



NOTES:

01	First Issue	RL	09/05/25
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REV:	DESCRIPTION:	BY:	DATE:
STATUS: Proposal			

Riverbridge House
Fetcham Grove, Guildford Road
Leatherhead, Surrey
KT22 9AD
United Kingdom



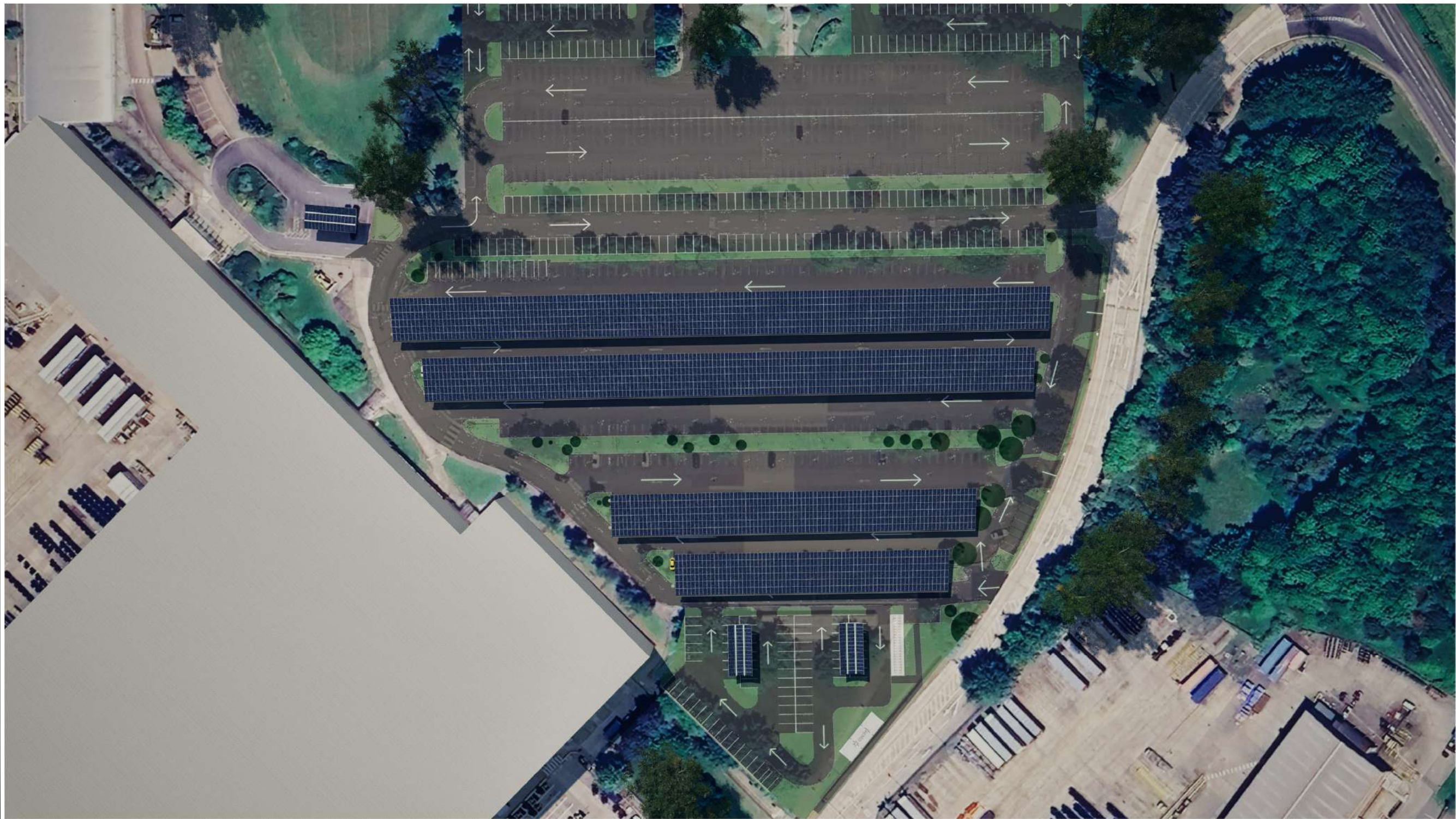
CLIENT:
Caterpillar UK Ltd

Project:
Solar Car Park

SITE:
Peckleton Lane, Leicester

TITLE:
Canopy Design Proposal Render

SCALE: NTS	DATE: 06/09/25	DRAWN: RL	CHECKED: TD
PROJECT NO: 229	DRAWING NO: CATD-10003 SHT1/3	REVISION: 01	



NOTES:

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Project:
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SITE:
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Canopy Design Proposal Render

SCALE: NTS	DATE: 06/09/25	DRAWN: RL	CHECKED: TD
PROJECT NO: 229	DRAWING NO: CATD-10003 SHT2/3	REVISION: 01	



NOTES:

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United Kingdom



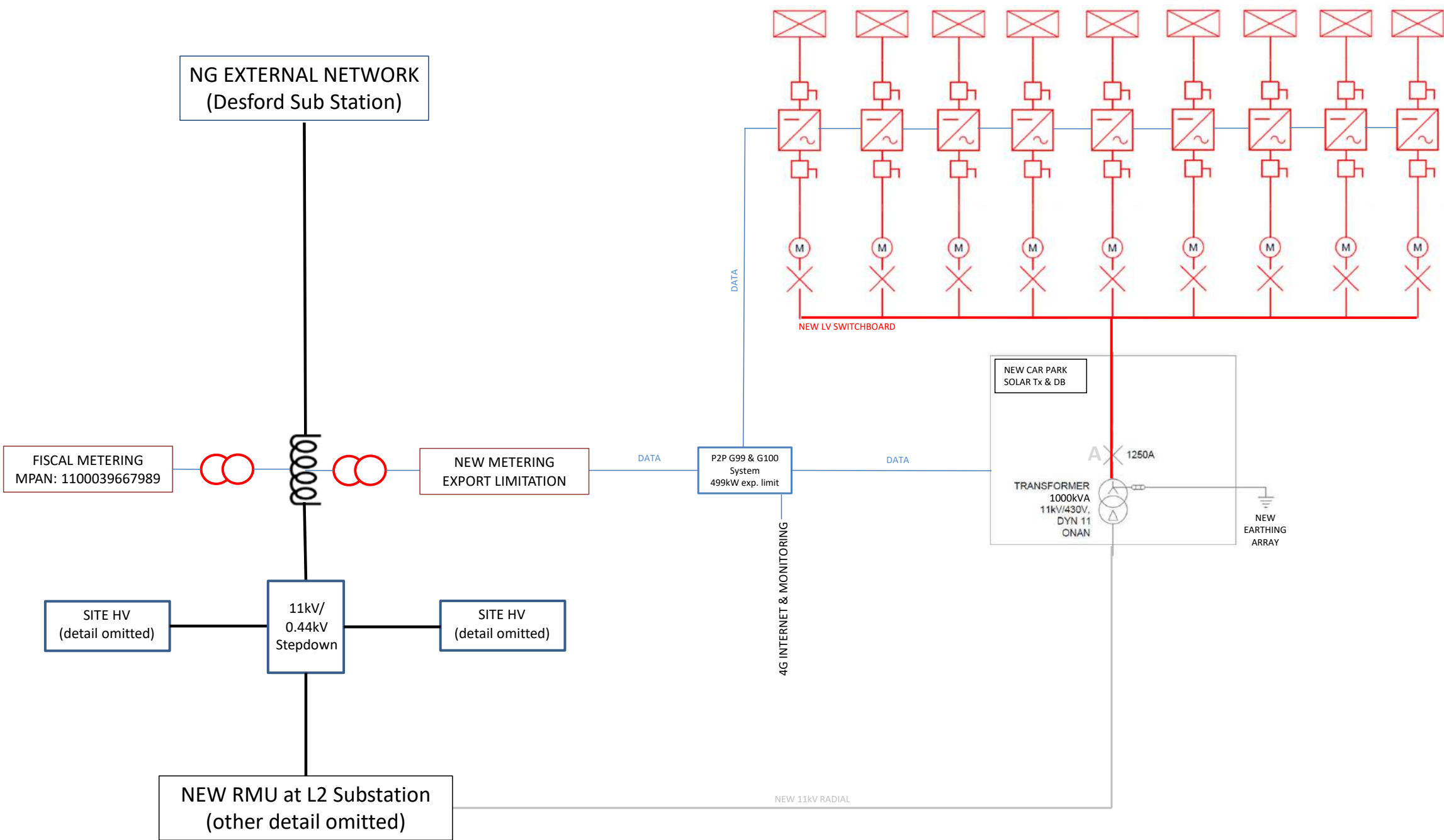
CLIENT:
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NOTES:

a) Type A Generating unit comprises:

JA Solar
2290 x JAM72D40- 600/LB
1,374 kWp

10No Solis 110K 5G.
G99 Type Test Ref:
SOLIS/02109/V1/A2

Total: 949kW

b) Exact LV or/or layout TBD

c) G100 Type Test Ref
JUGGL/12875/V1/A1
(or equal)

Export Limit: 499kW

Existing Generation Capacity: Nil

MPAN: 1100039667989

Grid Reference & Site Address:
SK 48151 02151
Caterpillar UK Ltd
Peckleton Ln, Leicester
LE9 9JT

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SITE:

Peckleton Lane, Leicester

TITLE:

Single Line Diagram

SCALE:	DATE:	DRAWN:	CHECKED:
NTS	05/09/25	RL	TD
PROJECT NO:	DRAWING NO:		REVISION:
229	CATD-10001		01

Project Name: 229 Caterpillar UK Ltd V2
Offer no.: 003-8522564

09/04/2025

Documentation- 003-8522564

Customer Details

Company	
Customer Number	
Contact person	
Address	Caterpillar UK Ltd, Peckleton Ln, Leicester LE9 9JT
Phone	
Fax	
E-Mail	

Project Data

Project Name	229 Caterpillar UK Ltd V2
Offer no.	003-8522564
Project Designer	CS
Address	Caterpillar UK Ltd, Peckleton Ln, Leicester LE9 9JT



Project Description:
V2 JAM72D-40-600-LB

Project Overview



Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System

Climate Data	Leicester, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
PV Generator Output	1374 kWp
PV Generator Surface	6,058.5 m ²
Number of PV Modules	2290
Number of Inverters	10

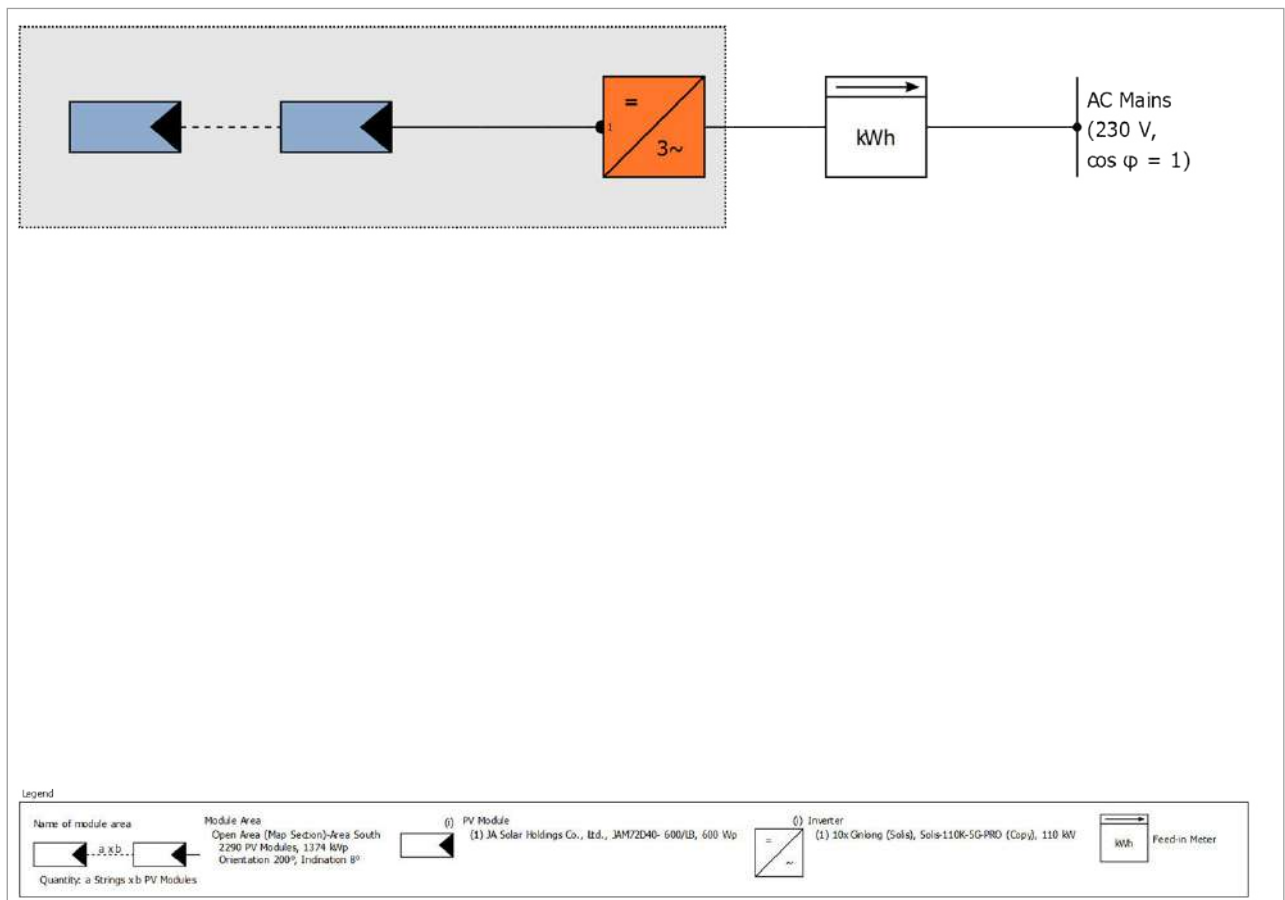


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	1,374.00 kWp
Spec. Annual Yield	870.21 kWh/kWp
Performance Ratio (PR)	84.38 %
Yield Reduction due to Shading	3.3 %
Grid Export	1,195,744 kWh/Year
Grid Export in the first year (incl. module degradation)	1,193,208 kWh/Year
Standby Consumption (Inverter)	74 kWh/Year
CO ₂ Emissions avoided	561,965 kg / year

Financial Analysis

Your Gain

Total investment costs	0.00 £
Internal Rate of Return (IRR)	299.80 %
Amortization Period	More than 20 Years
Electricity Production Costs	0 £/kWh
Energy Balance/Feed-in Concept	Full Feed-in

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	3D, Grid-connected PV System
Start of Operation	07/04/2025

Climate Data

Location	Leicester, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
Data resolution	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Module Areas

1. Module Area - Open Area (Map Section)-Area South

PV Generator, 1. Module Area - Open Area (Map Section)-Area South

Name	Open Area (Map Section)-Area South
PV Modules	2290 x JAM72D40- 600/LB (v1)
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	8 °
Orientation	South 200 °
Installation Type	Mounted - Open Space
PV Generator Surface	6,058.5 m ²



Figure: 1. Module Area - Open Area (Map Section)-Area South

Degradation of Module, 1. Module Area - Open Area (Map Section)-Area South

Characteristic curve

Linear (straight line)

Remaining power (power output) after 25 years

87 %

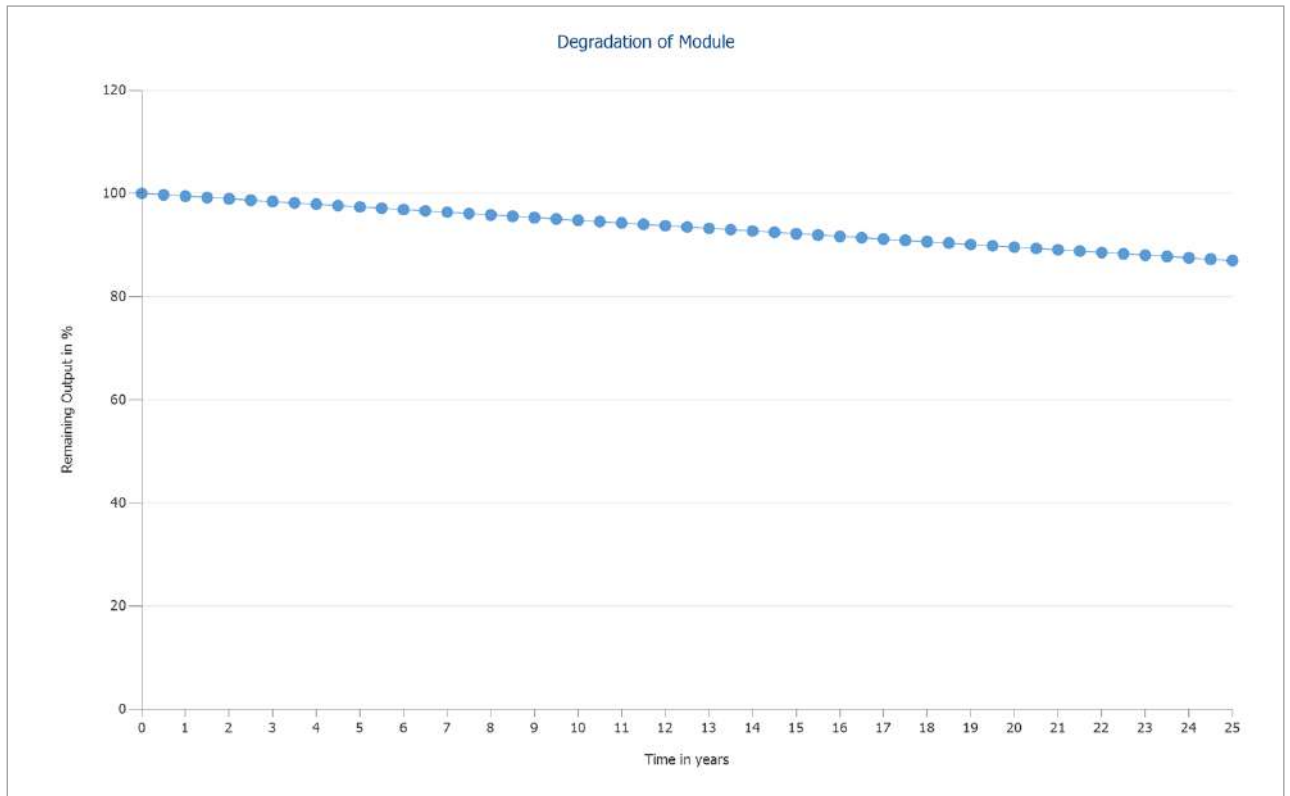


Figure: Degradation of Module, 1. Module Area - Open Area (Map Section)-Area South

Horizon Line, 3D Design

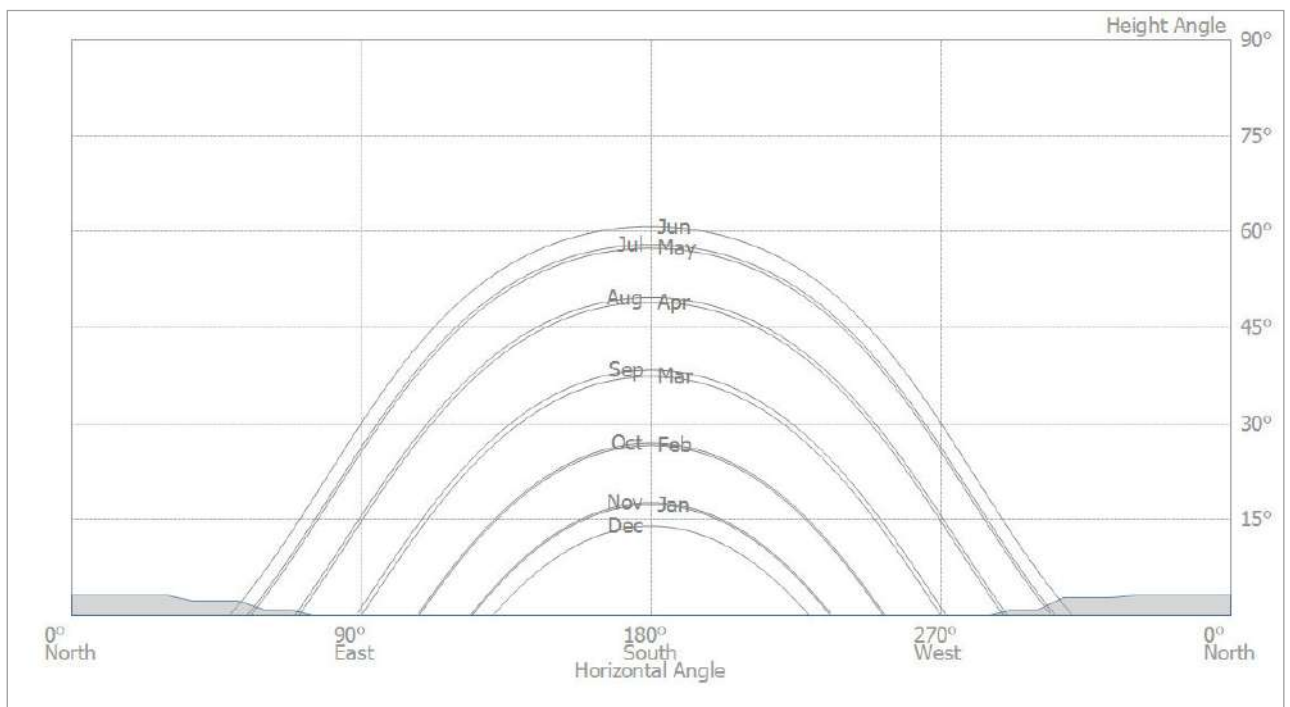


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Area	Open Area (Map Section)-Area South
Inverter 1	
Model	Solis-110K-5G-PRO (Copy) (v1)
Manufacturer	Ginlong (Solis)
Quantity	5
Sizing Factor	125.5 %
Configuration	MPP 1: 2 x 14
	MPP 2: 2 x 14
	MPP 3: 2 x 14
	MPP 4: 2 x 14
	MPP 5: 2 x 14
	MPP 6: 2 x 14
	MPP 7: 2 x 14
	MPP 8: 2 x 17
Inverter 2	
Model	Solis-110K-5G-PRO (Copy) (v1)
Manufacturer	Ginlong (Solis)
Quantity	5
Sizing Factor	124.4 %
Configuration	MPP 1: 2 x 14
	MPP 2: 2 x 14
	MPP 3: 2 x 14
	MPP 4: 2 x 14
	MPP 5: 2 x 14
	MPP 6: 2 x 14
	MPP 7: 2 x 14
	MPP 8: 2 x 16

AC Mains

AC Mains

Number of Phases	3
Mains voltage between phase and neutral	230 V
Displacement Power Factor (cos phi)	+/- 1

Simulation Results

Results Total System

PV System

PV Generator Output	1,374.00 kWp
Spec. Annual Yield	870.21 kWh/kWp
Performance Ratio (PR)	84.38 %
Yield Reduction due to Shading	3.3 %
Grid Export	1,195,744 kWh/Year
Grid Export in the first year (incl. module degradation)	1,193,208 kWh/Year
Standby Consumption (Inverter)	74 kWh/Year
CO ₂ Emissions avoided	561,965 kg / year

Energy Flow Graph

Project: 229 Caterpillar UK Ltd V2



All values in kWh
Small deviations in the totals can occur due to rounding
created with PV*SOL

Figure: Energy flow

229 Caterpillar UK Ltd V2

Project Designer: CS

Offer Number: 003-8522564

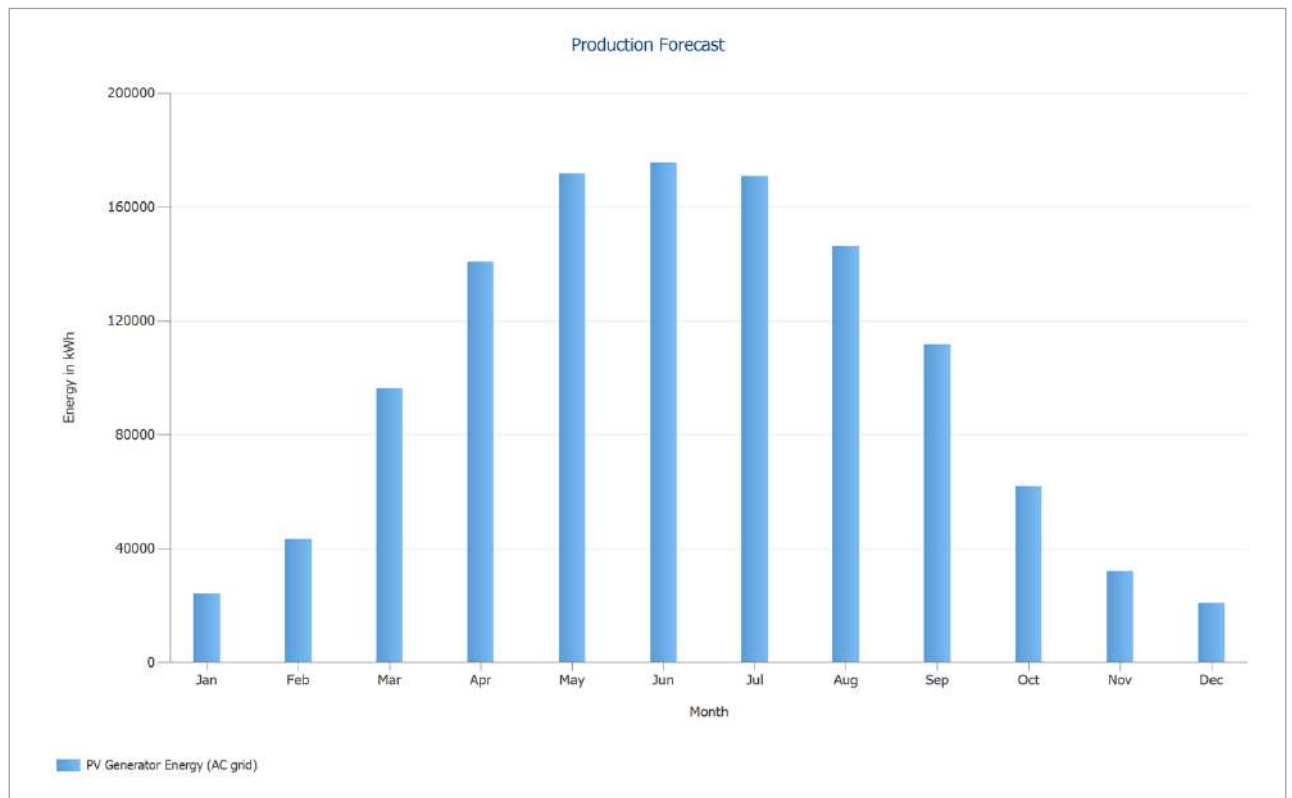


Figure: Production Forecast

Results per Module Area

Open Area (Map Section)-Area South

PV Generator Output	1374.00 kWp
PV Generator Surface	6,058.47 m ²
Global Radiation at the Module	1025.97 kWh/m ²
Global Radiation on Module without reflection	1031.43 kWh/m ²
Performance Ratio (PR)	84.38 %
PV Generator Energy (AC grid)	1195743.55 kWh/Year
Spec. Annual Yield	870.26 kWh/kWp

PV System Energy Balance

PV System Energy Balance

Global radiation - horizontal	992.69 kWh/m²	
Deviation from standard spectrum	-9.93 kWh/m ²	-1.00 %
Ground Reflection (Albedo)	0.96 kWh/m ²	0.10 %
Orientation and inclination of the module surface	56.94 kWh/m ²	5.79 %
Module-independent shading	-9.23 kWh/m ²	-0.89 %
Reflection on the Module Surface	-5.46 kWh/m ²	-0.53 %
Irradiance on the rear side of the module	0.00 kWh/m ²	0.00 %
Global Radiation at the Module	1,025.97 kWh/m²	
	1,025.97 kWh/m ²	
	x 6058.474 m ²	
	= 6,215,804.68 kWh	
Global PV Radiation	6,215,804.68 kWh	
Bifaciality (80 % of back irradiance)	0.00 kWh	0.00 %
Soiling	-186,443.76 kWh	-3.00 %
STC Conversion (Rated Efficiency of Module 22.68 %)	-4,662,078.42 kWh	-77.32 %
Rated PV Energy	1,367,282.51 kWh	
Module-specific Partial Shading	-24,849.01 kWh	-1.82 %
Low-light performance	-51,997.00 kWh	-3.87 %
Deviation from the nominal module temperature	2,670.36 kWh	0.21 %
Diodes	-670.28 kWh	-0.05 %
Mismatch (Manufacturer Information)	-25,848.73 kWh	-2.00 %
Mismatch (Configuration/Shading)	-6,564.90 kWh	-0.52 %
PV Energy (DC) without inverter clipping	1,260,022.94 kWh	
Failing to reach the DC start output	0.00 kWh	0.00 %
Clipping on account of the MPP Voltage Range	-13.64 kWh	0.00 %
Clipping on account of the max. DC Current	0.00 kWh	0.00 %
Clipping on account of the max. DC Power	0.00 kWh	0.00 %
Clipping on account of the max. AC Power/cos phi	-643.82 kWh	-0.05 %
MPP Matching	-1,745.77 kWh	-0.14 %
PV energy (DC)	1,257,619.72 kWh	
Energy at the Inverter Input	1,257,619.72 kWh	
Input voltage deviates from rated voltage	-2,067.41 kWh	-0.16 %
DC/AC Conversion	-27,223.18 kWh	-2.17 %
Standby Consumption (Inverter)	-74.16 kWh	-0.01 %
Total Cable Losses	-32,585.58 kWh	-2.65 %
PV energy (AC) minus standby use	1,195,669.39 kWh	
PV Generator Energy (AC grid)	1,195,743.55 kWh	

Energy balance Sankey-Diagram

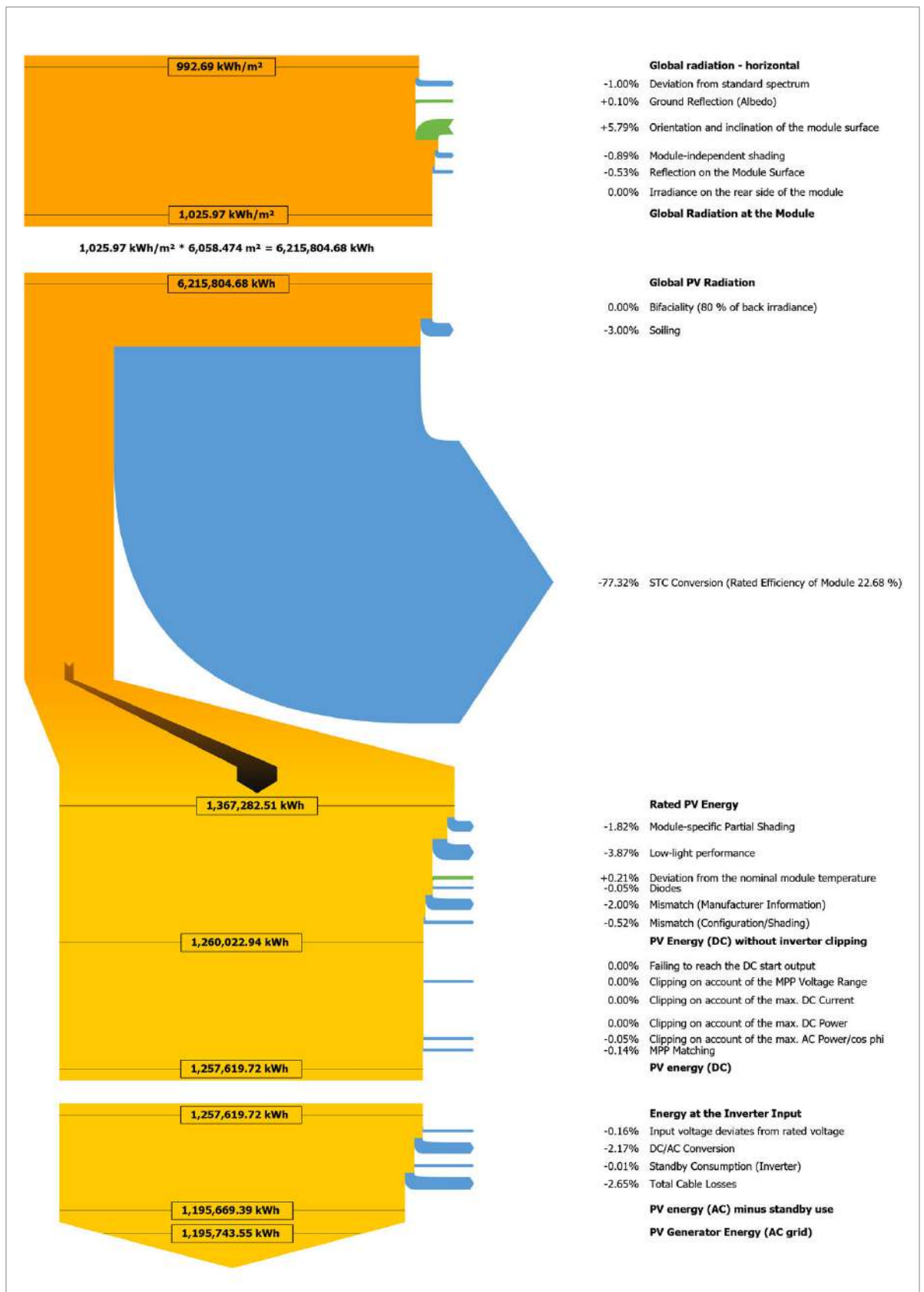


Figure: Energy balance Sankey-Diagram

Financial Analysis

Overview

System Data

Grid Export in the first year (incl. module degradation)	1,193,208 kWh/Year
PV Generator Output	1374 kWp
Start of Operation of the System	07/04/2025
Assessment Period	20 Years
Interest on Capital	1 %

Economic Parameters

Internal Rate of Return (IRR)	299.80 %
Accrued Cash Flow (Cash Balance)	0.00 £
Amortization Period	More than 20 Years
Electricity Production Costs	0 £/kWh

Payment Overview

Specific Investment Costs	0.00 £/kWp
Investment Costs	0.00 £
One-off Payments	0.00 £
Incoming Subsidies	0.00 £
Annual Costs	0.00 £/Year
Other Revenue or Savings	0.00 £/Year

Remuneration and Savings

Total Payment from Utility in First Year	0.00 £/Year
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Cash flow

Cash flow

Degradation and inflation rates are applied on a monthly basis over the entire observation period. This is done in the first year.

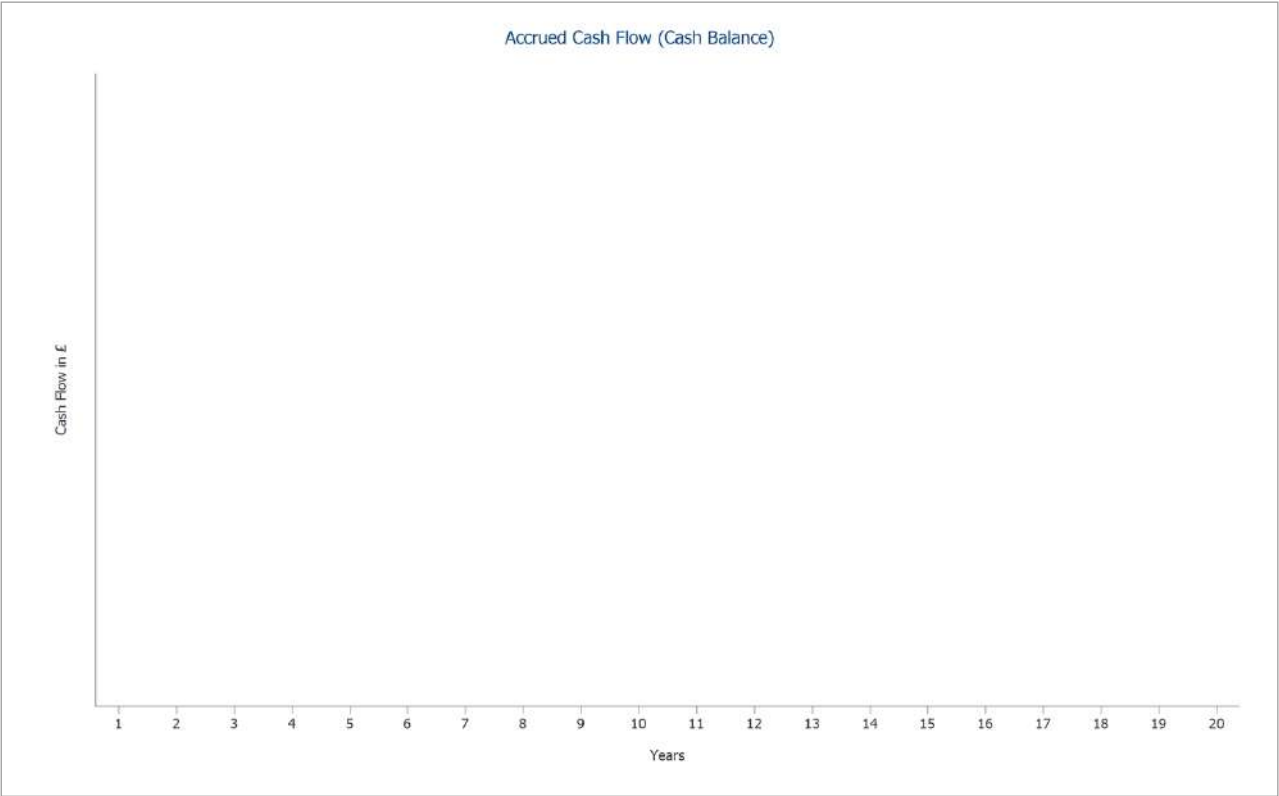


Figure: Accrued Cash Flow (Cash Balance)

Data Sheets

PV Module Data Sheet

PV Module: JAM72D40- 600/LB (v1)

Manufacturer	JA Solar Holdings Co., Ltd.
Available	Yes

Electrical Data

Cell Type	Si monocrystalline
Half-cell module	Yes
Cell Count	144
Number of Bypass Diodes	3
Loss voltage per bypass diode	1 V
Integrated power optimizer	No
Only Transformer Inverters suitable	No

I/V Characteristics at STC

MPP Voltage	43.76 V
MPP Current	13.71 A
Open Circuit Voltage	52.4 V
Short-Circuit Current	14.48 A
Increase open circuit voltage before stabilisation	0 %
Nominal output	600 W
Fill Factor	79.07 %
Efficiency	22.68 %

I/V Part Load Characteristics

Values source	Manufacturer/user-created
Irradiance	200 W/m ²
Voltage in MPP at Part Load	41.183 V
Current in MPP at Part Load	2.719 A
Open Circuit Voltage (Part Load)	47.353 V
Short Circuit Current at Part Load	2.842 A

Additional Parameters

Temperature Coefficient of Voc	-136.24 mV/K
Temperature Coefficient of Isc	6.66 mA/K
Temperature Coefficient of Pmpp	-0.3 %/K
Incident Angle Modifier (IAM)	100 %
Bifacial factor	80 %
Maximum System Voltage	1500 V

Mechanical Data

Width	1134 mm
Height	2333 mm
Depth	30 mm
Frame Width	28 mm
Weight	32.5 kg

229 Caterpillar UK Ltd V2

Project Designer: CS
Offer Number: 003-8522564

Inverter Data Sheet

Inverter: Solis-110K-5G-PRO (Copy) (v1)

Manufacturer	Ginlong (Solis)
Available	Yes
Electrical data - DC	
DC nominal output	110 kW
Max. DC Power	162 kW
Nom. DC Voltage	600 V
Max. Input Voltage	1100 V
Max. Input Current	272 A
Max. short circuit current	400 A
Number of DC Inlets	16
Electrical data - AC	
AC Power Rating	110 kW
Max. AC Power	121 kVA
Nom. AC Voltage	220 V
Number of Phases	3
With Transformer	No
Electrical data - other	
Change in Efficiency when Input Voltage deviates from Rated Voltage	0.2 %/100V
Min. Feed-in Power	20 W
Standby Consumption	4 W
Night Consumption	1 W
MPP Tracker	
Output Range < 20% of Power Rating	99.6 %
Output Range > 20% of Power Rating	99.9 %
Count of MPP Trackers	8
Count of different trackers	2
MPP Tracker Type 1	
Quantity	4
MPP Tracker	1-4
Max. Input Current	40 A
Max. short circuit current	50 A
Max. Input Power	21.6 kW
Min. MPP Voltage	160 V
Max. MPP Voltage	1000 V
MPP Tracker Type 2	
Quantity	4
MPP Tracker	5-8
Max. Input Current	32 A
Max. short circuit current	50 A
Max. Input Power	19.2 kW
Min. MPP Voltage	160 V
Max. MPP Voltage	1000 V

Plans and parts list
Circuit Diagram

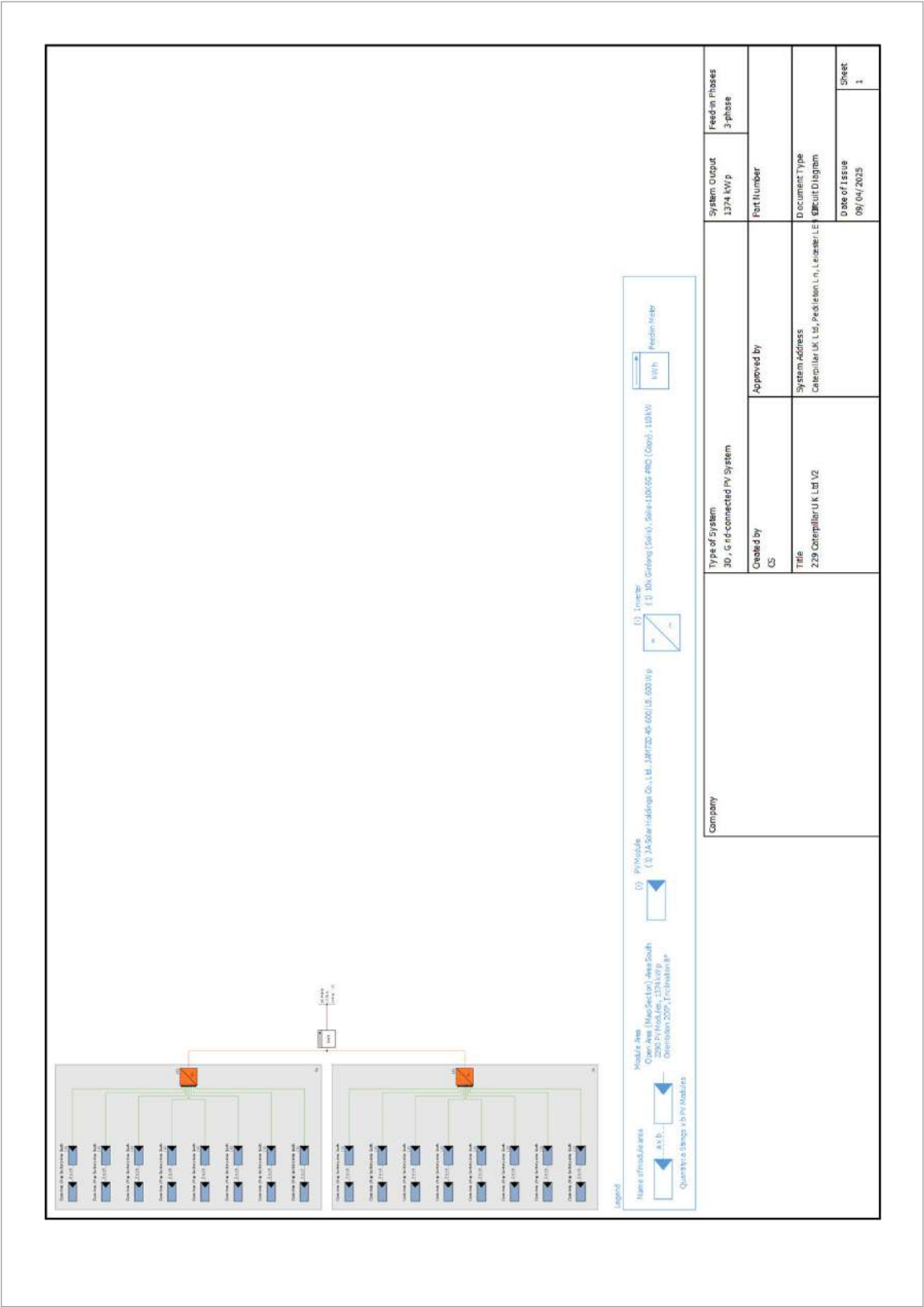


Figure: Circuit Diagram

Overview plan

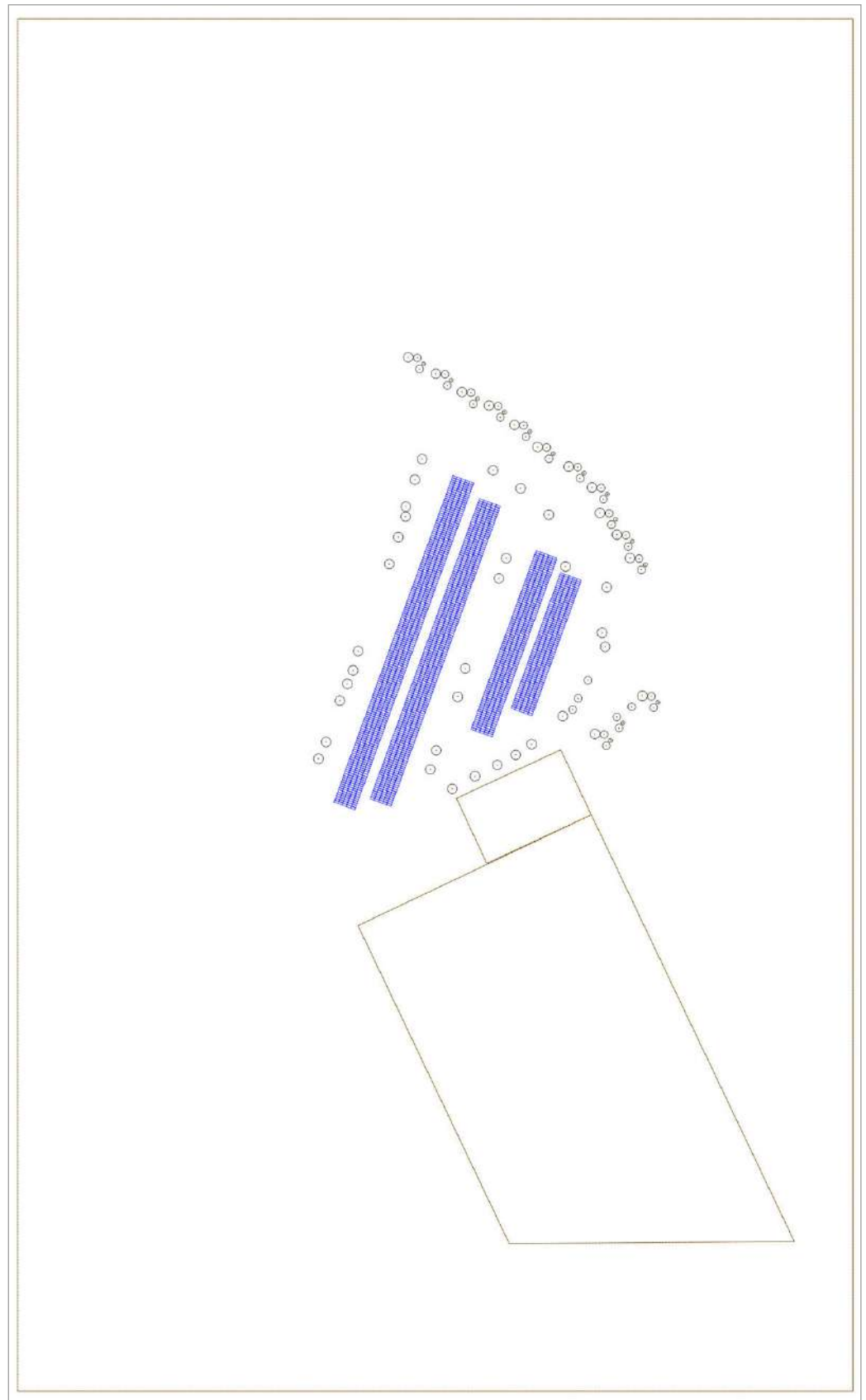


Figure: Overview plan

Dimensioning Plan

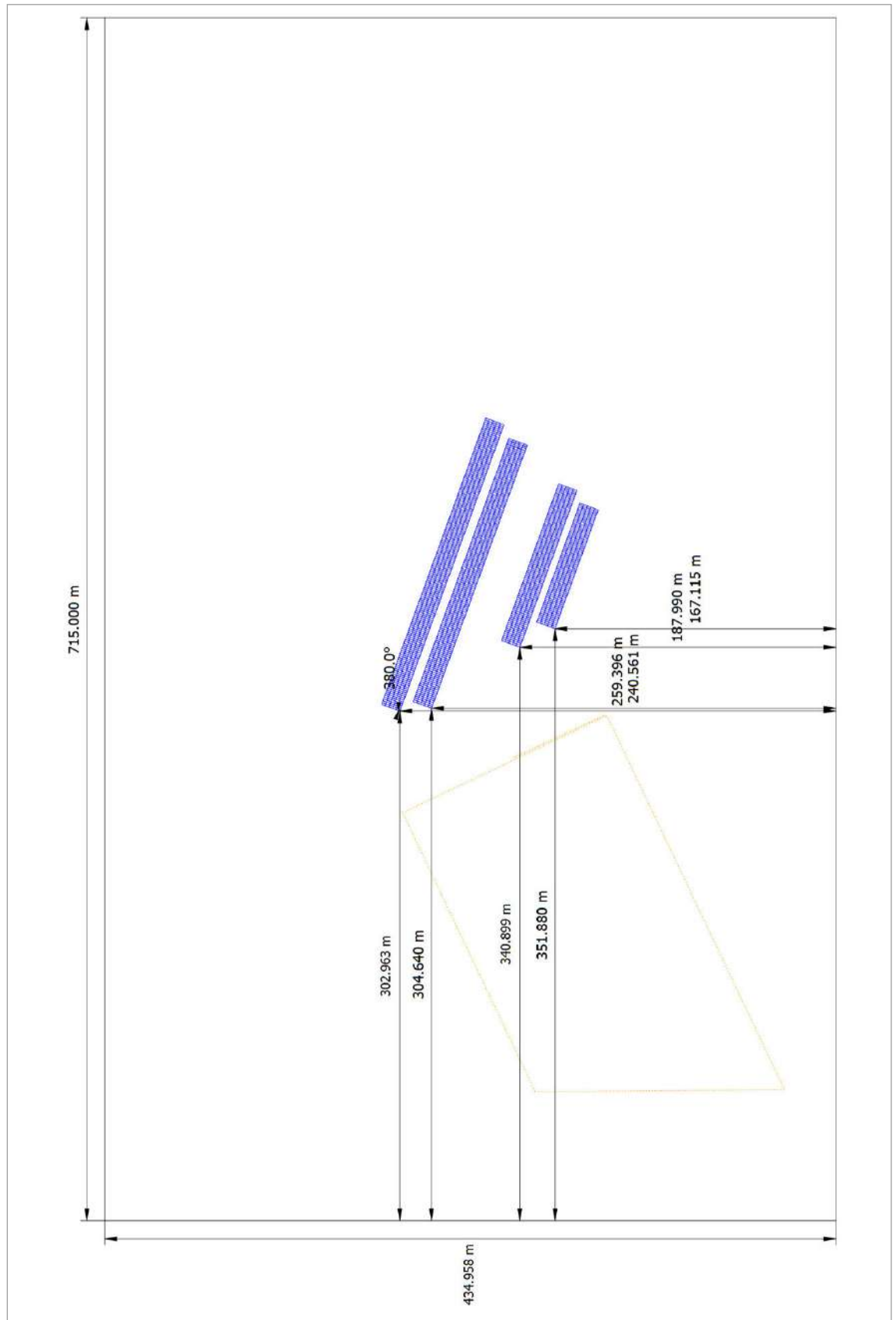


Figure: Open Area (Map Section) - Area South

String Plan

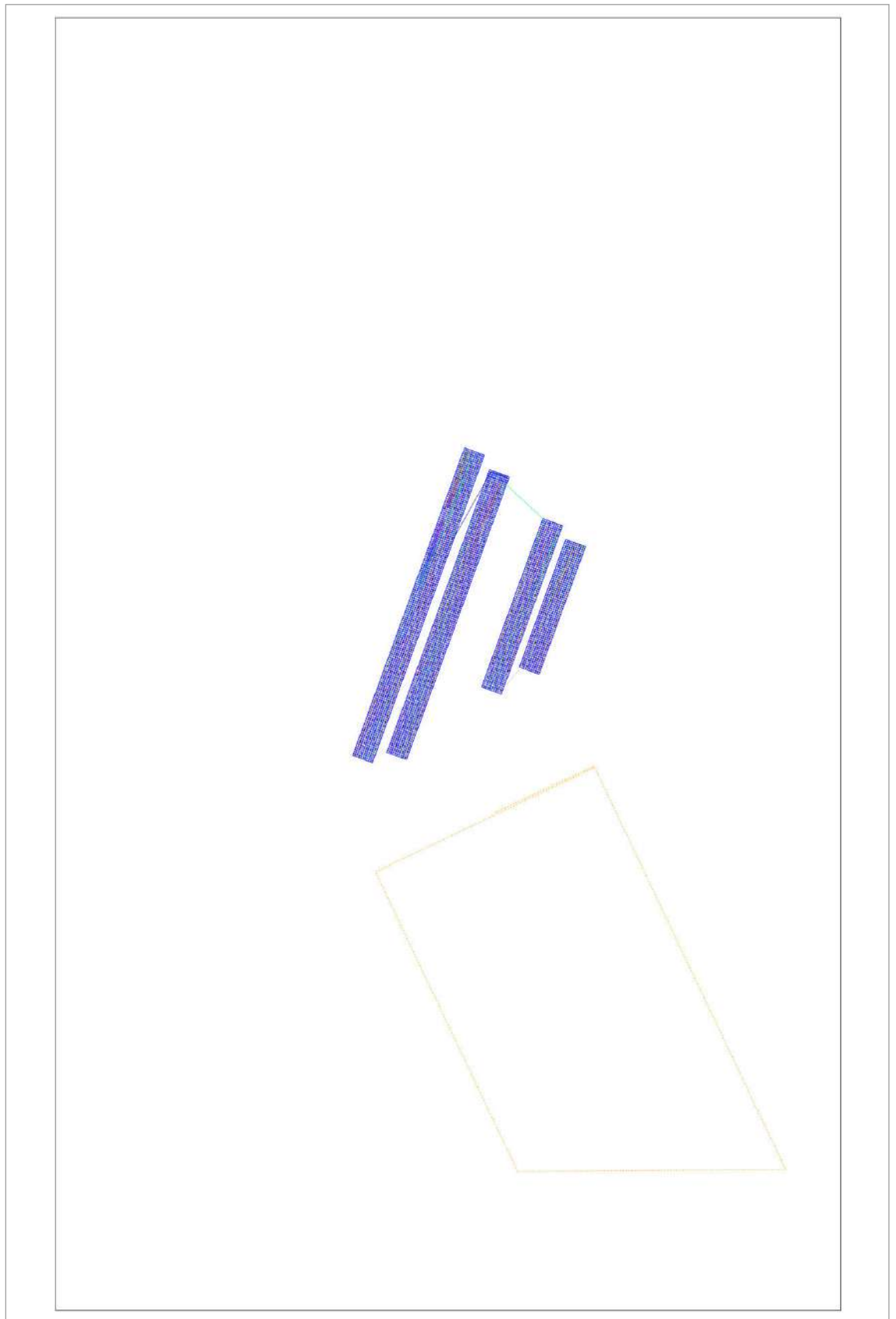


Figure: Open Area (Map Section) - Area South

229 Caterpillar UK Ltd V2

Project Designer: CS
Offer Number: 003-8522564

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		JA Solar Holdings Co., Ltd.	JAM72D40- 600/LB	2290	Piece
2	Inverter		Ginlong (Solis)	Solis-110K-5G-PRO (Copy)	10	Piece
3	Cable			String Cable 6 mm ² Copper	64000	m

Screenshots, 3D Design Environment



Figure: Screenshot01

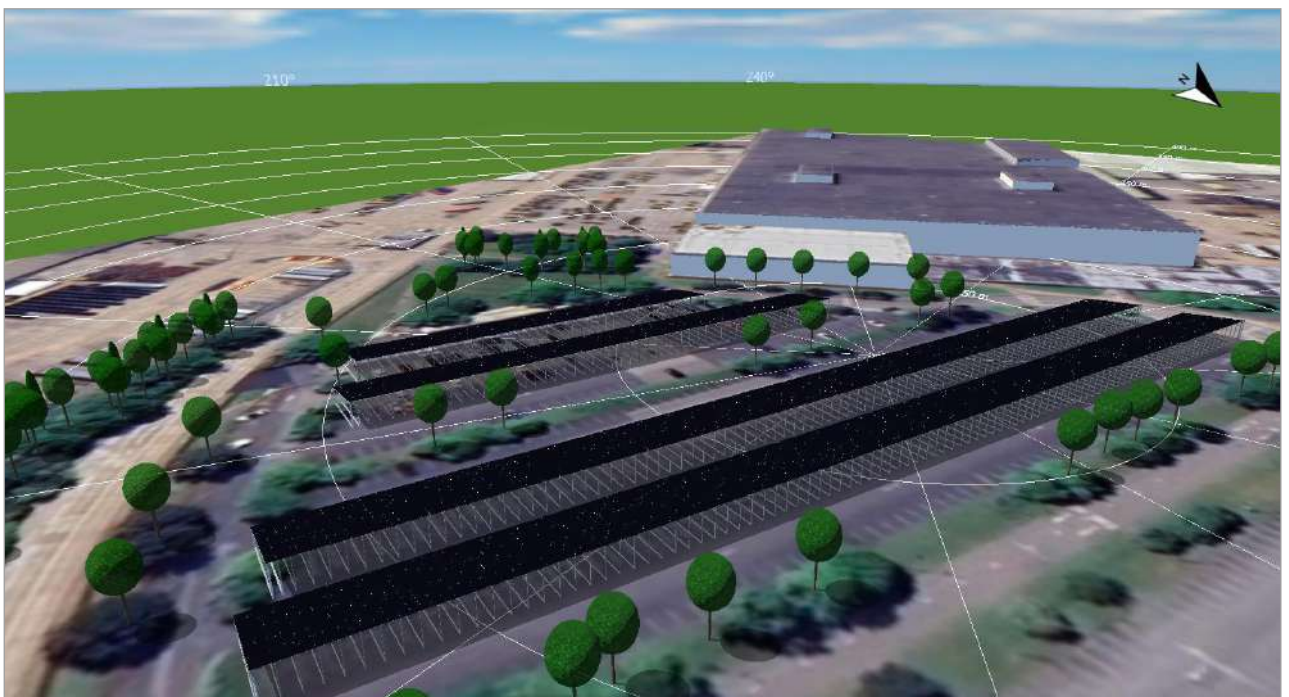


Figure: Screenshot04

229 Caterpillar UK Ltd V2

Project Designer: CS
Offer Number: 003-8522564



Figure: Screenshot05

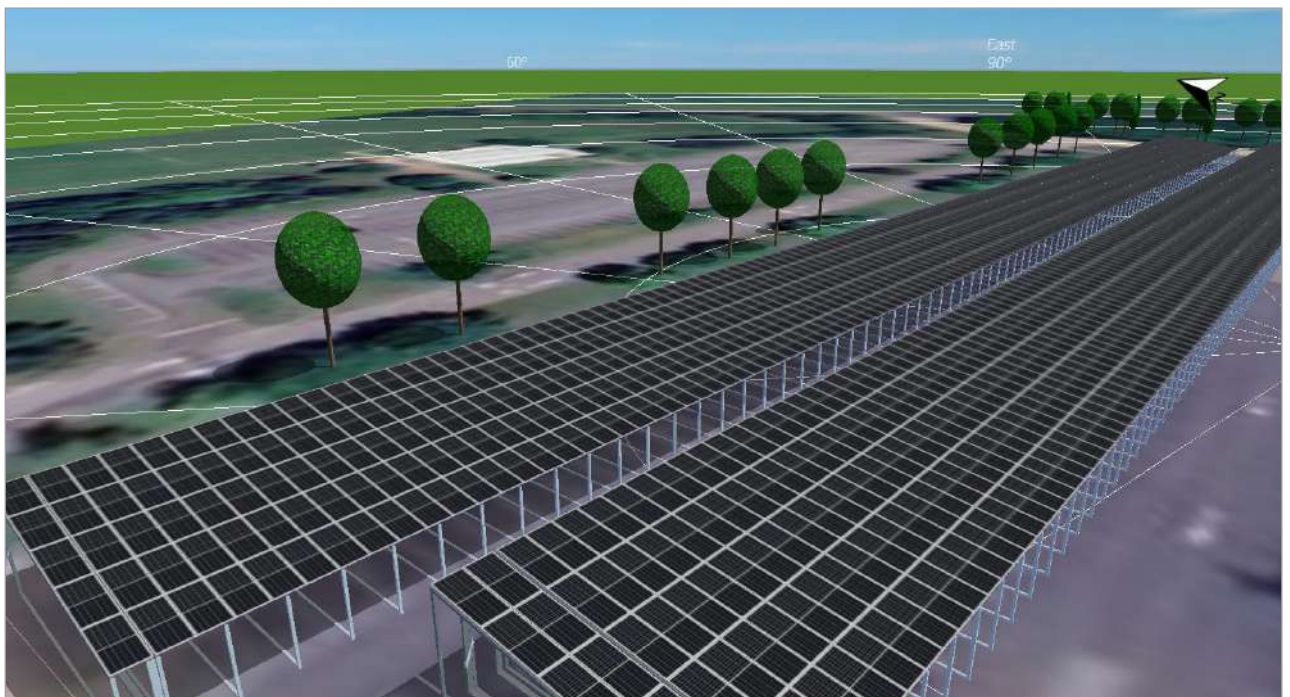


Figure: Screenshot06

229 Caterpillar UK Ltd V2

Project Designer: CS
Offer Number: 003-8522564



Figure: Screenshot21

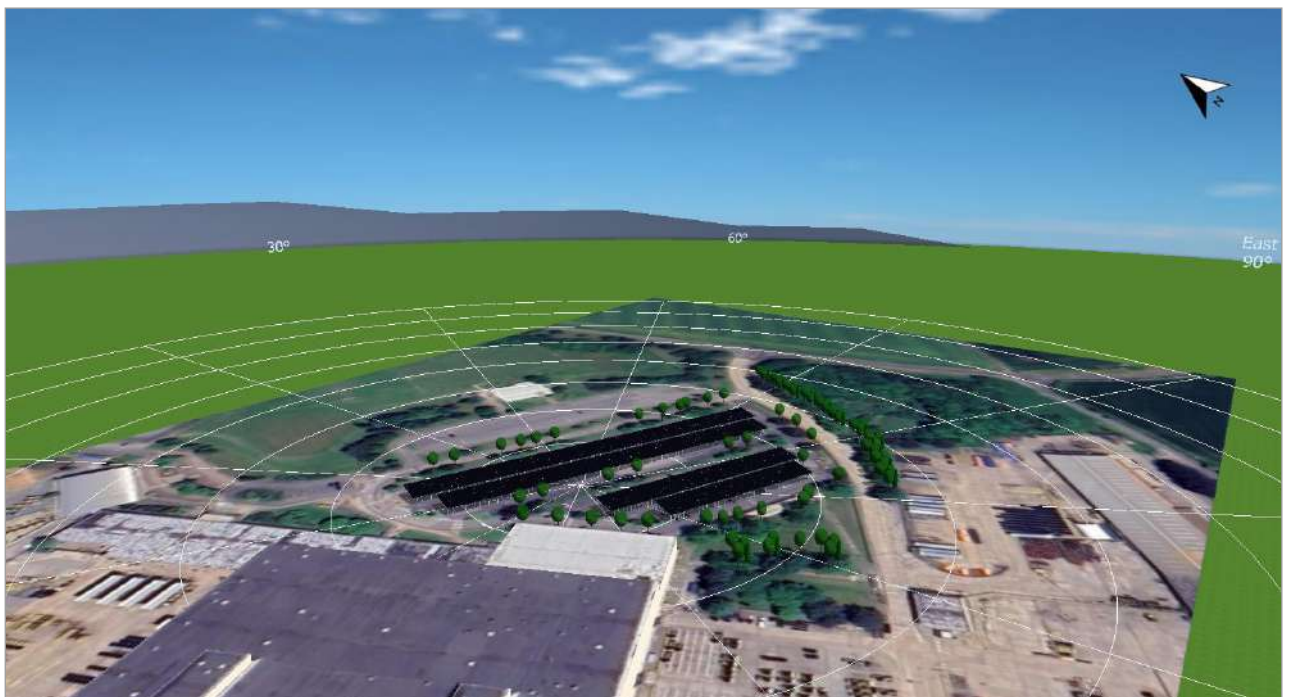


Figure: Screenshot22

Configuration

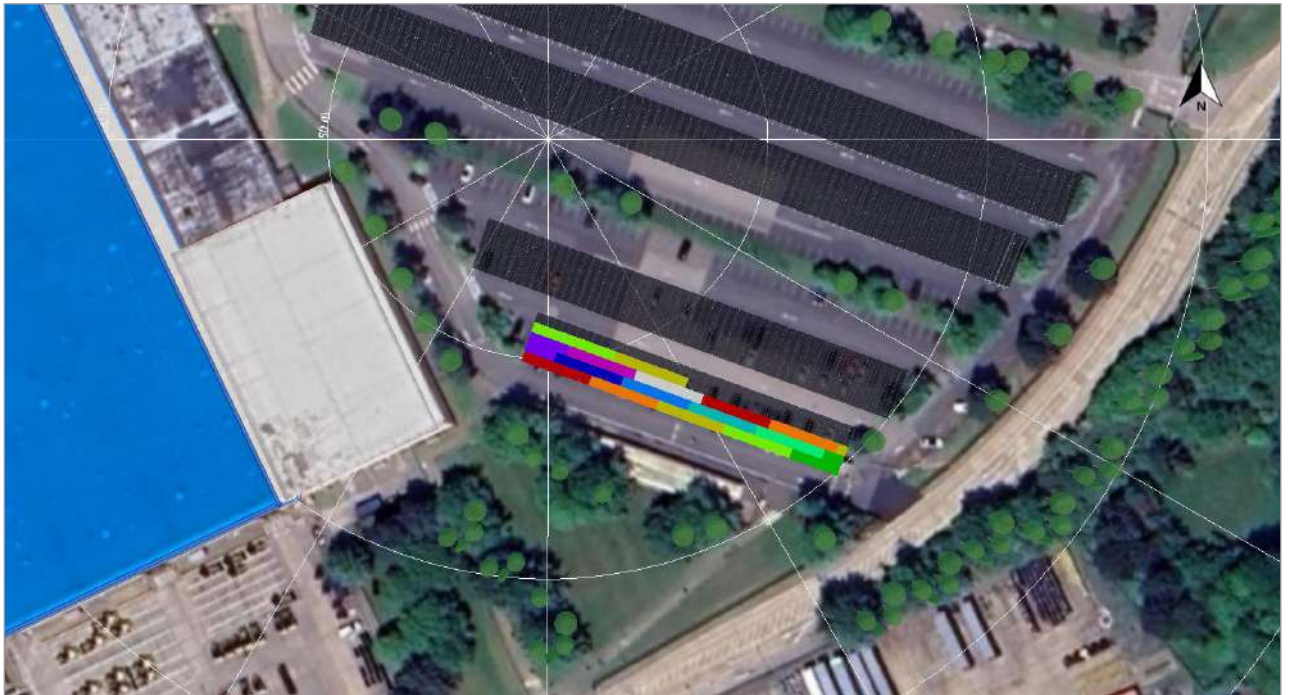


Figure: Screenshot13

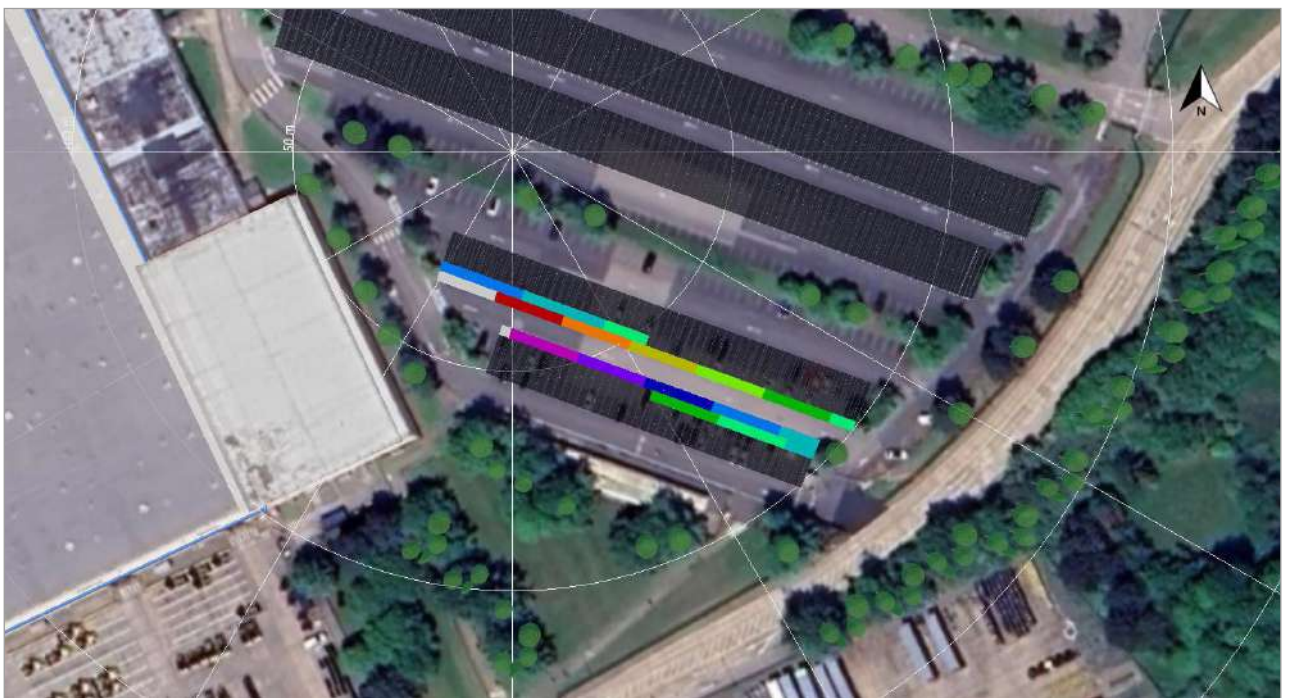


Figure: Screenshot14

229 Caterpillar UK Ltd V2

Project Designer: CS
Offer Number: 003-8522564

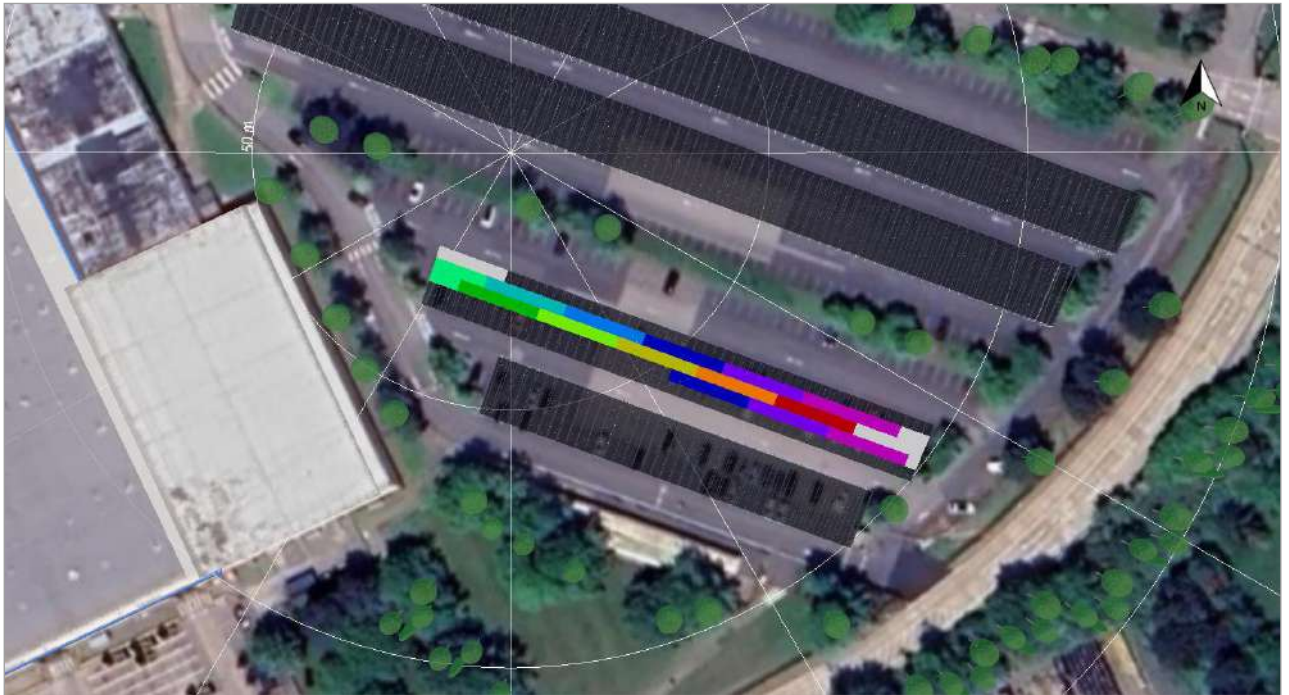


Figure: Screenshot15

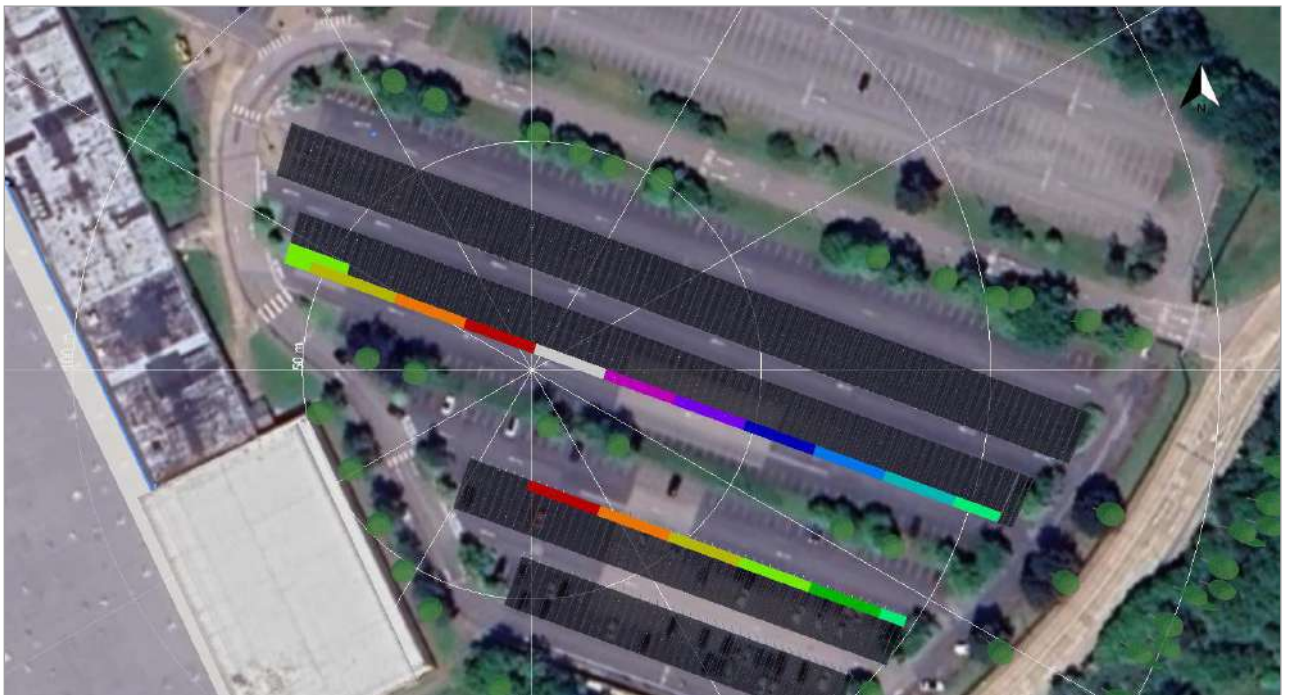


Figure: Screenshot16

229 Caterpillar UK Ltd V2

Project Designer: CS
Offer Number: 003-8522564

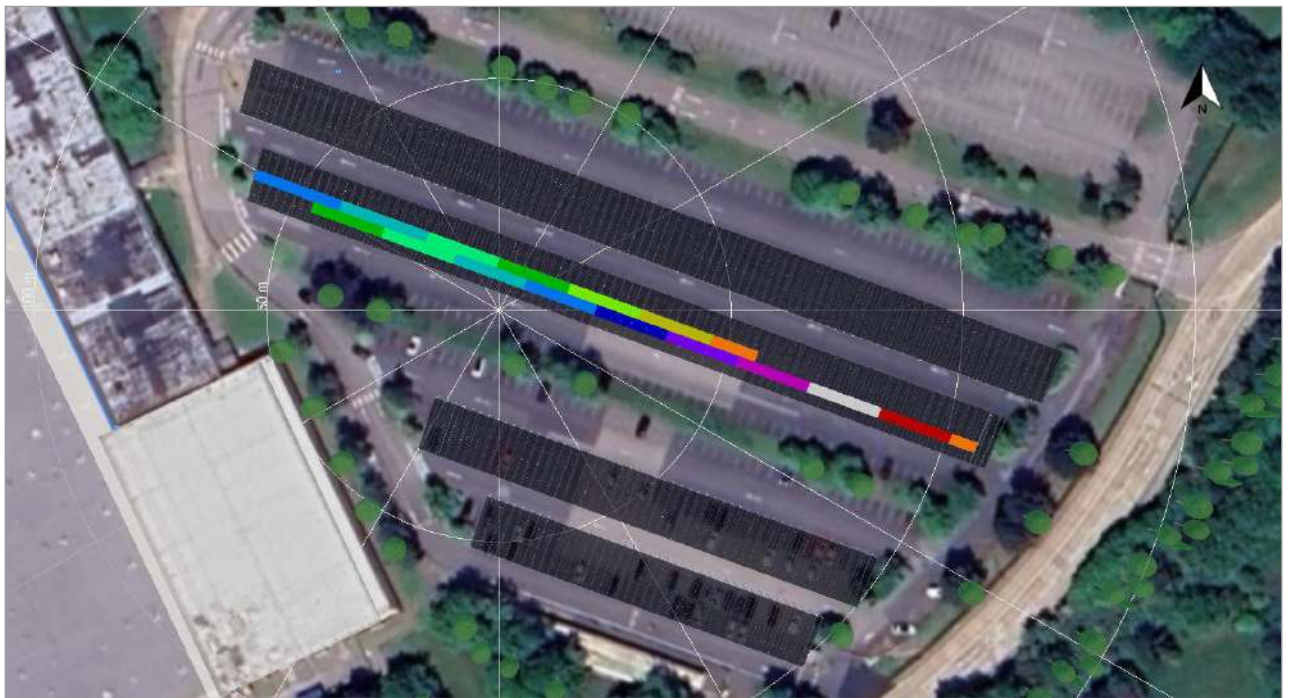


Figure: Screenshot23

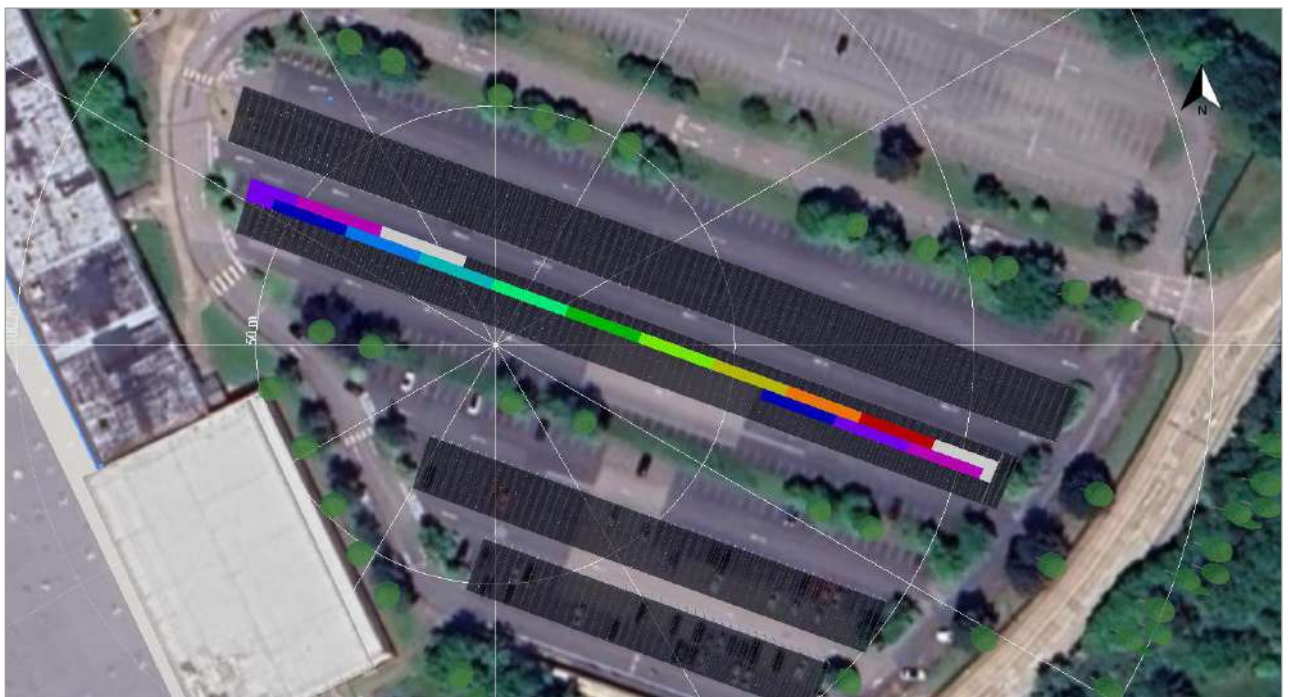


Figure: Screenshot24

229 Caterpillar UK Ltd V2

Project Designer: CS
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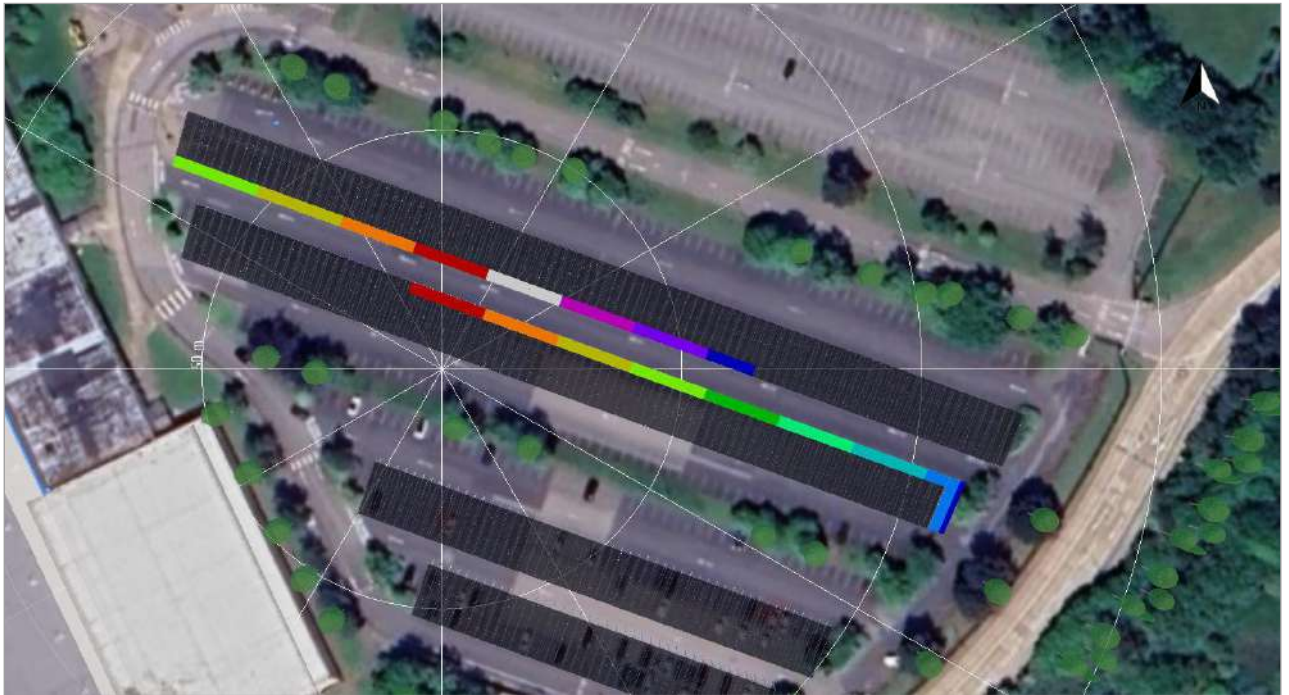


Figure: Screenshot25

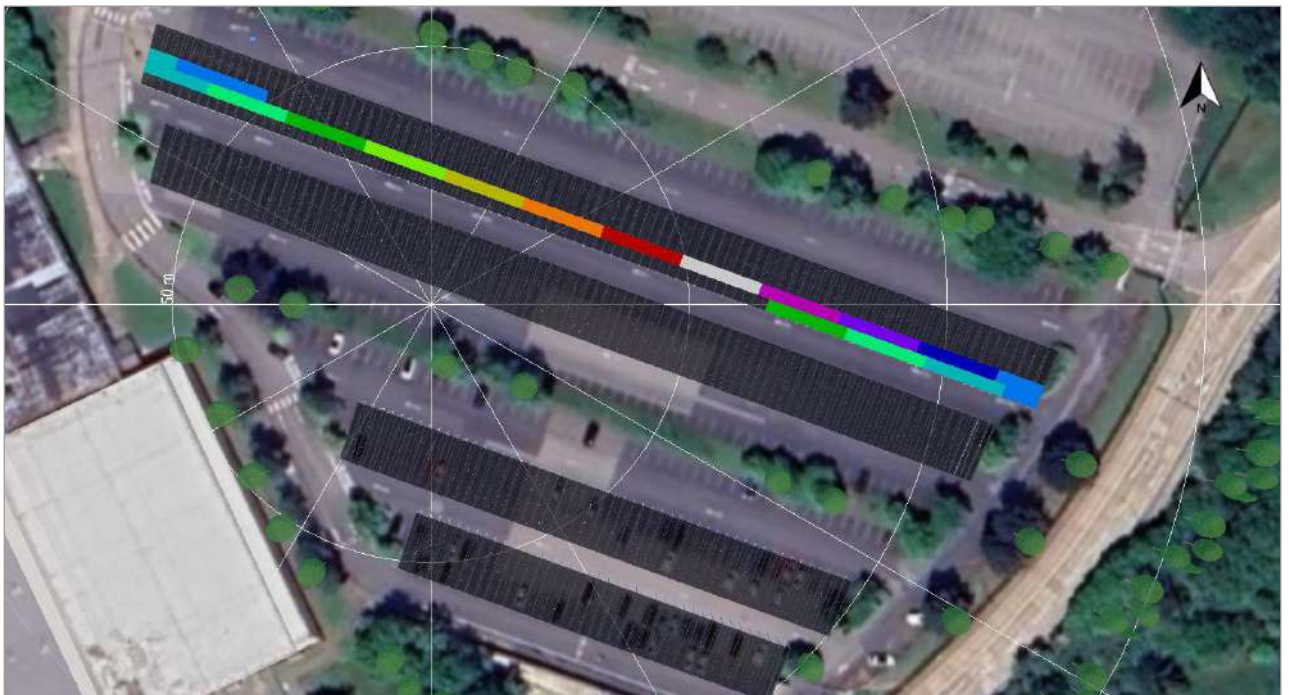


Figure: Screenshot26

229 Caterpillar UK Ltd V2

Project Designer: CS
Offer Number: 003-8522564

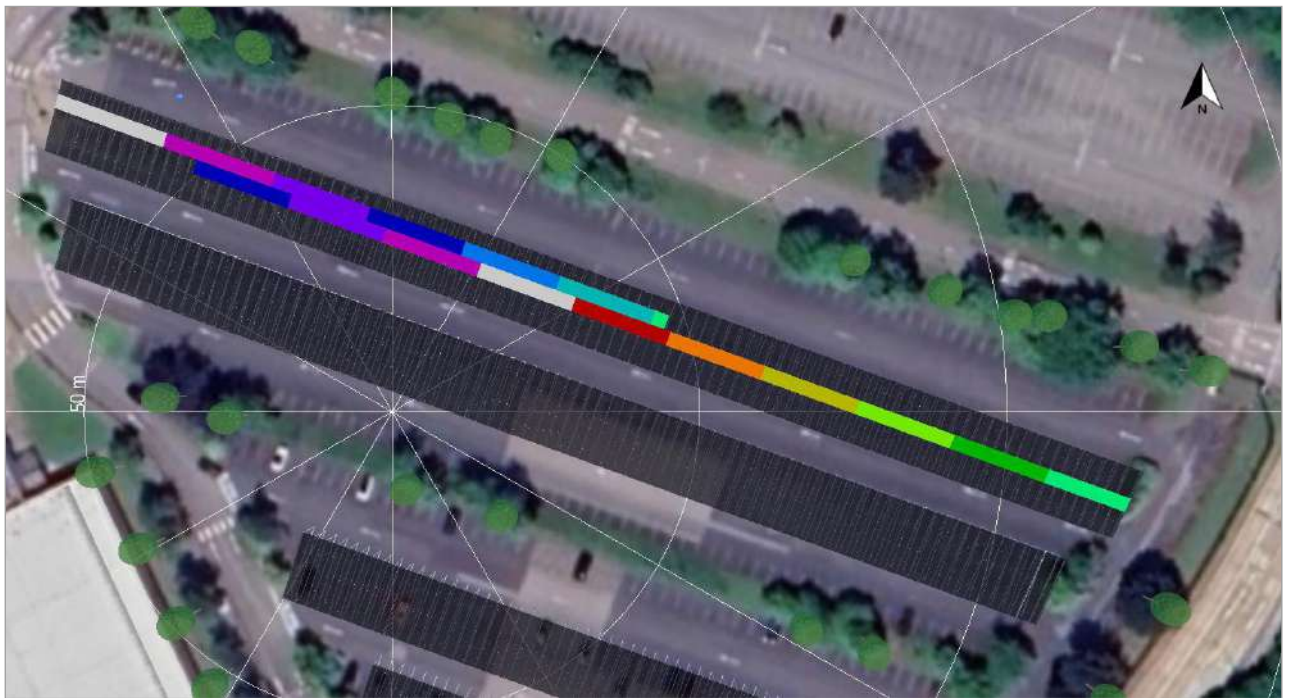


Figure: Screenshot27

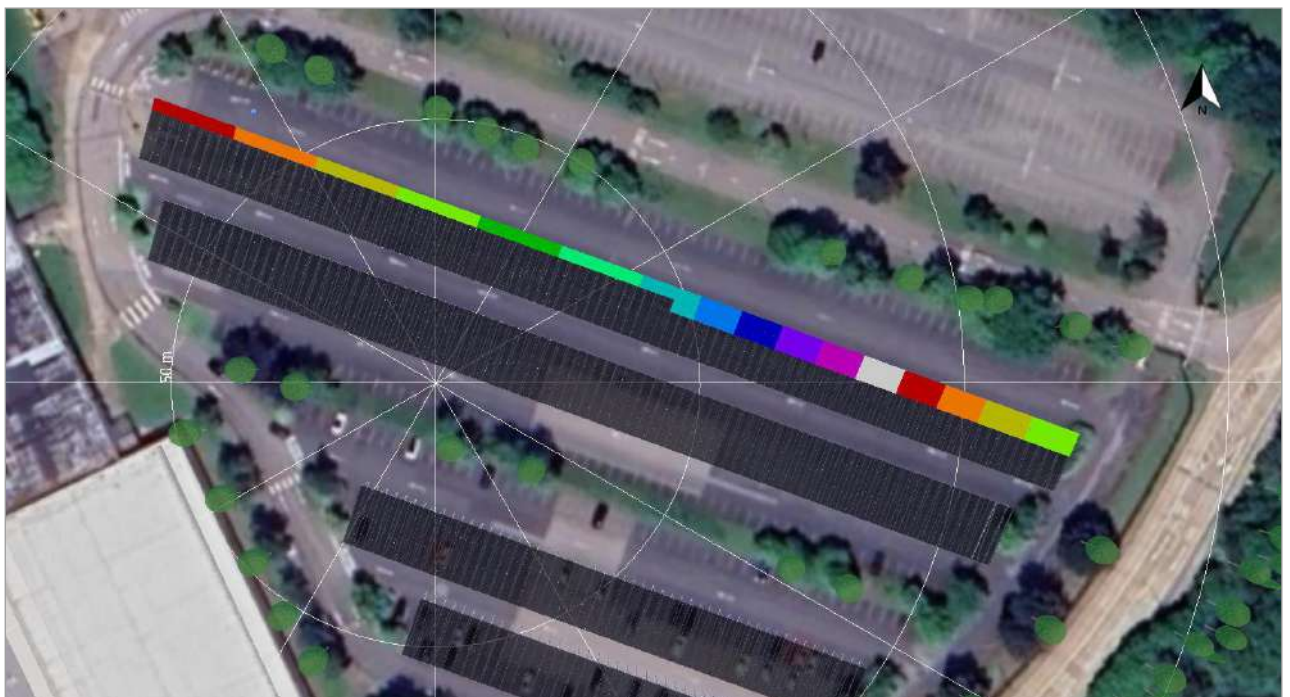


Figure: Screenshot28

Shading

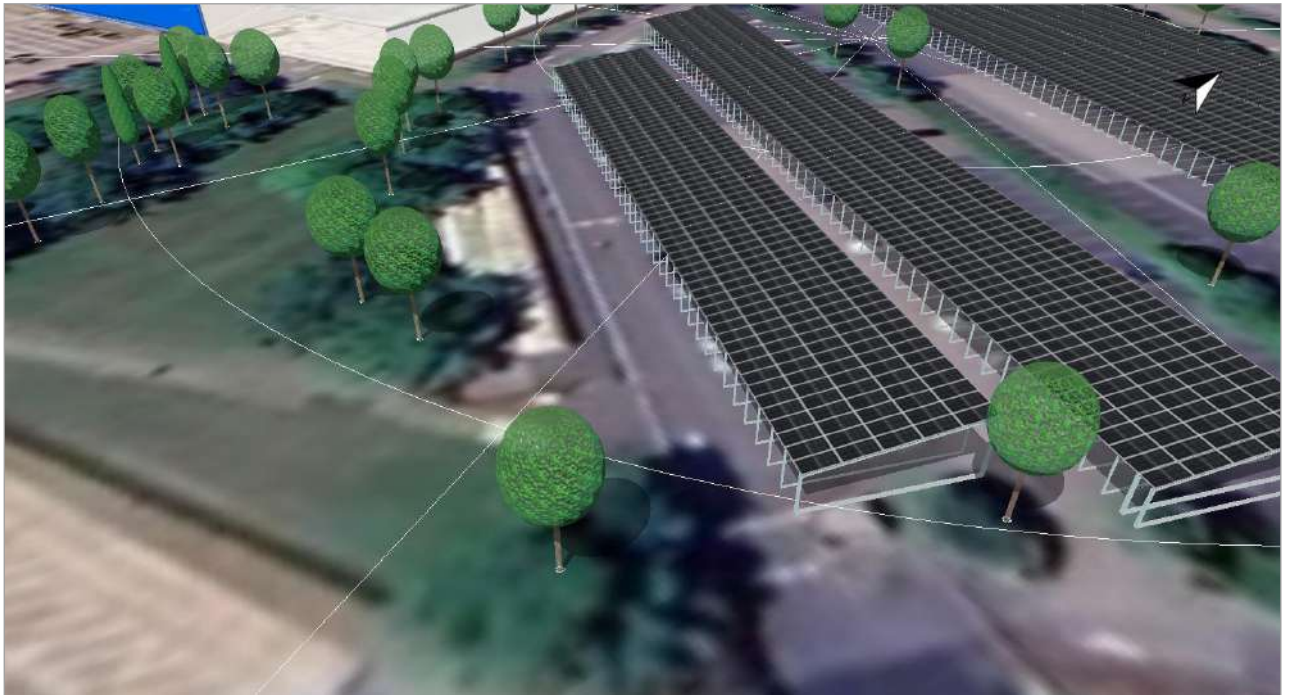


Figure: Screenshot02



Figure: Screenshot03

229 Caterpillar UK Ltd V2

Project Designer: CS
Offer Number: 003-8522564

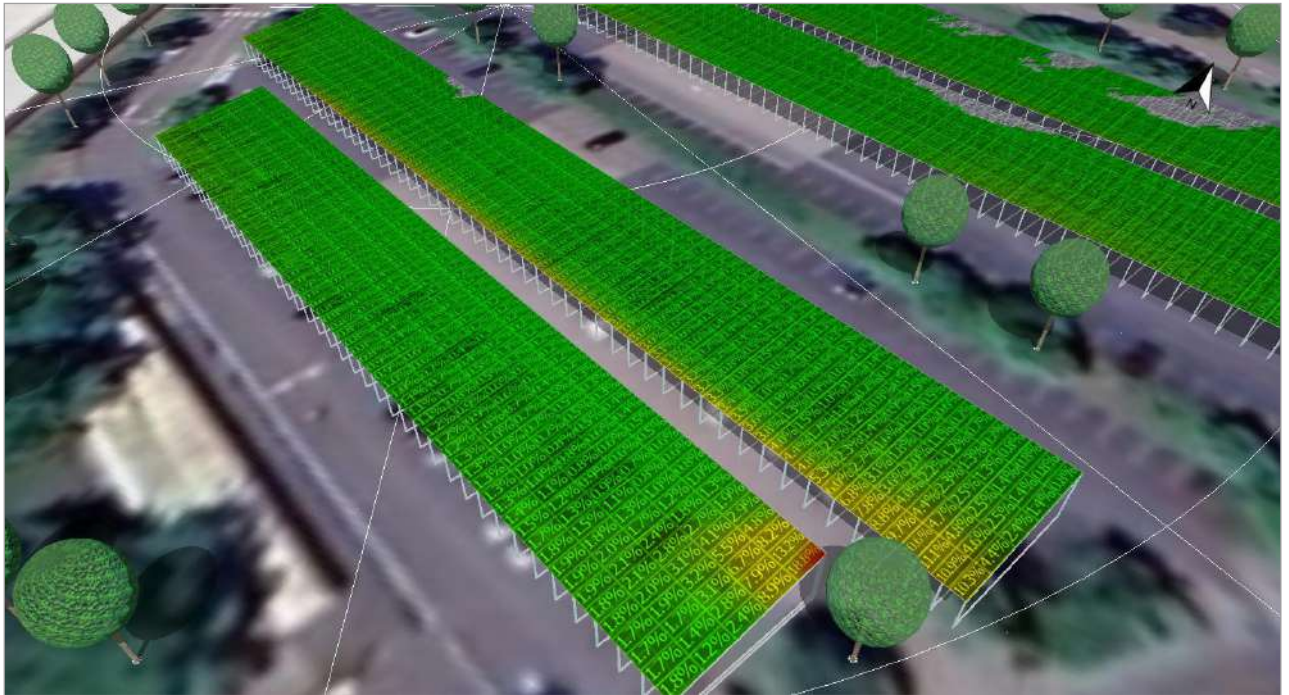


Figure: Screenshot17

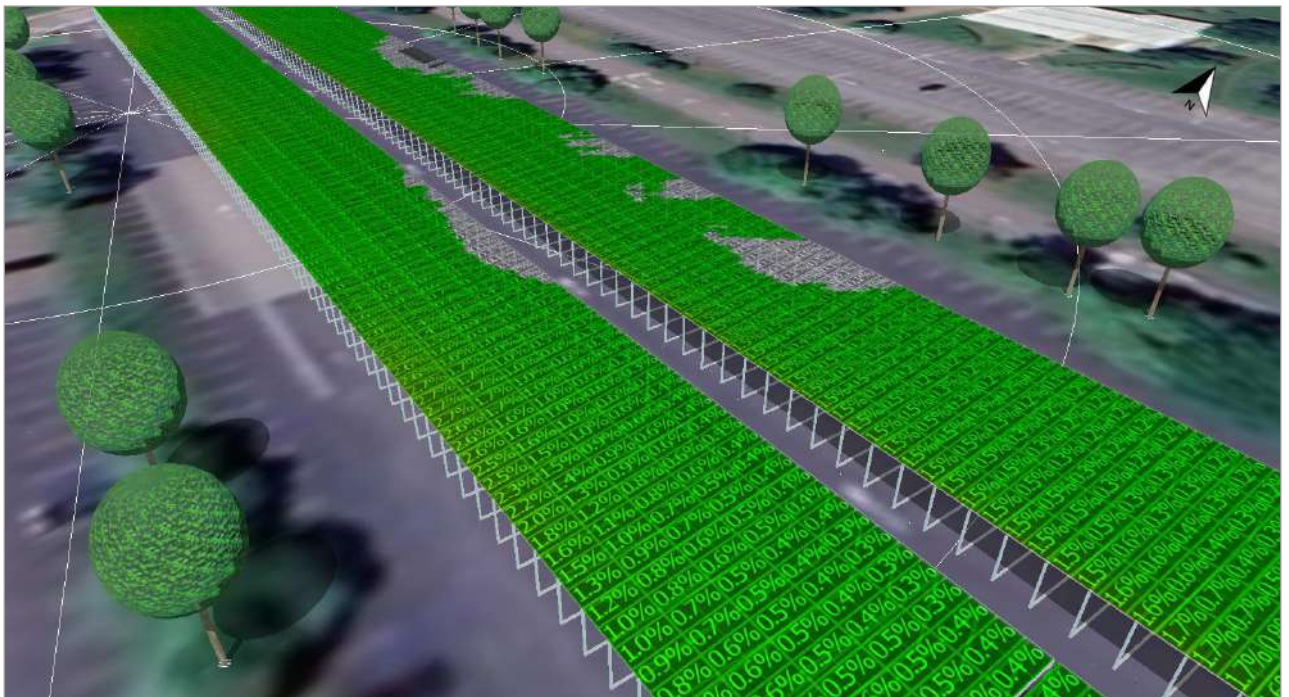


Figure: Screenshot18

229 Caterpillar UK Ltd V2

Project Designer: CS

Offer Number: 003-8522564

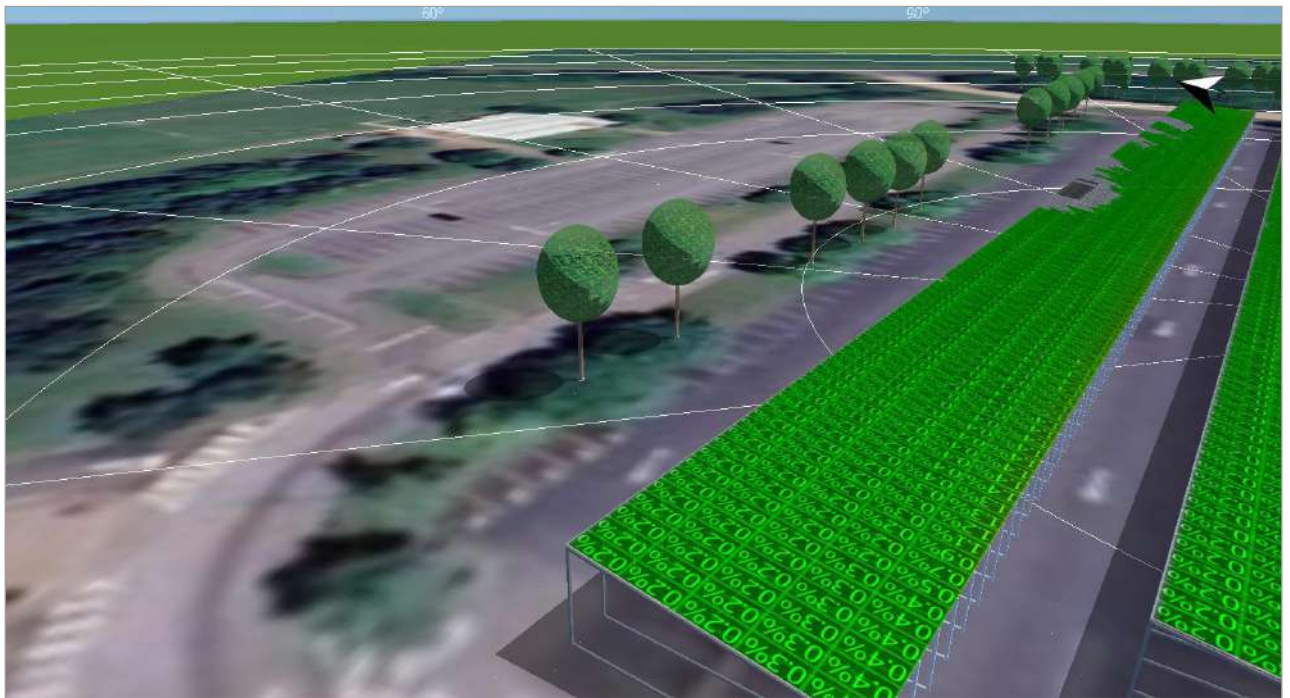


Figure: Screenshot19

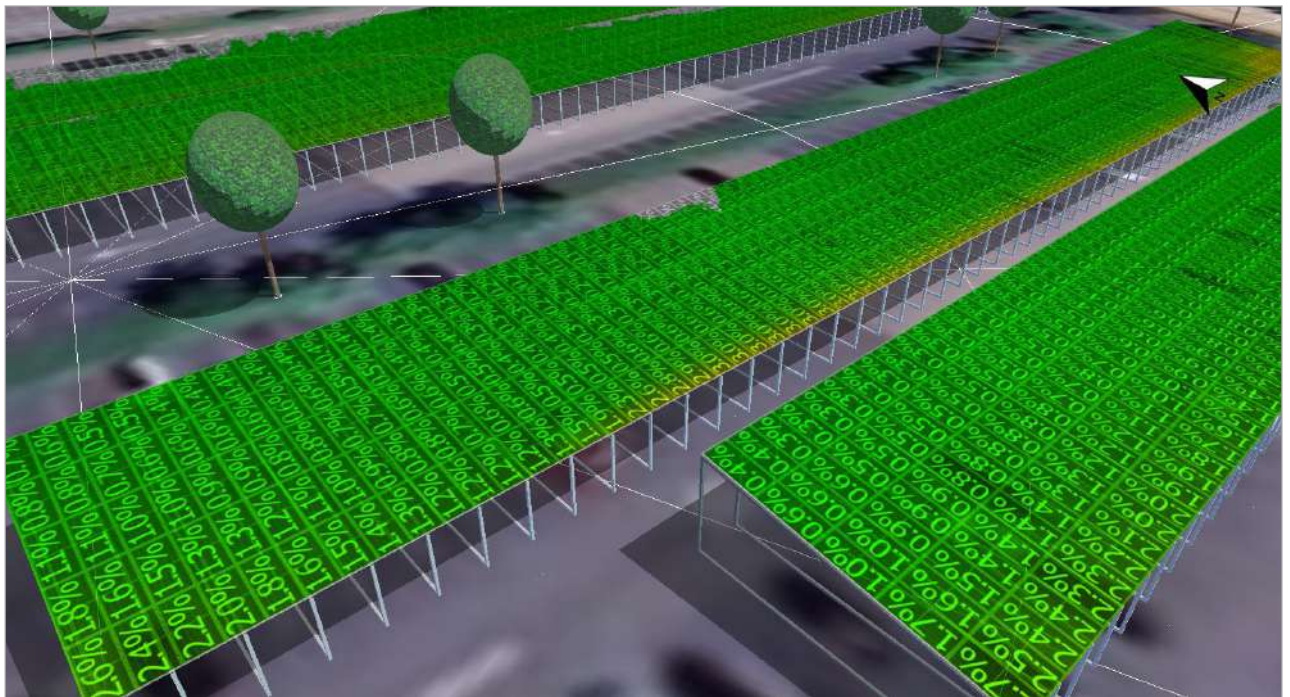
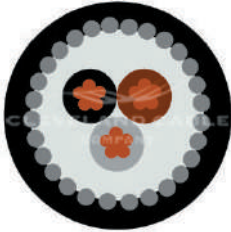


Figure: Screenshot20

BS 5467 PVC MULTICORE MAINS CABLE (25MM²-400MM²)



APPLICATION

Multi-core PVC cable with steel wire armour (SWA). Power and auxiliary control cables for use in power networks, underground, outdoor and indoor applications and for use in cable ducting.

CABLE STANDARDS

Flame propagation to BS EN/IEC 60332-1
BS 5467
BS EN 60228

CONSTRUCTION

Conductor: Class 2 stranded copper conductor
Insulation: Cross linked Polyethylene (XLPE)
Bedding: Polyvinyl Chloride (PVC)
Armour: Steel Wire Armour
Sheath: Polyvinyl Chloride PVC

CHARACTERISTICS

Voltage Rating: 600/1000 Volts
Temperature Limits: Fixed: -20°C to +90°C
Minimum Bending Radius: As per cable manufacturer datasheet

CORE IDENTIFICATION

2 Core: **Brown** **Blue**
*3 Core: **Brown** **Blue** **Green/Yellow**
3 Core: **Brown** **Black** **Grey**
4 Core: **Brown** **Blue** **Black** **Grey**
5 Core: **Brown** **Blue** **Black** **Grey** **Green/Yellow**

Should not be installed at temperatures below 0°C or above +60°C

For more information contact:
01642 241 133



BS 5467 PVC MULTICORE MAINS CABLE (25MM²-400MM²) - DIMENSIONS

CCC CODE	CONDUCTOR SIZE (MM ²)	STRANDING (MM)	NO OF CORES	WEIGHT (KG/KM)	OVERALL DIAMETER (MM)	GLAND SIZE (MM)	NYLON CLEAT SIZE
6942X25	25	7/2.14	2	1050	20	25	0.8
*6943X25	25	7/2.14	3	1500	23	25	1.0
6944X25	25	7/2.14	4	1800	25	32	1.0
6945X25	25	7/2.14	5	2200	29	32	1.2
6942X35	35	7/2.52	2	1400	22	25	0.9
*6943X35	35	7/2.52	3	1800	26	32	1.1
6944X35	35	7/2.52	4	2200	28	32	1.2
6945X35	35	7/2.52	5	2800	33	40	1.4
6942X50	50	19/1.78	2	1750	25	32	1.0
*6943X50	50	19/1.78	3	2250	28	32	1.2
6944X50	50	19/1.78	4	2850	31	32	1.4
6945X50	50	19/1.78	5	3850	38	40	1.6
6942X70	70	19/2.14	2	2200	28	32	1.2
*6943X70	70	19/2.14	3	3000	32	32	1.4
6944X70	70	19/2.14	4	4100	37	40	1.6
6945X70	70	19/2.14	5	5100	43	50s	1.8
6942X95	95	19/2.52	2	3000	32	40	1.4
*6943X95	95	19/2.52	3	4150	37	40	1.6
6944X95	95	19/2.52	4	5200	40	50s	1.8
6945X95	95	19/2.52	5	7700	52	50	TC9
6942X120	120	37/2.03	2	3600	35	40	1.4
*6943X120	120	37/2.03	3	4950	40	50s	1.8
6944X120	120	37/2.03	4	6700	46	50	2.0
6945X120	120	37/2.03	5	9030	57	63S	TC9
6942X150	150	37/2.25	2	4250	37	40	1.6
*6943X150	150	37/2.25	3	6300	45	50	1.8
6944X150	150	37/2.25	4	7900	49	50	2.0
6945X150	150	37/2.25	5	10430	61	63	TC11
6942X185	185	37/2.52	2	5500	43	50	1.8
*6943X185	185	37/2.52	3	7650	49	50	2.0
6944X185	185	37/2.52	4	9650	55	63S	TC9
6942X240	240	61/2.25	2	6900	48	50	2.0
*6943X240	240	61/2.25	3	9650	56	63S	TC9
6944X240	240	61/2.25	4	12400	62	63	TC10
6942X300	300	61/2.52	2	8200	50	50	2.0
*6943X300	300	61/2.52	3	11550	59	63	TC10
6944X300	300	61/2.52	4	14800	66	75S	TC11
6942X400	400	61/2.85	2	10100	56	63S	TC9
*6943X400	400	61/2.85	3	14350	65	75S	TC11
6944X400	400	61/2.85	4	19300	76.6	75	TC14

For more information contact:
01642 241 133





BS 5467 PVC MULTICORE POWER - CURRENT CARRYING CAPACITY (AMPS)

CONDUCTOR CROSS - SECTIONAL AREA	REFERENCE METHOD C (CLIPPED DIRECT)		REFERENCE METHOD E (IN FREE AIR OR ON A PERFORATED CABLE TRAY, HORIZONTAL OR VERTICAL)		REFERENCE METHOD D (DIRECT IN GROUND OR IN DUCTING IN GROUND, IN OR AROUND BUILDINGS)	
	1 TWO CORE CABLE SINGLE-PHASE AC OR DC	1 THREE OR 1 FOUR CORE CABLE THREE-PHASE AC	1 TWO CORE CABLE SINGLE-PHASE AC OR DC	1 THREE OR 1 FOUR CORE CABLE THREE-PHASE AC	1 TWO CORE CABLE SINGLE-PHASE AC OR DC	1 THREE OR 1 FOUR CORE CABLE THREE-PHASE AC
(MM ²)	(A)	(A)	(A)	(A)	(A)	(A)
25	146	124	152	131	116	96
35	180	154	188	162	139	115
50	219	187	228	197	164	135
70	279	238	291	251	203	167
95	338	289	354	304	239	197
120	392	335	410	353	271	223
150	451	386	472	406	306	251
185	515	441	539	463	343	281
240	607	520	636	546	395	324
300	698	599	732	628	446	365
400	787	673	847	728	-	-

BS 5467 CABLE - VOLTAGE DROP

NOMINAL CROSS SECTIONAL AREA MM ²	TWO CORE CABLE DC	TWO CORE CABLE SINGLE-PHASE AC MV/A/M			THREE OR FOUR CORE CABLE THREE-PHASE AC MV/A/M		
(MM ²)	(MV/A/M)	(MV/A/M)			(MV/A/M)		
		R	X	Z	R	X	Z
25	1.85	1.85	0.160	1.90	1.60	0.14	1.65
35	1.35	1.35	0.155	1.35	1.15	0.135	1.15
50	0.98	0.99	0.155	1.0	0.866	0.135	0.870
70	0.67	0.67	0.150	0.69	0.59	0.13	0.60
95	0.49	0.50	0.150	0.52	0.43	0.13	0.45
120	0.39	0.40	0.415	0.42	0.34	0.13	0.37
150	0.31	0.32	0.145	0.350	0.28	0.125	0.30
185	0.25	0.26	0.145	0.29	0.22	0.125	0.26
240	0.195	0.20	0.14	0.24	0.175	0.125	0.21
300	0.155	0.15	0.14	0.21	0.14	0.12	0.185
400	0.12	0.13	0.14	0.19	0.115	0.120	0.165

THE ABOVE IS IN ACCORDANCE WITH 18TH EDITION OF IET WIRING REGULATIONS

CONDUCTOR OPERATING TEMPERATURE: 90°C

R = RESISTIVE COMPONENT

X = REACTIVE COMPONENT

Z = IMPEDANCE VALUE

THE INFORMATION CONTAINED WITHIN THIS DATASHEET IS FOR GUIDANCE ONLY AND IS SUBJECT TO CHANGE WITHOUT NOTICE OR LIABILITY. WE BELIEVE THE INFORMATION IS CORRECT AT THE TIME OF PUBLICATION. PLEASE NOTE WHEN SELECTING CABLE ACCESSORIES THAT ACTUAL CABLE DIMENSIONS MAY VARY DUE TO MANUFACTURING TOLERANCES.

For more information contact:
01642 241 133



DESCRIPTIONS

EN50618 10mm² Tinned Copper Non-Halogen DC rated Voltage 1.8kV

STANDARDS

TÜV EN50618 H1Z2Z2-K file No.: No. B 004850 0002 Rev. 00

CABLE CONSTRUCTION



Conductor	Stranded tinned copper, IEC60228, cl5
Size	10mm ²
Stranding	142/0.30± 0.01mm
Diameter	4.3mm
Insulation material	XLPO e-beam cross-linked
Insulation thickness	0.8mm
Color	Black
Sheath material	XLPO e-beam cross-linked
Sheath thickness	0.9mm
Color	Black、 Red
Outer Diameter	7.7 ± 0.30mm

ELECTRICAL CHARACTERISTICS

Voltage Rating	U ₀ =1.5kV DC, Max.1.8kV
Ambient Temperature	-40°C up to 90°C, Max Temp at conductor +120°C
Insulation Resistance at 20°C	≥ 100 0 MΩ.km
Current carrying capacity at 60°C	98A
Spark test	10000 VAC
Voltage Withstand	6500 VAC
Conductor Resistance at 20°C	≤ 1.95 Ω/km

MECHANICAL FEATURE

Bending Radius	
Dynamic	≥ 5 X O.D.
Static	≥ 4 X O.D.
Ozone resistant	EN60811-403 Method A;EN 50396 8.1.3 Method B
Weathering/UV resistance	EN50289-4-17
Halogen free	IEC 60754-1
Flame retardant	IEC 60332-1-2
Shortage circuit temperature	250°C for 5s
Anticipated service life	25years

PRINT LEGEND

Customized or General as:
SHANGHAI KUKA CABLE EN50618 H1Z2Z2-K 1X10mm² 1.0KV AC 1.5KV DC + Meter mark

PACKING

- a)500M/roll, 12rolls/pallet, 20pallets/20GP (120KM);
b)Consulting if delivering in other ways.

DEEP BLUE 4.0 Pro

Mono

600W n-type Bifacial Double Glass
High Efficiency Mono Module
JAM72D40 575-600/LB/1500V Series

Introduction

Power by the latest SMBB n-type solar cell, half-cell configuration, these modules have higher output power, lower LID, better weak illumination response, and better temperature coefficient.



Higher power generation
better LCOE



Better weak illumination response



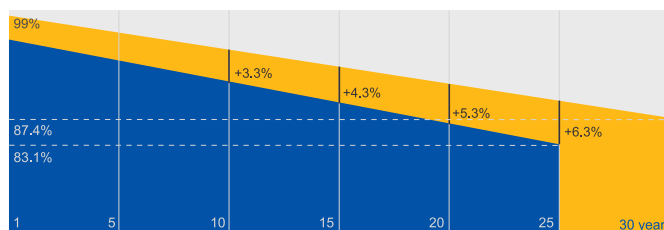
Better Temperature Coefficient

Superior Warranty

- 12-year product warranty
- 30-year linear power output warranty

1% 1st-year Degradation

0.4% Annual Degradation
Over 30 years



■ n-type Bifacial Double Glass Module Linear Performance Warranty

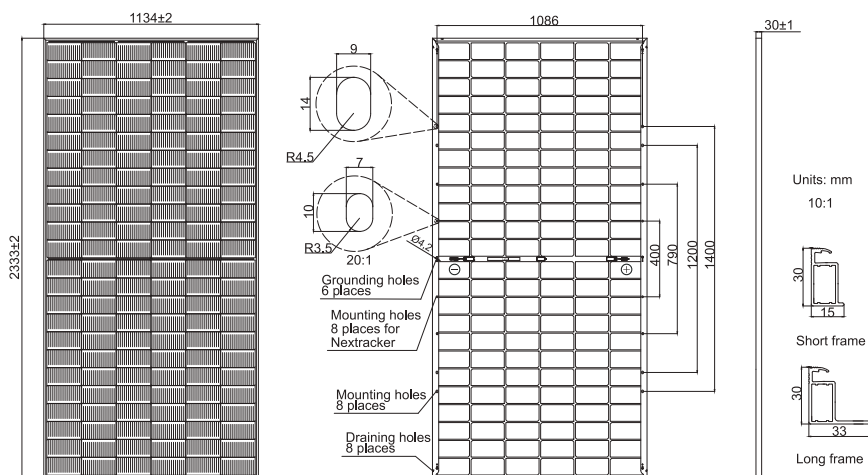
■ Standard Module Linear Performance Warranty

Comprehensive Certificates

- IEC 61215, IEC 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems



MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono-16BB
Weight	32.5kg
Dimensions	2333±2mm×1134±2mm×30±1mm
Cable Cross Section Size	4mm ² (IEC), 12 AWG(UL)
No. of cells	144(6×24)
Junction Box	IP68, 3 diodes
Connector	Stäubli MC4-EVO2A/MC4-EVO2 QC Solar QC 4.10-351/QC 4.10-35
Cable Length (Including Connector)	Portrait: 300mm(+)/400mm(-); 800mm(+)/800mm(-)(Leapfrog) Landscape: 1400mm(+)/1400mm(-)
Front Glass/Back Glass	2.0mm/2.0mm
Country of Manufacturer	China/Vietnam

ELECTRICAL PARAMETERS AT STC

TYPE	JAM72D40- 575/LB/1500V	JAM72D40- 580/LB/1500V	JAM72D40- 585/LB/1500V	JAM72D40- 590/LB/1500V	JAM72D40- 595/LB/1500V	JAM72D40- 600/LB/1500V
Rated Maximum Power(P _{max}) [W]	575	580	585	590	595	600
Open Circuit Voltage(V _{oc}) [V]	51.40	51.60	51.80	52.00	52.20	52.40
Maximum Power Voltage(V _{mp}) [V]	42.88	43.06	43.24	43.41	43.59	43.76
Short Circuit Current(I _{sc}) [A]	14.16	14.23	14.29	14.35	14.42	14.48
Maximum Power Current(I _{mp}) [A]	13.41	13.47	13.53	13.59	13.65	13.71
Module Efficiency [%]	21.7	21.9	22.1	22.3	22.5	22.7
Power Tolerance	0~+5W					
Temperature Coefficient of I _{sc} (α _{Isc})	+0.046%/°C					
Temperature Coefficient of V _{oc} (β _{Voc})	-0.260%/°C					
Temperature Coefficient of P _{max} (γ _{Pmp})	-0.300%/°C					

STC

Irradiance 1000W/m², cell temperature 25°C, AM1.5G

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.
Measurement tolerance at STC: P_{max} ±3 %, V_{oc} ±3% and I_{sc} ±4%.

ELECTRICAL CHARACTERISTICS WITH 10% SOLAR IRRADIATION RATIO

OPERATING CONDITIONS

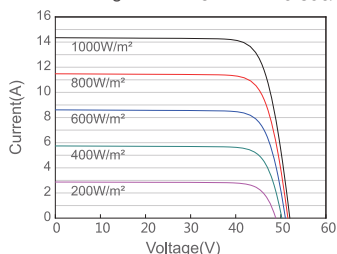
TYPE	JAM72D40-575/LB/1500V	JAM72D40-580LB/1500V	JAM72D40-585/LB/1500V	JAM72D40-590/LB/1500V	JAM72D40-595/LB/1500V	JAM72D40-600/LB/1500V	Maximum System Voltage	1500V DC
Rated Max Power(Pmax) [W]	621	626	632	637	643	648	Operating Temperature	-40℃~+85℃
Open Circuit Voltage(Voc) [V]	51.40	51.60	51.80	52.00	52.20	52.40	Maximum Series Fuse Rating	30A
Max Power Voltage(Vmp) [V]	42.88	43.06	43.24	43.41	43.59	43.76	Maximum Static Load,Front* Maximum Static Load,Back*	3600Pa, 1.5 1600Pa, 1.5
Short Circuit Current(Isc) [A]	15.30	15.36	15.43	15.50	15.57	15.64	NOCT	45±2℃
Max Power Current(Imp) [A]	14.48	14.55	14.61	14.68	14.74	14.81	Bifaciality**	80%±10%
Irradiation Ratio (rear/front)	10%						Fire Safety Class	Class C

*For NexTracker installations, maximum static load please take compatibility approve letter between JA Solar and NexTracker for reference.

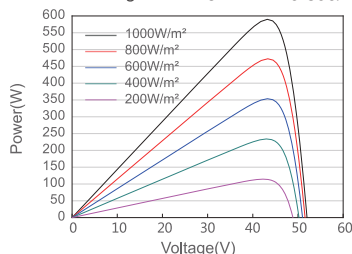
**Bifaciality=P_{max, rear}/Rated P_{max, front}

CHARACTERISTICS

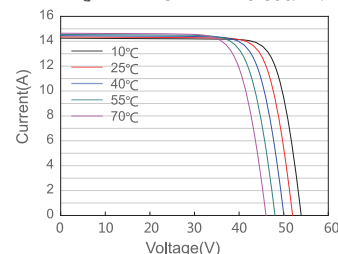
Current-Voltage Curve JAM72D40-590/LB/1500V



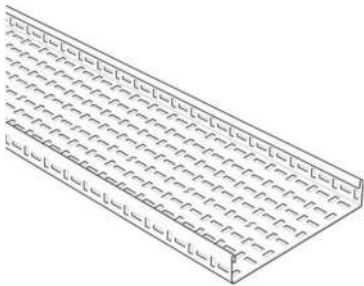
Power-Voltage Curve JAM72D40-590/LB/1500V



Current-Voltage Curve JAM72D40-590/LB/1500V



Product Data Sheet



SWIFTS LEGRAND

Swifts Heavy Duty Hot Dip Galvanised Steel Cable
Tray 300mm x 50mm x 3m Length

REF. SRFL300G | EAN. 5012774337850

> [Link to e-catalog product sheet](#)

Technical characteristics

Height	50 mm
Width	300 mm
Material thickness	1.2 mm
Length	3000 mm
Usable cross section	15000 mm ²
With cover	No
Side perforation	Yes
Bottom perforation	Yes
NATO-mounting holes	No

Model	Without connector
Suitable for circuit integrity	No
Material	Steel
Operating / setting temperature	-20-120 °C
Material quality	Other
Surface protection	Hot-dip galvanized
Colour	Other
Storage temperature	-20-120 °C
Halogen free	Yes

Documents

Catalogue pages

-  swifts-cable-tray-2015-020.pdf | PDF (0.23Mo)
-  swifts-cable-tray-2015-014-015.pdf | PDF (0.37Mo)



Main

Range	PowerLogic
Product name	PowerLogic PM5000
Device short name	PM5110
Product or component type	Power meter

Complementary

Power quality analysis	Up to the 15th harmonic
Device application	Power monitoring
Type of measurement	Current Voltage Frequency Power factor Energy Active and reactive power
Supply voltage	100...415 V AC 45...65 Hz 125...250 V DC
Network frequency	50 Hz 60 Hz
Line Rated Current	1 A 5 A
Type of network	1P + N 3P + N 3P
Maximum power consumption in VA	10 VA at 415 V
Ride-through time	80 Ms 120 V AC typical 100 Ms 230 V AC typical 100 ms 415 V AC typical
Display type	Backlit LCD
Display resolution	128 x 128 pixels
Sampling rate	64 samples/cycle
Measurement current	10...9000 mA
Analogue input type	Voltage (impedance 5 MOhm) Current (impedance 0.3 MOhm)
Measurement voltage	35...690 V AC 45...65 Hz between phases 20...400 V AC 45...65 Hz between phase and neutral
Frequency measurement range	45...65 Hz
Number of inputs	0
Measurement accuracy	Active energy +/- 0.5 % Reactive energy +/- 2 % Active power +/- 0.5 % Apparent power +/- 0.5 % Frequency +/- 0.05 % Power factor +/- 0.005 Current +/- 0.5 % Voltage +/- 0.5 %
Accuracy class	Class 0.5S active energy IEC 62053-22

Number of outputs	1 digital
Communication port protocol	Modbus RTU and ASCII at 9.6, 19.2 and 38.4 kbauds even/odd or none - 2 wires, insulation 2500 V JBUS
Communication port support	RS485
Data recording	Time stamping Min/max of instantaneous values
Connections - terminals	Voltage circuit: screw terminal block4 Control circuit: screw terminal block2 Current transformer: screw terminal block6 Input/Output circuit: screw terminal block6 RS485 link: screw terminal block4
Mounting mode	Flush-mounted
Mounting support	Framework
Standards	UL 61010-1 EN 50470-3 EN 50470-1 IEC 62053-22 IEC 60529 IEC 62053-24 IEC 61557-12
Product certifications	CE conforming to IEC 61010-1 CULus conforming to UL 61010-1
Maximum Width	3.78 in (96 mm)
Depth	72 mm
Height	3.78 in (96 mm)
Net Weight	13.40 oz (380 g)

Environment

Electromagnetic compatibility	Limits for harmonic current emissions class A conforming to IEC 61000-3-2 Electrostatic discharge level 4 conforming to IEC 61000-4-2 Conducted RF disturbances level 3 conforming to IEC 61000-4-6 Magnetic field at power frequency level 4 conforming to IEC 61000-4-8 Conducted and radiated emissions class B conforming to EN 55022
IP degree of protection	IP52 front: conforming to IEC 60529 IP30 body: conforming to IEC 60529
Relative humidity	5...95 % at 50 °C
Pollution degree	2
Ambient air temperature for operation	-25...70 °C
Ambient air temperature for storage	-40...185 °F (-40...85 °C)
Operating altitude	6561.68 ft (2000 m)

Ordering and shipping details

Category	09777 - POWERLOGIC PM5000 HARDWARE
Discount Schedule	PL1
GTIN	00785901869535
Nbr. of units in pkg.	1
Package weight(Lbs)	1.12 lb(US) (0.51 kg)
Returnability	Yes
Country of origin	IN

Packing Units

Unit Type of Package 1	PCE
Package 1 Height	4.33 in (11 cm)
Package 1 width	4.96 in (12.6 cm)
Package 1 Length	4.96 in (12.6 cm)
Unit Type of Package 2	S03
Number of Units in Package 2	12
Package 2 Weight	14.23 lb(US) (6.456 kg)
Package 2 Height	11.81 in (30 cm)
Package 2 width	11.81 in (30 cm)

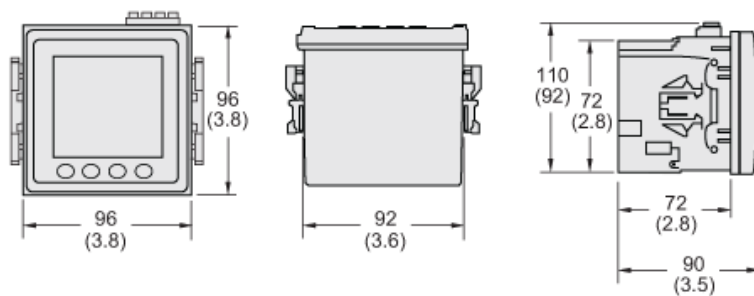
Package 2 Length	15.75 in (40 cm)
Unit Type of Package 3	P06
Number of Units in Package 3	96
Package 3 Weight	136.29 lb(US) (61.82 kg)
Package 3 Height	19.69 in (50 cm)
Package 3 width	31.50 in (80 cm)
Package 3 Length	23.62 in (60 cm)

Offer Sustainability

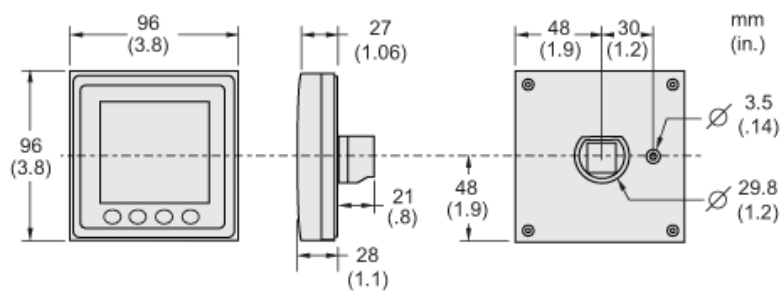
Sustainable offer status	Green Premium product
California proposition 65	WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov
REACH Regulation	REACH Declaration
EU RoHS Directive	Compliant EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS Declaration
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End Of Life Information
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.

Approximate Dimensions

PM5000 Series Meters

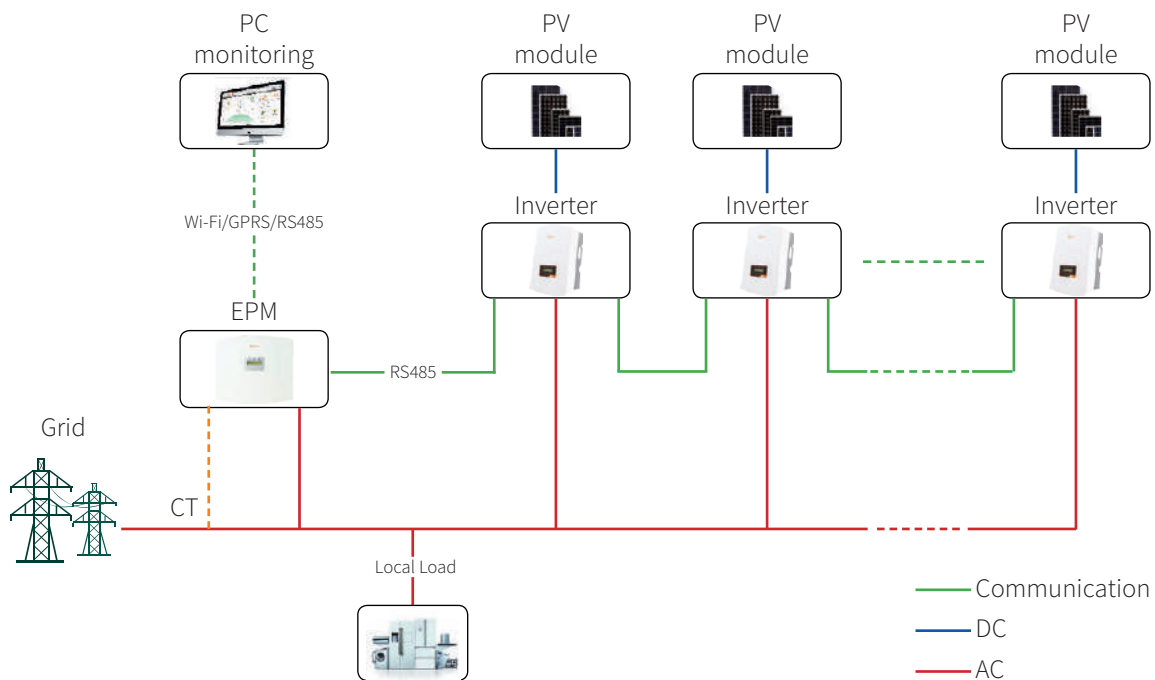


PM5000 Series Remote Display



Accessories

» Solis-EPM1/3-5G



Smart & strong

- Simultaneous control of 80 X Solis inverters
- Realizing reactive compensation of the system, which ensure the power factor of the system is up to standard

Saving & high precision

- Simultaneously monitor the operating data of the 80 X Solis inverter, saving the cost of the monitoring system
- The control accuracy is up to 3%, which improves the system's spontaneous use rate

Friendly & compatible

- Supports simultaneous access of Solis inverters with different powers
- Monitor power generation and load consumption at all times

Datasheet

Model Name	Solis-EPM1-5G	Solis-EPM3-5G	Solis-EPM3-5G-PLUS
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Input AC

Rated voltage	230 V, 1/N/PE	400 V, 3/N/PE or 3/PE	400 V, 3/N/PE
Input voltage range	L to N: 100~277 V L to L: 176~480 V		L to N: 100~263 V
Input frequency range	45~65 Hz		

Communication

Inverter communication	Modbus RS485		
Communication interface	2pin RS485		2pin RS485, RJ45
Max. communication inverter numbers	10	10	80 ⁽¹⁾
Max. communication distance	1000 m		
Monitoring	S3-GPRS-ST or S3-WiFi-ST		DLB-W (Built in)

General Data

Ambient temperature	-25 ~ +60°C		
Relative humidity	5%~95%		
Ingress protection	IP65		
Self consumption	<5 W		<15 W
Dimensions (W*H*D)	364*276*114 mm		488*446*149 mm
Weight	2.1 kg		5.4 kg
AC connection	Quick connection terminal		
Display	LCD		
CT connection	Plug terminal		
CT specification	Optional (5 A) ⁽³⁾		

Features

Failsafe fuction	Yes
Remote upgrated	Yes ⁽²⁾
Control time	5 s
Power Accuracy	3%

CT specification

Specification	Dimensions (mm)			Hole size (mm)		Ratio
	W	H	D	a	e	
CT-30×20-100 A	90	114	40	22	32	100:5 A
CT-60×40-300 A	114	140	36	42	62	300:5 A
CT-80×40-600 A	122	162	40	42	82	600:5 A
CT-80×40-1000 A	122	162	40	42	82	1000:5 A
CT-160×80-2000 A	184	254	52	82	162	2000:5 A
CT-160×80-3000 A	184	254	52	82	162	3000:5 A

(1) The AC capacity of EPM system should not exceed 2MW.

(2) EPM dedicated version, Non-EPM-dedicated does not support remote upgrade.

(3) Due to different on-site installation conditions, Solis currently has optional specifications as shown in the above table. It is suggested that the client can choose the appropriate CT specifications according to the actual installation requirements.

S1-W4G-ST

Solis Data Loggers

Use RS485 communication method to connect the inverters, up to 10 inverters can be connected at the same time. Data communication with the monitoring system through wireless WiFi network or 4G, which can realize remote control and monitoring. The network transmits intuitive data, which is convenient for customers to monitor anytime and anywhere.

Features:

- Support WiFi and 4G communication
- Status indicator, easy to display working status
- RESET button, one key to send data, convenient debugging
- Fault alarm, real-time monitoring
- Support Bluetooth nearby connection and debugging
- One-key assignment of inverter address, efficient and labor-saving

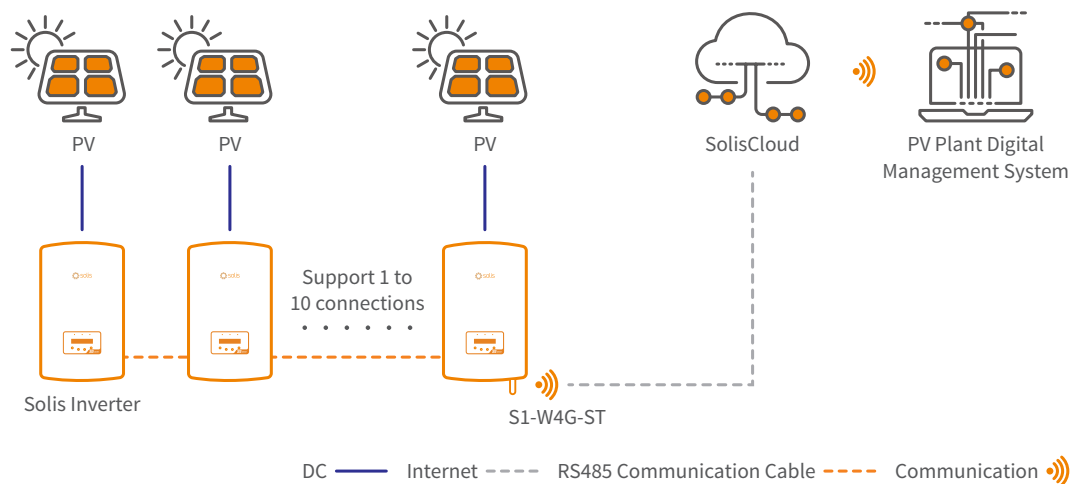


S1-W4G-ST (4 Pin)



S1-W4G-ST (USB)

Intelligent Monitoring Solution - S1-W4G-ST



DATASHEET

S1-W4G-ST

Models	S1-W4G-ST (4 Pin)	S1-W4G-ST (USB)
Communication		
Supported device type	Solis inverter	
Number of connected inverters ⁽¹⁾	≤10	
Data collection intervals	5 minutes	
Status indicator	3 LED Indicator Lights	
Communication interface	External 4-Pin Port	External USB Port
Wireless communication	WiFi: 802.11b/g/n (2.4G) ⁽²⁾ GSM/GPRS: 850/900/1800/1900 MHz	
Near end communication	BLE4.2	
Configuration method	APP/WEB	
Electrical		
Operating voltage	DC 5 V (+/-5%)	
Operating power consumption	≤5 W	
Environment		
Operating ambient temperature range	-30 ~ +65°C	
Operating humidity	5%-95%, relative humidity, non-condensing	
Storage temperature	-40 ~ +70°C	
Storage humidity	< 40%	
Max. operation altitude	4000 m	
Protection degree	IP65	
Mechanical		
Dimensions (L*W*H)	128*50*34 mm	113*50*34 mm
Installation method	Externally Insert + Twist Lock	Externally Insert + Tab Lock
Weight	80 g	65 g
Others		
Certification	CE, FCC	

(1) Inverters must first be hand-in-hand connected by RS485. (2) 5 GHz Wi-Fi networks are not supported.

Solis-(80-110)K-5G-PRO

Solis Three Phase Grid-Tied Inverters

Efficient

- 6/8 MPPTs, max. efficiency 98.5%
- > 150% DC/AC ratio
- Compatible with bifacial modules

Smart

- Night SVG function
- Intelligent string monitoring, smart I-V curve scan
- Remote firmware upgrade with simple operation

Safe

- IP66
- AFCI protection, proactively reduces fire risk
- Built-in PID recovery for better module performance (optional)
- Globally recognised branded componentry for longer life

Economic

- Power line communication (PLC) (optional)
- DC side supports "Y" connector

Models:

Solis-80K-5G-PRO

Solis-100K-5G-PRO

Solis-110K-5G-PRO



DATASHEET

Solis-(80-110)K-5G-PRO

Models	80K	100K	110K
Input DC			
Max. input voltage	1100 V		
Rated voltage	600 V		
Start-up voltage	180 V		
MPPT voltage range	160 - 1000 V		
Max. input current	3 × (40 A / 32 A)	4 × (40 A / 32 A)	
Max. short circuit current	6 × 50 A	8 × 50 A	
MPPT number / Max. input strings number	6 / 12	8 / 16	
Output AC			
Rated output power	80 kW	100 kW	110 kW
Max. apparent output power	88 kVA	110 kVA	121 kVA
Max. output power	88 kW	110 kW	121 kW
Rated grid voltage	3/N/PE, 220 V / 380 V, 230 V / 400 V		
Rated grid frequency	50 Hz / 60 Hz		
Rated grid output current	121.6 A / 115.5 A	152.0 A / 144.3 A	167.1 A / 158.8 A
Max. output current	133.7 A	167.1 A	183.8 A
Power factor	> 0.99 (0.8 leading - 0.8 lagging)		
THDi	< 3%		
DC injection current	< 0.5% In		
Efficiency			
Max. efficiency	98.5%		
EU efficiency	98.0%		
Protection			
DC reverse-polarity protection	Yes		
Short circuit protection	Yes		
Output over current protection	Yes		
Insulation resistance monitoring	Yes		
Residual current detection	Yes		
Surge protection	DC Type II / AC Type II		
Grid monitoring	Yes		
Anti-islanding protection	Yes		
Temperature protection	Yes		
Strings monitoring	Yes		
I/V Curve scanning	Yes		
Integrated AFCI 2.0	Optional		
Integrated PID recovery	Optional		
Integrated DC switch	Yes		
Integrated AC switch	Optional		
General Data			
Dimensions (W × H × D)	1065 × 585 × 363 mm (with or without AC switch)	1183 × 585 × 363 mm (with no AC switch); 1295 × 585 × 363 mm (with AC switch)	
Weight	78 kg	98 kg	
Topology	Transformerless		
Self-consumption (night)	< 2 W		
Operating ambient temperature range	- 30 ~ +60°C		
Relative humidity	0 - 100%		
Ingress protection	IP66		
Noise emission (typical)	< 80dB(A)		
Cooling concept	Intelligent fan-cooling		
Max. operation altitude	4000 m		
Grid connection standard	G99, IEC61727, EN50549-1/2, VDE4110		
Safety / EMC standard	IEC/EN 62109-1/-2, IEC/EN 61000-6-2/-4		
Features			
DC connection	MC4 connector		
AC connection	OT terminal (max. 240 mm²)		
Display	LCD		
Communication	RS485, Optional: S3-WiFi-ST, S3-GRPS-ST, PLC		