



Aztec Solar Energy

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Project Name: ABC Care Home

14/08/2024

Your PV system from Aztec Solar Energy

Address of Installation

Burnside Court,
106 Torquay Rd,
Paignton
TQ3 2AA



Project Overview



Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances and Battery Systems

Climate Data	Plymouth/Roborough, GBR (2001 - 2020)
Values source	Meteonorm 8.2
PV Generator Output	16.1 kWp
PV Generator Surface	72.3 m ²
Number of PV Modules	37
Number of Inverters	1
No. of battery systems	3

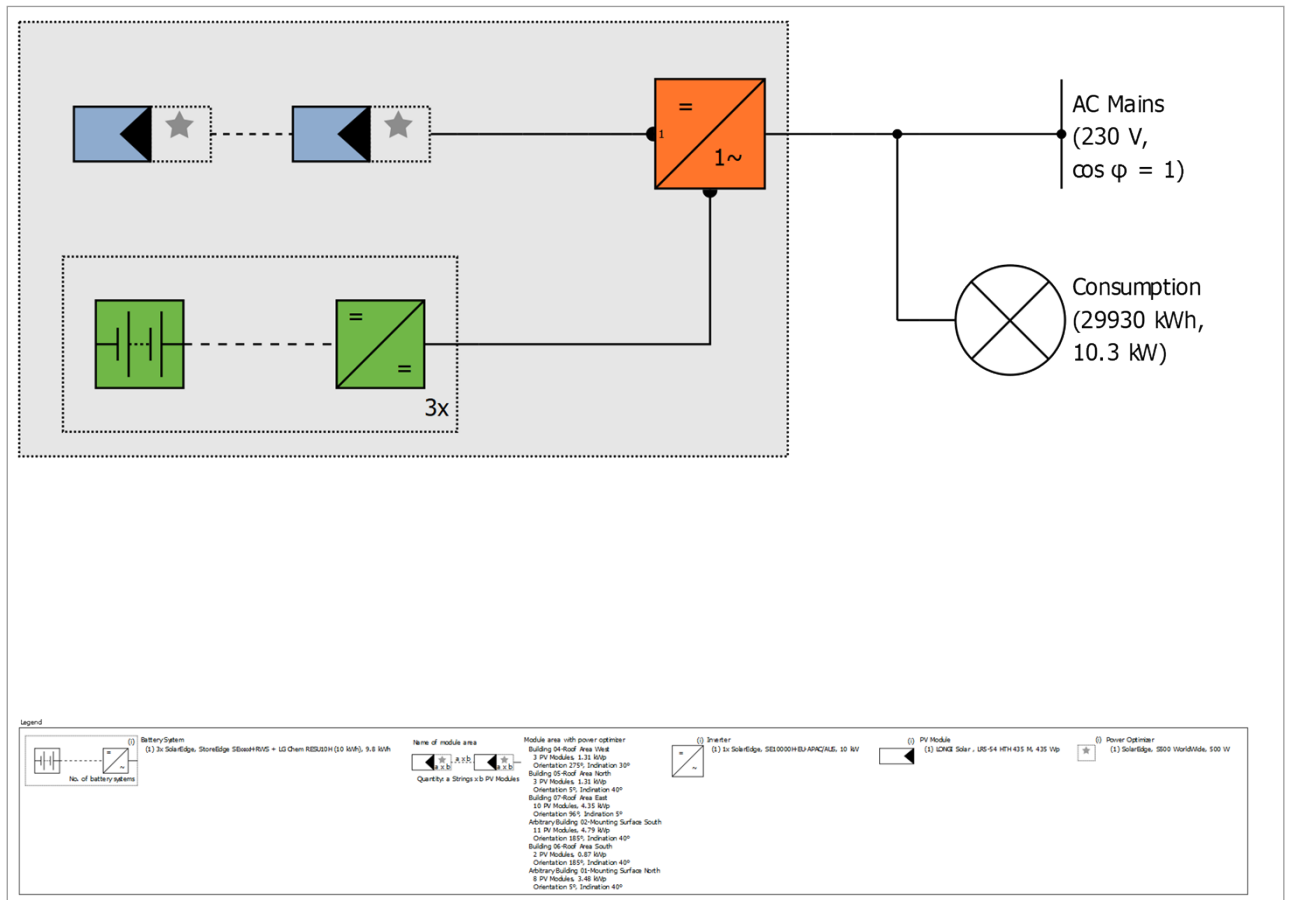


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	16.10 kWp
Spec. Annual Yield	885.34 kWh/kWp
Performance Ratio (PR)	91.25 %
Yield Reduction due to Shading	10.0 %
PV Generator Energy (AC grid) with battery	14,152 kWh/Year
Direct Own Use	11,436 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	2,716 kWh/Year
Own Power Consumption	80.8 %
CO ₂ Emissions avoided	6,579 kg / year
Level of Self-sufficiency	38.2 %

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 with Electrical Appliances and Battery Systems
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Climate Data

Location	Plymouth/Roborough, GBR (2001 - 2020)
Values source	Meteonorm 8.2
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	29930 kWh
New	29930 kWh
Load Peak	10.3 kW

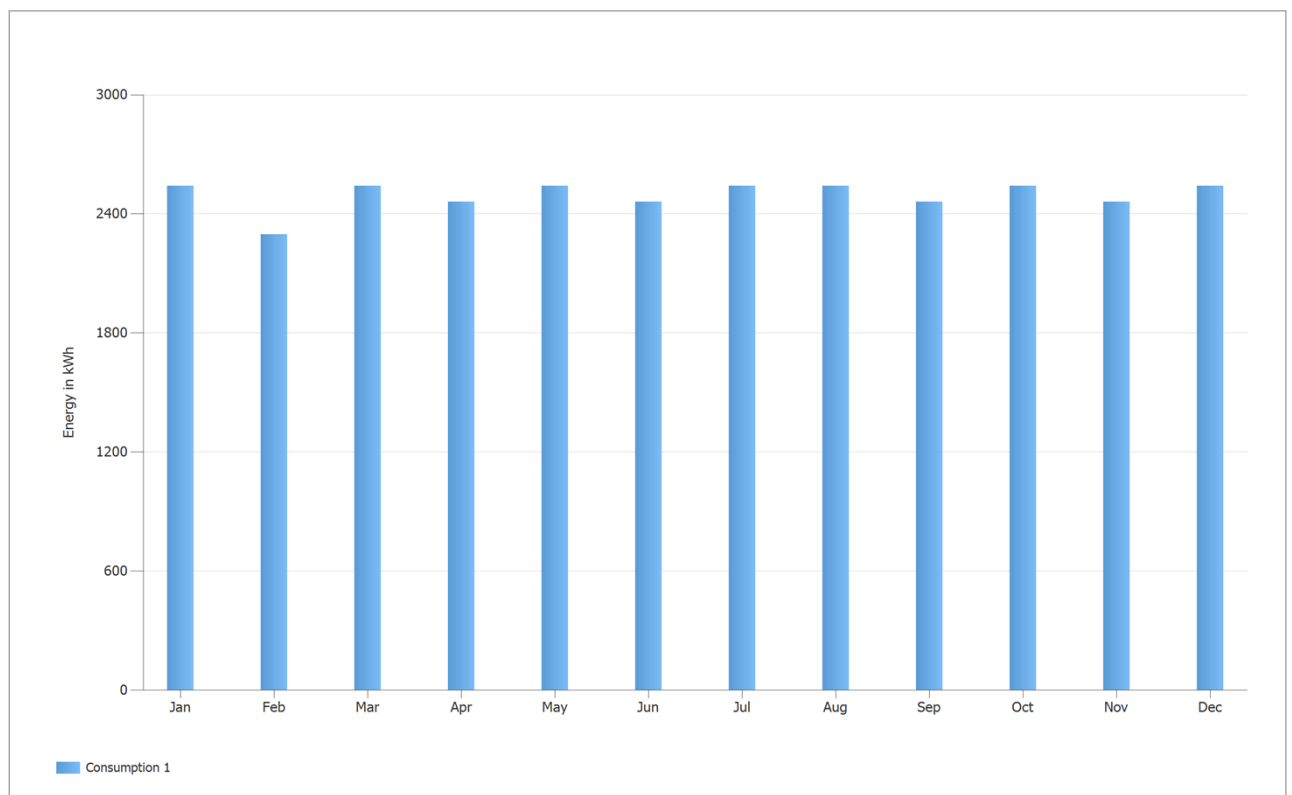


Figure: Consumption

Module Areas

1. Module Area - Building 04-Roof Area West

PV Generator, 1. Module Area - Building 04-Roof Area West

Name	Building 04-Roof Area West
PV Modules	3 x LR5-54 HTH 435 M (v3)
Manufacturer	LONGI Solar
Inclination	30 °
Orientation	West 275 °
Installation Type	Roof parallel
PV Generator Surface	5.9 m ²

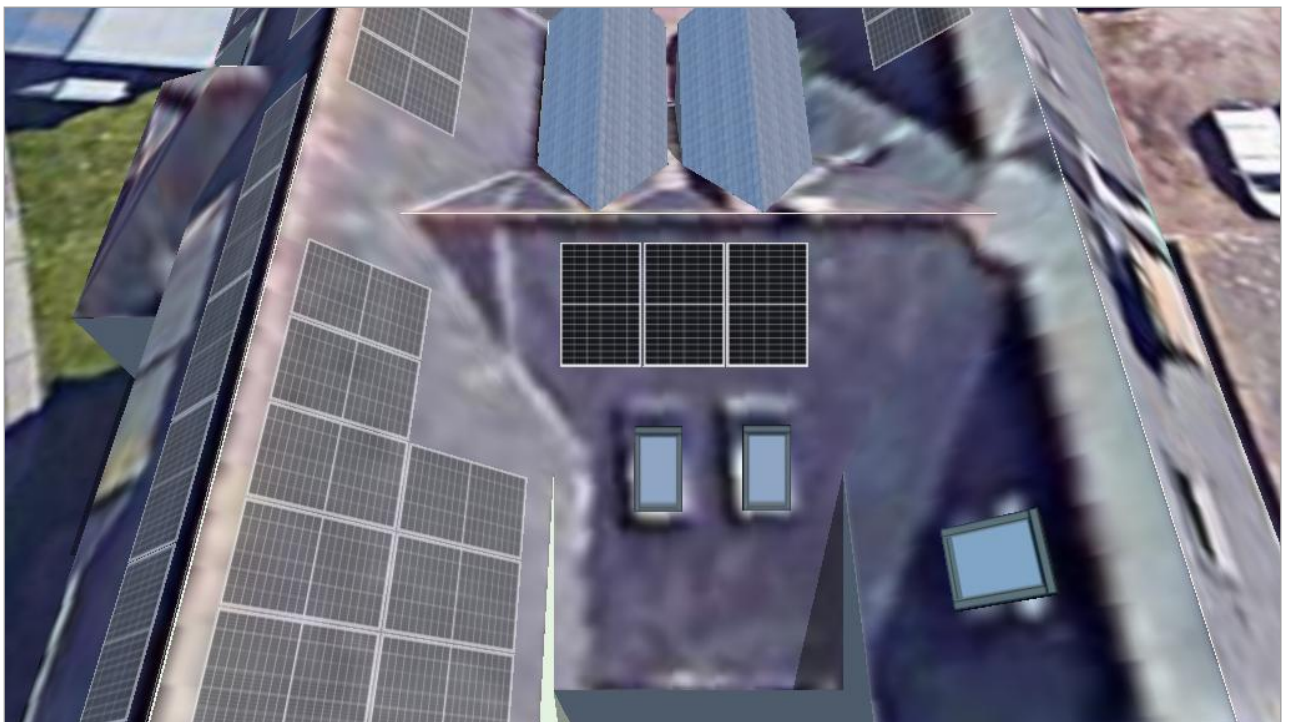


Figure: 1. Module Area - Building 04-Roof Area West

2. Module Area - Building 05-Roof Area North

PV Generator, 2. Module Area - Building 05-Roof Area North

Name	Building 05-Roof Area North
PV Modules	3 x LR5-54 HTH 435 M (v3)
Manufacturer	LONGI Solar
Inclination	40 °
Orientation	North 5 °
Installation Type	Roof parallel
PV Generator Surface	5.9 m ²

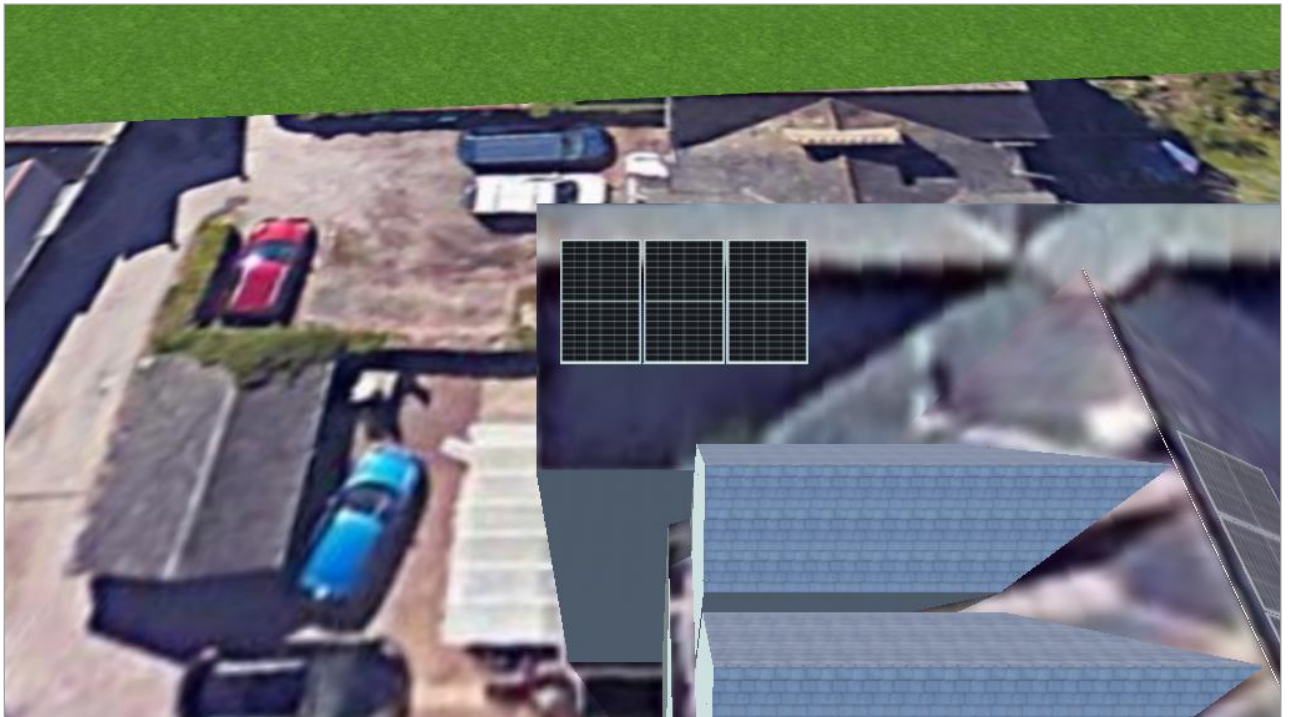


Figure: 2. Module Area - Building 05-Roof Area North

3. Module Area - Building 07-Roof Area East

PV Generator, 3. Module Area - Building 07-Roof Area East

Name	Building 07-Roof Area East
PV Modules	10 x LR5-54 HTH 435 M (v3)
Manufacturer	LONGI Solar
Inclination	5 °
Orientation	East 96 °
Installation Type	Roof parallel
PV Generator Surface	19.5 m²



Figure: 3. Module Area - Building 07-Roof Area East

4. Module Area - Arbitrary Building 02-Mounting Surface South

PV Generator, 4. Module Area - Arbitrary Building 02-Mounting Surface South

Name	Arbitrary Building 02-Mounting Surface South
PV Modules	11 x LR5-54 HTH 435 M (v3)
Manufacturer	LONGI Solar
Inclination	40 °
Orientation	South 185 °
Installation Type	Roof parallel
PV Generator Surface	21.5 m ²

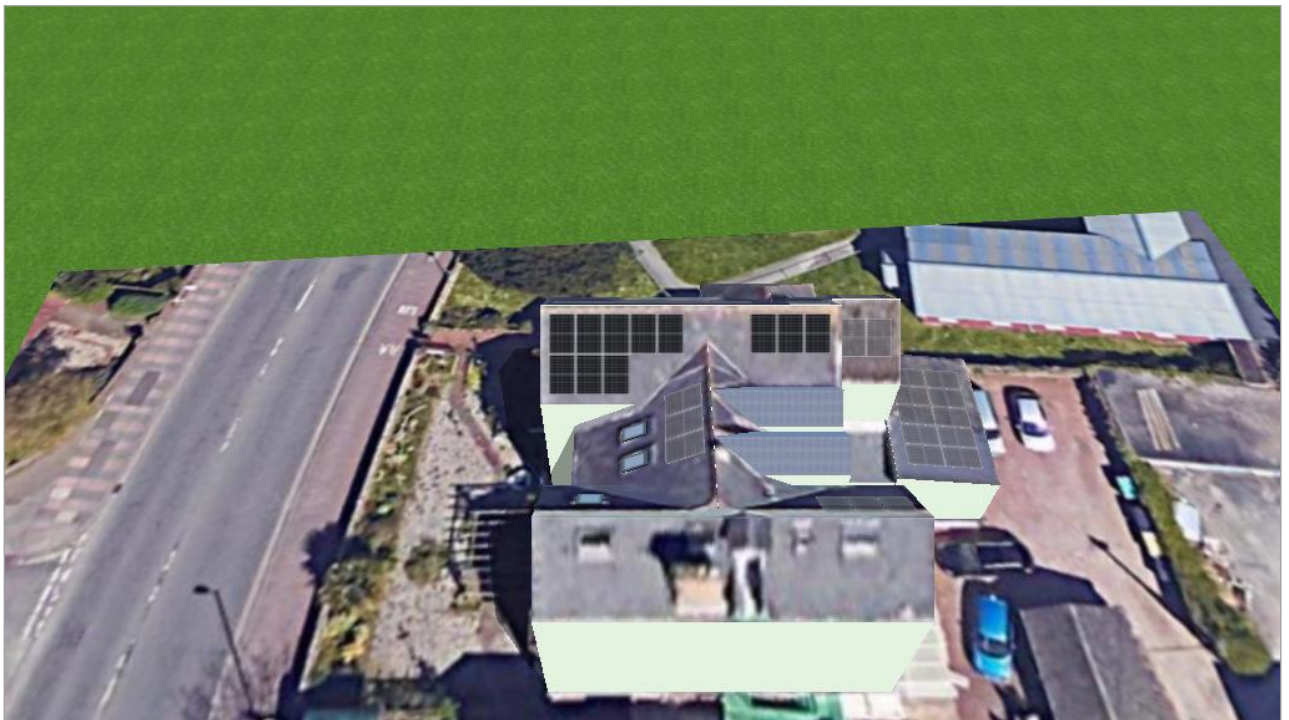


Figure: 4. Module Area - Arbitrary Building 02-Mounting Surface South

5. Module Area - Building 06-Roof Area South

PV Generator, 5. Module Area - Building 06-Roof Area South

Name	Building 06-Roof Area South
PV Modules	2 x LR5-54 HTH 435 M (v3)
Manufacturer	LONGI Solar
Inclination	40 °
Orientation	South 185 °
Installation Type	Roof parallel
PV Generator Surface	3.9 m²

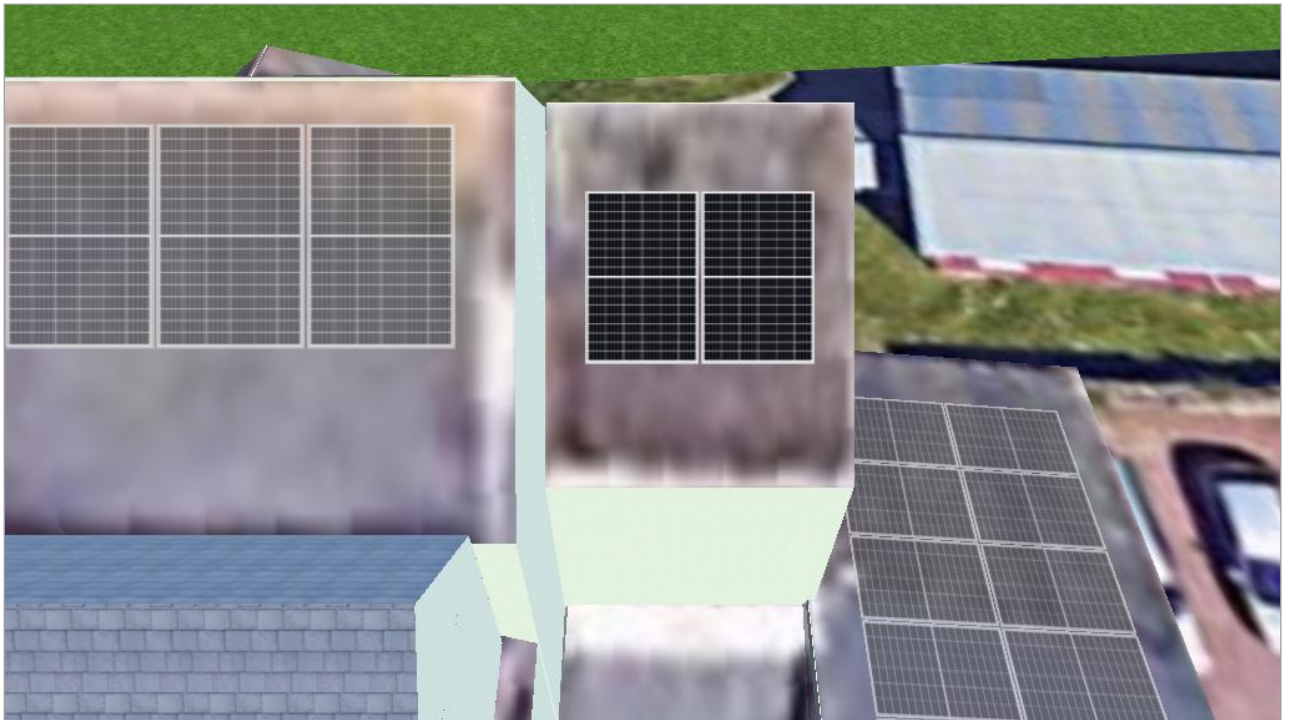


Figure: 5. Module Area - Building 06-Roof Area South

6. Module Area - Arbitrary Building 01-Mounting Surface North

PV Generator, 6. Module Area - Arbitrary Building 01-Mounting Surface North

Name	Arbitrary Building 01-Mounting Surface North
PV Modules	8 x LR5-54 HTH 435 M (v3)
Manufacturer	LONGI Solar
Inclination	40 °
Orientation	North 5 °
Installation Type	Roof parallel
PV Generator Surface	15.6 m ²



Figure: 6. Module Area - Arbitrary Building 01-Mounting Surface North

Horizon Line, 3D Design

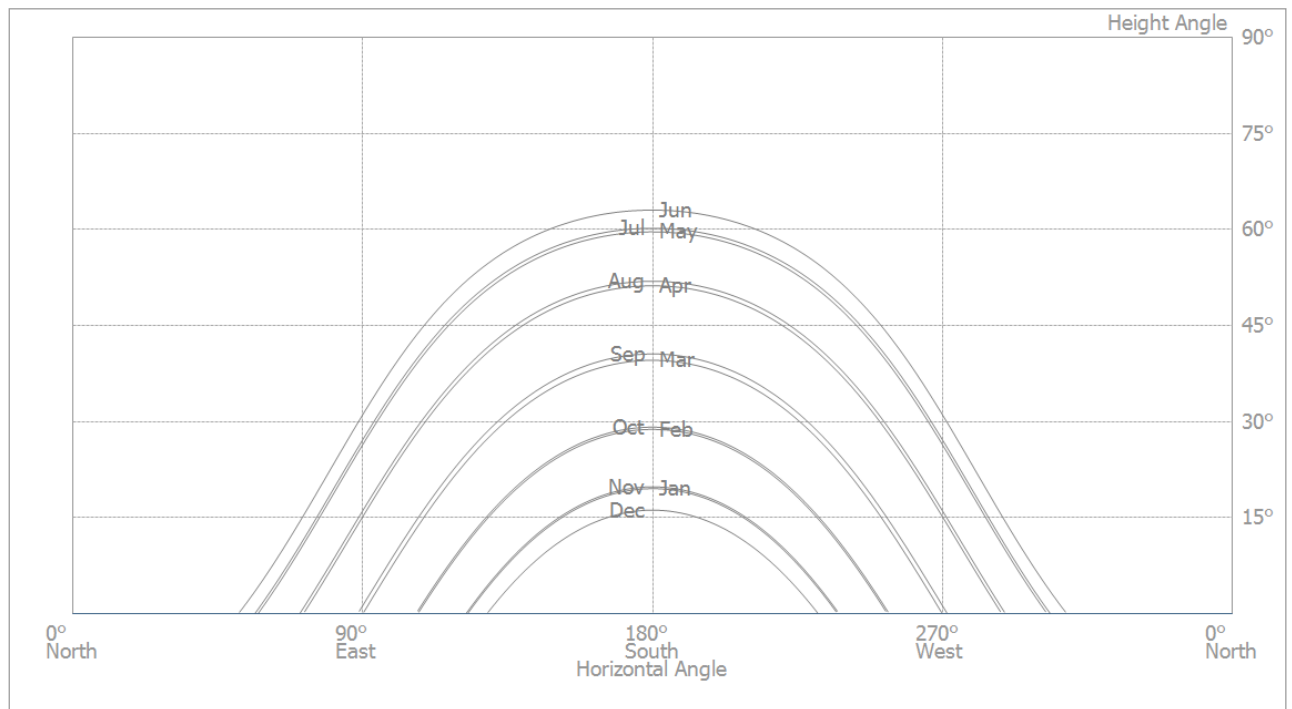


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Areas	Building 04-Roof Area West + Building 05-Roof Area North + Building 07-Roof Area East + Arbitrary Building 02-Mounting Surface South + Building 06-Roof Area South + Arbitrary Building 01-Mounting Surface North
Inverter 1	
Model	SE10000H-EU-APAC/AUS (v3)
Manufacturer	SolarEdge
Quantity	1
Sizing Factor	161 %
Configuration	MPP 1: 1 x 3 ☆ [1 x 1] + 1 x 3 ☆ [1 x 1] + 1 x 10 ☆ [1 x 1] + 1 x 11 ☆ [1 x 1] + 1 x 2 ☆ [1 x 1] + 1 x 8 ☆ [1 x 1]
Power Optimizer	37x SolarEdge, S500 WorldWide (v2)

AC Mains

AC Mains

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

Battery Systems

Battery System - Group 1

Model	StoreEdge SExxxxH-RWS + LG Chem RESU10H (10 kWh) (v1)
Manufacturer	SolarEdge
Quantity	3
Battery Inverter	
Type of Coupling	DC intermediate circuit coupling
Nominal output	5 kW
Battery	
Manufacturer	LG Energy Solution
Model	LG RESU10H (v2)
Quantity	1
Battery Energy	9.8 kWh
Battery Type	Lithium nickel oxide

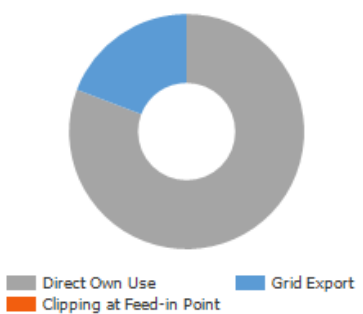
Simulation Results

Results Total System

PV System

PV Generator Output	16.10 kWp
Spec. Annual Yield	885.34 kWh/kWp
Performance Ratio (PR)	91.25 %
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PV Generator Energy (AC grid) with battery	14,152 kWh/Year
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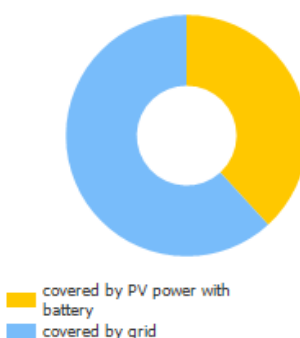
PV Generator Energy (AC grid) with battery



Appliances

Appliances	29,930 kWh/Year
Standby Consumption (Inverter)	13 kWh/Year
Total Consumption	29,943 kWh/Year
covered by PV power with battery	11,436 kWh/Year
covered by grid	18,507 kWh/Year
Solar Fraction	38.2 %

Total Consumption



Battery System

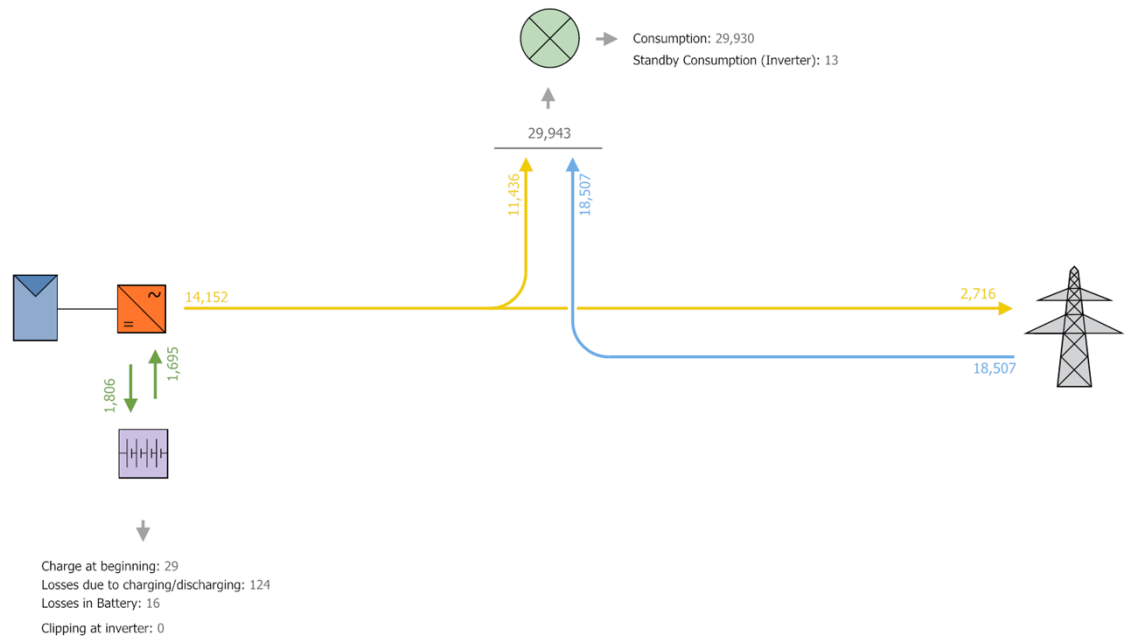
Charge at beginning	29 kWh
Battery Charge (PV System)	1,806 kWh/Year
Battery Energy for the Covering of Consumption	1,695 kWh/Year
Battery discharge into the grid	0 kWh/Year
Losses due to charging/discharging	124 kWh/Year
Losses in Battery	16 kWh/Year
Cycle Load	1.5 %
Service Life	>20 Years

Level of Self-sufficiency

Total Consumption	29,943 kWh/Year
covered by grid	18,507 kWh/Year
Level of Self-sufficiency	38.2 %

Energy Flow Graph

Project: ABC Care Home



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

Figure: Energy flow

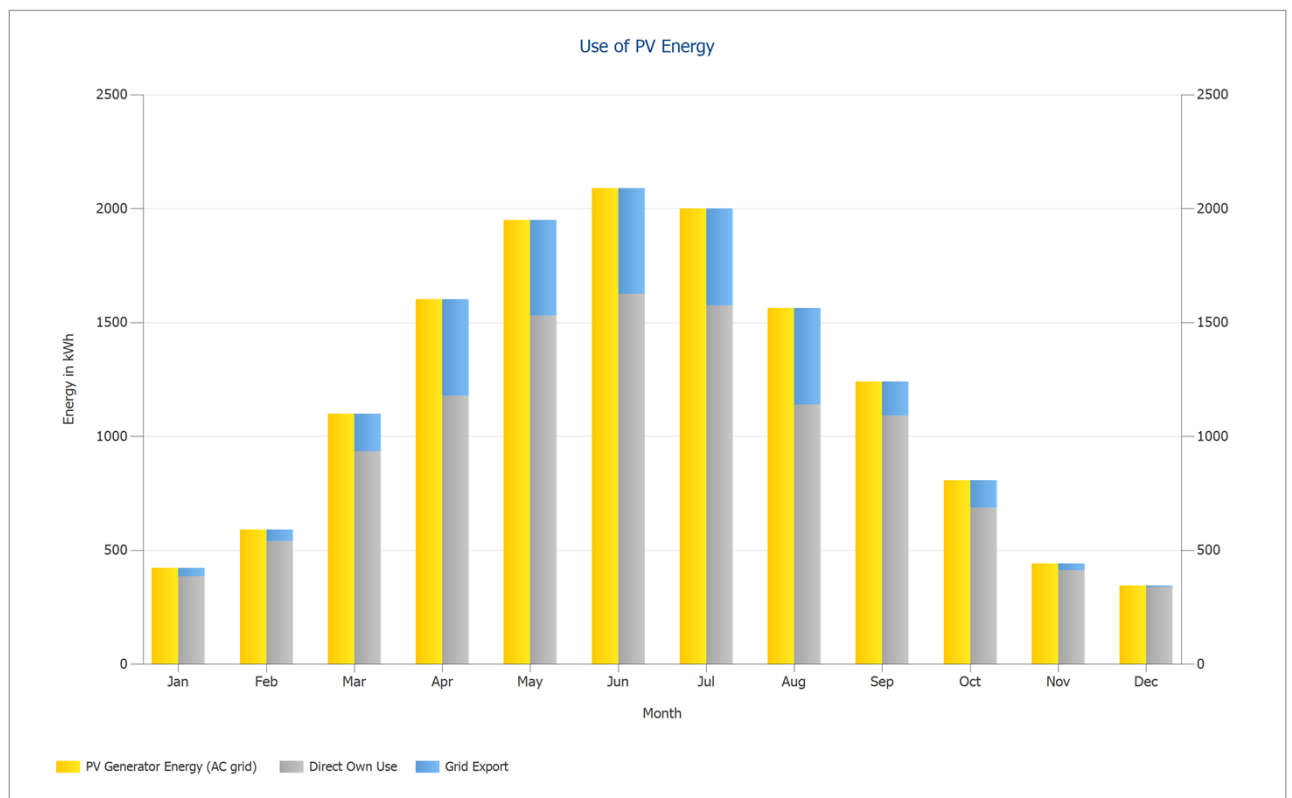


Figure: Use of PV Energy

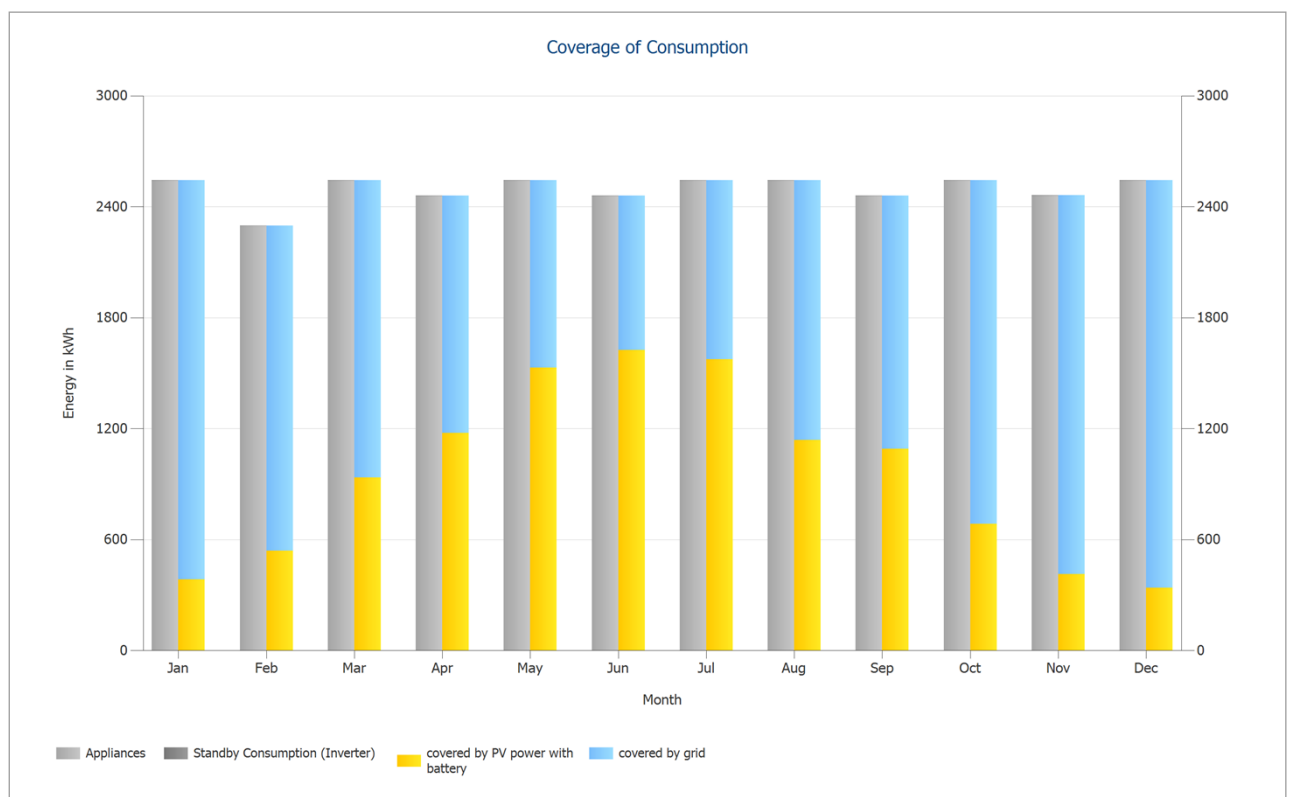


Figure: Coverage of Consumption

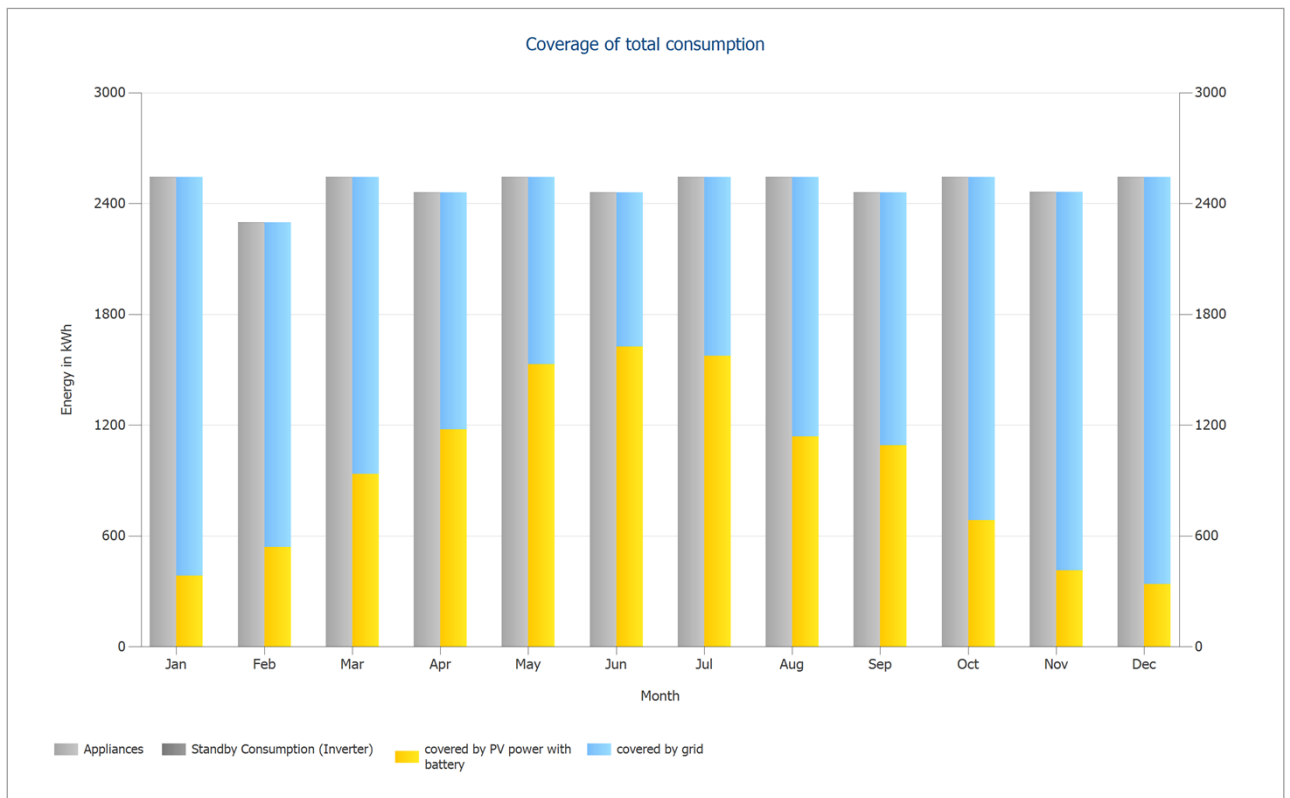


Figure: Coverage of total consumption

Plans and parts list

Circuit Diagram

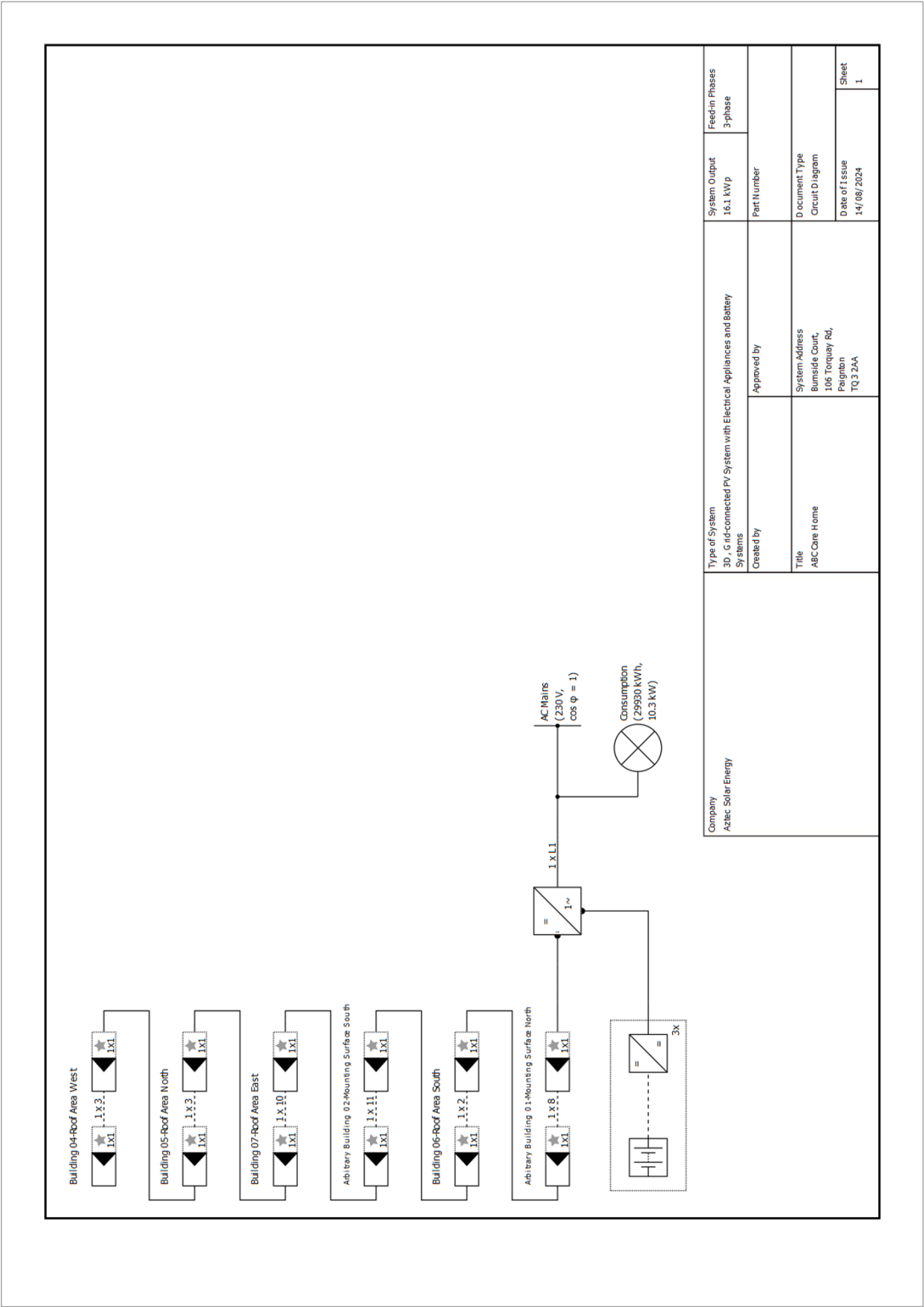


Figure: Circuit Diagram

Overview plan

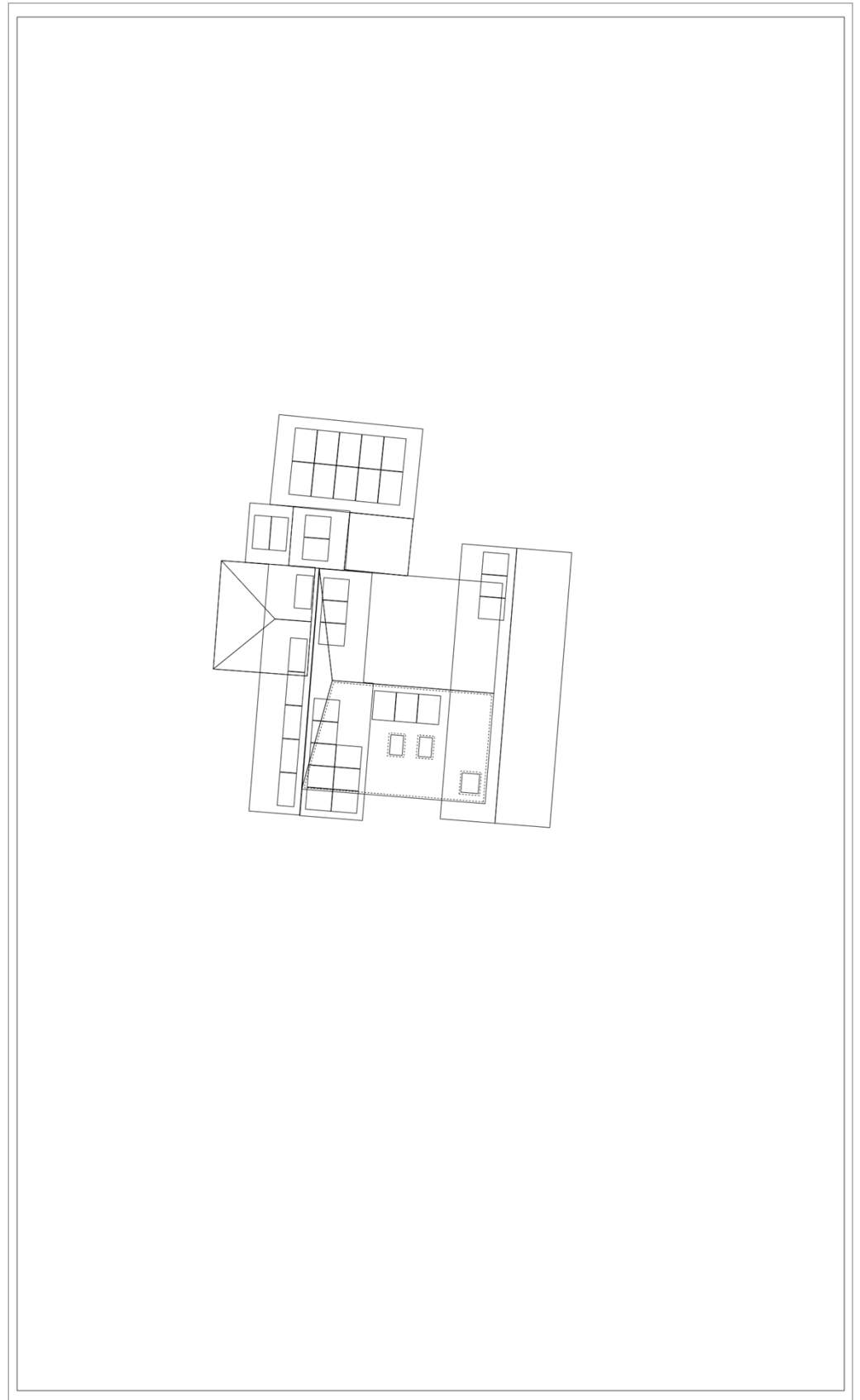


Figure: Overview plan

String Plan

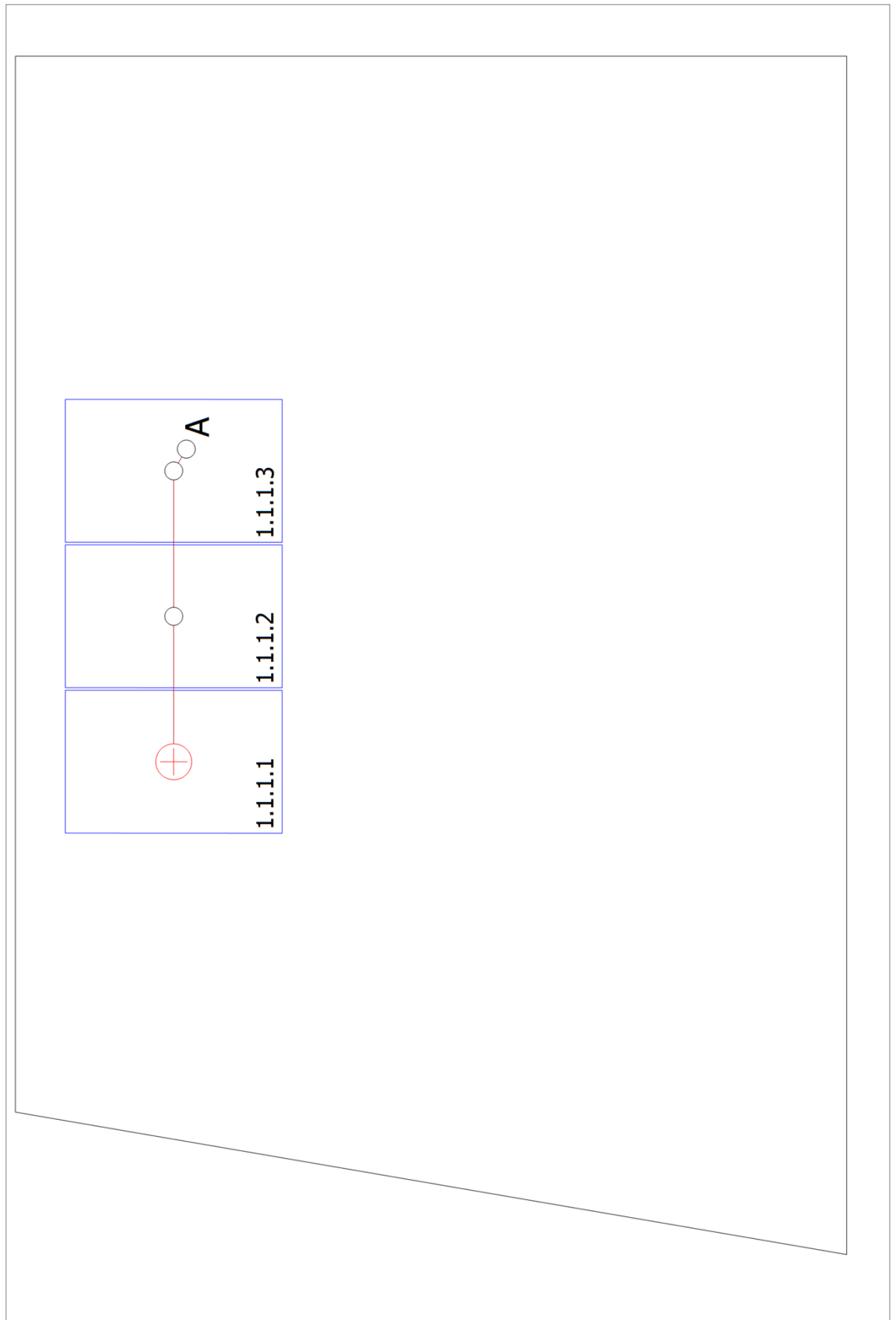


Figure: Building 04 - Roof Area West

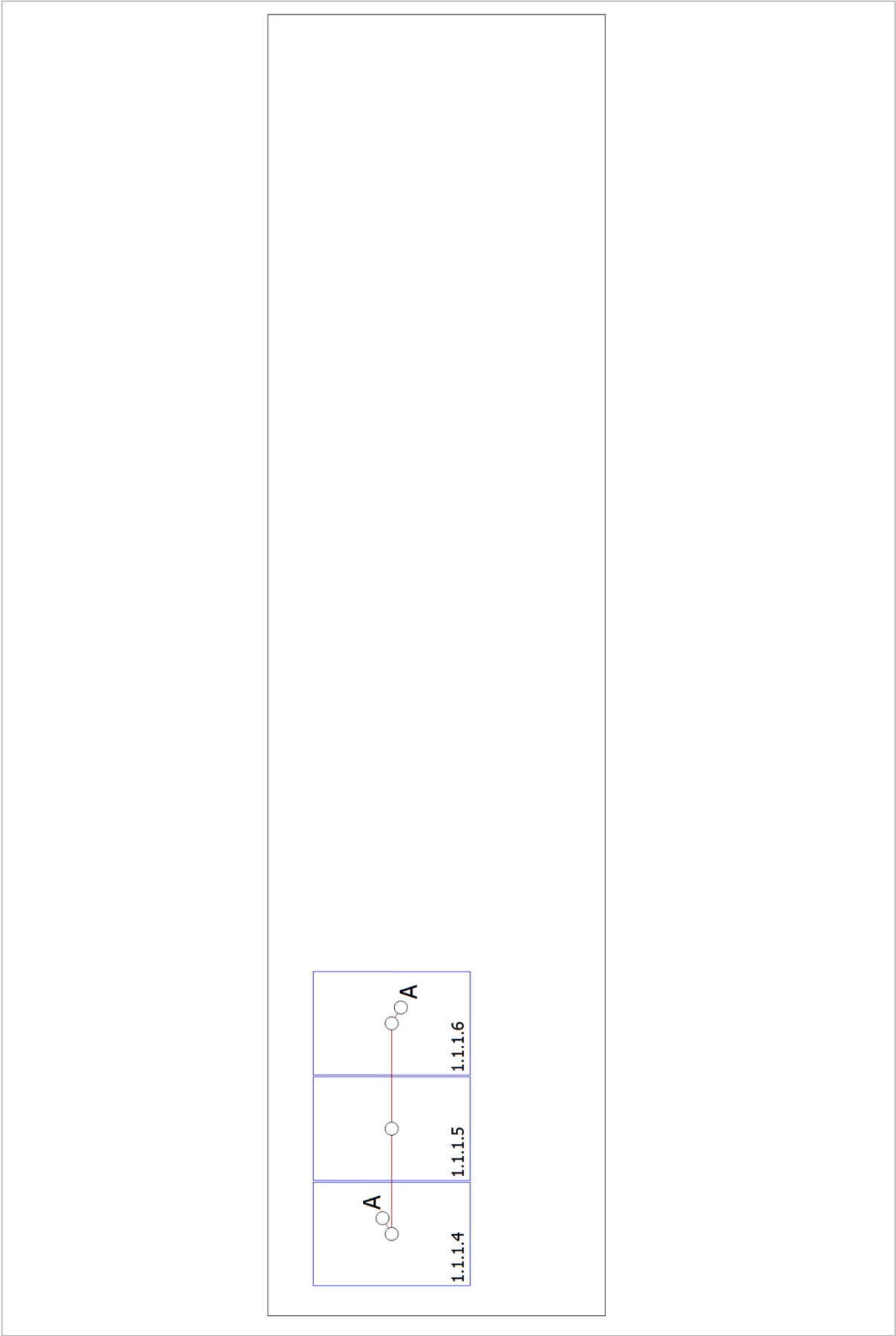


Figure: Building 05 - Roof Area North

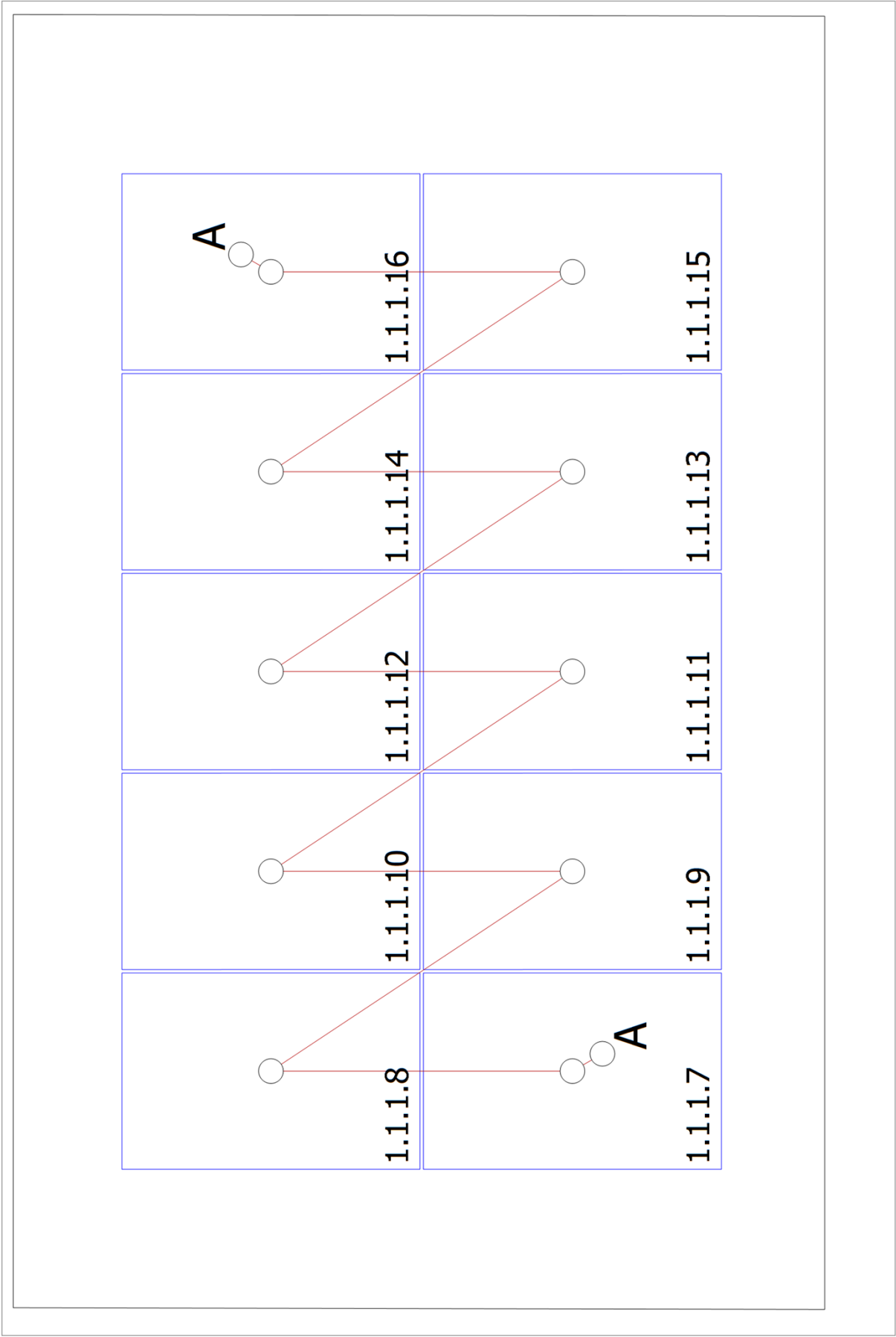


Figure: Building 07 - Roof Area East

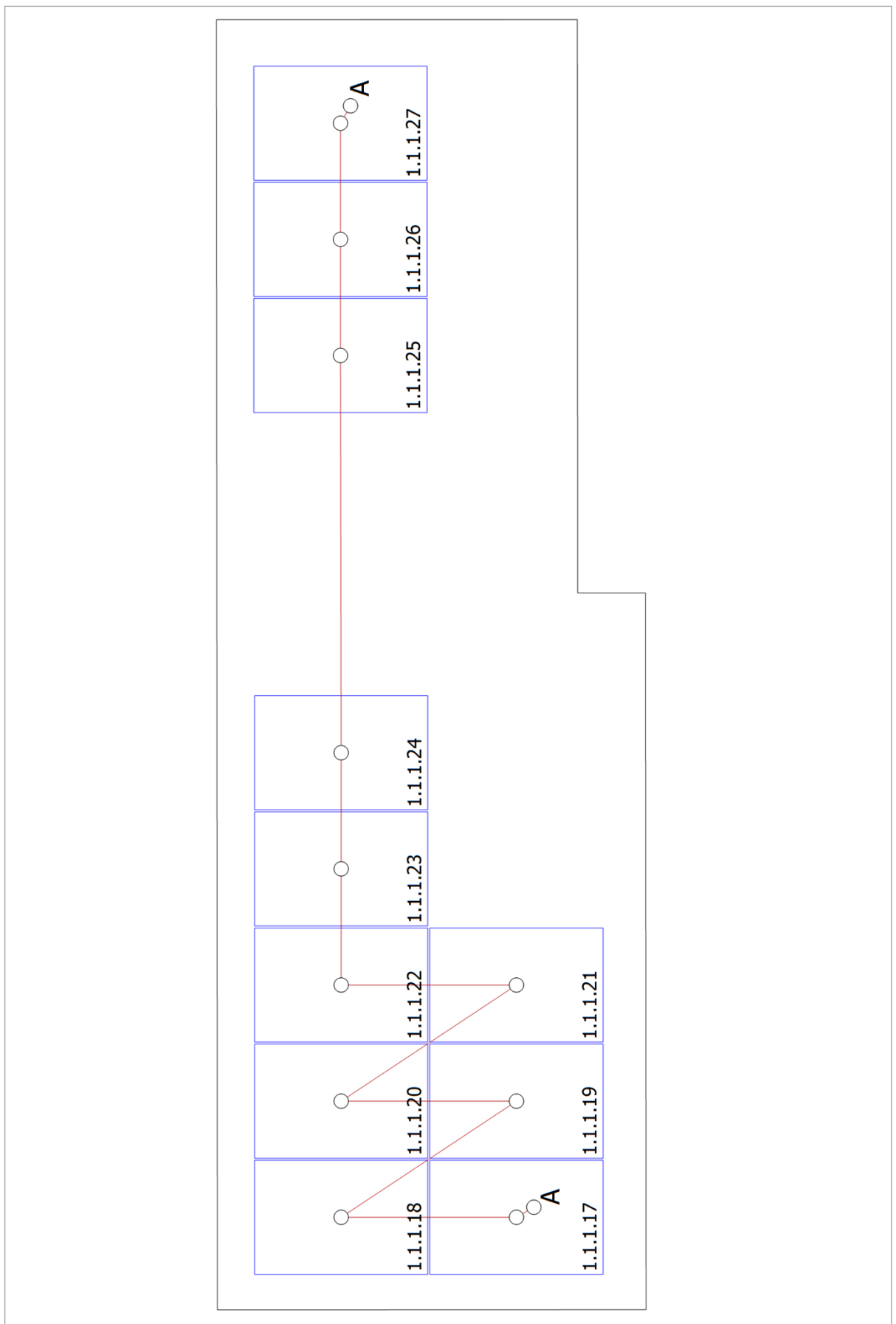


Figure: Arbitrary Building 02 - Mounting Surface South

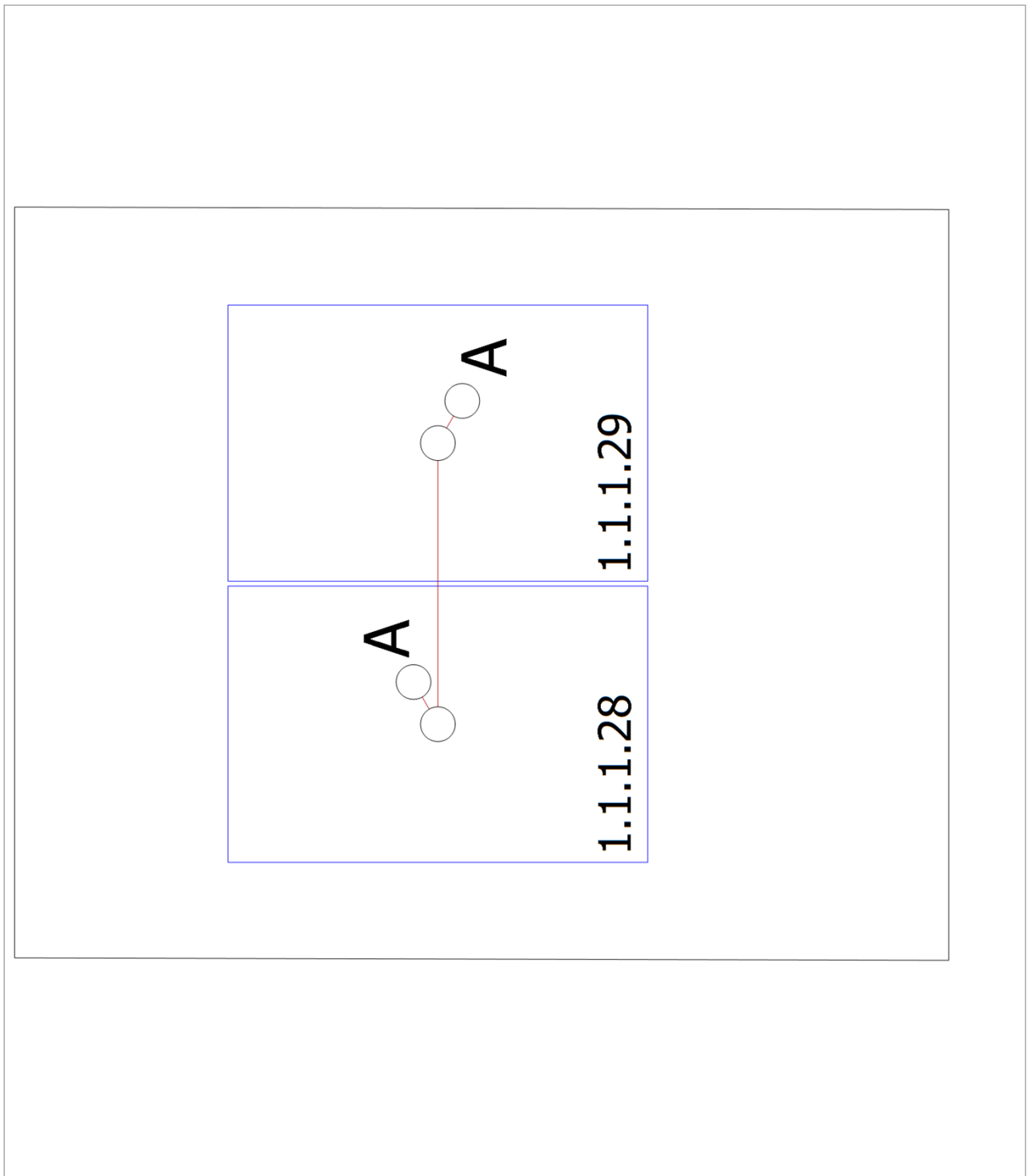


Figure: Building 06 - Roof Area South

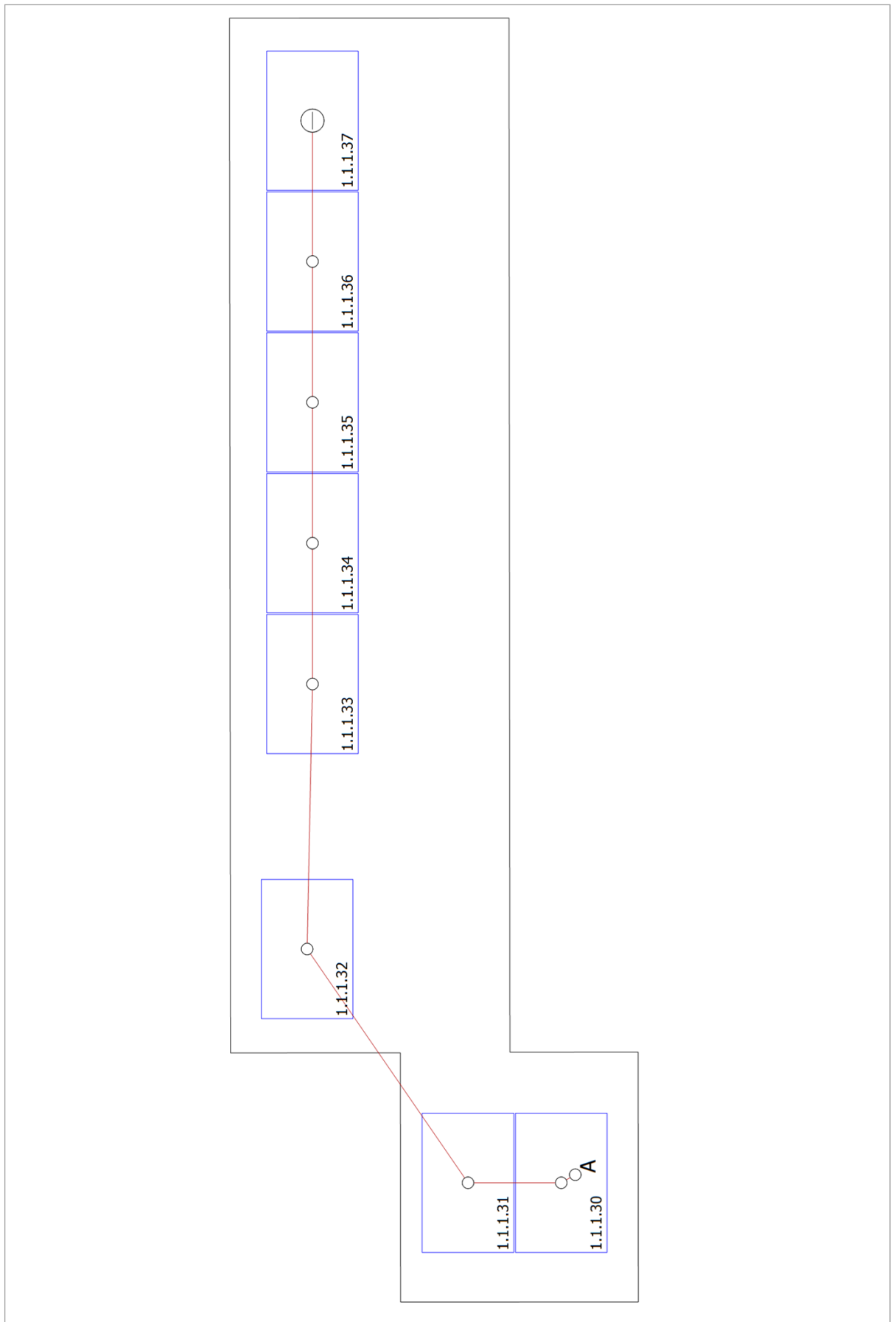


Figure: Arbitrary Building 01 - Mounting Surface North

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		LONGI Solar	LR5-54 HTH 435 M	37	Piece
2	Inverter		SolarEdge	SE10000H-EU- APAC/AUS	1	Piece
3	Power Optimizer		SolarEdge	S500 WorldWide	37	Piece
4	Battery System		SolarEdge	StoreEdge SExxxxH- RWS + LG Chem RESU10H (10 kWh)	3	Piece

Screenshots, 3D Design Environment

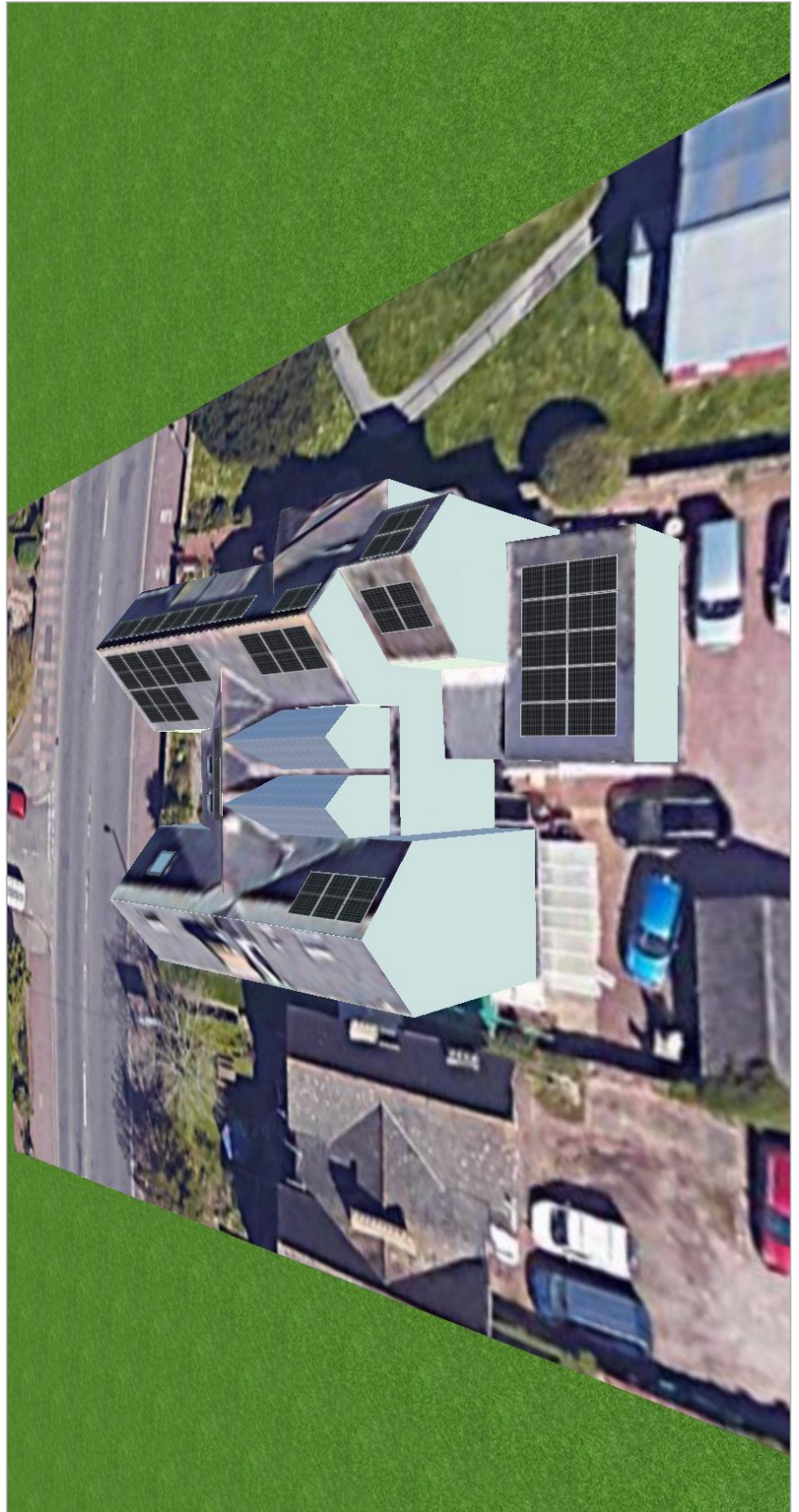


Figure: Screenshot08

Configuration



Figure: Screenshot07

Shading

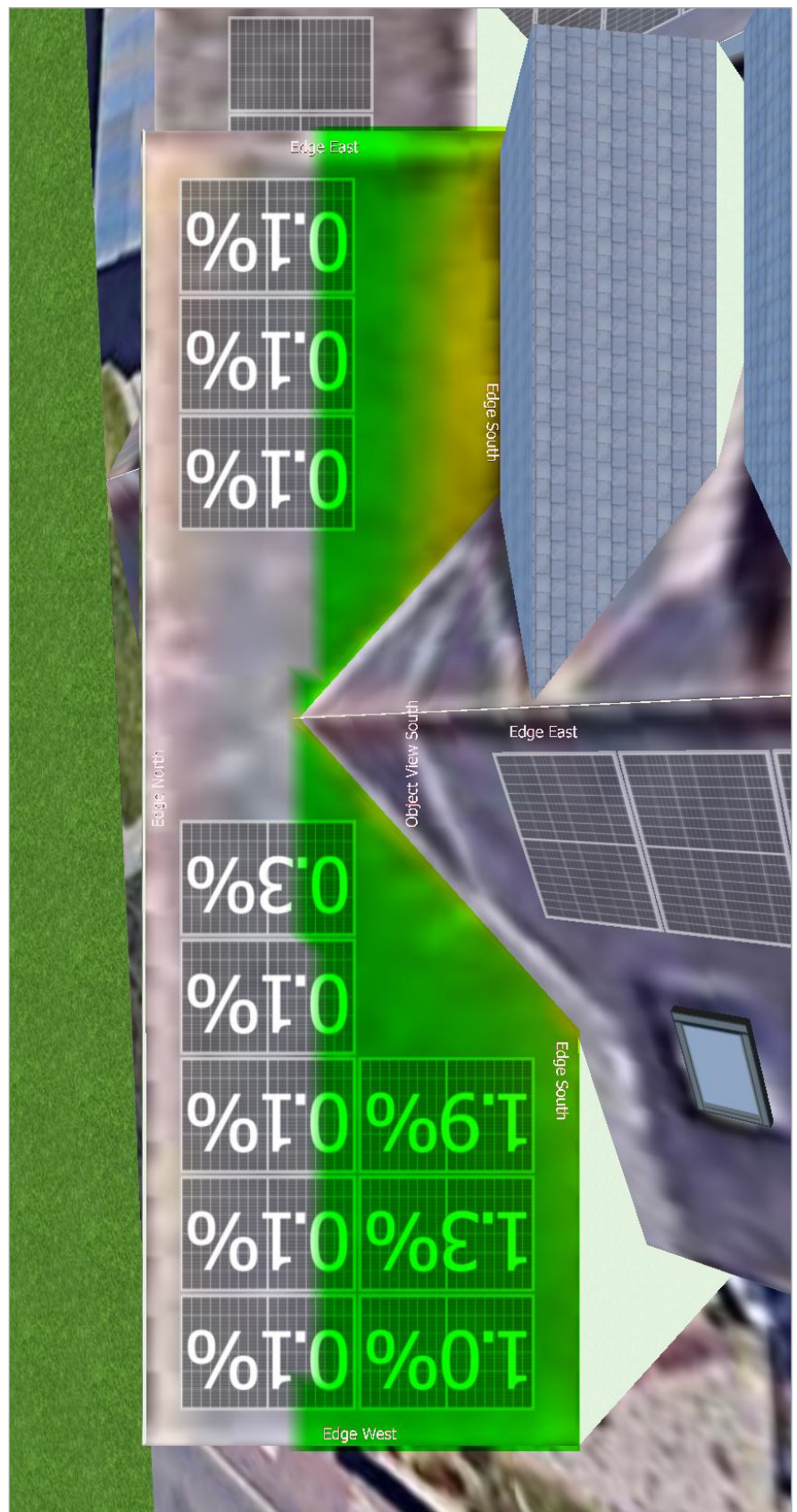


Figure: Screenshot01

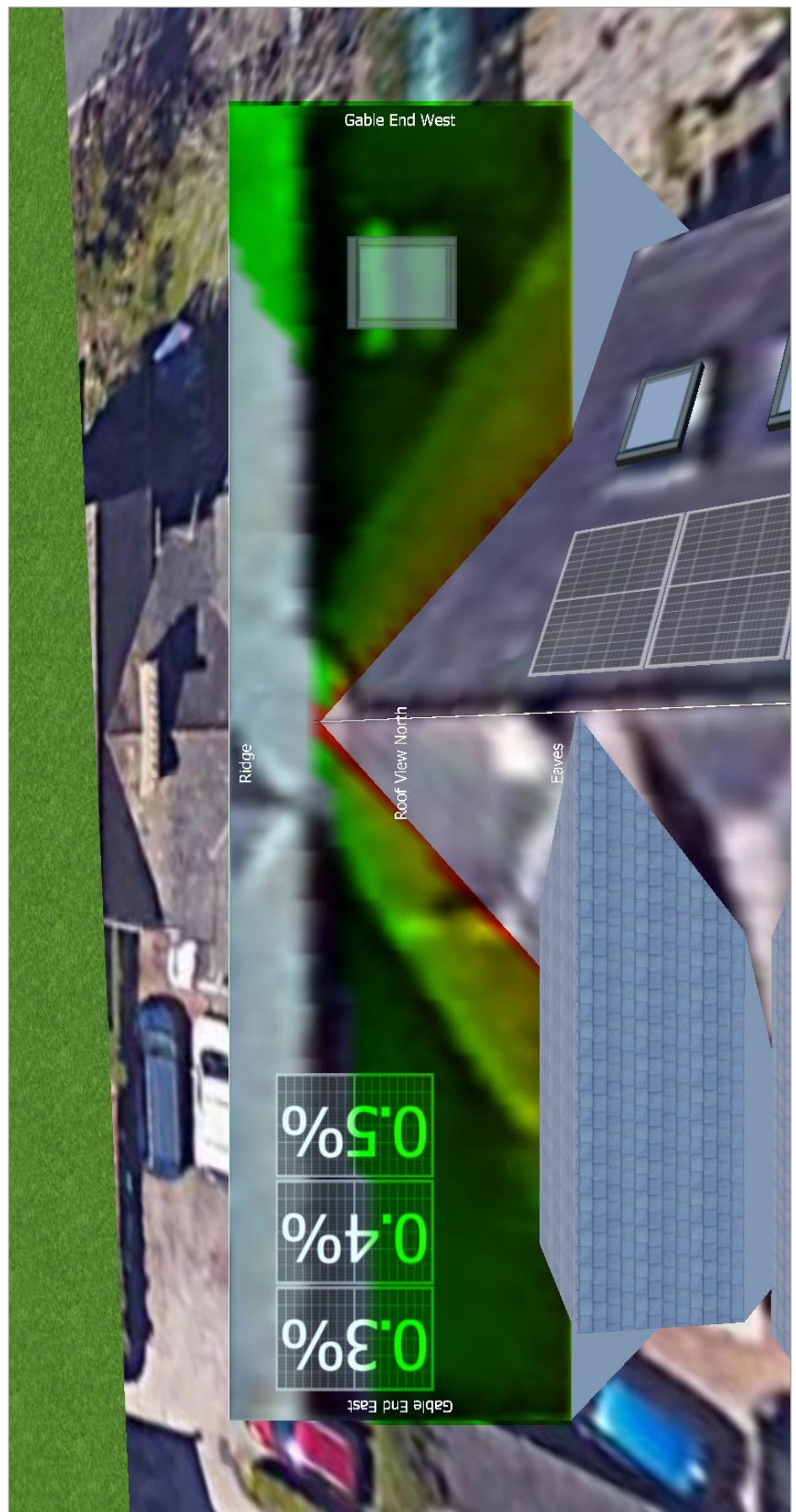


Figure: Screenshot02

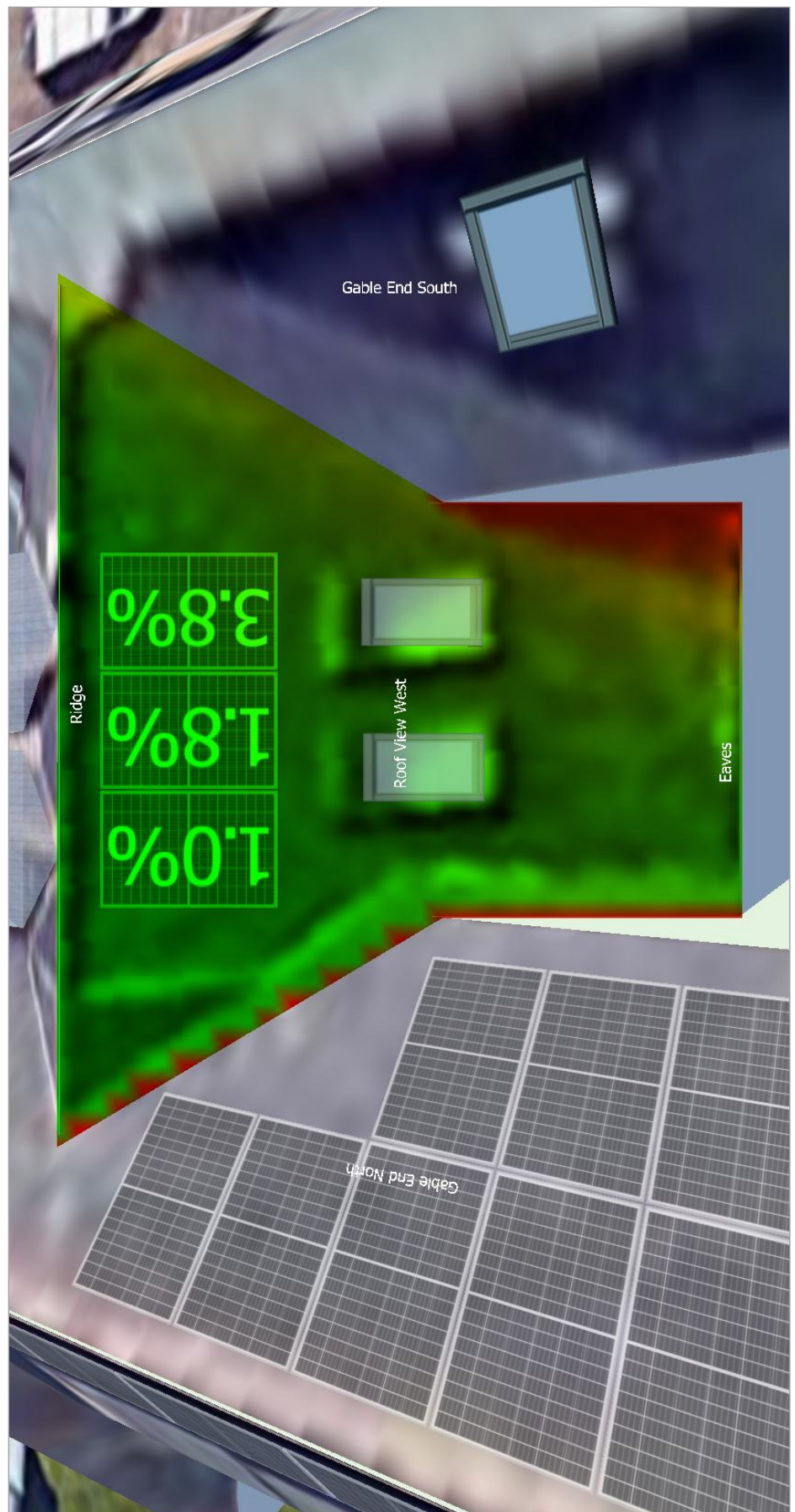


Figure: Screenshot03

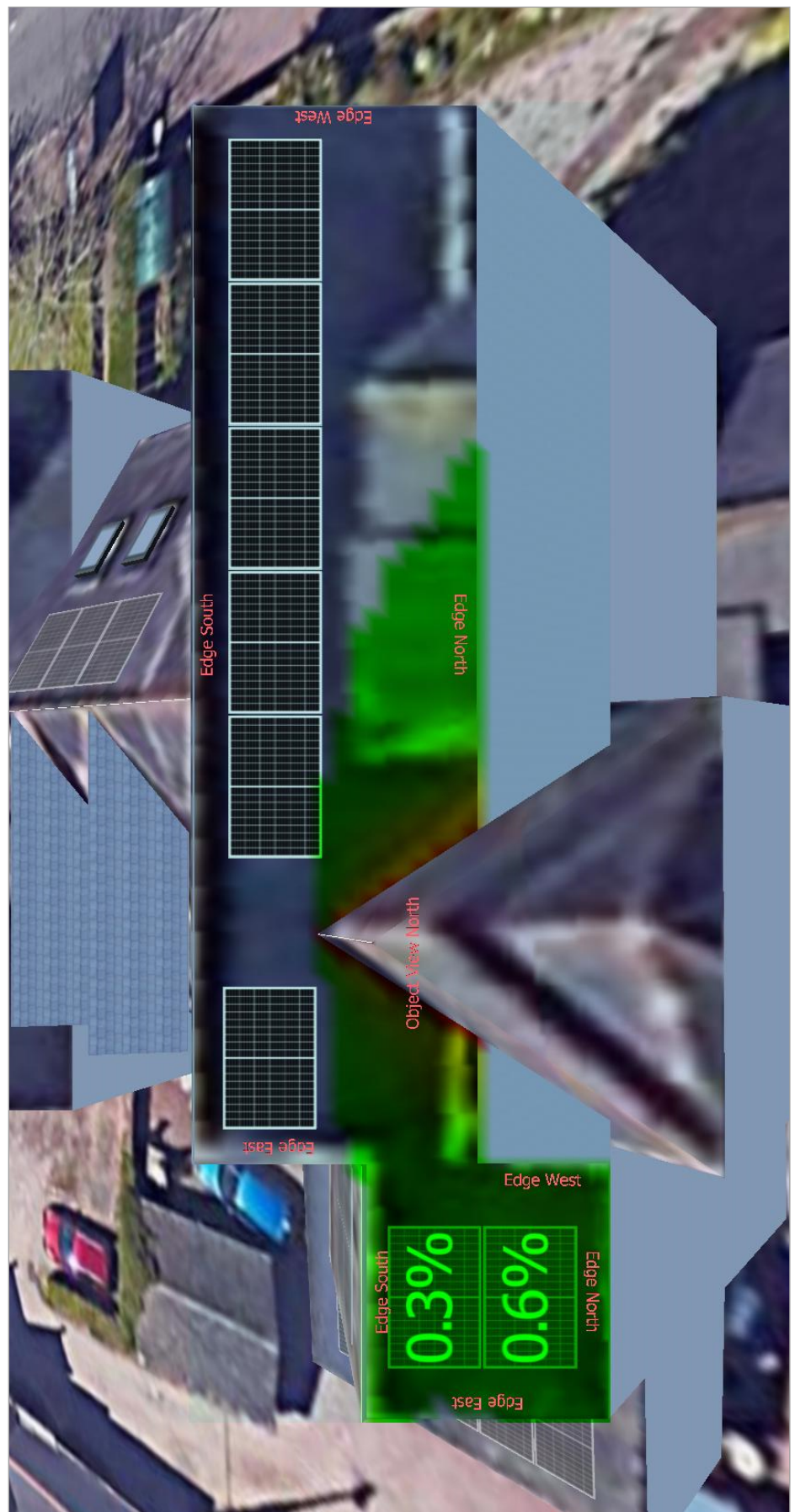


Figure: Screenshot04

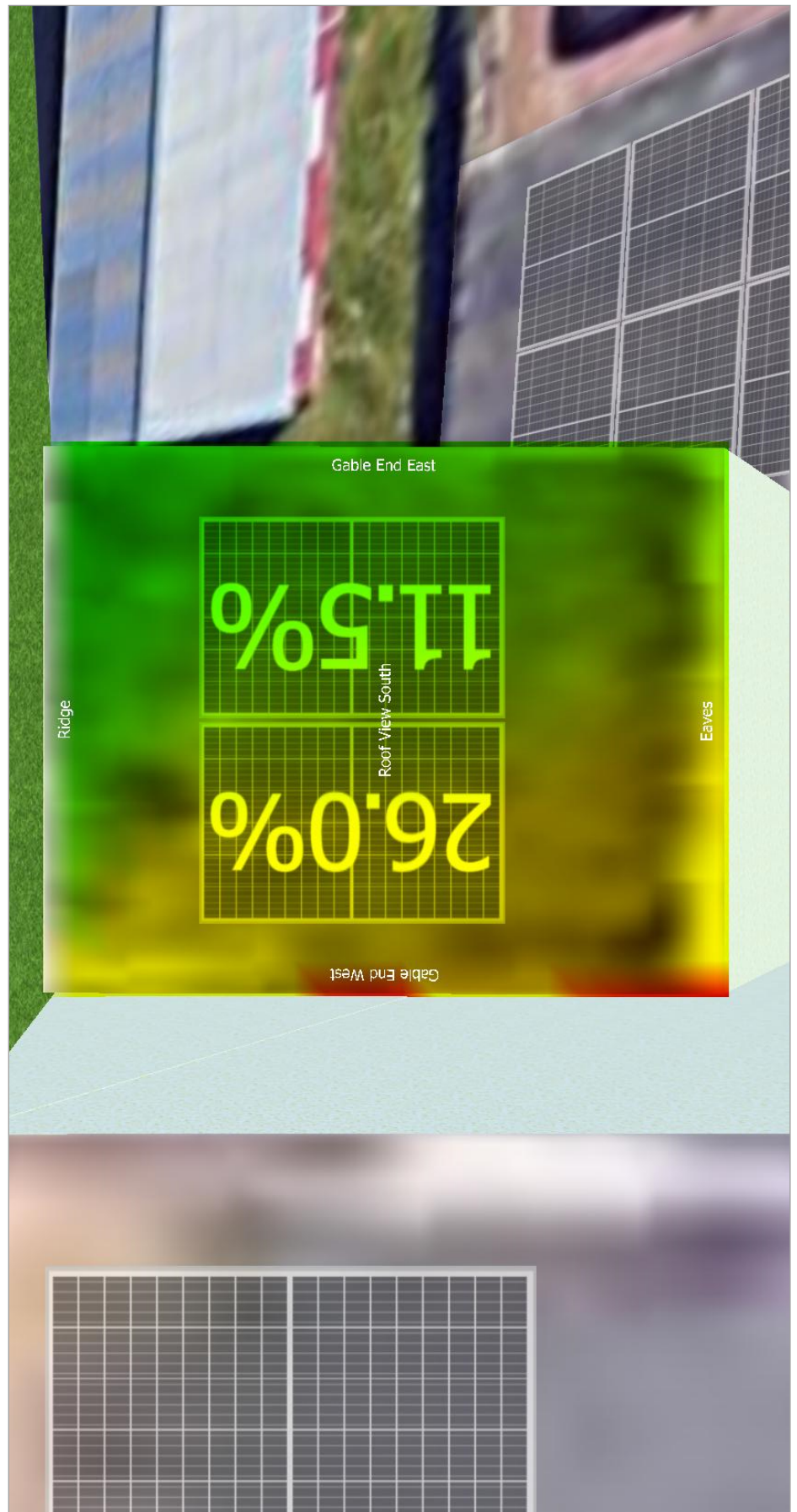


Figure: Screenshot05

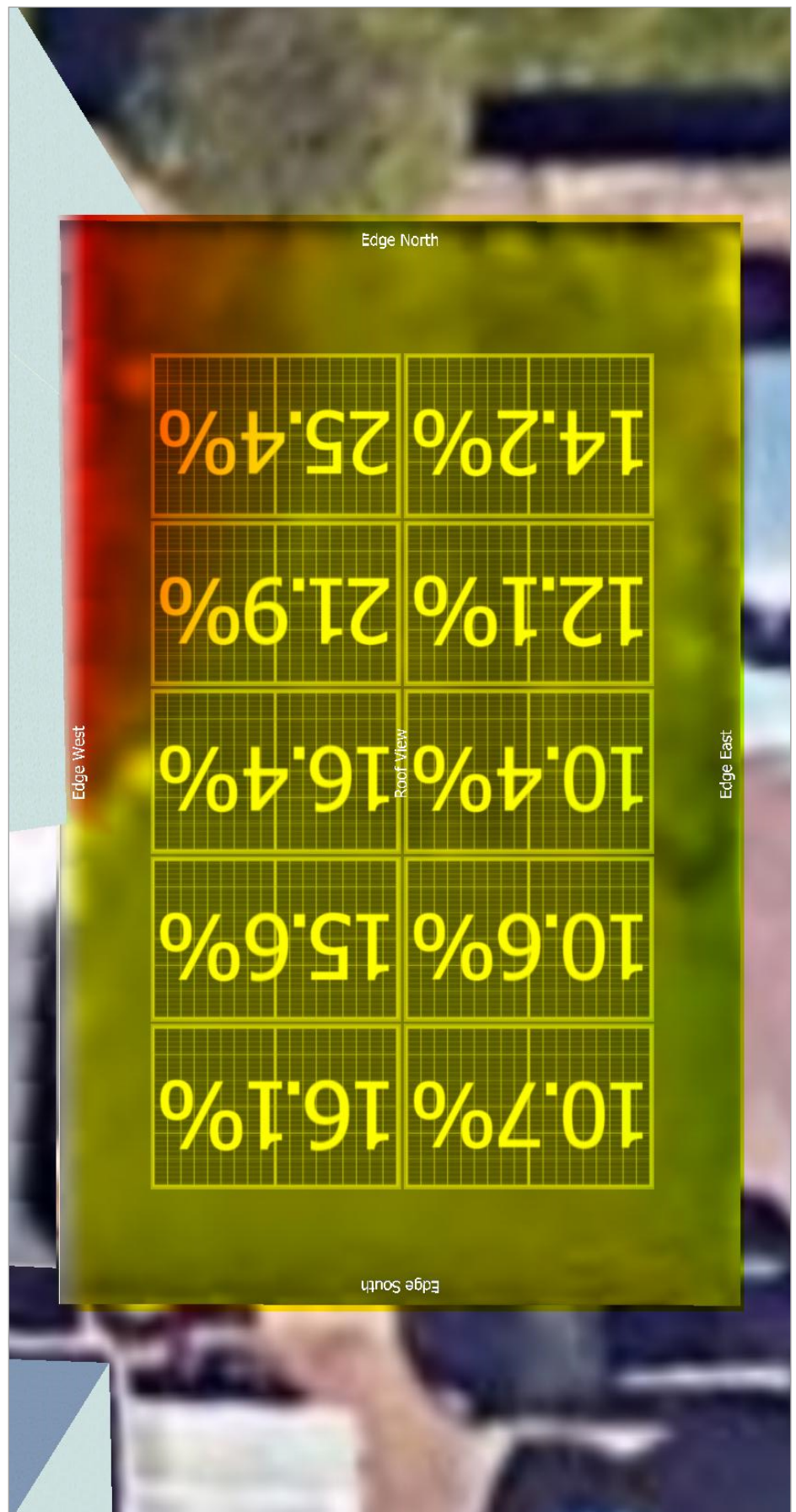


Figure: Screenshot06