connect Sunnica East Site A, Sunnica East Site B, Sunnica West Site A, and Sunnica West Site B to the Burwell National Grid Substation Extension. The Applicant has, or will have, the ability to procure the necessary land and rights in order to upgrade the Burwell National Grid Substation to accommodate the Grid Connection; and as set out in the draft Development Consent Order **[EN010106/APP/3.1]** the Grid Connection forms part of the Scheme for which development consent is being sought.

Table of contents

1 Introduction

1.1 Introduction

1.1.1 This Grid Connection Statement (the Statement) has been prepared by Sunnica Limited (the 'Applicant') as part of an application for a Development Consent Order (DCO). The application for the DCO has been submitted to the Planning Inspectorate (on behalf of the Secretary of State), with the ultimate decision whether to grant a DCO being made by the Secretary of State for Business, Energy and Industrial Strategy (the Secretary of State) pursuant to the Planning Act 2008.

1.1.2 Sunnica Energy Farm is a new solar energy farm proposal that would deliver electricity to the national electricity transmission network (the 'Scheme'). 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.

1.1.3 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 (collectively referred to as the 'Sites'). All locations will comprise ground mounted solar PV panel arrays, supporting electrical infrastructure and, with the exception of Sunnica West Site B, a BESS.

1.1.4 The BESSs will consist of a compound and battery array to allow for the importation, storage and exportation of energy to the National Grid. The Sites will be connected to a new substation extension at the existing Burwell National Grid Substation, using 132 kilovolt (kV) cables buried underground. 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). The Burwell National Grid Substation Extension will convert the 132kV to 400kV. The 400kV cables will be buried and will connect the Scheme to the existing Burwell National Grid Substation to allow distribution to the national transmission network.

1.1.5 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, due to its generating capacity exceeding 50 megawatts (MW).

1.2 Purpose and Structure of this Statement

1.2.1 This Statement is part of a suite of documents which must accompany the DCO Application pursuant to Section 55 of the Planning Act 2008 and Regulations 5 and 6 of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (APFP Regulations).

1.2.2 This Statement has been prepared in accordance with Regulation 6(1)(a)(i) of the APFP Regulations, which requires an applicant for a DCO in respect of an

onshore generating station to provide a statement of who will be responsible for designing and building the connection to the electricity grid.

1.2.3 The Statement is structured as follows:

a. Section 1: Introduction;
b. Section 2: Elements of Grid Connection;
c. Section 3: Installation and Construction Details;
d. Section 4: Responsibilities for Designing and Building the Grid Connection;
e. Section 5: Consent for the Grid Connection Works; and
f. Section 6: Conclusion.

2 Elements of Grid Connection

2.1 Connection between the Sites and Burwell National Grid Substation

2.1.1 The connection to Burwell National Grid Substation will be provided via a 400kV underground cable from the Burwell National Grid Substation Extension. The Sites will connect to the Burwell National Grid Substation Extension via buried 132kV cables. The cable will connect Sunnica East Site A to Sunnica East Site B; Sunnica East Site B to Sunnica West Site A (Grid Connection Route A); Sunnica West Site A to Sunnica West Site B; and Sunnica West Site B to the Burwell National Grid Substation Extension (Grid Connection Route B). The total length of the cable run for Grid Connection Route A will be approximately 7km, and 13km for Grid Connection Route B.

2.1.2 The indicative cable routing is shown is shown on the following figures:

a. Figure 2-1: Grid Connection Route A between Sunnica East Site A and Sunnica East Site B

a. Figure 2-2: Grid Connection Route A between Sunnica East Site B and Sunnica West Site A

b. Figure 2-3: Grid Connection Route B between Sunnica West Site A and Sunnica West Site B

c. Figure 2-4: Grid Connection Route B between Sunnica West Site B and Burwell

2.2 Upgrades Required to Burwell National Grid Substation

2.2.1 In order to accommodate the proposed connection, upgrades are required to Burwell National Grid Substation. The Burwell National Grid Substation Extension will have a maximum footprint of 43m by 76m in plan and will be up to 12m in height, with an associated laydown area of up to 43m by 30m. The extension will house a new transformer, a 132kV busbar to connect the two 132kV circuits from the Sites with associated equipment and protections, including circuit breakers and voltage suppressors. The Burwell National Grid Substation Extension is shown on the following figures:

a. Figure 2-5: Burwell Substation Extension Elevation

b. Figure 2-6: Burwell Substation Extension General Arrangement

3 Installation and Construction Details

3.1 Construction programme

3.1.1 The construction of the 132 kV cable route will be undertaken in two concurrent phases over a 30 week period. The first phase will run from the Burwell National Grid Substation Extension to the onsite substation within Sunnica West Site A and the second will run from the substation in Sunnica West Site A to the substation in Sunnica East Site A. A total construction period of 24 weeks is proposed for the Burwell National Grid Substation Extension, and it is anticipated that the 400 kV grid connection from the Burwell National Grid Substation Extension to Burwell National Grid Substation will be constructed within this 24 week programme. It is currently assumed that the construction programme for the cable routes (132kV and 400kV) and the National Grid Substation Extension will be undertaken concurrently.

3.1.2 Where trenchless techniques are required these will be scheduled individually within the overall programme envelope to ensure that the works are completed in the most efficient manner possible. This will be determined at the detailed planning and pre-construction phase.

3.1.3 Cable installation will follow behind excavation in the same sequence. There will be an overlap of up to two weeks between sections as individual joint bays become available and completed bays are backfilled and reinstated.

3.2 Construction method

3.2.1 The Scheme will require two 132kV circuits comprised of up to three sets of cables per circuit to connect the onsite substation with the Burwell National Grid Substation Extension. Joint bays will be required up to every 2km to join sections of cable together and up to 30 fibre bays will be provided up to every 2km.

3.2.2 The cable route will need to cross a range of existing infrastructure such as major roads, minor roads and tracks, Public Rights of Way (PRoW), existing buried/underground utilities (such as medium and high-pressure gas mains), a railway, rivers, field drains and main drains. Open cut trenching will be primarily utilised for crossings. Trenchless techniques, such as boring, micro-tunnelling or moling methods will be undertaken where environmental constraints or design concludes the need for an alternative to open trenching.

3.2.3 Further detail on the construction methods can be found in **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.1].**

3.3 Construction of the extension required to the Burwell National Grid Substation

3.3.1 An extension to the Burwell National Grid Substation will be required, including a transformer compound to transform the 132kV export voltage from the Sites to the National Grid 400kV connection voltage.

3.3.2 The two areas identified for Burwell National Grid Substation Extension are currently agricultural fields. Option 1 is located within National Grid land ownership to the east of the existing Burwell Substation and an undeveloped area

designated by National Grid for its own extension to Burwell Substation, adjacent to Weirs Drove, approximately 200m west of Burwell. Option 2 is to the north of the existing Burwell Substation approximately 450m from Burwell. The maximum footprint of the Burwell National Grid Substation Extension will be approximately the same within both locations; however, the area identified for Option 2 is larger to avoid the loss of the tree line along Newnham Drove and minimise the environmental effects associated with this option. There are also constraints related to the overhead powerline and land owner negotiations. The larger area for option 2 allow for micro-siting post-consent, should this option be taken forward.

4 Contractual Agreements

4.1.1 The Solar PV and BESS will supply electricity to the System Operator (National Grid Electricity System Operator (NGESO)) via the infrastructure owned by the Transmission Owner (NGET). NGESO and NGET are both owned and operated by National Grid Electricity Transmission PLC (NGET) as two distinct legal entities (from April 2019).

4.1.2 The Applicant accepted the grid connection offer reference A/SUNN/18/1-2EX(0) provided by NGESO during December 2018, thereby securing a Bilateral Connection Agreement (BCA) to the existing Burwell 400kV substation.

4.1.3 Subsequently a Modification Application (Mod App) was made to NGESO which resulted in an Agreement to Vary (ATV) offer (dated 26th April 2021) for the existing Bilateral Connection Agreement (BCA) A/NP/90/1-9EN(5) (as amended from time to time) that was accepted by Sunnica.

4.1.4 The connection to the NETS will be an import and export connection to facilitate both the export of electricity from the solar PV and the BESS and the charging of the BESS from external sources.

4.1.5 As such, the Applicant confirms that output of the Solar and BESS will be exported via the NETS.

5 Responsibilities for Designing and Building the Grid Connection

5.1 Responsibilities of Sunnica Limited

5.1.1 The Applicant and its appointed contractors will be responsible for designing and building the following elements of the grid connection:

a. Extension to the substation which would include the construction of a new transformer and 132kV busbar in order to connect the two 132kV circuits with the associated works such as equipment and protections, circuit breakers, and voltage suppressors;

b. Install a generator bay;

c. Interconnecting cables; and

d. The diversion of utilities.

5.2 Responsibilities of National Grid

5.2.1 National Grid will be responsible designing and building all non-contestable works (works that will be undertaken by National Grid). It is anticipated these will include:

a. Convert the existing 400kV Burwell National Grid Substation to a double busbar arrangement;

b. Extension of the existing Burwell National Grid Substation to accommodate space for the Applicant to install one generator bay.

c. Uprate the busbar sections at Burwell-Pelham 400kV 1 and 2 circuits;

d. Uprate the cable section on the Burwell-Pelham 400kV 2 circuit; and

e. The diversion of utilities.

5.2.2 National Grid will be building a separate extension to Burwell Substation on land between the existing substation and the Option 1 land shown in Figure 5-1.

6 Acquisition of land and rights

6.1.1 The Applicant currently does not have the necessary property interests to construct, operate and maintain the Grid Connection or the Burwell National Grid Substation Extension.

6.1.2 The Applicant is seeking to negotiate an option for easement with affected landowners for the Grid Connection. Heads of Terms have been issued to the affected landowners but to date no option agreements have been secured. As such the Applicant will require powers of compulsory acquisition to acquire the easement that it requires to install, maintain and operate the Grid Connection.

6.1.3 The Application includes two options for the Burwell National Grid Substation Extension. Only one of these would ever be implemented and the Order includes a mechanism to secure this. The preferred option is that Option 1 will be selected. This is located wholly on land owned by National Grid and the Applicant has had detailed discussions with National Grid over these Heads of Terms. It is anticipated that an option will be secured by the close of the examination. At the time of making the Application National Grid were unable to confirm Option 1 would be technically feasible in the context of its own plans to extend the existing National Grid Substation. It is for this reason that Option 2 remains within the Application. The owner of the land on which Option 2 would be located has indicated that he is not willing to negotiate the acquisition of this land voluntarily. Therefore, if Option 2 is ever selected for locating the Burwell National Grid Substation Extension then the Applicant would need to rely on powers of compulsory acquisition under the Order to secure this land.

7 Consent for the Grid Connection Works

7.1.1 The Grid Connection and Burwell National Grid Substation Extension forms part of the Scheme for which development consent is being sought via the DCO Application.

7.1.2 As such, it is considered that if the same terms as those set out in the draft Development Consent Order **[EN010106/APP/3.1]** are granted, development consent for the Grid Connection will have been secured.

8 Conclusion

8.1.1 Sunnica Limited is required to submit a statement pursuant to Regulation 6(1)(a)(i) of the APFP Regulations, stating who will be responsible for designing and building the connection to the electricity grid.

8.1.2 It is considered that this Grid Connection Statement provides confirmation to the Secretary of State of the requirement above, namely:

a. A connection to the Burwell National Grid Substation will be provided via 400kV underground cables from the Burwell National Grid Substation Extension. 132kV cables will connect Sunnica East Site A, Sunnica East Site B, Sunnica West Site A, and Sunnica West Site B to Burwell National Grid Substation Extension;

b. The Applicant has, or will have, the ability to procure the necessary land and rights in order to upgrade the Burwell National Grid Substation to accommodate the Grid Connection; and

c. As stipulated in the **draft Development Consent Order [EN010106/APP/3.1]** the Grid Connection forms part of the Scheme for which development consent is being sought.

Appendices

Appendix A Supporting Figures

565000 566000 567000 568000 569000 570000 571000

275000 274000 273000 272000 271000

Marina
East Fen
Lee Brook
West Row
Hill Fm
PH
Bargate Fm
River Lark
Wks
Mildenhall
Sch
Cross
Mus
PH
Wamil Hall
Mill
Hotel
Isleham
The Pits
Lee Fm
Rectory Fm
Hotel
Barton Mills
Worlington
Moat
Dismtd
fly
The Grange Fm
CH
Hall Fm
Freckenham
B1102
PH
Hall
Rectory Fm
Quarry
Tumulus
Quarry Hill
Tumulus
Isleham Plantn
Leechmere Fm
B1104
B1085
Badlingham Manor
Moat
Red Lodge
Park Fm

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

0 500 1,000m

N

File Name: \\eu.aecomnet.com\emia\UKIUKCBG1\Jobs\PR-334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\Grid Connection\210927_SunnicaEnergyFarm_Figure2-1_GridConnectionsEastSiteA_B.mxd

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order limits
- Maximum corridor for Grid Connection Route A
- High Voltage Connection Corridors
- Proposed 132kV Cable Route
- Public Highway within Scheme
- Developable Area
- BESS and Substation

NOTE:
Document Reference: EN/0101006/APP/7.4
APFP Regulation 6(1)(a)(i)
Locations of internal cable routes have not been fixed and will be determined at detailed design stage.

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2-1
GRID CONNECTION ROUTE A BETWEEN SUNNICA EAST SITE A AND SUNNICA EAST SITE B

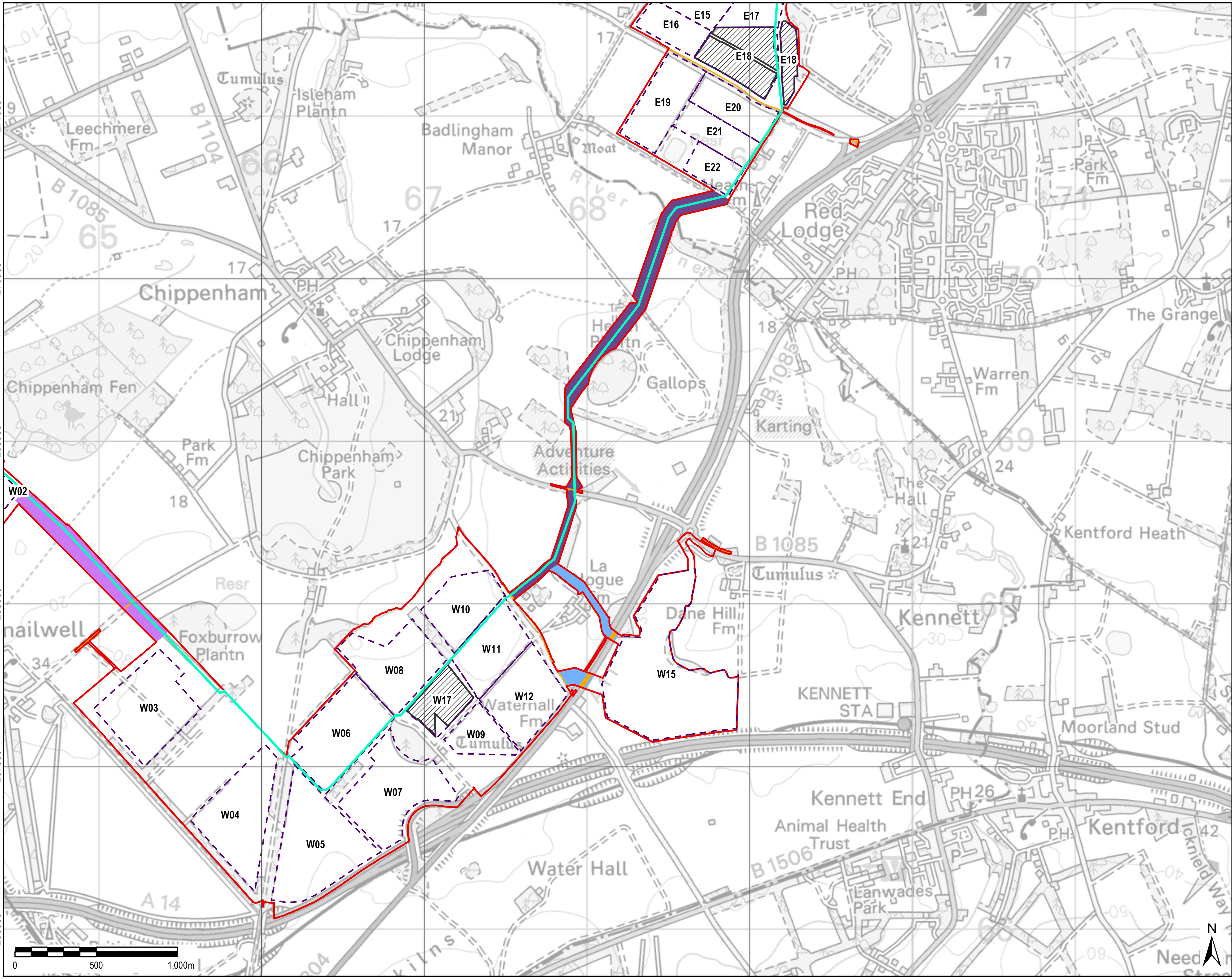
Drawn	Checked	Approved	Date
LL	DW	NC	01/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:20,180

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

AECOM

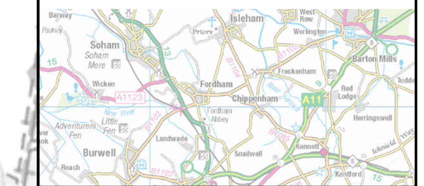
Drawing Number	Rev
60589004_ES_GC_001	0



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order limits
- Maximum corridor for Grid Connection Route A
- Maximum corridor for Grid Connection Route B
- High Voltage Connection Corridors
- Proposed 132kV Cable Route
- Public Highway within Scheme
- Developable Area
- BESS and Substation



NOTE:
Document Reference: EN/0101006/APP/7.4
APFP Regulation 6(1)(a)(i)
Locations of internal cable routes have not been fixed and will be determined at detailed design stage.

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2-2
GRID CONNECTION ROUTE A BETWEEN SUNNICA EAST SITE B AND SUNNICA WEST SITE A

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

AECOM Internal Project No.	Scale @ A3
60589004	1:21,390

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number: 60589004_ES_GC_002
Rev: 0

File Name:\\eu.aecomnet.com\emea\UKI\UKCBG1\Jobs\PR-334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17_GIS\Layout\Grid Connection\210927_SunnicaEnergyFarm_Figure2-2_GridConnectionsEastSiteB_WestA.mxd

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order limits
- Maximum corridor for Grid Connection Route A
- Maximum corridor for Grid Connection Route B
- High Voltage Connection Corridors
- Proposed 132kV Cable Route
- Public Highway within Scheme
- Developable Area
- BESS and Substation

NOTE:
Document Reference: EN.0101006/APP/7.4
APFP Regulation 6(1)(a)(i)
Locations of internal cable routes have not been fixed and will be determined at detailed design stage.

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2-3
GRID CONNECTION ROUTE B BETWEEN SUNNICA WEST SITE A AND SUNNICA WEST SITE B

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

AECOM Internal Project No.	Scale @ A3
60589004	1:20,180

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

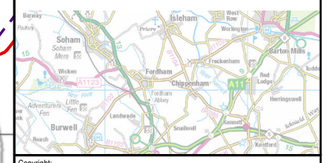
Drawing Number	Rev
60589004_ES_GC_003	0

File Name: \\eu.aecomnet.com\emia\UK\UKCBG1\Jobs\PR-334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\Grid Connection\2 10927_SunnicaEnergyFarm_Figure2-3_GridConnectionsWestSiteA_B.mxd

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order limits
- Maximum corridor for Grid Connection Route B
- Proposed 132kV Cable Route
- Public Highway within Scheme
- Developable Area
- Burwell National Grid Substation Extension location – Option 1
- Burwell National Grid Substation Extension location – Option 2



NOTE:
Document Reference: EN/0101006/APP/7.4
APFP Regulation 6(1)(a)(i)
Locations of internal cable routes have not been fixed and will be determined at detailed design stage.

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2-4
GRID CONNECTION ROUTE B
BETWEEN SUNNICA WEST
SITE B AND BURWELL

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

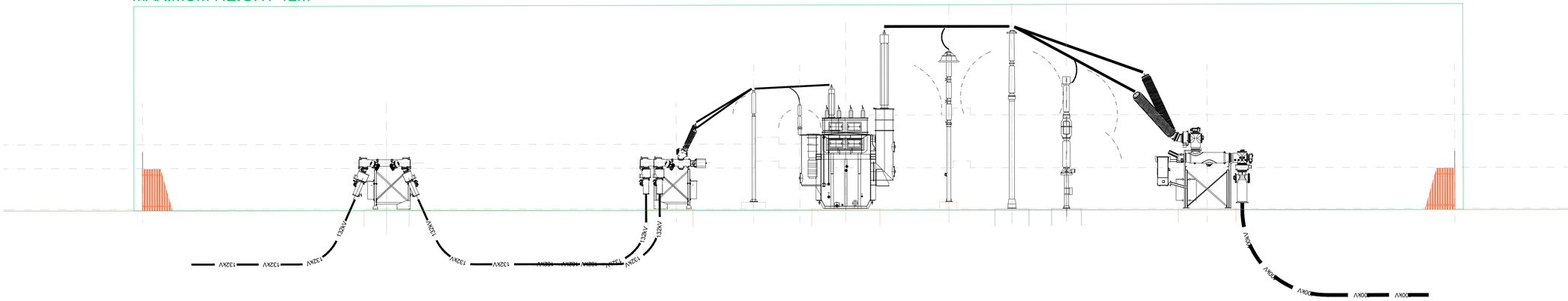
AECOM Internal Project No.	Scale @ A3
60589004	1:20,180

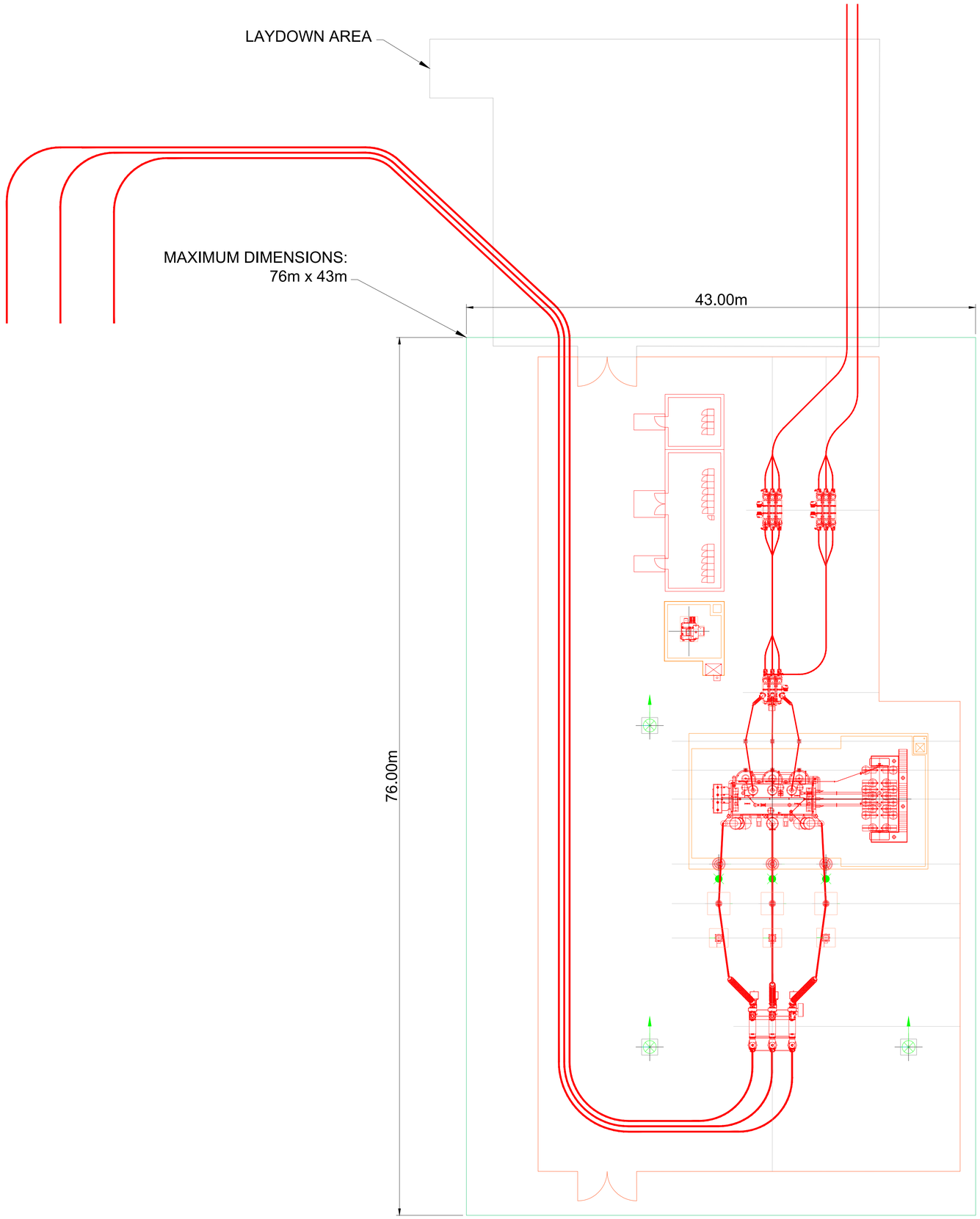
AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_GC_004	0

File Name: \\eu.aecomnet.com\emia\UK\UKCBG1\Jobs\PR.334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\Grid Connection\210927_SunnicaEnergyFarm_Figure2-4_GridConnections\WestSiteB_Burwell.mxd

MAXIMUM HEIGHT 12M


132kV
132kV
132kV



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

Document Reference: EN010106/APP/7.4
APFP Regulation 6(1)(a)(i)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2-6
BURWELL SUBSTATION EXTENSION GENERAL ARRANGEMENT (ILLUSTRATIVE)

Drawn	Checked	Approved	Date
LE	DW	NC	01/10/21

AECOM Internal Project No.	Scale @ A3
60589004	NOT TO SCALE

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_GC_006	0

558000

267000

Option 2

Option 1

Burwell Substation

Newnham Drove

Weirs Drove

0

500m

N

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order limits
- National Grid Substation Extension Burwell - Option 1
- National Grid Substation Extension Burwell - Option 2
- Indicative Location of National Grid Extension

NOTE:
Document Reference: EN/0101006/APP/7.4
APFP Regulation: 6(1)(a)(i)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 5-1
INDICATIVE LOCATION OF NATIONAL GRID EXTENSION

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

AECOM Internal Project No.	Scale @ A3
60589004	1:3,660

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

AECOM

Drawing Number	Rev
60589004_ES_GC_007	0

File Name:\\eu.aecomnet.com\UKUKCBG1\Jobs\PR.334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\Grid Connection\210927_SunnicaEnergyFarm_Figure5-1_IndicativeLocationofNationalGridExtension.mxd