

Engenera Renewables

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England

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Project Name: Cardross Golf Club

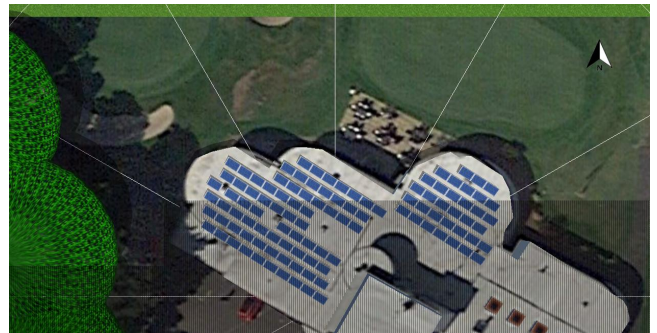
Offer no.: 1722

08/10/2019

Your PV system from Engenera Renewables

Address of Installation

Main Rd, Cardross, Dumbarton G82 5LB



Project Overview



Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System

Climate Data	Cardross, GBR (1991 - 2010)
PV Generator Output	29.7 kWp
PV Generator Surface	176.2 m ²
Number of PV Modules	108
Number of Inverters	1

Cardross Golf Club

Engenera Renewables
Project Number: 1722

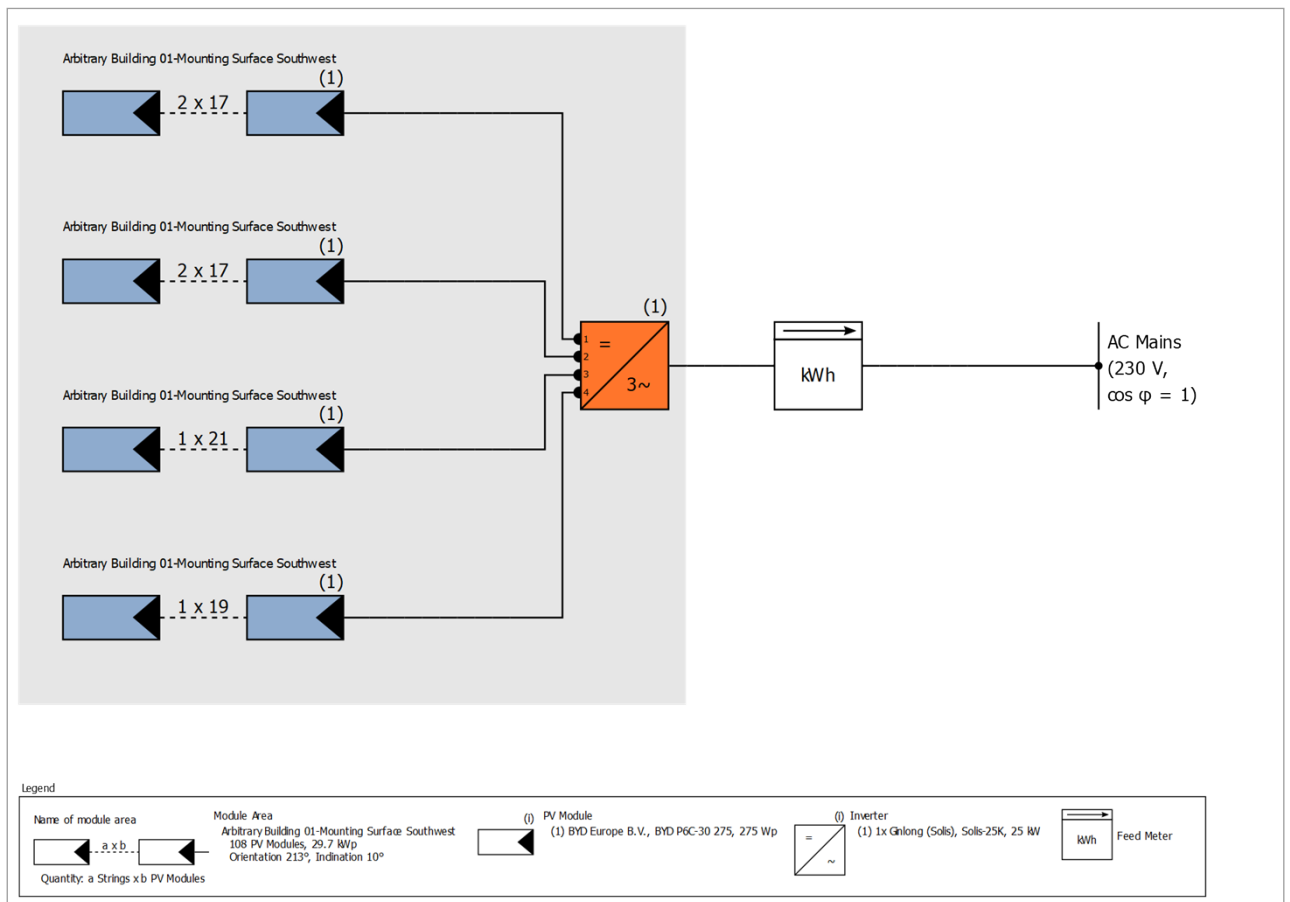


Figure: Schematic diagram

The yield

The yield

PV Generator Energy (AC grid)	23,280 kWh
Grid Feed-in	23,280 kWh
Down-regulation at Feed-in Point	0 kWh
Own Power Consumption	0.0 %
Solar Fraction	0.0 %
Spec. Annual Yield	783.83 kWh/kWp
Performance Ratio (PR)	78.8 %
Yield Reduction due to Shading	8.7 %/year
CO ₂ Emissions avoided	13,968 kg / year

Financial Analysis

Your Gain

Total investment costs	35,640.00 £
Return on Assets	0.00 %
Amortization Period	More than 25 Years
Electricity Production Costs	0.1 £/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	08/10/2019

Climate Data

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

Module Areas

1. Module Area - Arbitrary Building 01-Mounting Surface Southwest

PV Generator, 1. Module Area - Arbitrary Building 01-Mounting Surface Southwest

Name	Arbitrary Building 01-Mounting Surface Southwest
PV Modules	108 x BYD P6C-30 275
Manufacturer	BYD Europe B.V.
Inclination	10 °
Orientation	Southwest 213 °
Installation Type	Mounted - Roof
PV Generator Surface	176.2 m ²



Figure: 1. Module Area - Arbitrary Building 01-Mounting Surface Southwest

Horizon Line, 3D Design

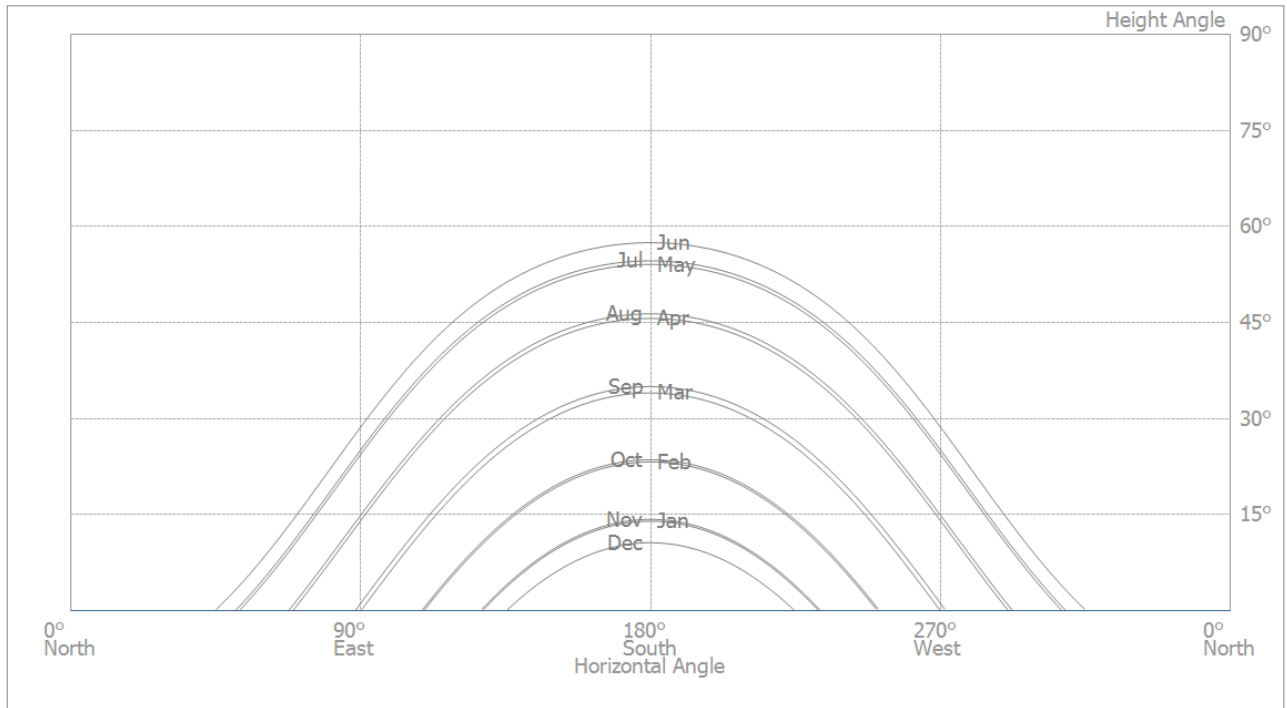


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Area	Arbitrary Building 01-Mounting Surface Southwest
Inverter 1	
Manufacturer	Ginlong (Solis)
Model	Solis-25K
Quantity	1
Sizing Factor	118.8 %
Configuration	MPP 1: 2 x 17
	MPP 2: 2 x 17
	MPP 3: 1 x 21
	MPP 4: 1 x 19

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	29.7 kWp
Spec. Annual Yield	783.83 kWh/kWp
Performance Ratio (PR)	78.8 %
Yield Reduction due to Shading	8.7 %/year
Grid Feed-in	23,280 kWh/year
Grid Feed-in in the first year (incl. module degradation)	23,280 kWh/year
Standby Consumption (Inverter)	2 kWh/year
CO ₂ Emissions avoided	13,968 kg / year

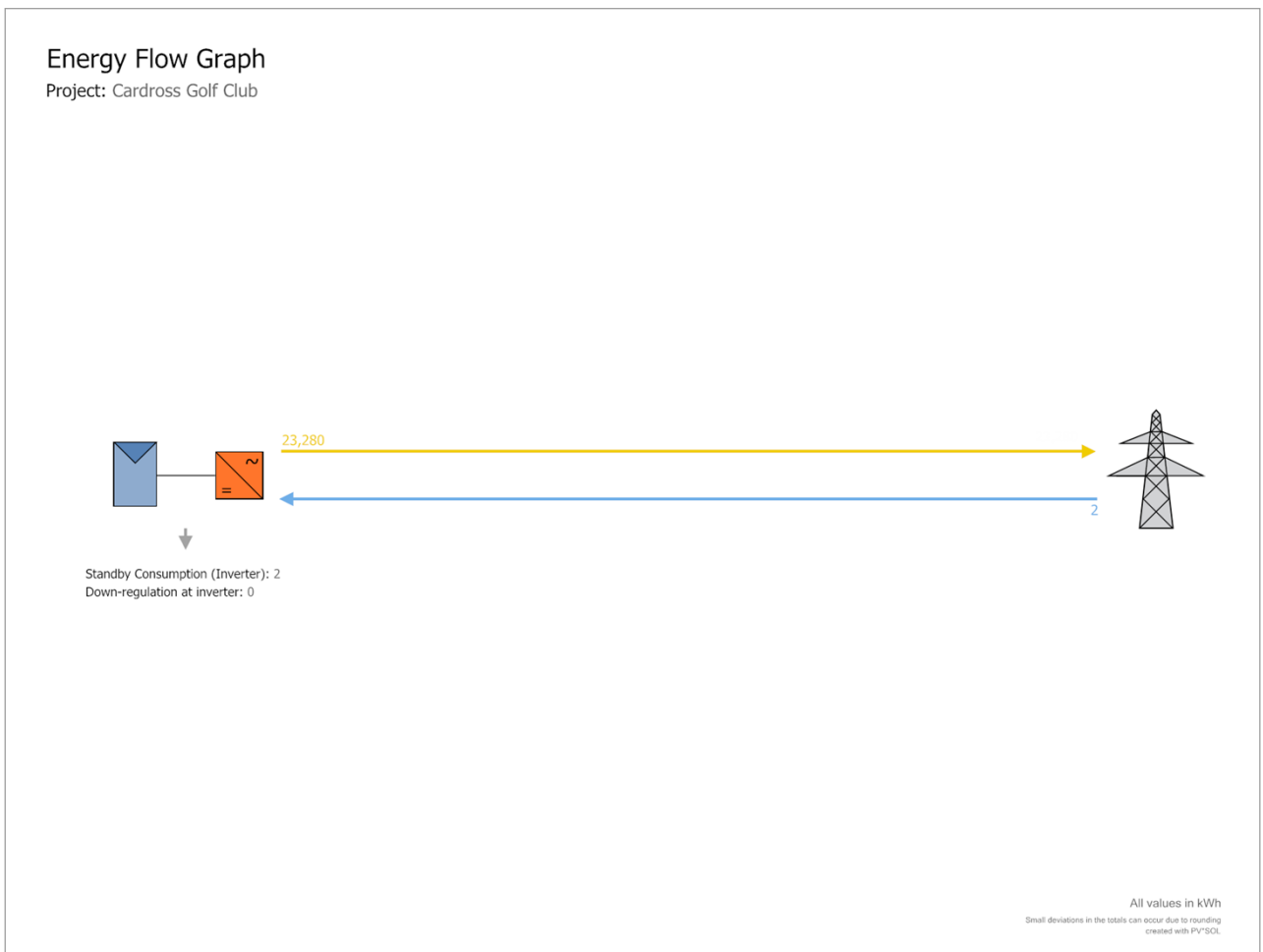


Figure: Energy Flow Graph

Financial Analysis

Overview

System Data

Grid Feed-in in the first year (incl. module degradation)	23,280 kWh/year
PV Generator Output	29.7 kWp
Start of Operation of the System	08/10/2019
Assessment Period	25 Years
Interest on Capital	1 %

Economic Parameters

Return on Assets	0.00 %
Accrued Cash Flow (Cash Balance)	-21,396.28 £
Amortization Period	More than 25 Years
Electricity Production Costs	0.1 £/kWh

Payment Overview

Specific Investment Costs	1,200.00 £/kWp
Investment Costs	35,640.00 £
One-off Payments	0.00 £
Incoming Subsidies	0.00 £
Annual Costs	712.80 £/year
Other Revenue or Savings	0.00 £/year

Remuneration and Savings

Total Payment from Utility in First Year	1,539.96 £/year
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FIT 2017 (Oct - Dec) Higher Rate - Export tariff with 50% deeming - Building Attached

Validity	08/10/2019 - 07/10/2039
Specific generation remuneration	0.0491 £/kWh
Generation Tariff	575.00 £/year
Inflation Rate for Generation Tariff	1.00 %/year

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

Validity	08/10/2019 - 07/10/2039
Specific generation remuneration	0.0412 £/kWh
Generation Tariff	964.96 £/year
Inflation Rate for Generation Tariff	1.00 %/year

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Cash flow

Cashflow Table

	year 1	year 2	year 3	year 4	year 5
Investments	-£35,640.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£705.74	-£698.76	-£691.84	-£684.99	-£678.20
Feed-in / Export Tariff	£1,509.42	£1,524.78	£1,524.85	£1,524.92	£1,524.99
Annual Cash Flow	-£34,836.32	£826.03	£833.01	£839.93	£846.79
Accrued Cash Flow (Cash Balance)	-£34,836.32	-£34,010.30	-£33,177.28	-£32,337.35	-£31,490.56

	year 6	year 7	year 8	year 9	year 10
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£671.49	-£664.84	-£658.26	-£651.74	-£645.29
Feed-in / Export Tariff	£1,525.06	£1,525.13	£1,525.20	£1,525.27	£1,525.34
Annual Cash Flow	£853.57	£860.29	£866.94	£873.53	£880.05
Accrued Cash Flow (Cash Balance)	-£30,636.99	-£29,776.71	-£28,909.77	-£28,036.24	-£27,156.19

	year 11	year 12	year 13	year 14	year 15
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£638.90	-£632.57	-£626.31	-£620.11	-£613.97
Feed-in / Export Tariff	£1,525.41	£1,525.48	£1,525.55	£1,525.61	£1,525.68
Annual Cash Flow	£886.51	£892.90	£899.23	£905.51	£911.71
Accrued Cash Flow (Cash Balance)	-£26,269.68	-£25,376.78	-£24,477.55	-£23,572.04	-£22,660.33

	year 16	year 17	year 18	year 19	year 20
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£607.89	-£601.87	-£595.91	-£590.01	-£584.17
Feed-in / Export Tariff	£1,525.75	£1,525.82	£1,525.89	£1,525.96	£1,526.03
Annual Cash Flow	£917.86	£923.95	£929.98	£935.95	£941.86
Accrued Cash Flow (Cash Balance)	-£21,742.46	-£20,818.51	-£19,888.53	-£18,952.59	-£18,010.73

	year 21	year 22	year 23	year 24	year 25
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Operating costs	-£578.39	-£572.66	-£566.99	-£561.38	-£555.82
Feed-in / Export Tariff	£0.00	£0.00	£0.00	£0.00	£0.00
Annual Cash Flow	-£578.39	-£572.66	-£566.99	-£561.38	-£555.82
Accrued Cash Flow (Cash Balance)	-£18,589.11	-£19,161.77	-£19,728.76	-£20,290.14	-£20,845.96

	year 26
Investments	£0.00
Operating costs	-£550.32
Feed-in / Export Tariff	£0.00
Annual Cash Flow	-£550.32
Accrued Cash Flow (Cash Balance)	-£21,396.28

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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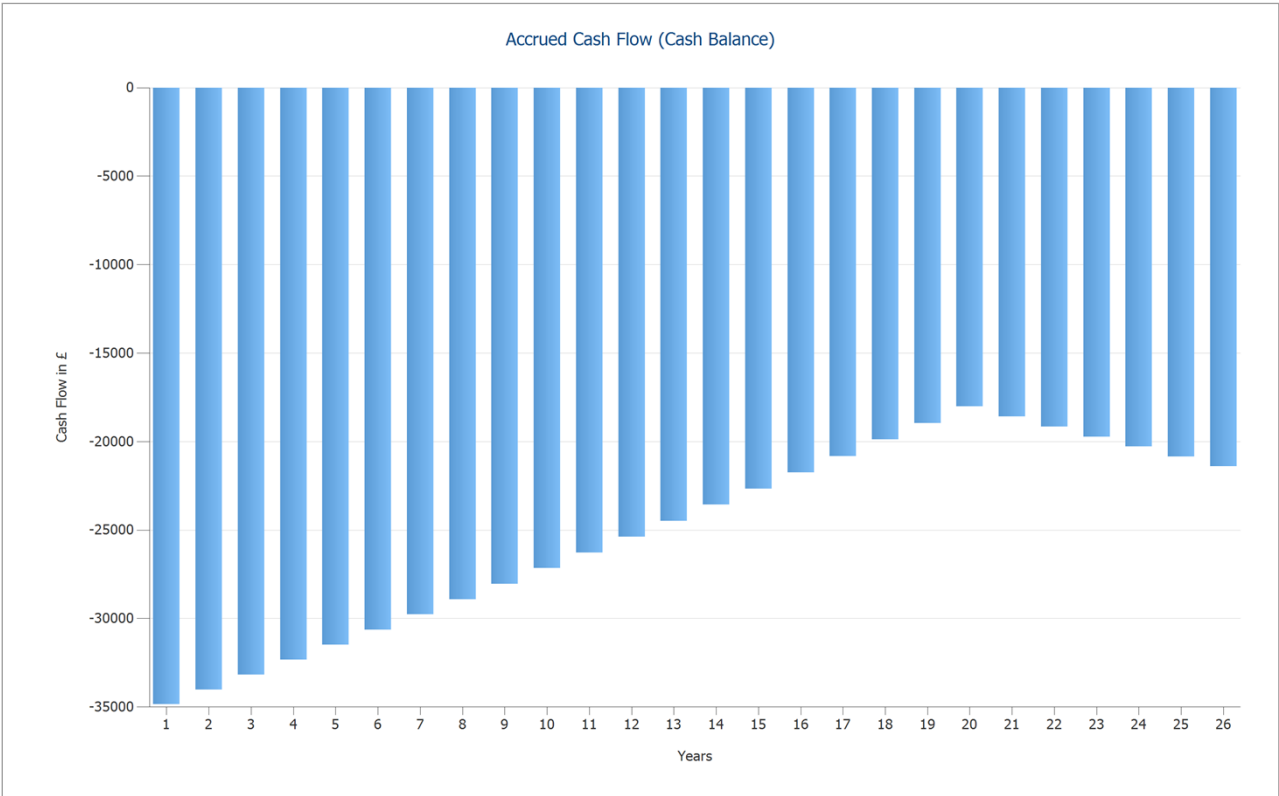


Figure: Accrued Cash Flow (Cash Balance)

Plans

Circuit Diagram

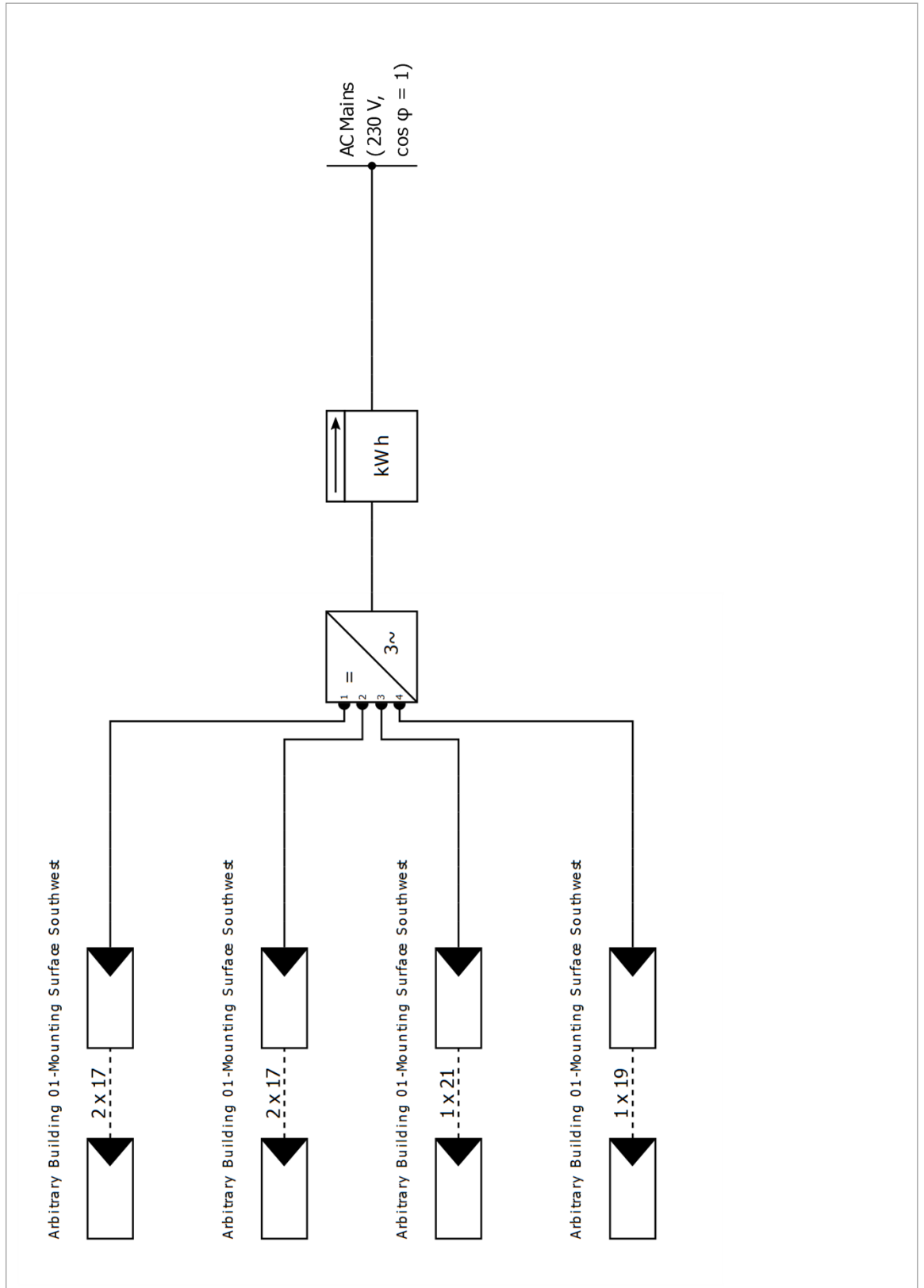


Figure: Circuit Diagram

Dimensioning Plan

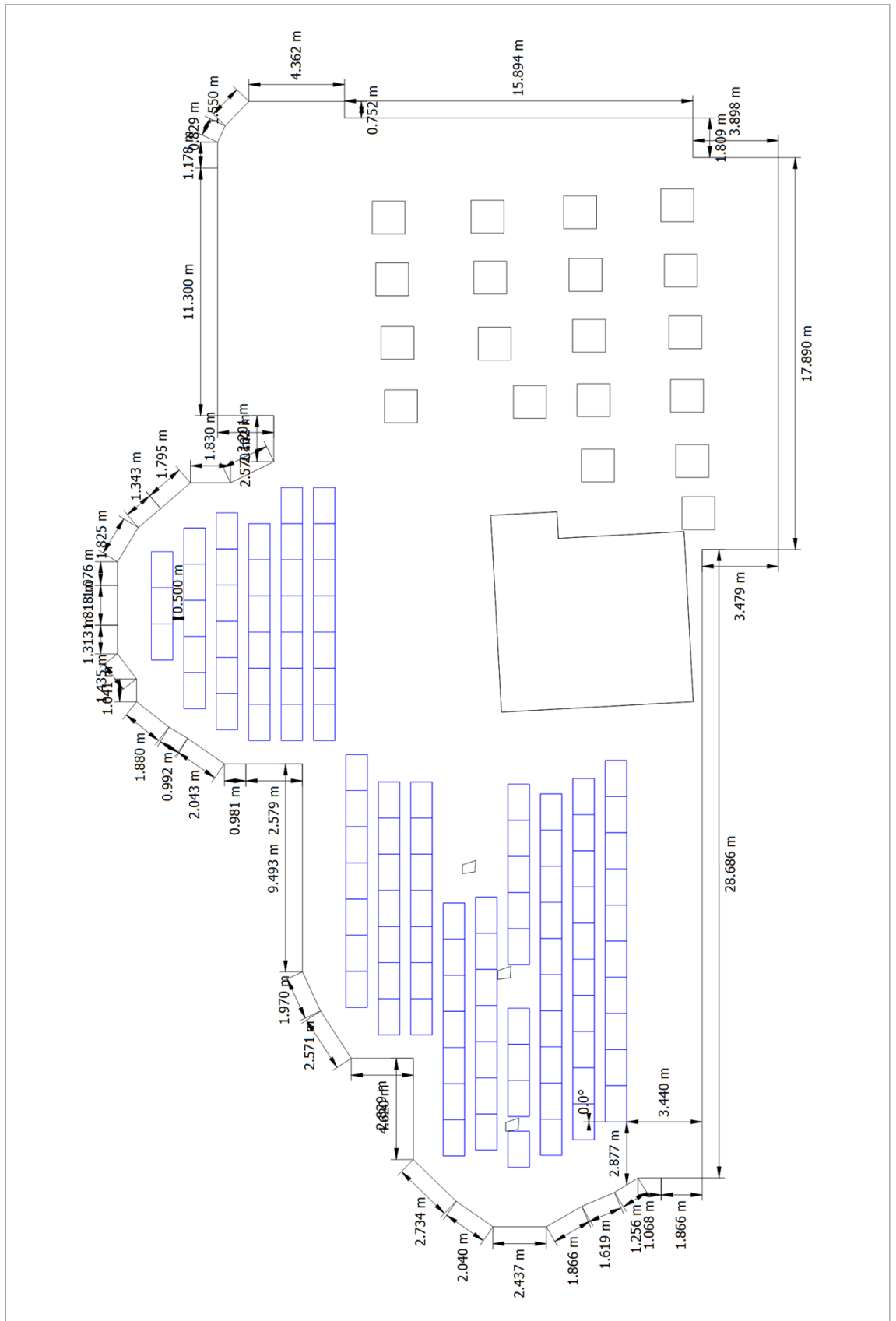


Figure: Arbitrary Building 01-Mounting Surface Southwest