

Main Rd, Cardross, Dumbarton G82 5LB

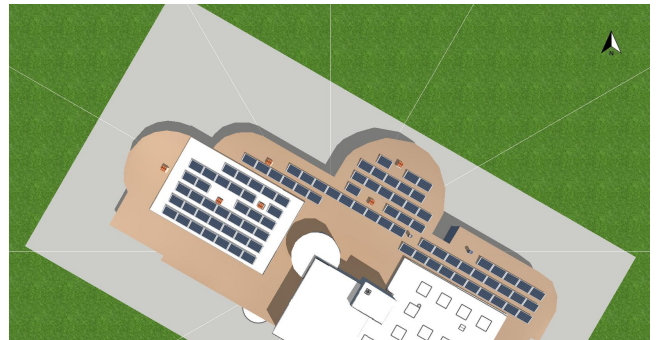
Project Name: Cardross Golf Club
Offer no.: 1722

20/04/2020

Your PV system

Address of Installation

Main Rd, Cardross, Dumbarton G82 5LB



Project Description:
Solar PV

Project Overview

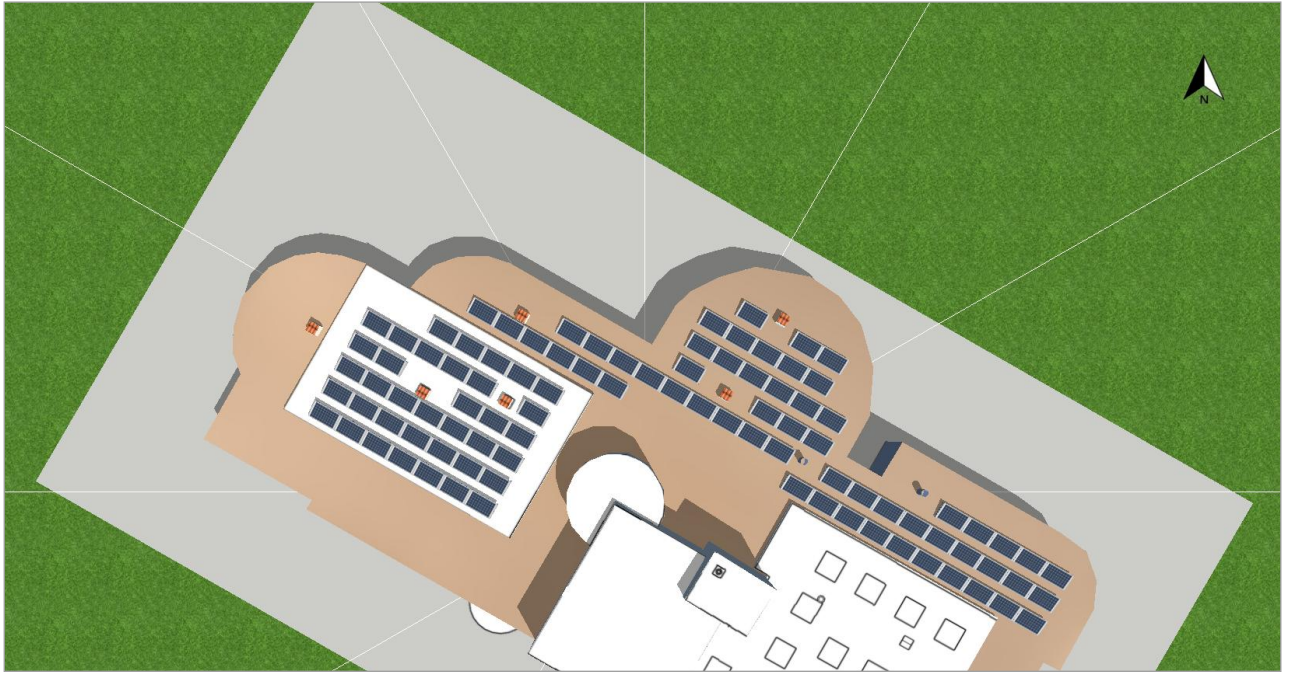


Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System

Climate Data	Cardross, GBR (1991 - 2010)
PV Generator Output	30.08 kWp
PV Generator Surface	155.8 m ²
Number of PV Modules	94
Number of Inverters	1

Cardross Golf Club

Project Number: 1722

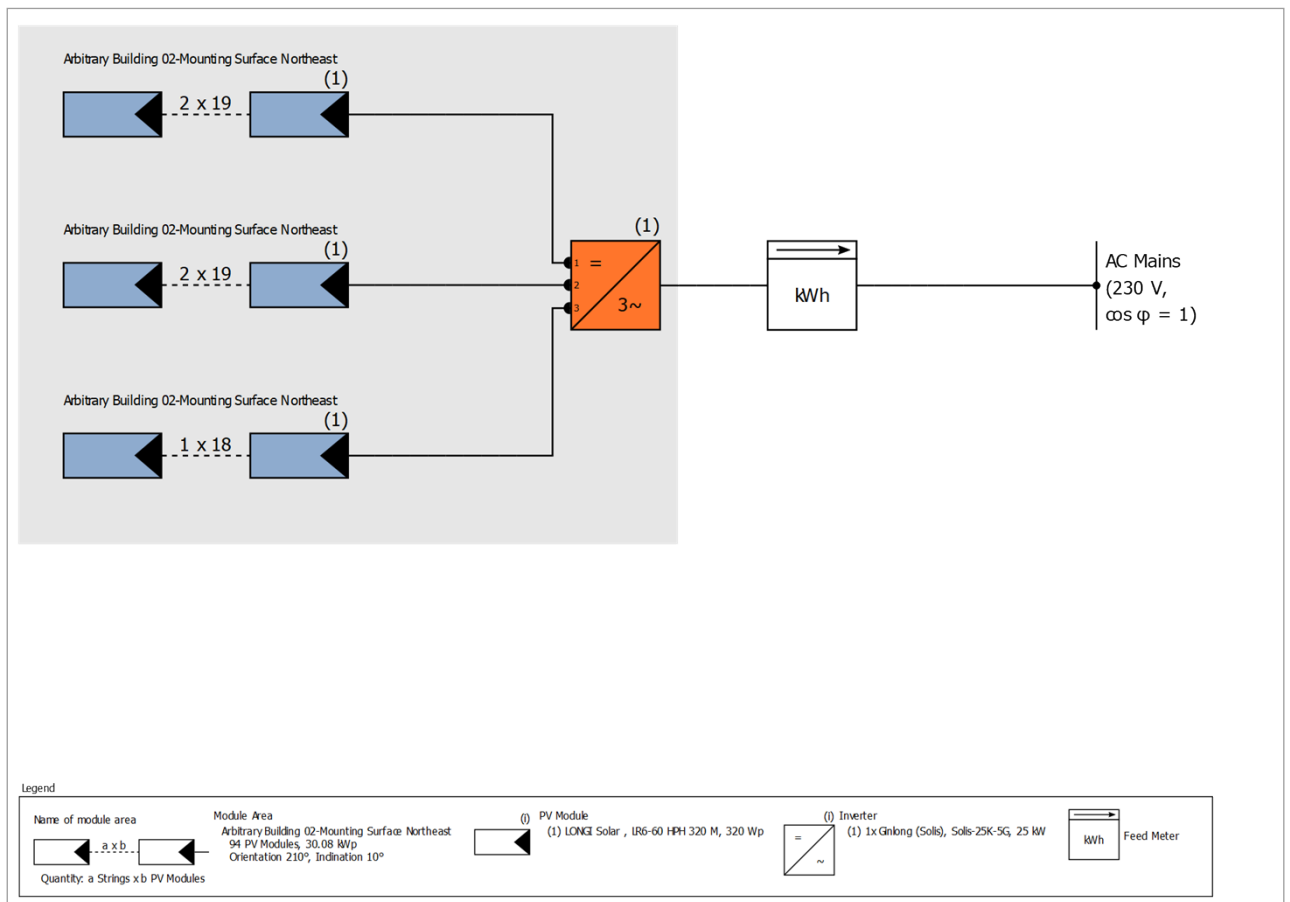


Figure: Schematic diagram

The yield

The yield

PV Generator Energy (AC grid)	24,606 kWh
Grid Feed-in	24,606 kWh
Down-regulation at Feed-in Point	0 kWh
Own Power Consumption	0.0 %
Solar Fraction	0.0 %
Spec. Annual Yield	818.03 kWh/kWp
Performance Ratio (PR)	83.1 %
Yield Reduction due to Shading	8.1 %/Year
CO ₂ Emissions avoided	11,565 kg / year

Financial Analysis

Your Gain

Total investment costs	36,096.00 £
Return on Assets	0.00 %
Amortization Period	More than 25 Years
Electricity Production Costs	0.09 £/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	20/04/2020

Climate Data

Location	Cardross, GBR (1991 - 2010)
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Module Areas

1. Module Area - Arbitrary Building 02-Mounting Surface Northeast

PV Generator, 1. Module Area - Arbitrary Building 02-Mounting Surface Northeast

Name	Arbitrary Building 02-Mounting Surface Northeast
PV Modules	94 x LR6-60 HPH 320 M (v1)
Manufacturer	LONGI Solar
Inclination	10 °
Orientation	Southwest 210 °
Installation Type	Mounted - Roof
PV Generator Surface	155.8 m ²

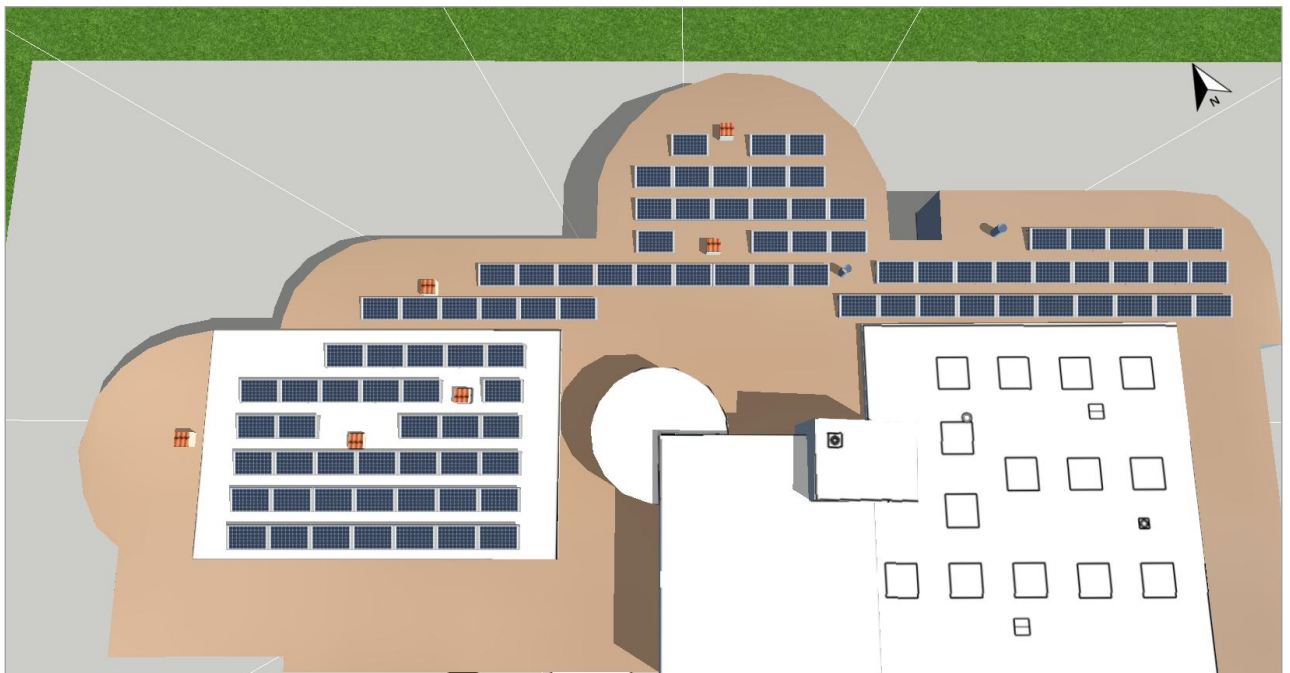


Figure: 1. Module Area - Arbitrary Building 02-Mounting Surface Northeast

Horizon Line, 3D Design

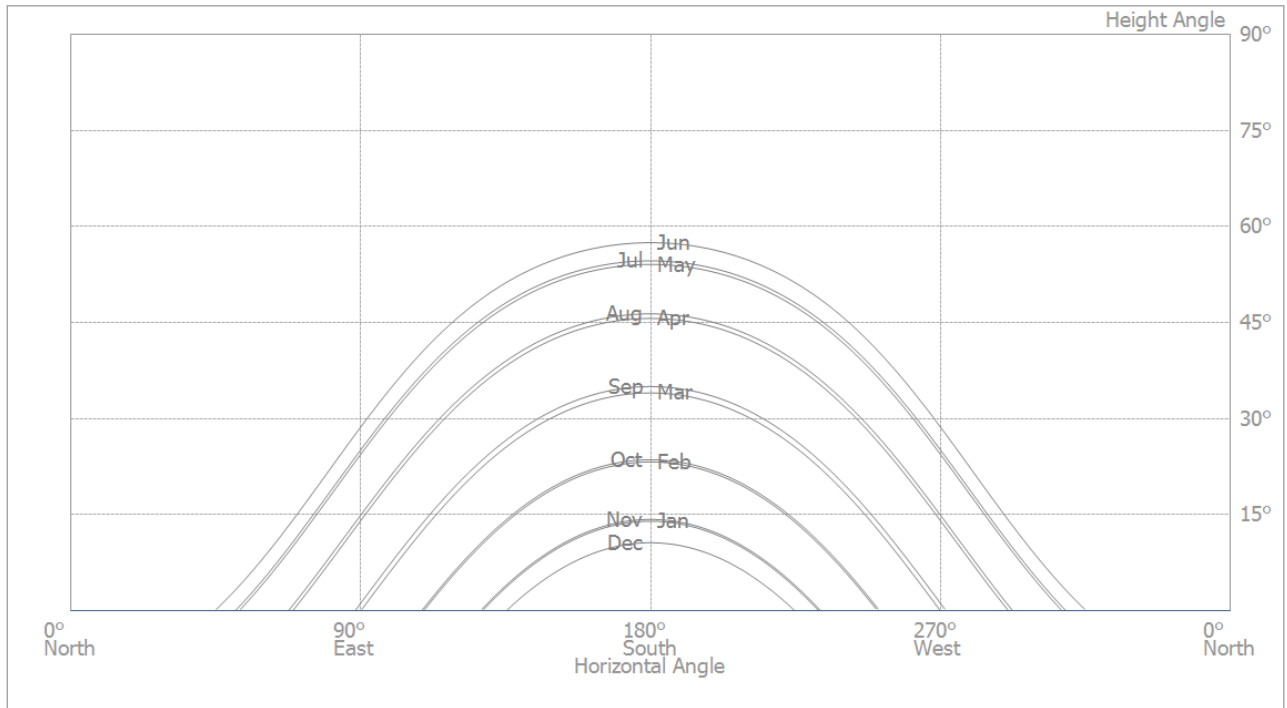


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Area	Arbitrary Building 02-Mounting Surface Northeast
Inverter 1	
Model	Solis-25K-5G (v1)
Manufacturer	Ginlong (Solis)
Quantity	1
Sizing Factor	120.3 %
Configuration	MPP 1: 2 x 19
	MPP 2: 2 x 19
	MPP 3: 1 x 18

AC Mains

AC Mains

Number of Phases	3
Mains Voltage (1-phase)	230 V
Displacement Power Factor (cos phi)	+/- 1

Simulation Results

Results Total System

PV System

PV Generator Output	30.1 kWp
Spec. Annual Yield	818.03 kWh/kWp
Performance Ratio (PR)	83.1 %
Yield Reduction due to Shading	8.1 %/Year
Grid Feed-in	24,606 kWh/Year
Grid Feed-in in the first year (incl. module degradation)	24,606 kWh/Year
Standby Consumption (Inverter)	28 kWh/Year
CO ₂ Emissions avoided	11,565 kg / year

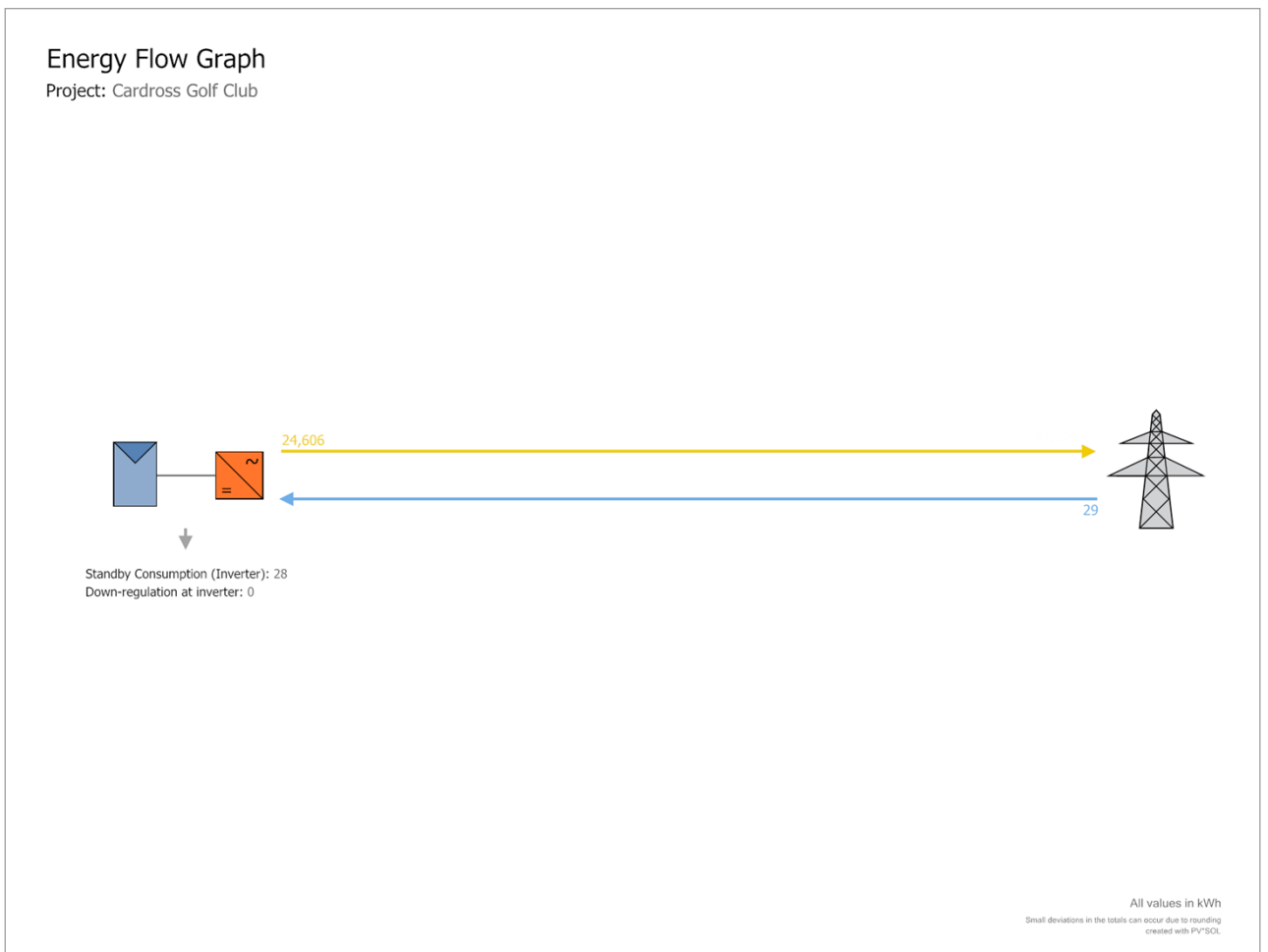


Figure: Energy Flow Graph

Financial Analysis

Overview

System Data

Grid Feed-in in the first year (incl. module degradation)	24,606 kWh/Year
PV Generator Output	30.1 kWp
Start of Operation of the System	20/04/2020
Assessment Period	25 Years
Interest on Capital	1 %

Economic Parameters

Return on Assets	0.00 %
Accrued Cash Flow (Cash Balance)	-20,538.29 £
Amortization Period	More than 25 Years
Electricity Production Costs	0.09 £/kWh

Payment Overview

Specific Investment Costs	1,200.00 £/kWp
Investment Costs	36,096.00 £
One-off Payments	0.00 £
Incoming Subsidies	0.00 £
Annual Costs	721.92 £/Year
Other Revenue or Savings	0.00 £/Year

Remuneration and Savings

Total Payment from Utility in First Year	1,622.64 £/Year
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FIT 2017 (Oct - Dec) Higher Rate - Export tariff with 50% deeming - Building Attached

Validity	20/04/2020 - 19/04/2040
Specific generation remuneration	0.0491 £/kWh
Generation Tariff	605.87 £/Year
Inflation Rate for Generation Tariff	1.00 %/Year

FIT 2017 (Oct - Dec) Higher Rate - Generation tariff only - Building Attached

Validity	20/04/2020 - 19/04/2040
Specific generation remuneration	0.0412 £/kWh
Generation Tariff	1,016.77 £/Year
Inflation Rate for Generation Tariff	1.00 %/Year

Cash flow

Cashflow Table

	Year 1	Year 2	Year 3	Year 4	Year 5
Investments	-£36,096.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£714.77	-£707.70	-£700.69	-£693.75	-£686.88
Feed-in / Export Tariff	£1,475.30	£1,606.64	£1,606.72	£1,606.79	£1,606.86
Annual Cash Flow	-£35,335.47	£898.95	£906.03	£913.04	£919.98
Accrued Cash Flow (Cash Balance)	-£35,335.47	-£34,436.52	-£33,530.49	-£32,617.45	-£31,697.47

	Year 6	Year 7	Year 8	Year 9	Year 10
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£680.08	-£673.35	-£666.68	-£660.08	-£653.54
Feed-in / Export Tariff	£1,606.94	£1,607.01	£1,607.08	£1,607.15	£1,607.23
Annual Cash Flow	£926.85	£933.66	£940.40	£947.07	£953.68
Accrued Cash Flow (Cash Balance)	-£30,770.62	-£29,836.96	-£28,896.56	-£27,949.48	-£26,995.80

	Year 11	Year 12	Year 13	Year 14	Year 15
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£647.07	-£640.67	-£634.32	-£628.04	-£621.83
Feed-in / Export Tariff	£1,607.30	£1,607.37	£1,607.45	£1,607.52	£1,607.59
Annual Cash Flow	£960.23	£966.71	£973.12	£979.48	£985.77
Accrued Cash Flow (Cash Balance)	-£26,035.57	-£25,068.87	-£24,095.74	-£23,116.27	-£22,130.50

	Year 16	Year 17	Year 18	Year 19	Year 20
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£615.67	-£609.57	-£603.54	-£597.56	-£591.65
Feed-in / Export Tariff	£1,607.67	£1,607.74	£1,607.81	£1,607.89	£1,607.96
Annual Cash Flow	£992.00	£998.17	£1,004.28	£1,010.32	£1,016.31
Accrued Cash Flow (Cash Balance)	-£21,138.50	-£20,140.33	-£19,136.06	-£18,125.73	-£17,109.42

	Year 21	Year 22	Year 23	Year 24	Year 25
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£585.79	-£579.99	-£574.25	-£568.56	-£562.93
Feed-in / Export Tariff	£0.00	£0.00	£0.00	£0.00	£0.00
Annual Cash Flow	-£585.79	-£579.99	-£574.25	-£568.56	-£562.93
Accrued Cash Flow (Cash Balance)	-£17,695.20	-£18,275.19	-£18,849.44	-£19,418.00	-£19,980.93

	Year 26
Investments	£0.00
Operating costs	-£557.36
Feed-in / Export Tariff	£0.00
Annual Cash Flow	-£557.36
Accrued Cash Flow (Cash Balance)	-£20,538.29

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

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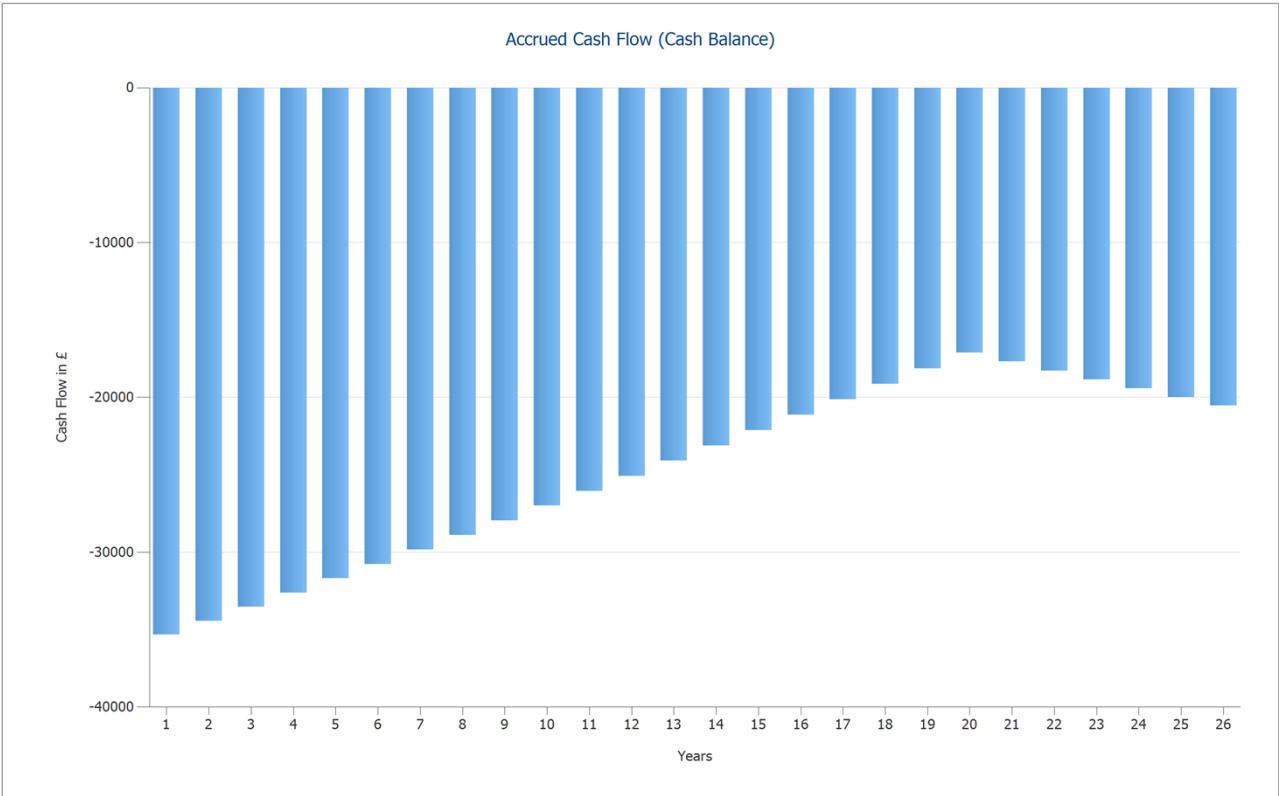


Figure: Accrued Cash Flow (Cash Balance)

Plans and parts list

Circuit Diagram

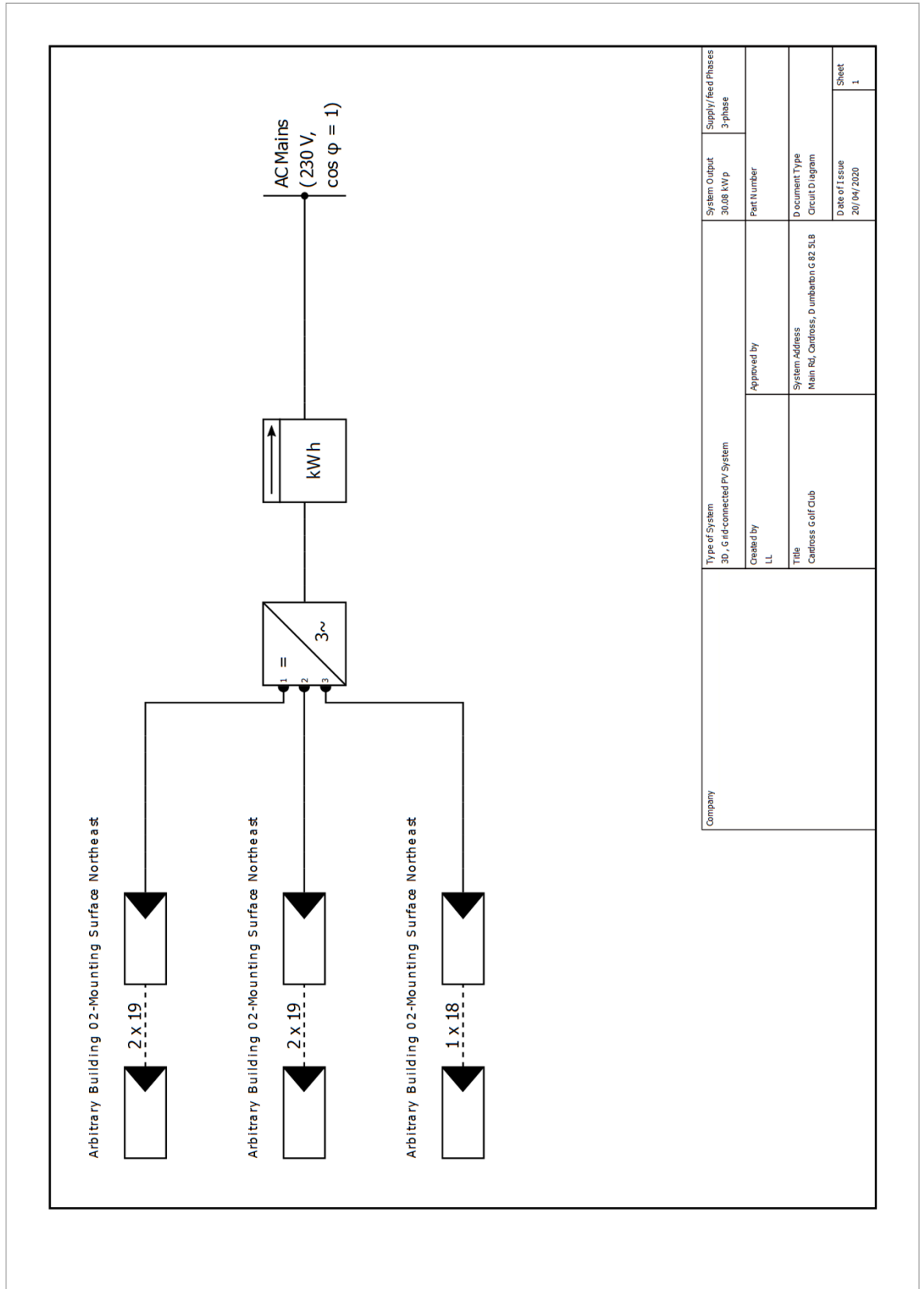


Figure: Circuit Diagram

Dimensioning Plan

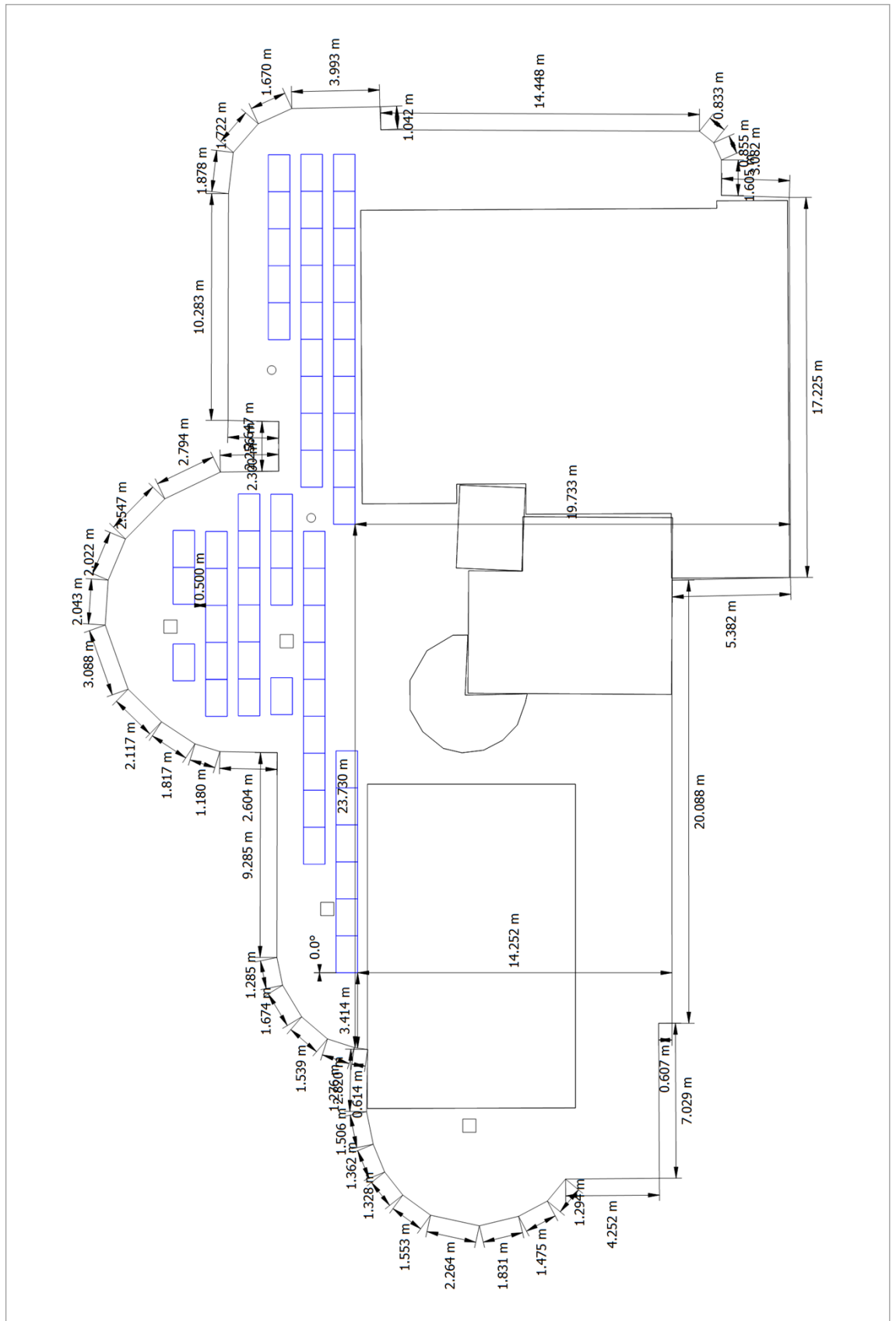


Figure: Arbitrary Building 01-Mounting Surface Southwest

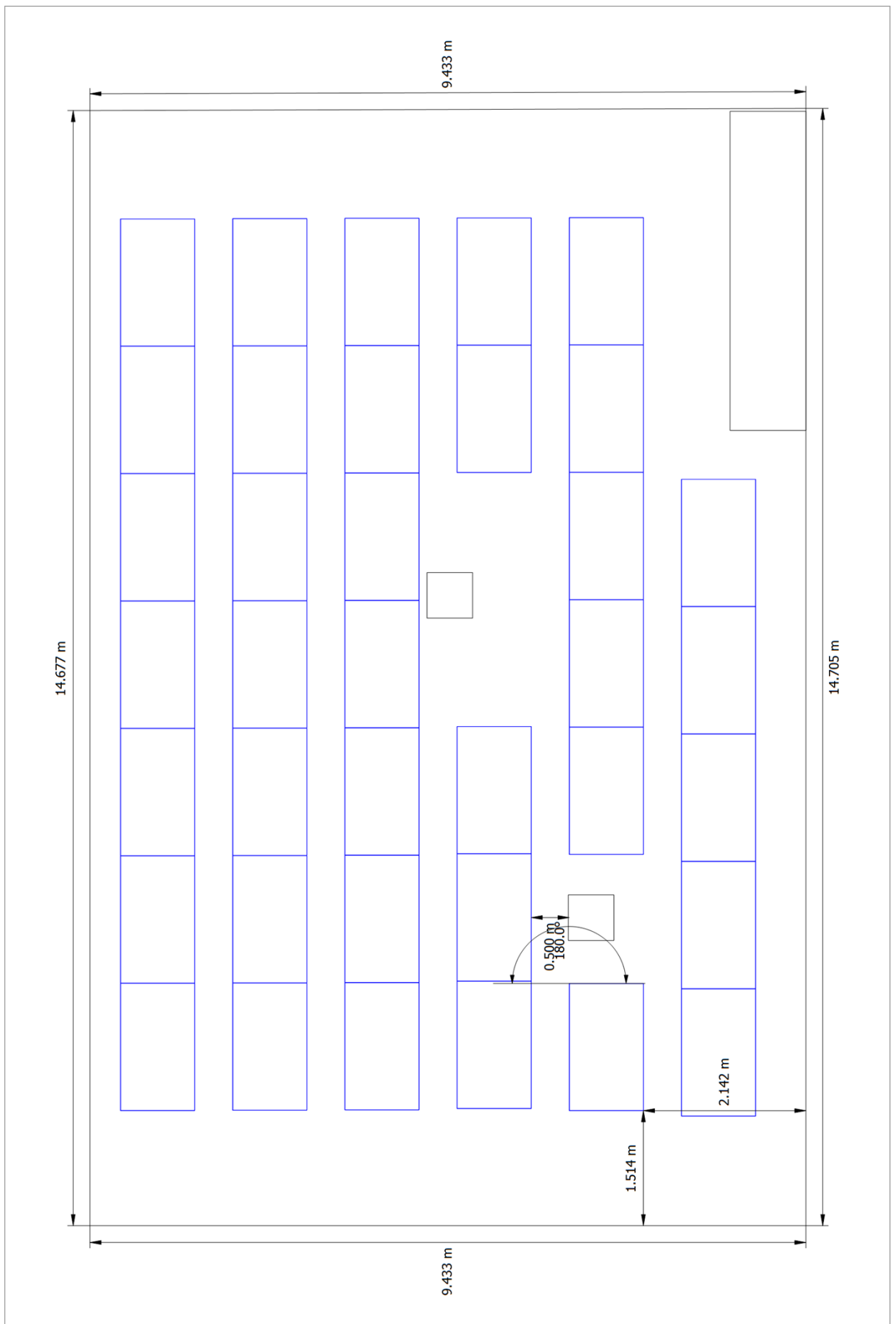


Figure: Arbitrary Building 02-Mounting Surface Northeast

Cardross Golf Club

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Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		LONGI Solar	LR6-60 HPH 320 M	94	Piece
2	Inverter		Ginlong (Solis)	Solis-25K-5G	1	Piece
3	Meter			Feed Meter	1	Piece