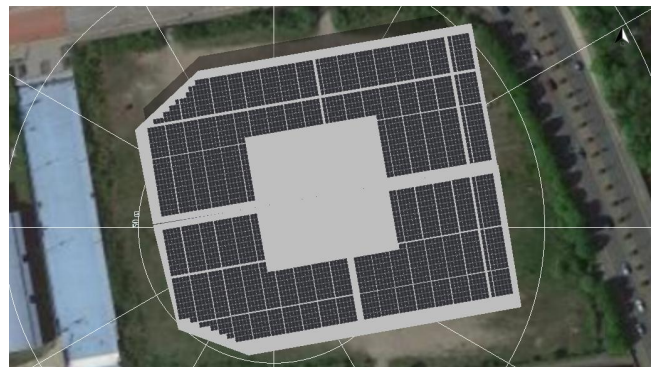


Project Name: Co-op Live Building

19/12/2024

Your PV system

Address of Installation



Project Overview

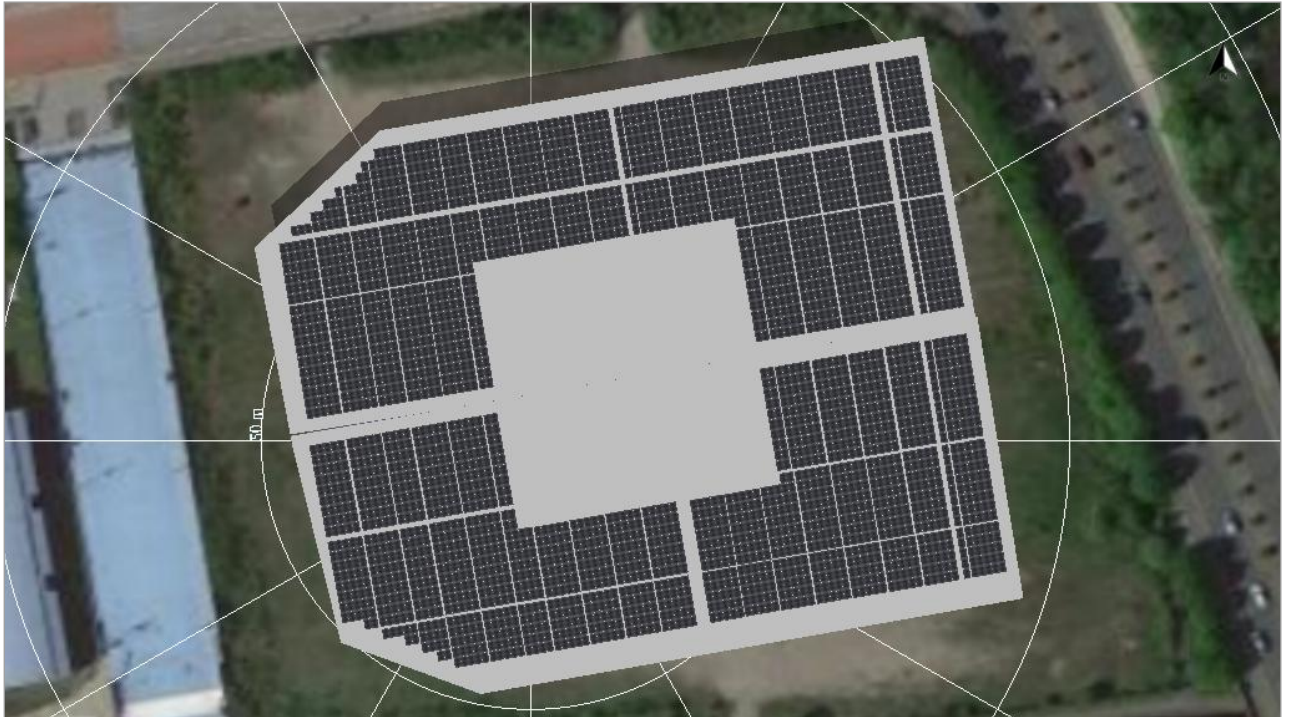


Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Manchester-Ringway, GBR (1991 - 2010)
Values source	Meteonorm 7.3
PV Generator Output	1310 kWp
PV Generator Surface	6,283.8 m ²
Number of PV Modules	3275
Number of Inverters	8

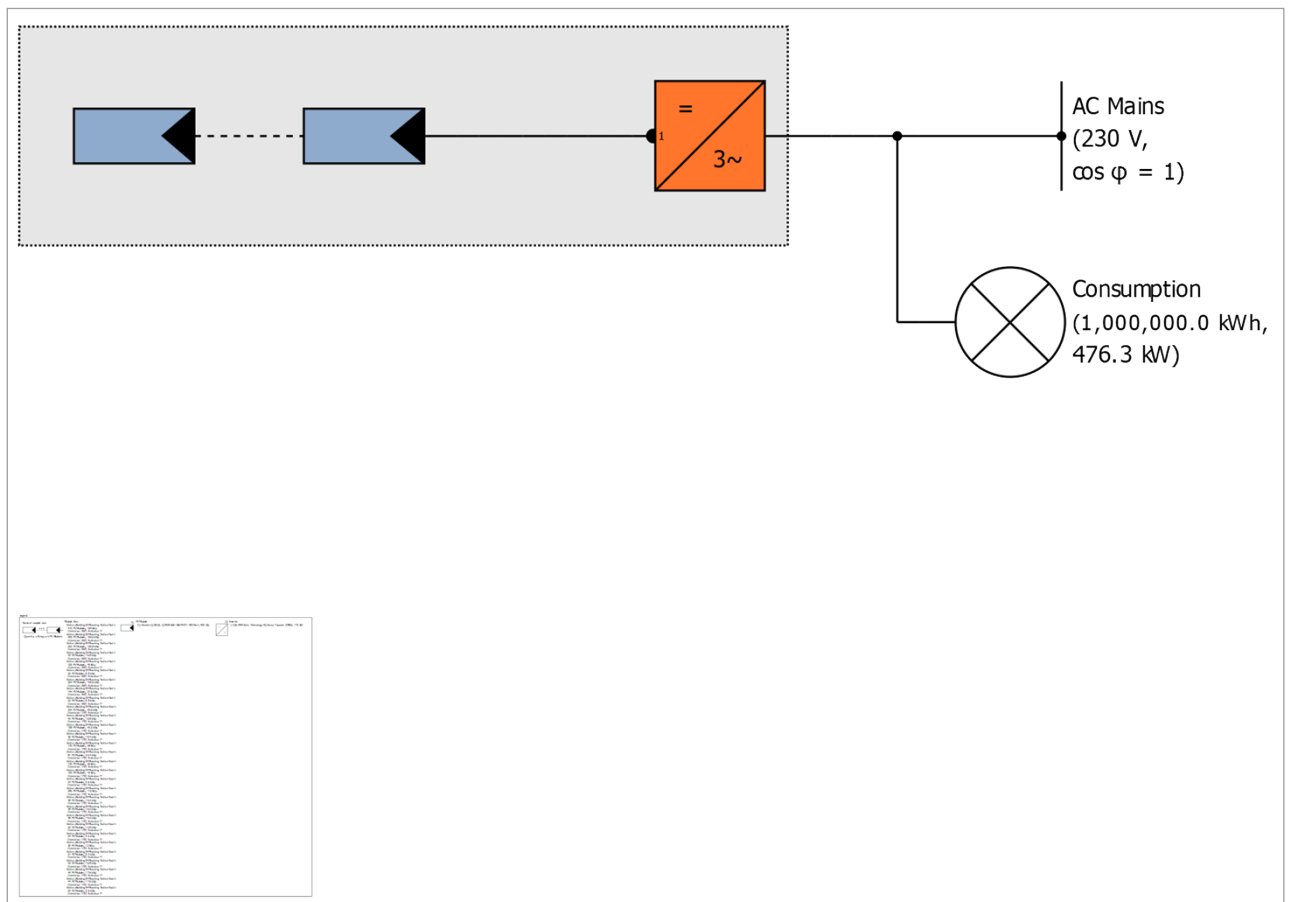


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	1,310.00 kWp
Spec. Annual Yield	732.66 kWh/kWp
Performance Ratio (PR)	84.59 %
Yield Reduction due to Shading	0.3 %
PV Generator Energy (AC grid)	959,984 kWh/Year
Own Consumption	512,505 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	447,478 kWh/Year
Own Power Consumption	53.4 %
CO ₂ Emissions avoided	451,101 kg / year
Level of Self-sufficiency	51.2 %

Financial Analysis

Your Gain

Total investment costs	869,840.00 £
Internal Rate of Return (IRR)	21.43 %
Amortization Period	4.8 Years
Electricity Production Costs	0.0363 £/kWh
Energy Balance/Feed-in Concept	Surplus 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 with Electrical Appliances
Climate Data	
Location	Manchester-Ringway, GBR (1991 - 2010)
Values source	Meteonorm 7.3
Data resolution	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies
Consumption	
Total Consumption	1000000 kWh
BDEW commercial load profile (G1)	1000000 kWh
Load Peak	476.3 kW

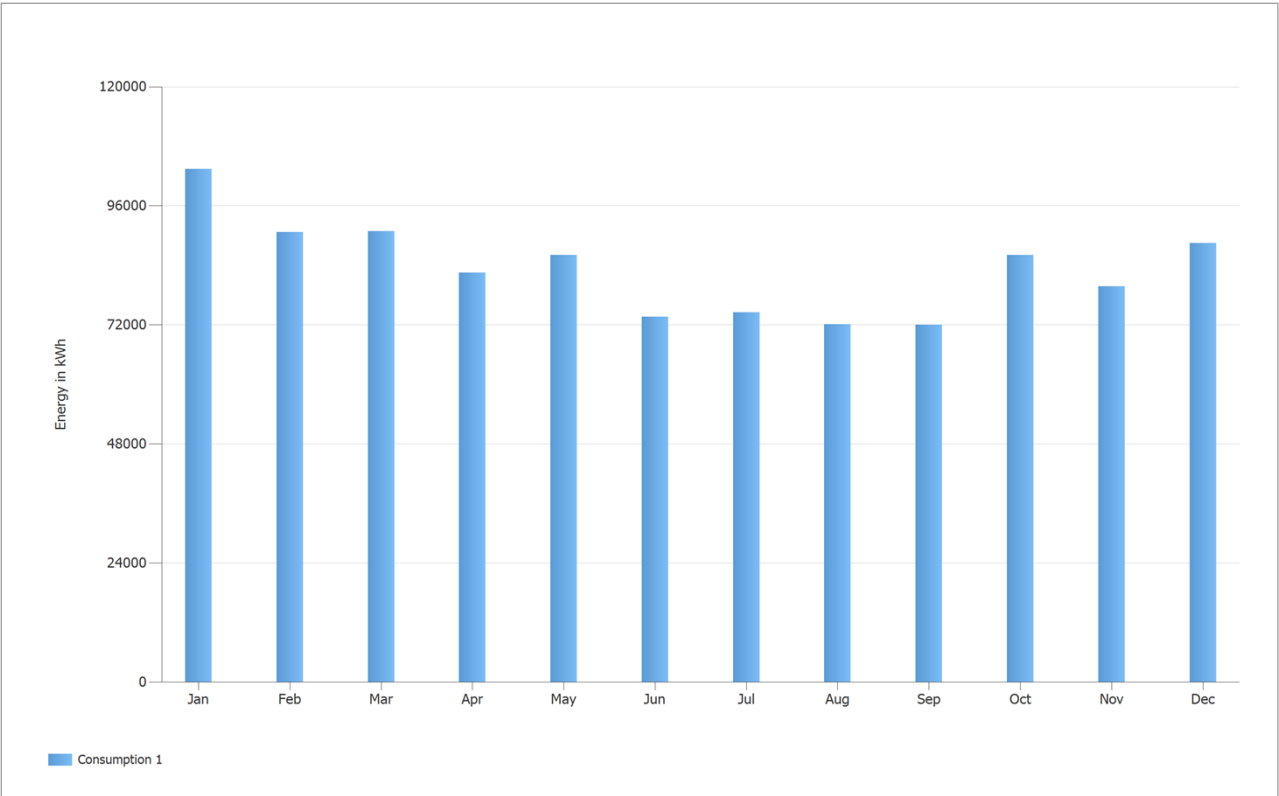


Figure: Consumption

Module Areas

1. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 1. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	410 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	786.7 m ²

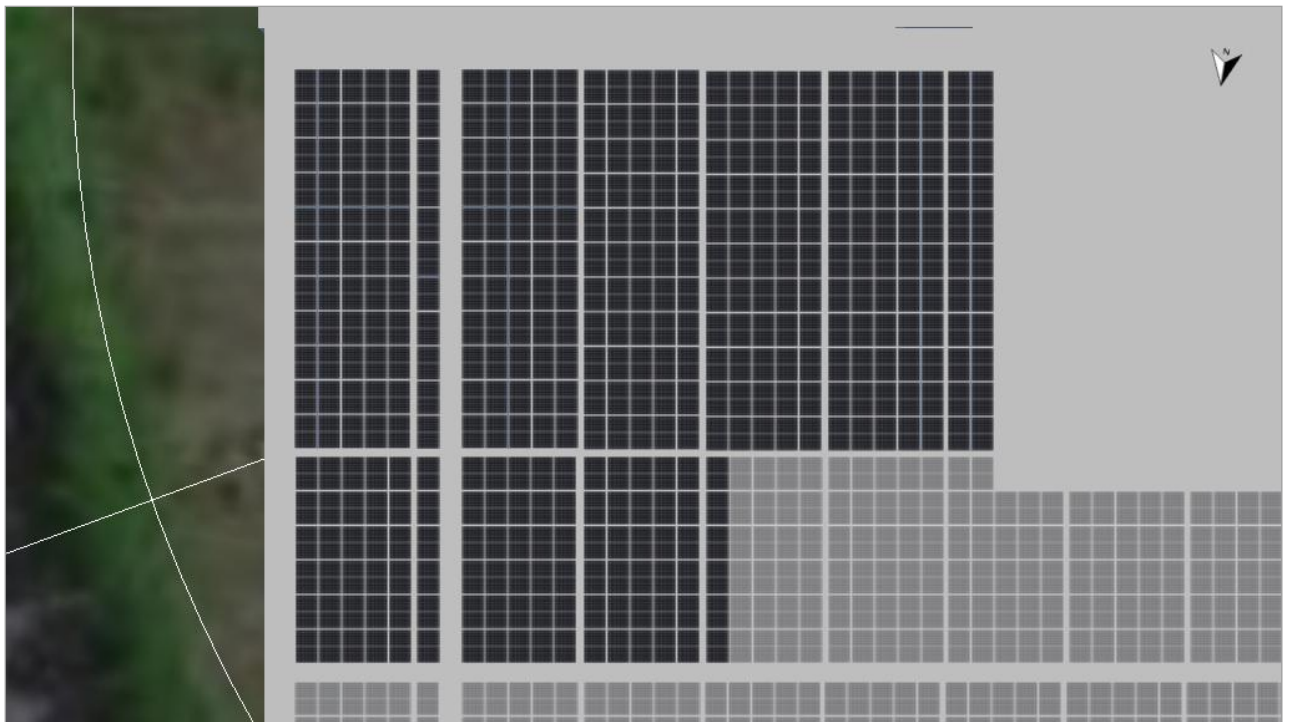


Figure: 1. Module Area - Arbitrary Building 03-Mounting Surface North

2. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 2. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	409 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	784.8 m²



Figure: 2. Module Area - Arbitrary Building 03-Mounting Surface North

3. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 3. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	252 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	483.5 m ²



Figure: 3. Module Area - Arbitrary Building 03-Mounting Surface North

4. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 4. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	42 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	80.6 m²

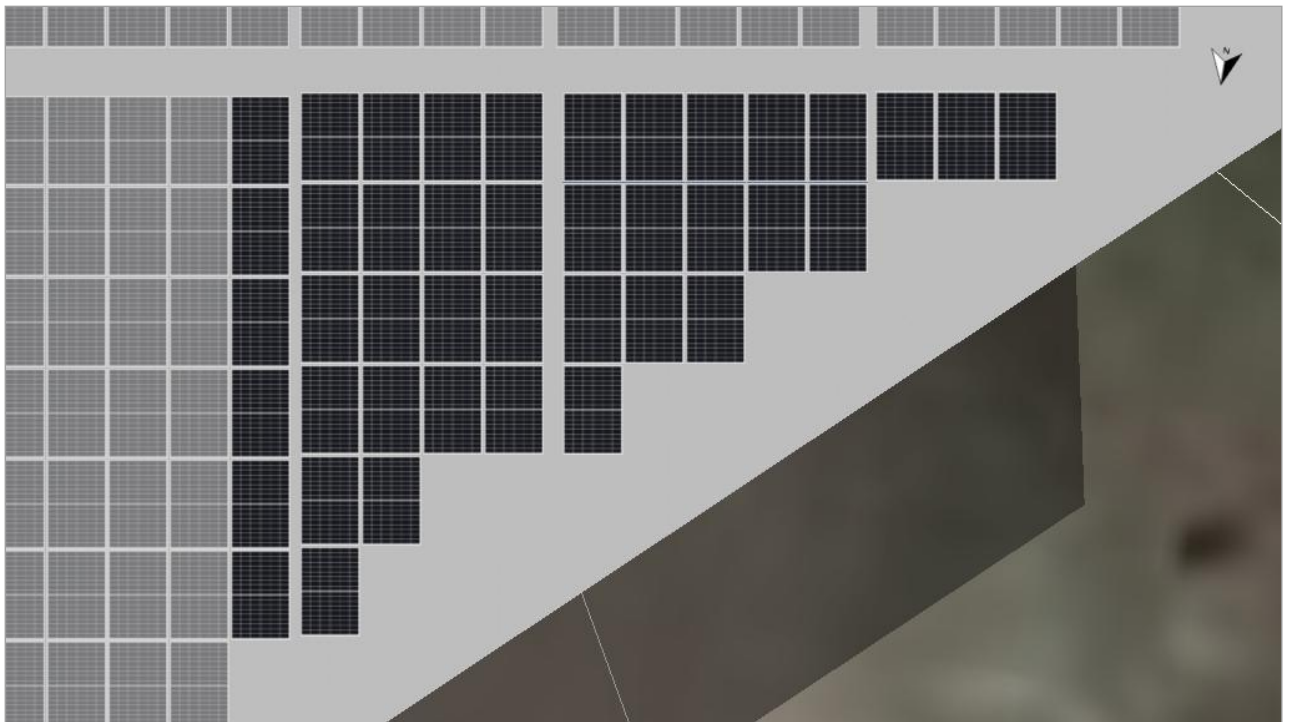


Figure: 4. Module Area - Arbitrary Building 03-Mounting Surface North

5. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 5. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	100 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	191.9 m ²

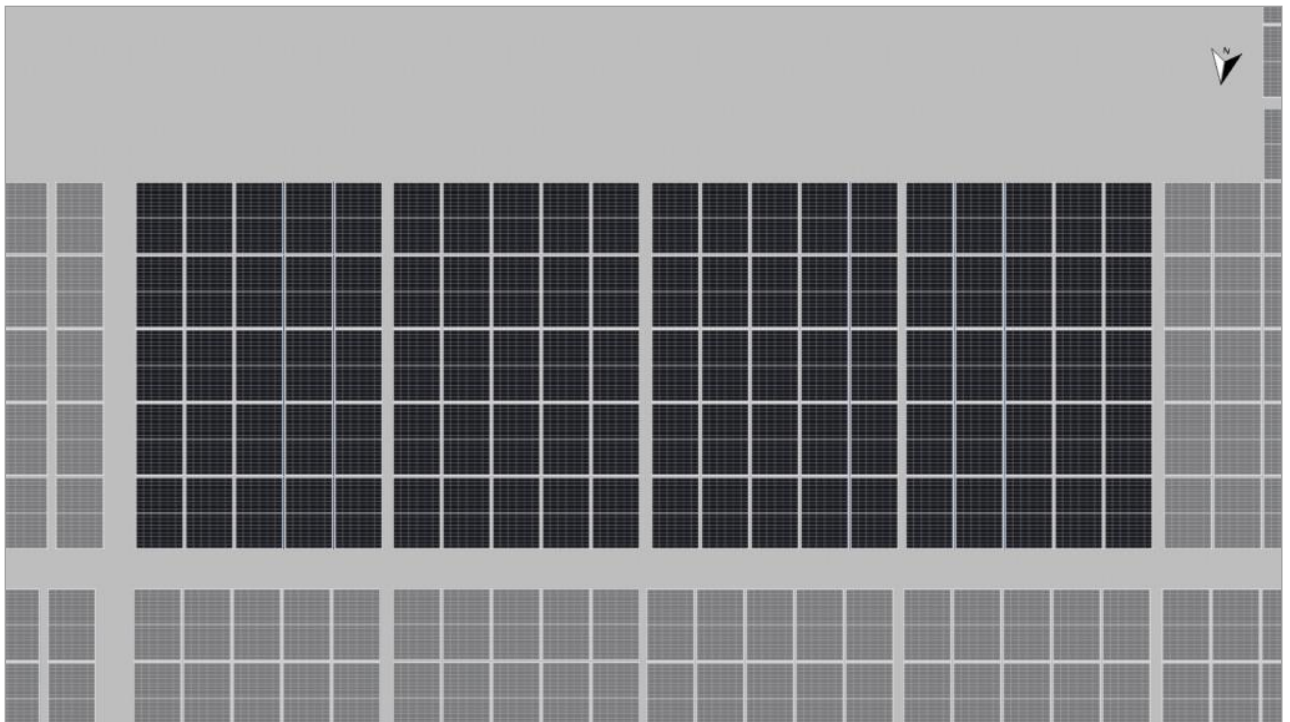


Figure: 5. Module Area - Arbitrary Building 03-Mounting Surface North

6. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 6. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	22 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	42.2 m²

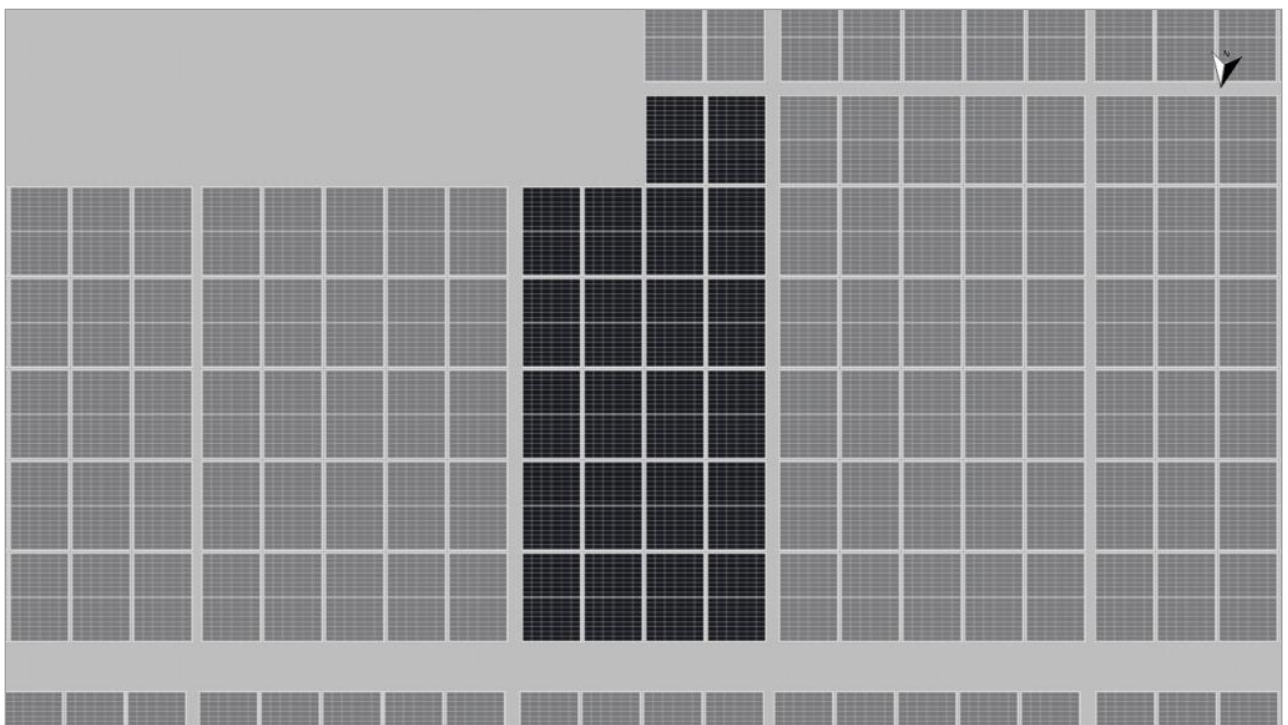


Figure: 6. Module Area - Arbitrary Building 03-Mounting Surface North

7. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 7. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	264 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	506.5 m ²

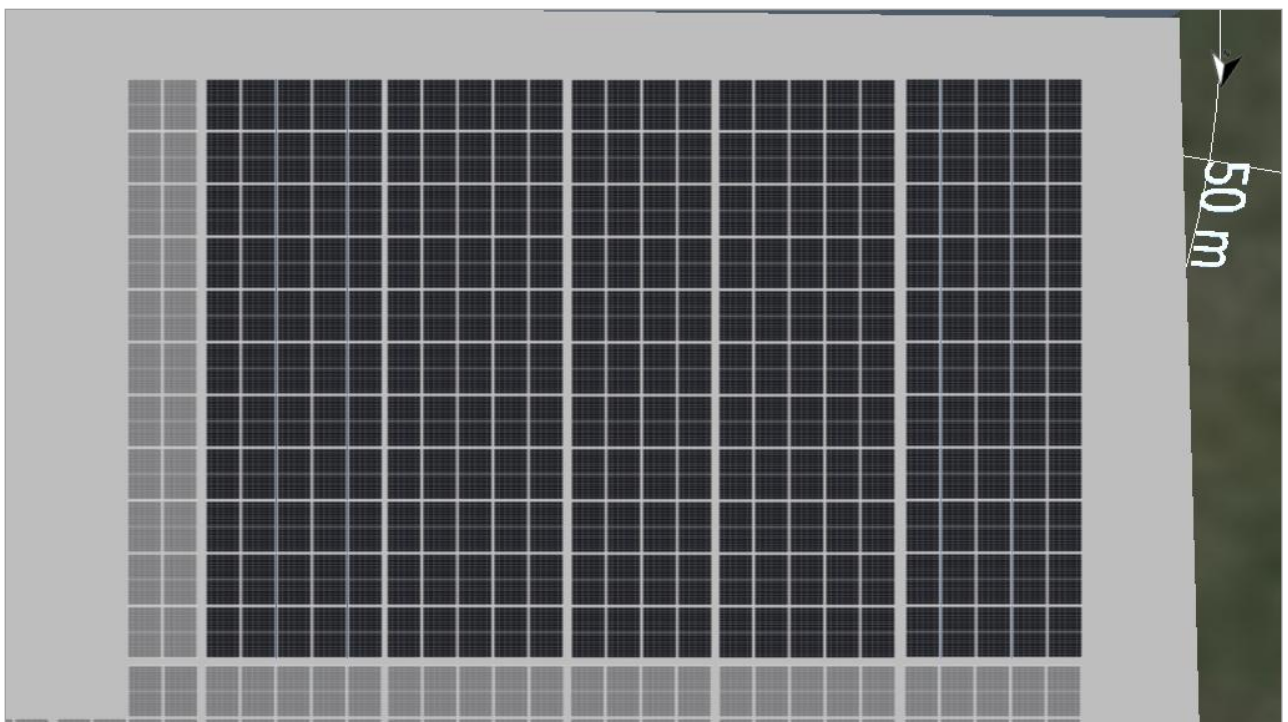


Figure: 7. Module Area - Arbitrary Building 03-Mounting Surface North

8. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 8. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	144 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	276.3 m²

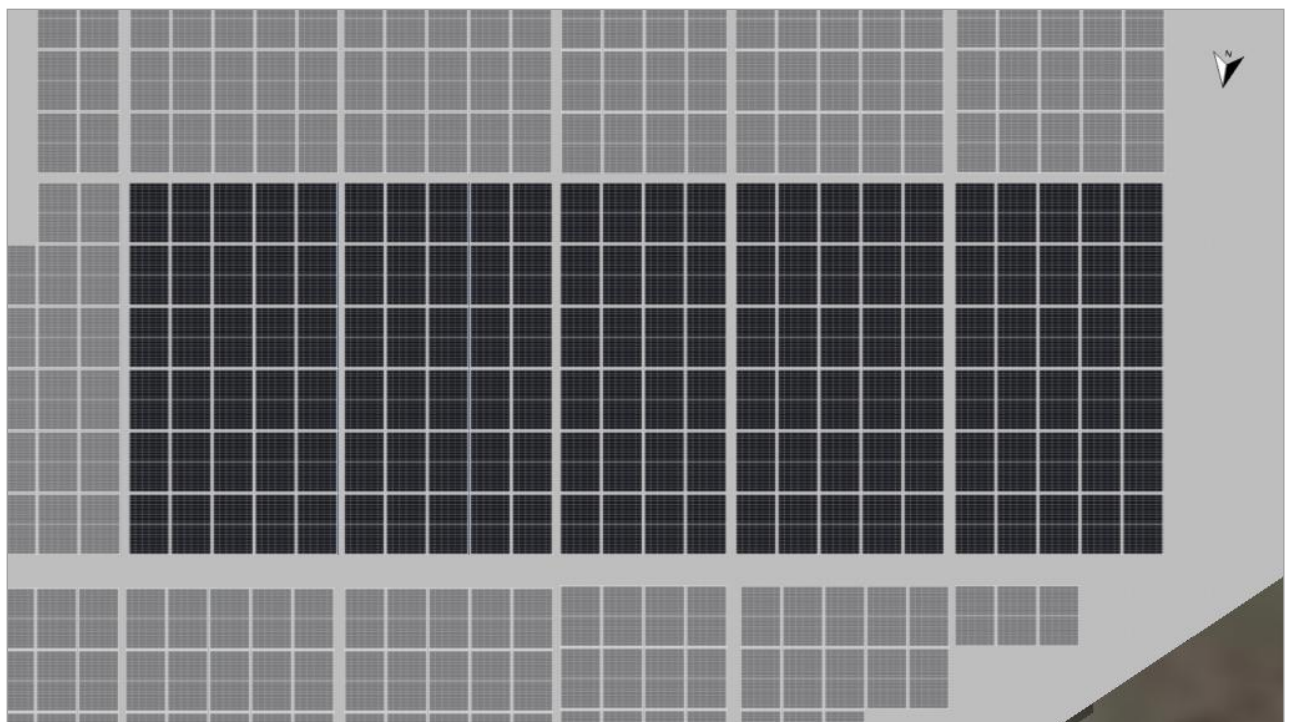


Figure: 8. Module Area - Arbitrary Building 03-Mounting Surface North

9. Module Area - Arbitrary Building 03-Mounting Surface North

PV Generator, 9. Module Area - Arbitrary Building 03-Mounting Surface North

Name	Arbitrary Building 03-Mounting Surface North
PV Modules	22 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	North 350 °
Installation Type	Roof parallel
PV Generator Surface	42.2 m²

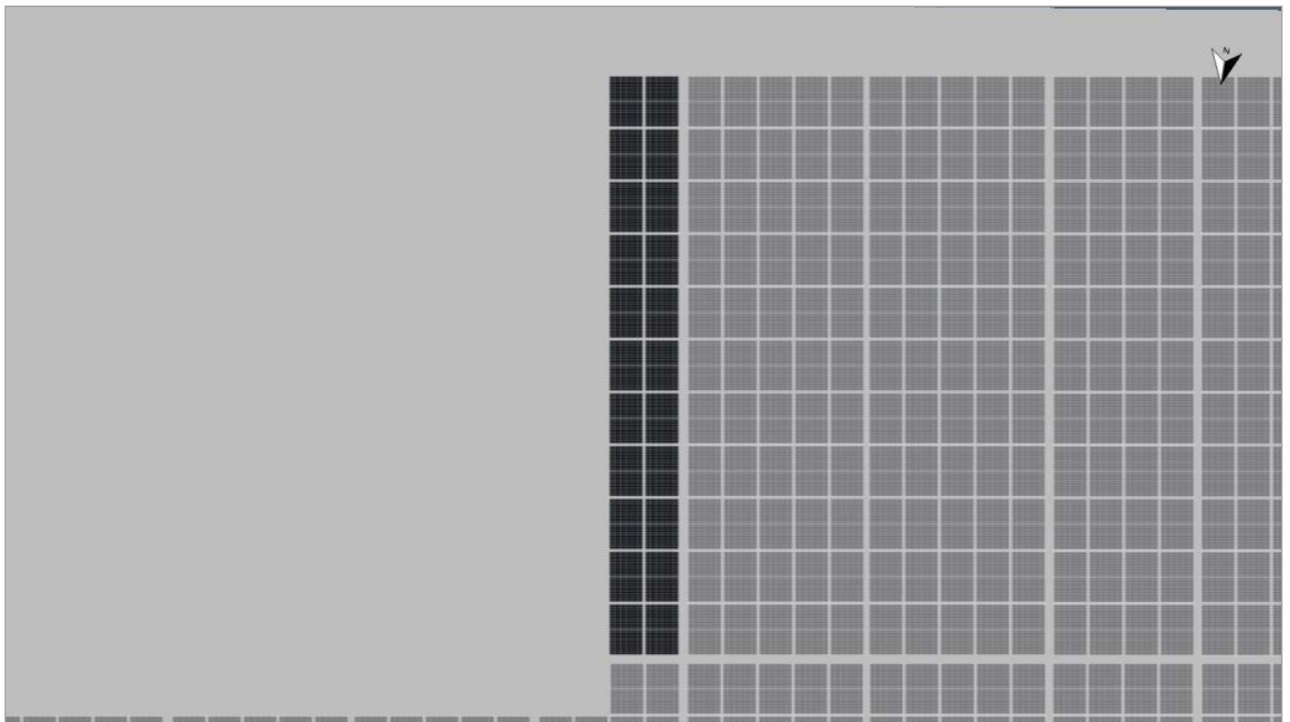


Figure: 9. Module Area - Arbitrary Building 03-Mounting Surface North

10. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 10. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	234 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	449.0 m ²

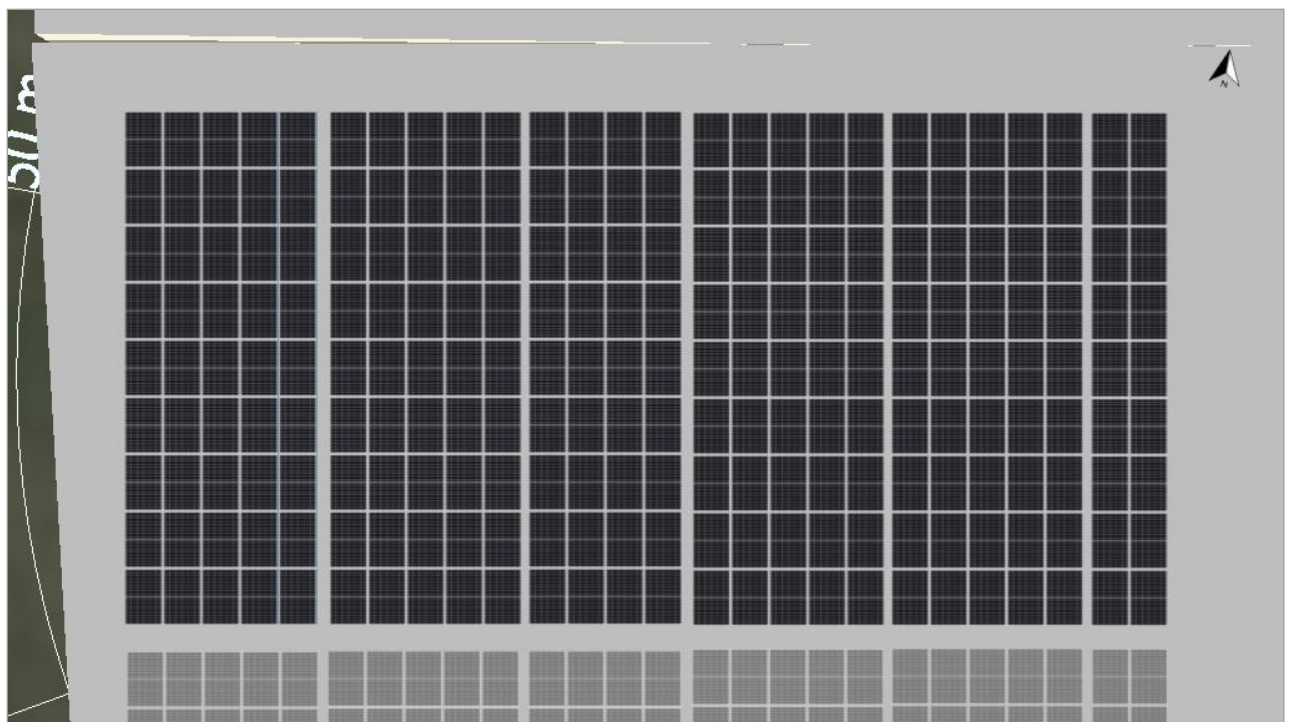


Figure: 10. Module Area - Arbitrary Building 04-Mounting Surface South

11. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 11. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	42 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	80.6 m ²

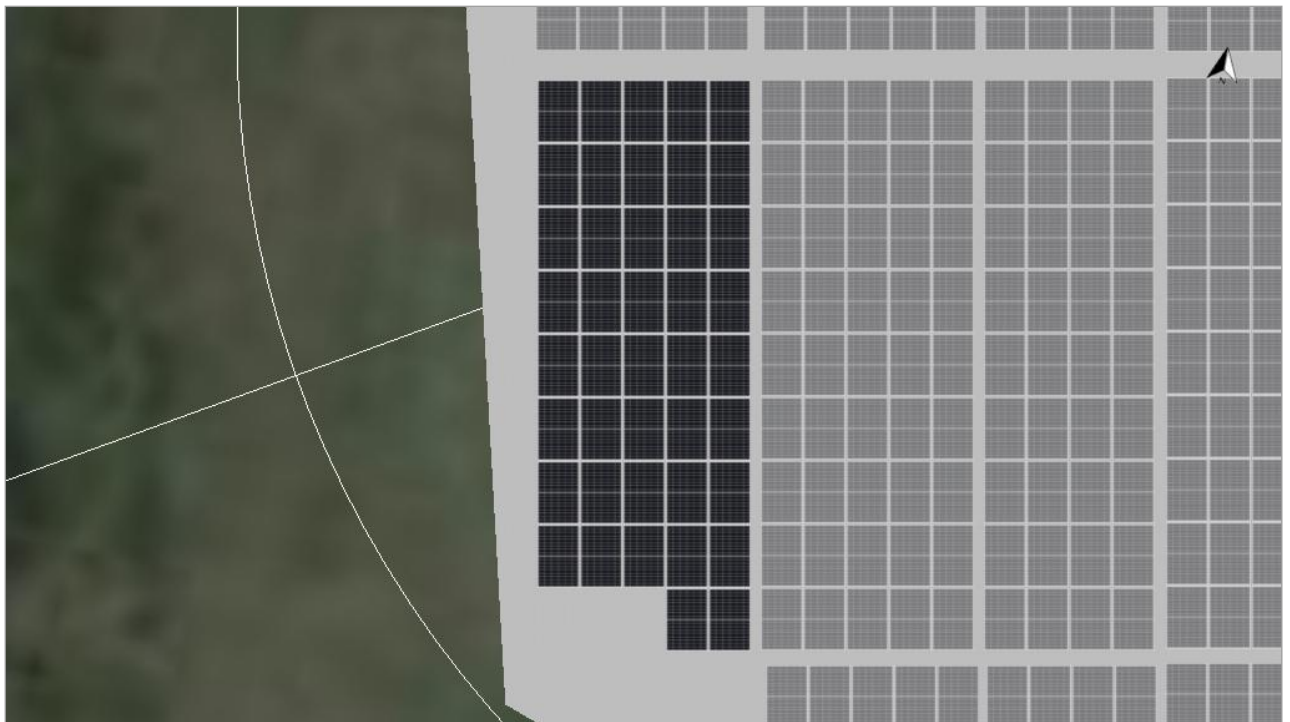


Figure: 11. Module Area - Arbitrary Building 04-Mounting Surface South

12. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 12. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	108 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	207.2 m ²

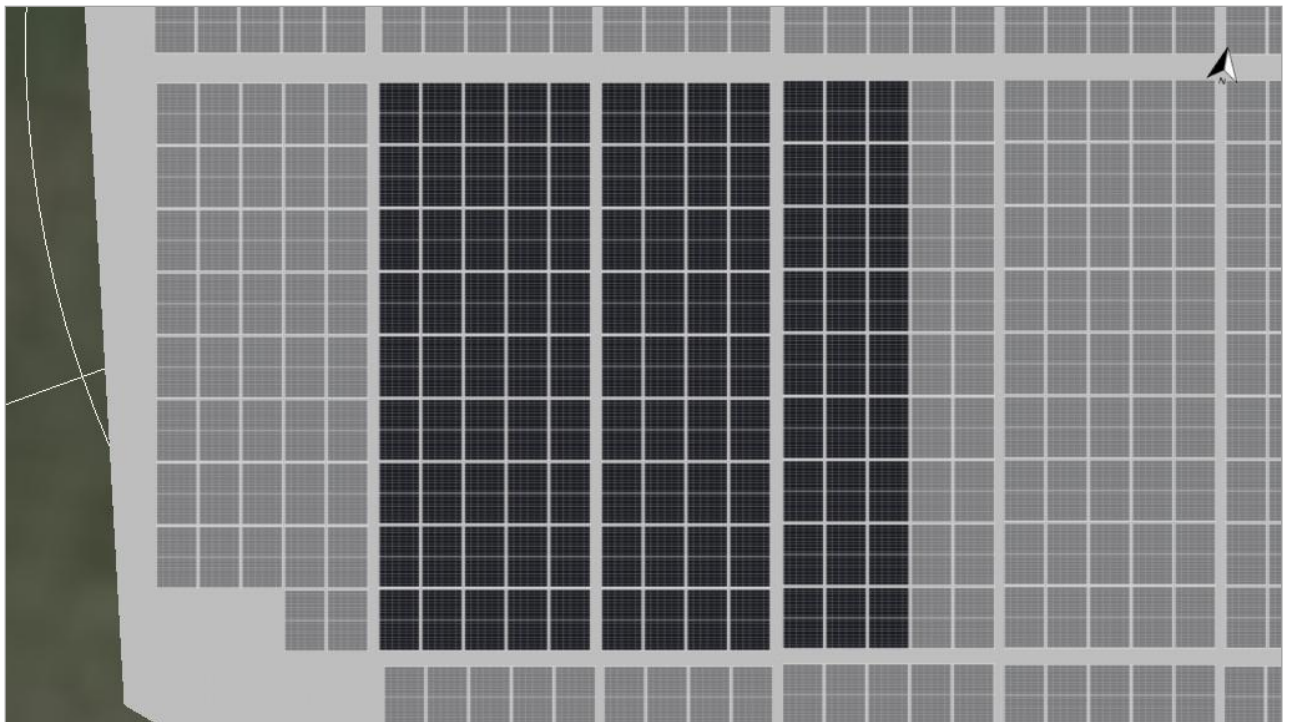


Figure: 12. Module Area - Arbitrary Building 04-Mounting Surface South

13. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 13. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	46 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	88.3 m ²

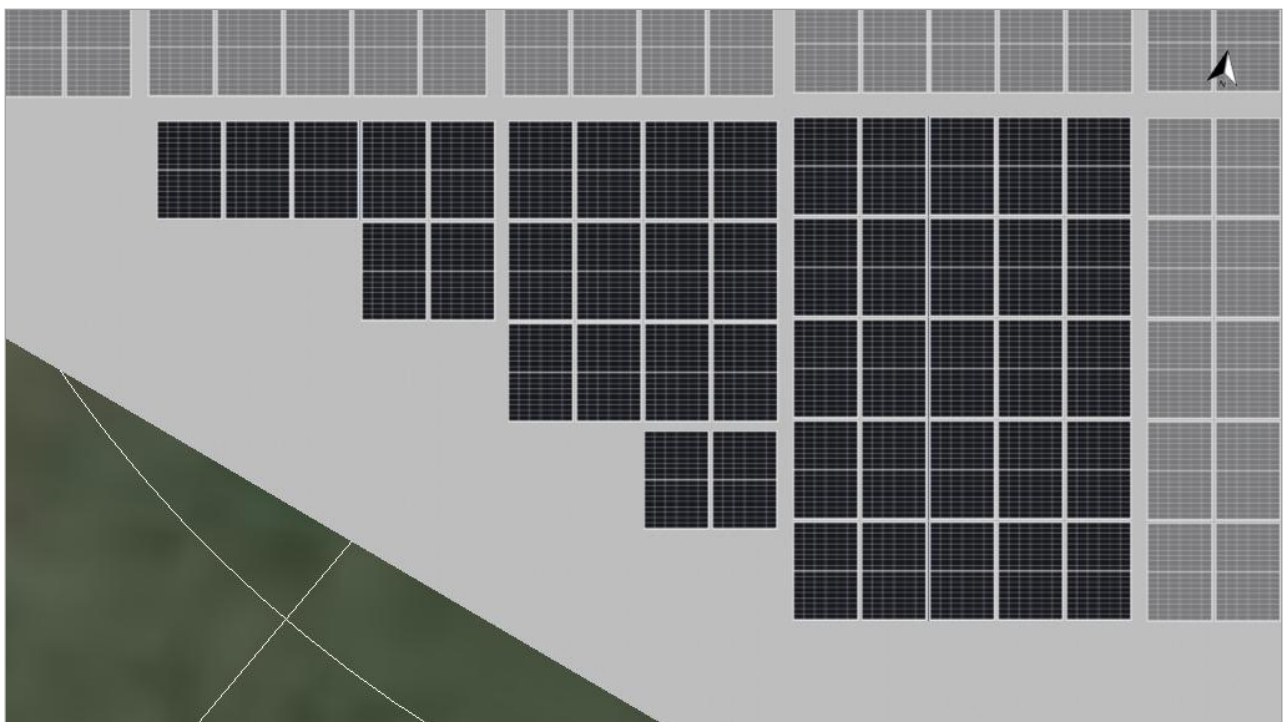


Figure: 13. Module Area - Arbitrary Building 04-Mounting Surface South

14. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 14. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	145 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	278.2 m ²



Figure: 14. Module Area - Arbitrary Building 04-Mounting Surface South

15. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 15. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	81 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	155.4 m²

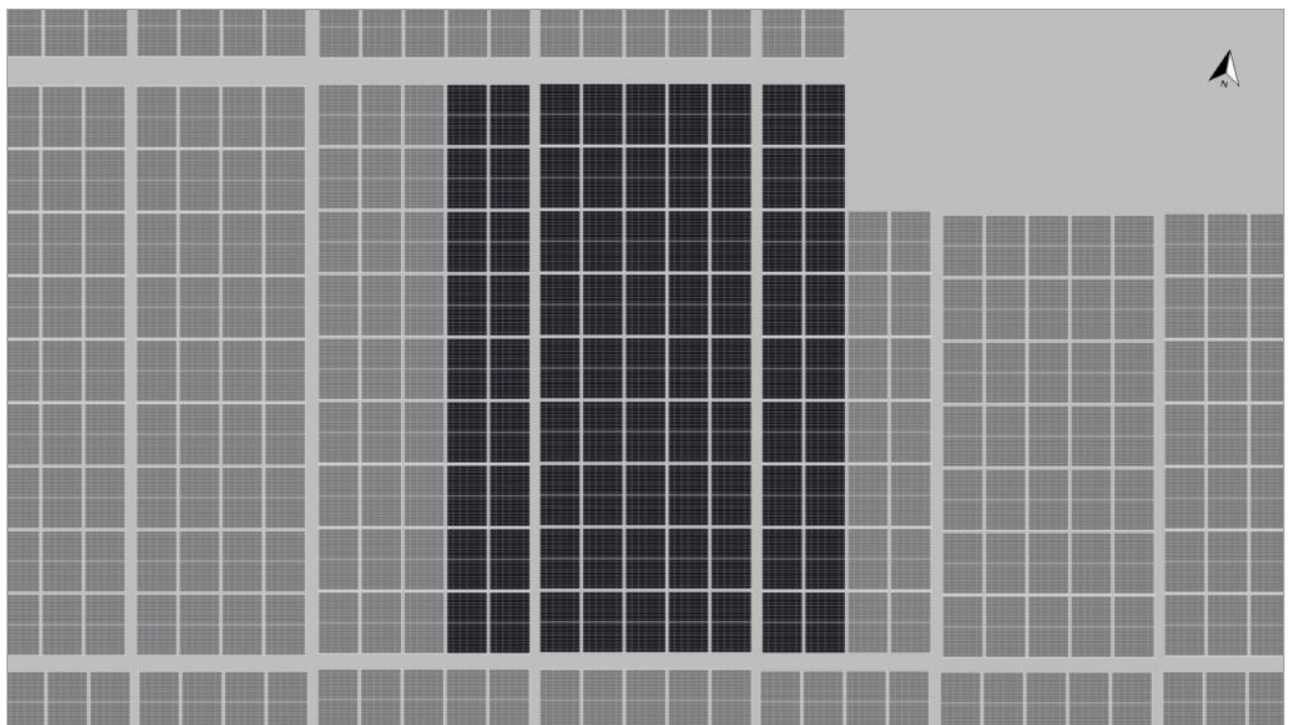


Figure: 15. Module Area - Arbitrary Building 04-Mounting Surface South

16. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 16. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	140 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	268.6 m ²

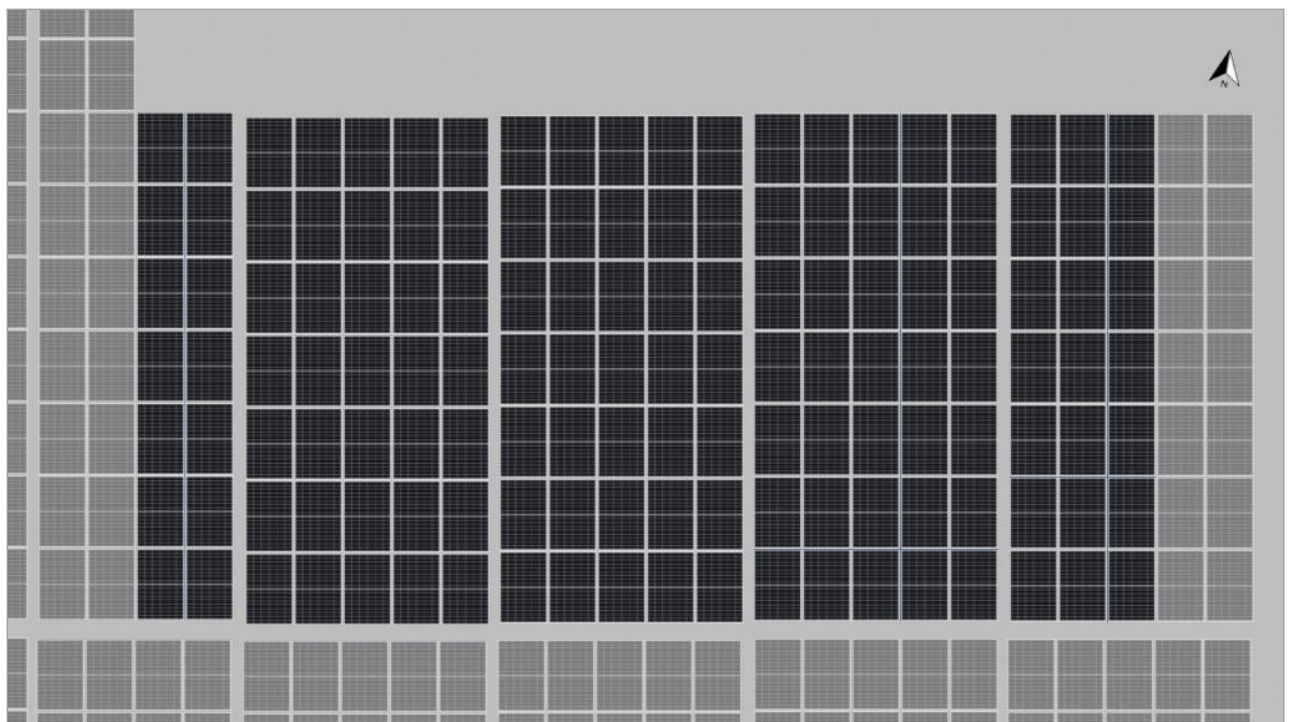


Figure: 16. Module Area - Arbitrary Building 04-Mounting Surface South

17. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 17. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	105 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	201.5 m ²

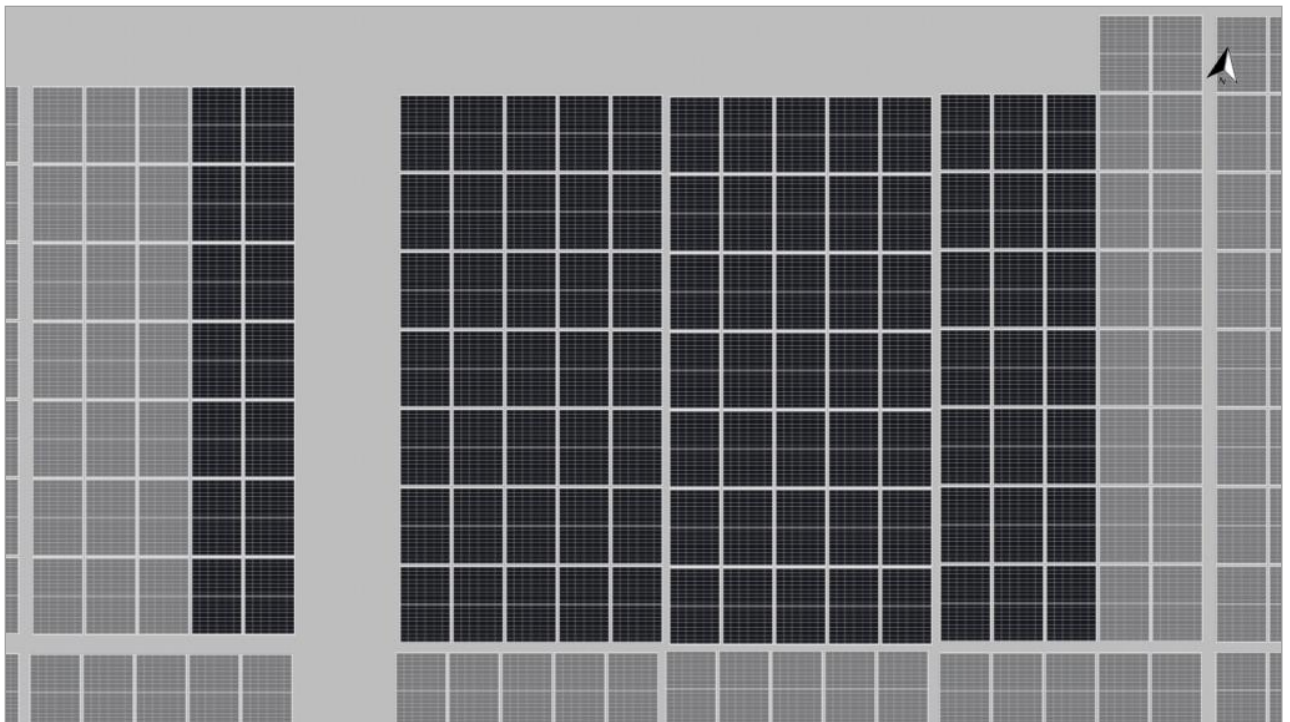


Figure: 17. Module Area - Arbitrary Building 04-Mounting Surface South

18. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 18. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	24 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	46.0 m²

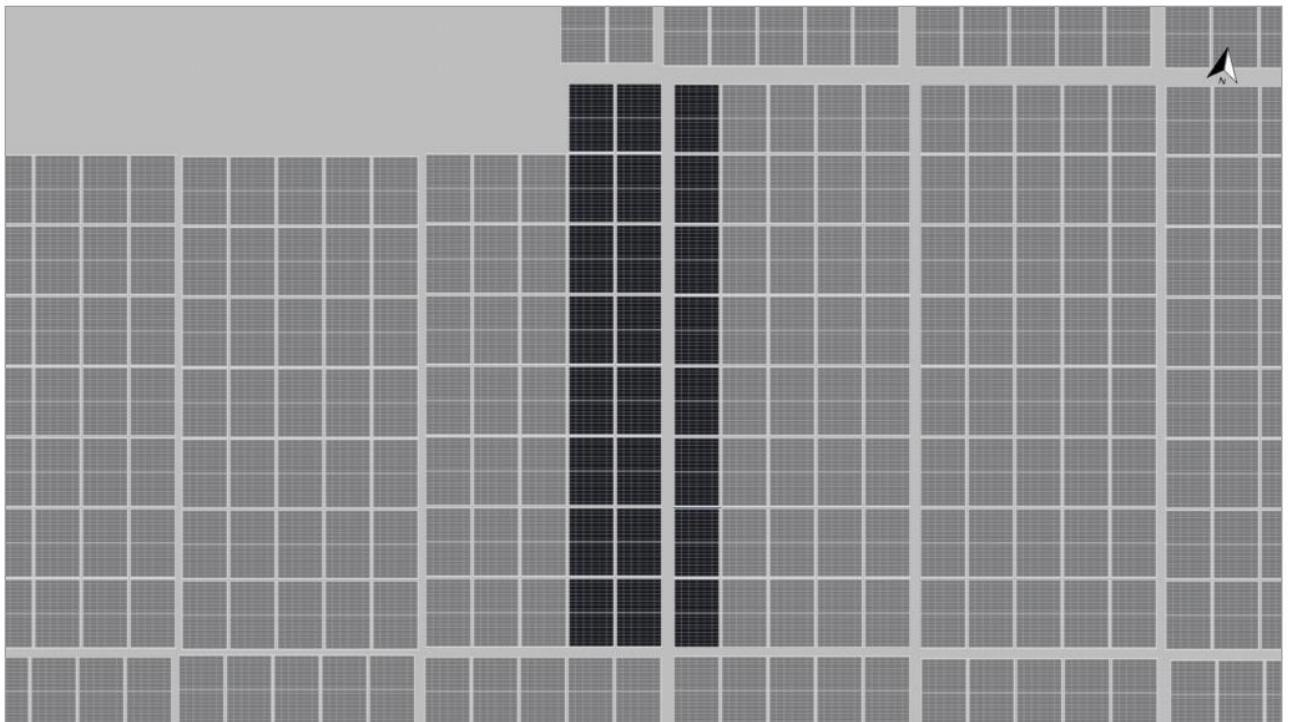


Figure: 18. Module Area - Arbitrary Building 04-Mounting Surface South

19. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 19. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	280 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	537.2 m²

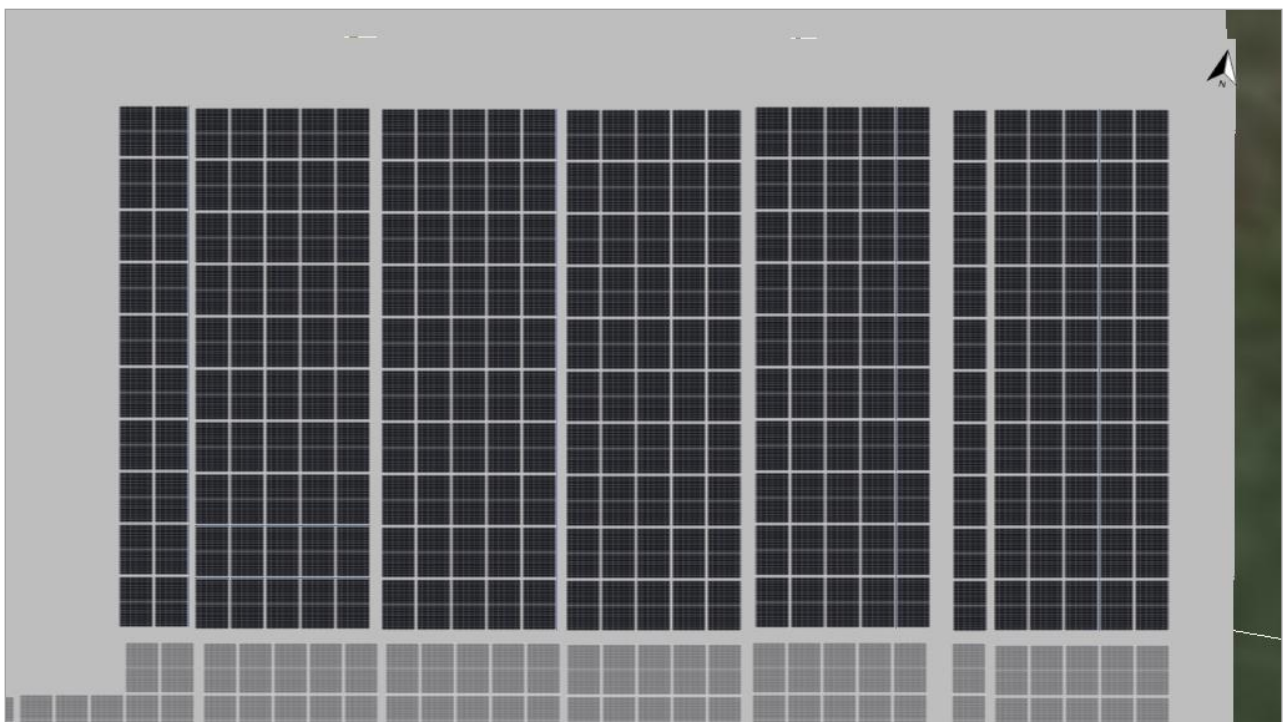


Figure: 19. Module Area - Arbitrary Building 04-Mounting Surface South

20. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 20. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	48 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	92.1 m ²

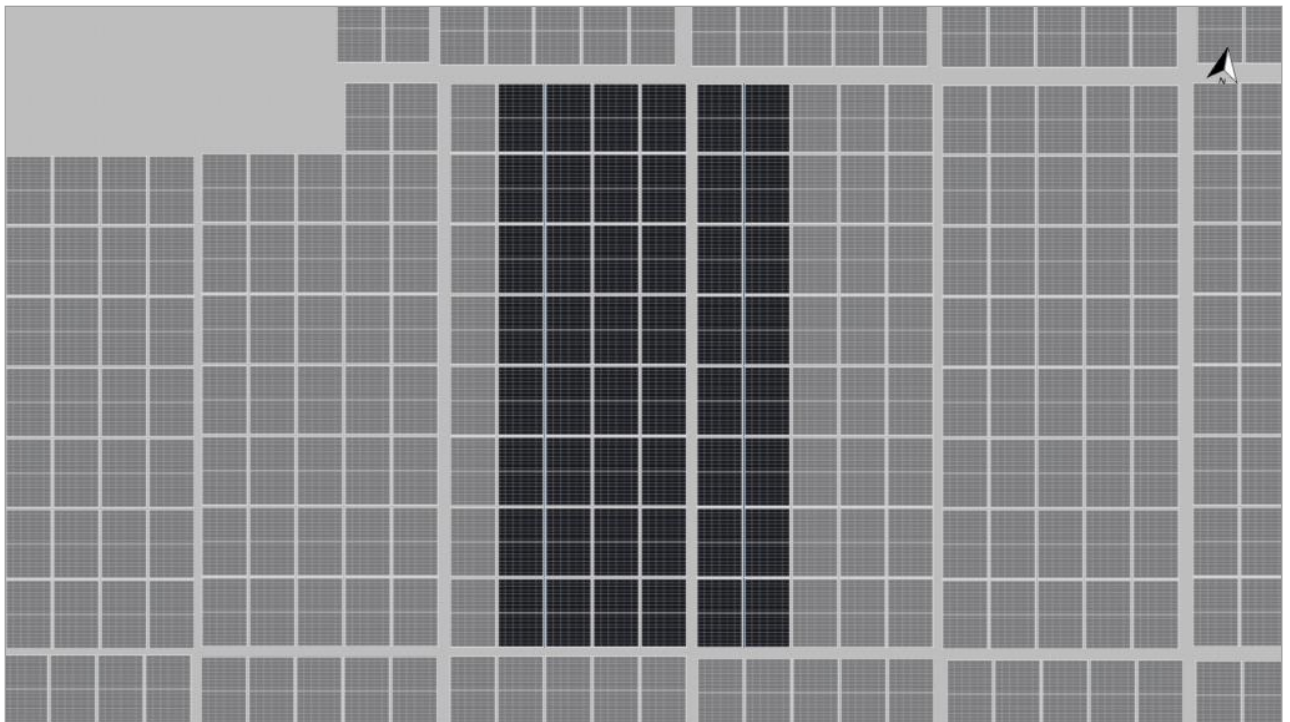


Figure: 20. Module Area - Arbitrary Building 04-Mounting Surface South

21. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 21. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	48 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	92.1 m ²

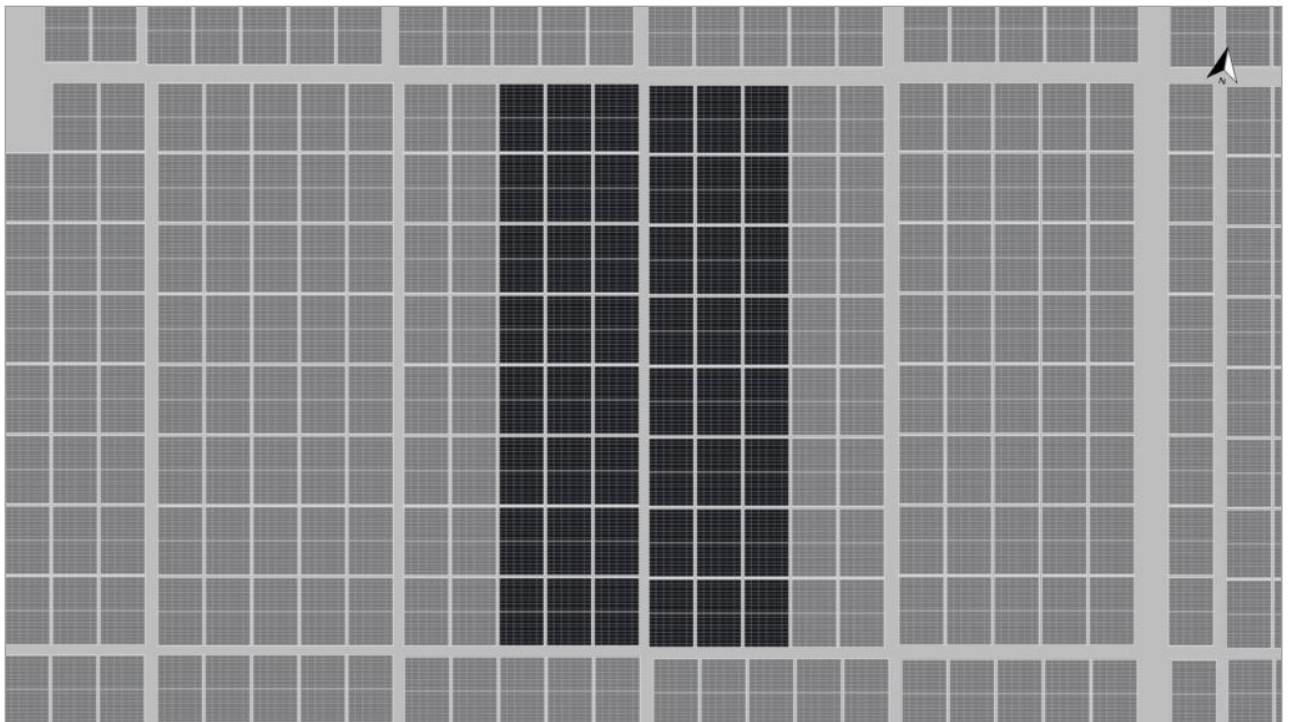


Figure: 21. Module Area - Arbitrary Building 04-Mounting Surface South

22. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 22. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	48 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	92.1 m ²

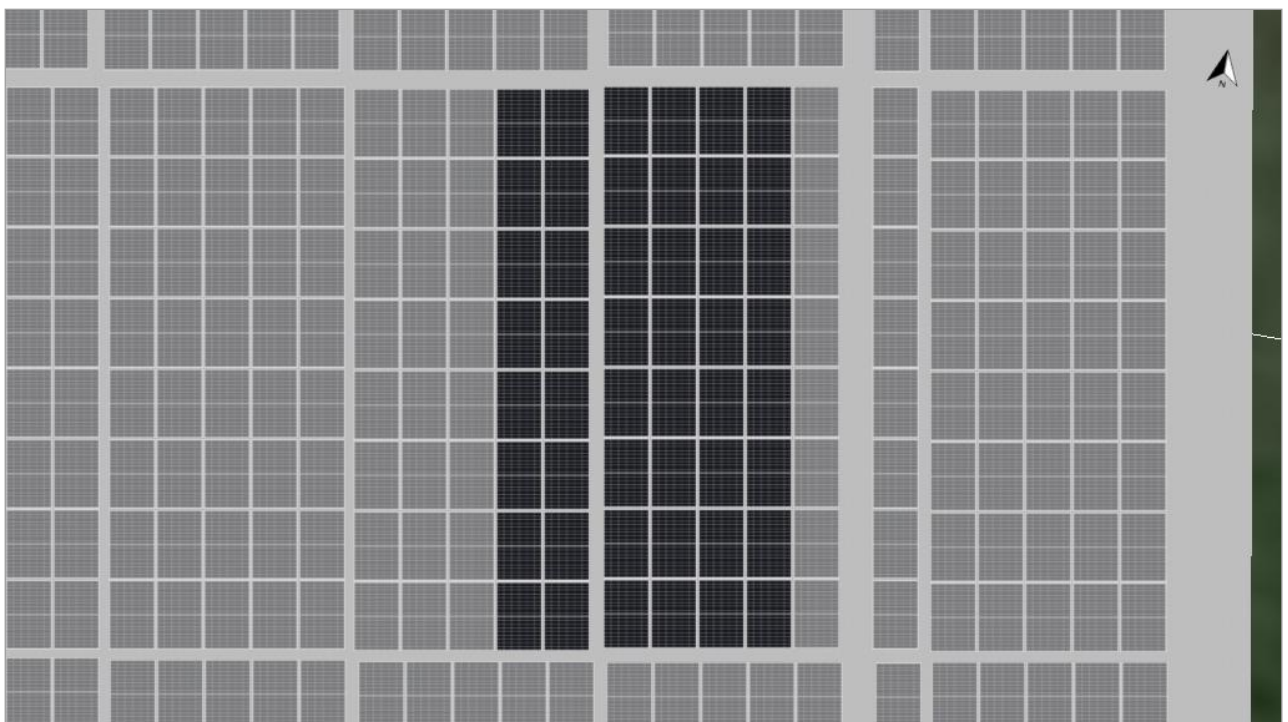


Figure: 22. Module Area - Arbitrary Building 04-Mounting Surface South

23. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 23. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	32 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	61.4 m ²

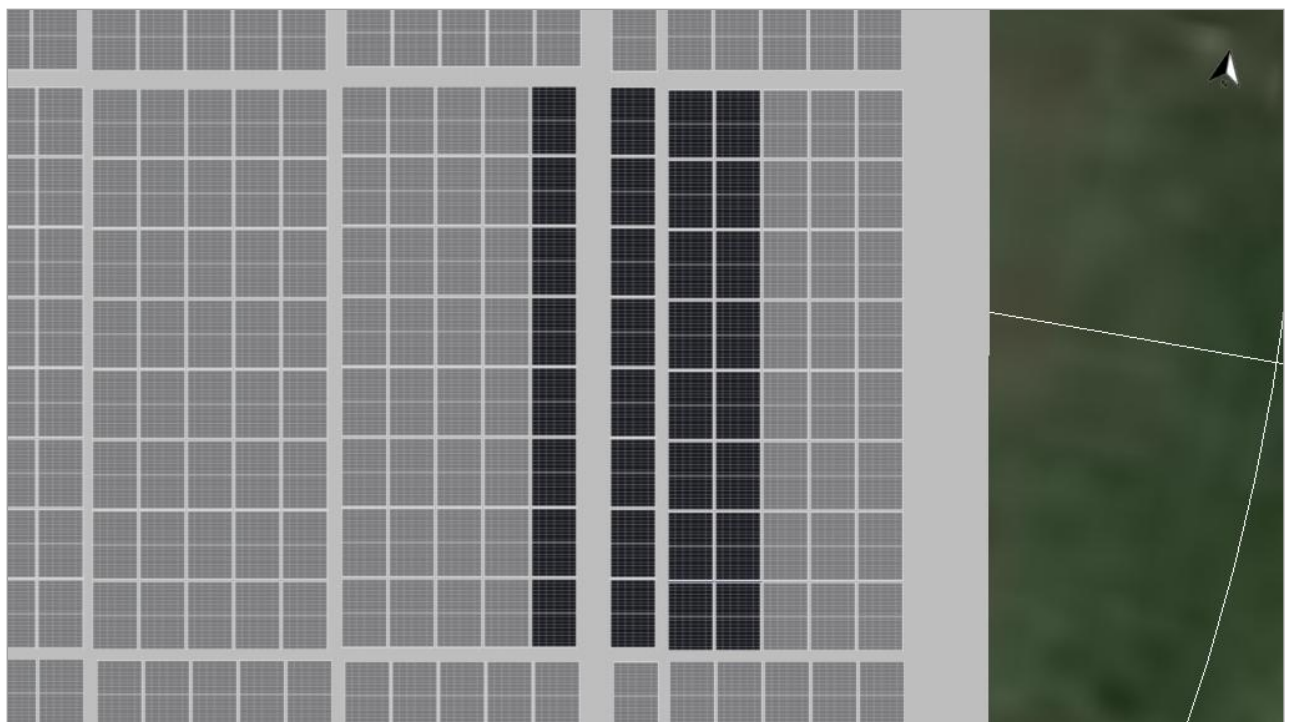


Figure: 23. Module Area - Arbitrary Building 04-Mounting Surface South

24. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 24. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	24 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	46.0 m ²

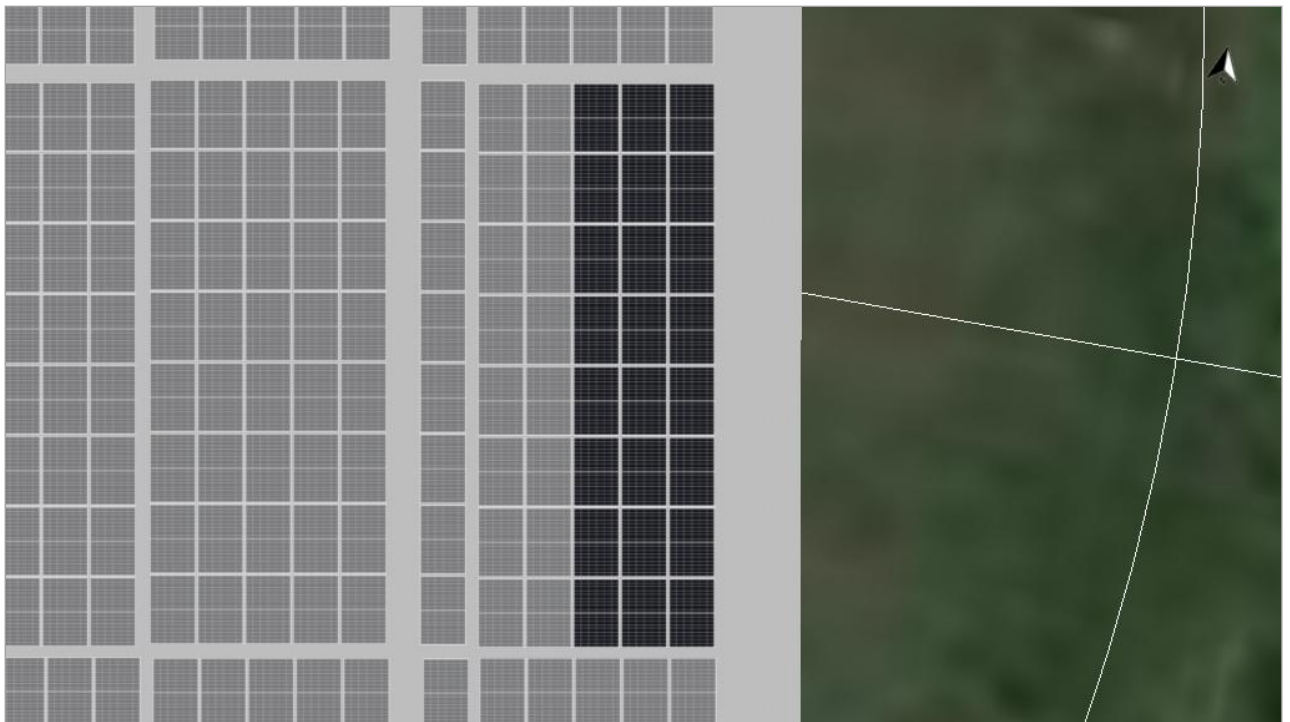


Figure: 24. Module Area - Arbitrary Building 04-Mounting Surface South

25. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 25. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	30 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	57.6 m ²

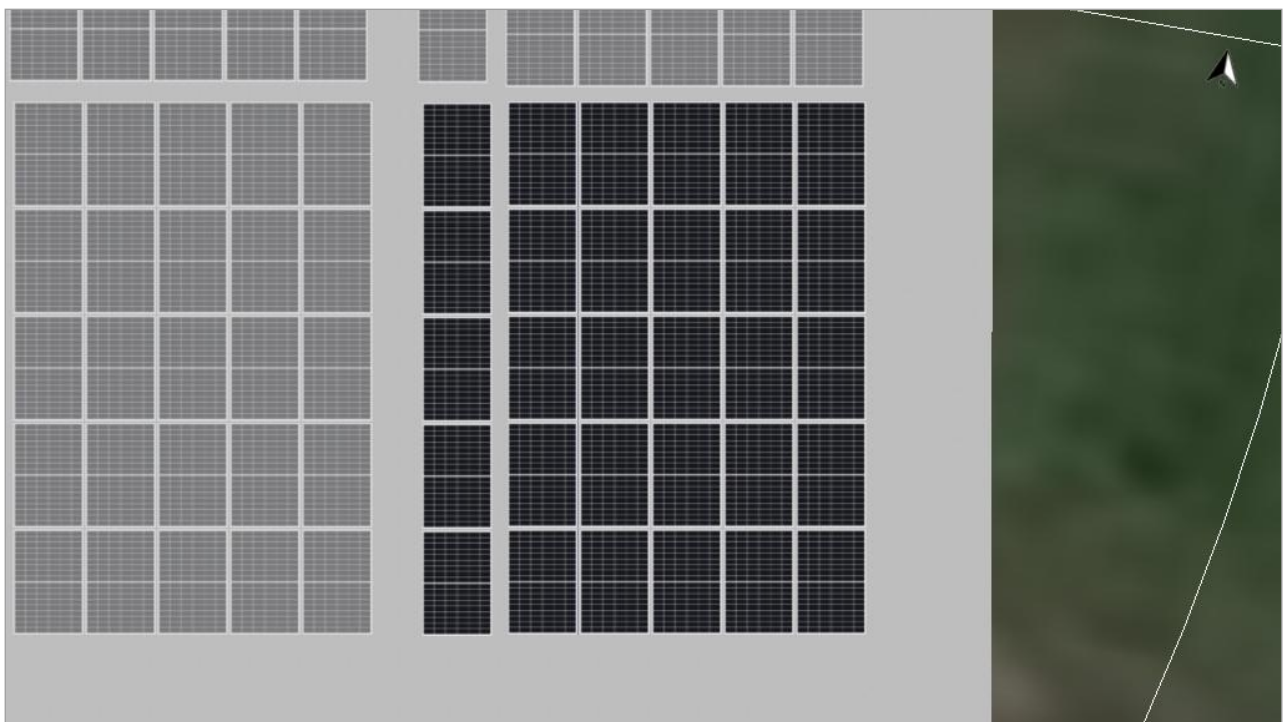


Figure: 25. Module Area - Arbitrary Building 04-Mounting Surface South

26. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 26. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	21 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	40.3 m²

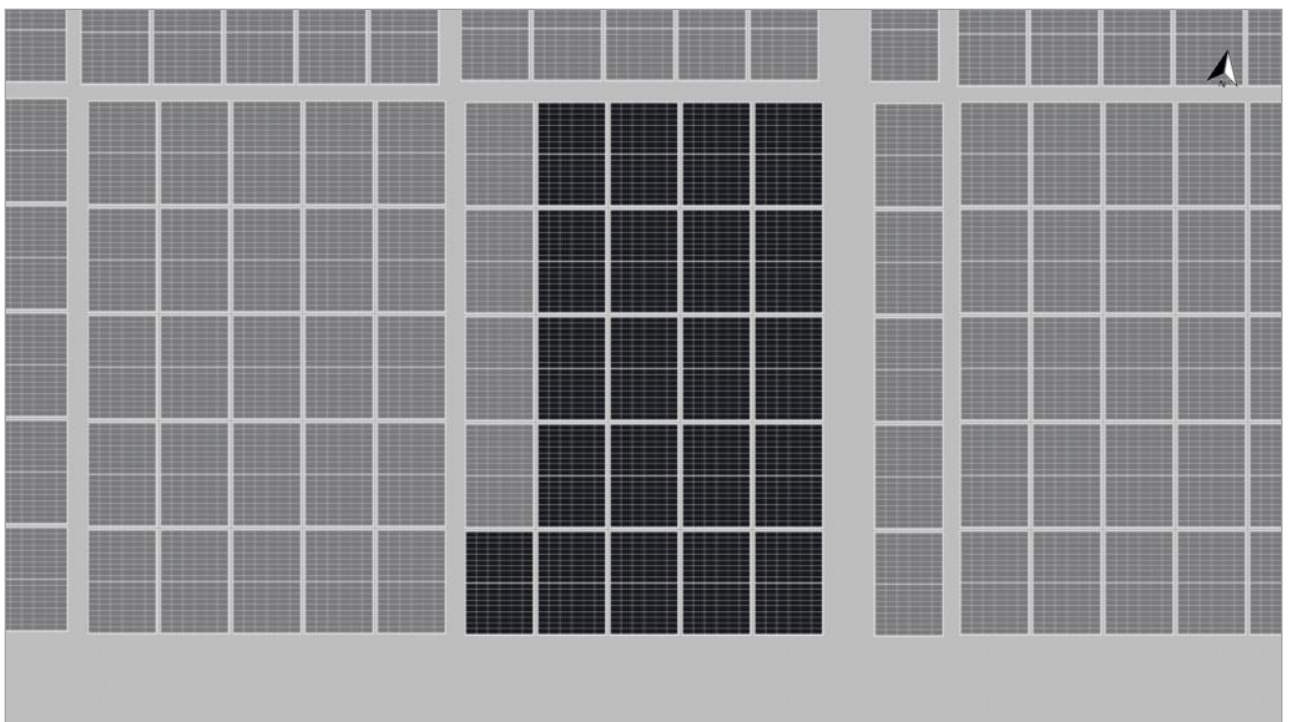


Figure: 26. Module Area - Arbitrary Building 04-Mounting Surface South

27. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 27. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	42 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	80.6 m²

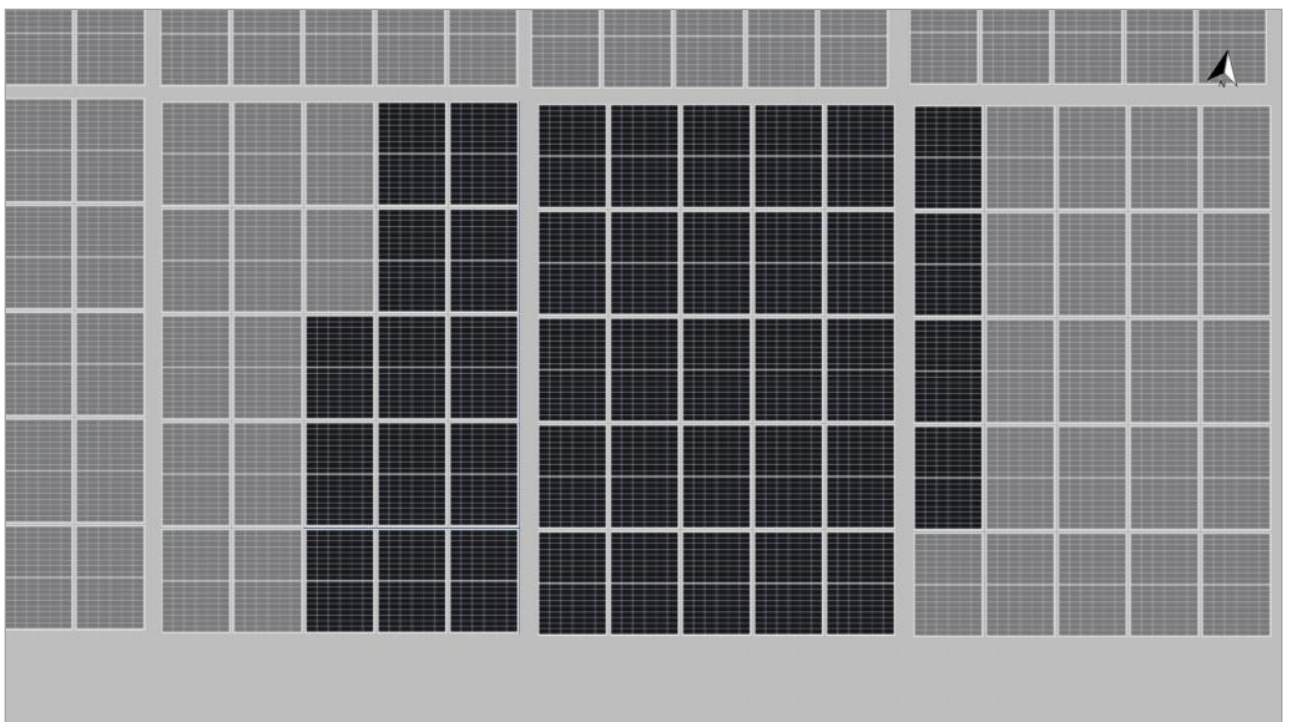


Figure: 27. Module Area - Arbitrary Building 04-Mounting Surface South

28. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 28. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	44 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	84.4 m ²

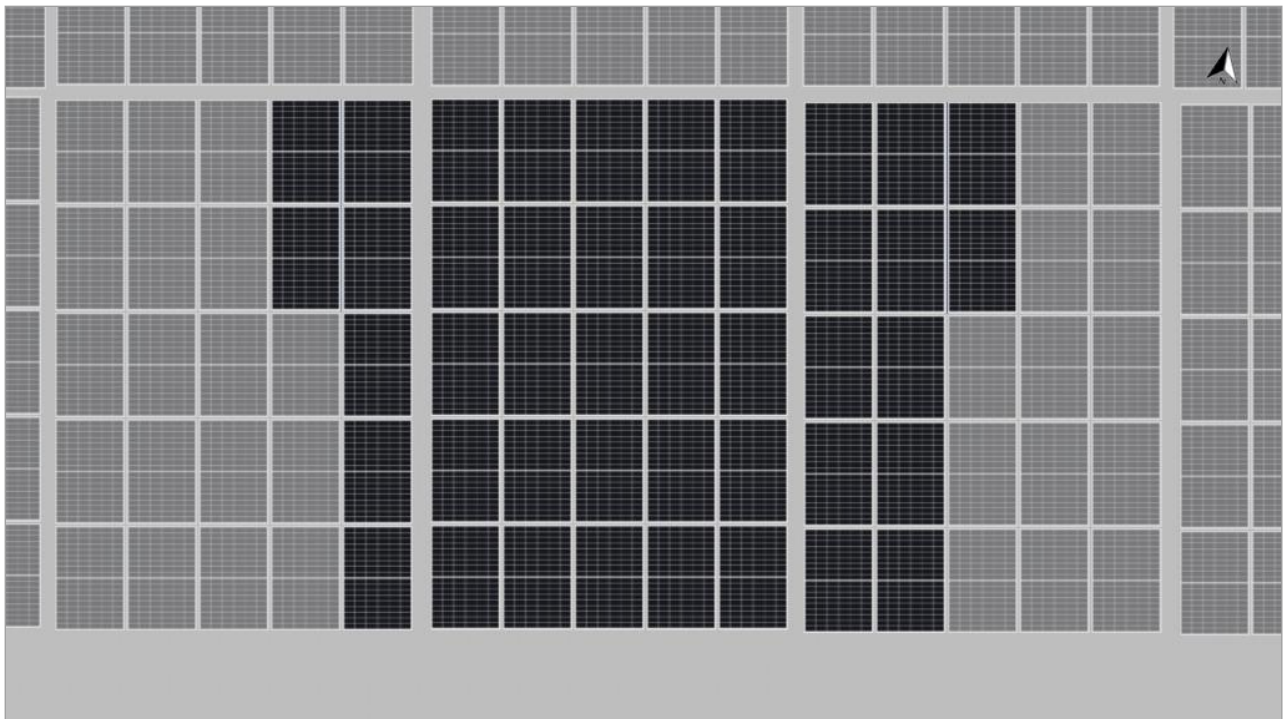


Figure: 28. Module Area - Arbitrary Building 04-Mounting Surface South

29. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 29. Module Area - Arbitrary Building 04-Mounting Surface South	
Name	Arbitrary Building 04-Mounting Surface South
PV Modules	44 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	84.4 m²

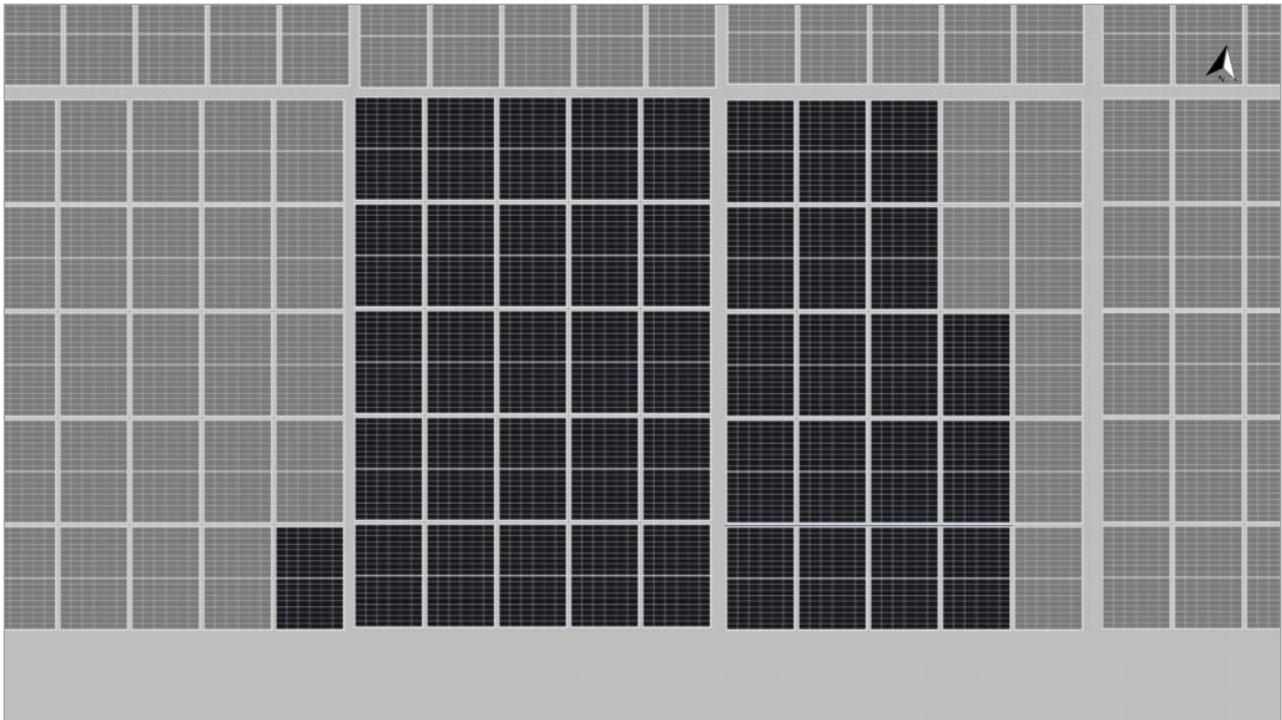


Figure: 29. Module Area - Arbitrary Building 04-Mounting Surface South

30. Module Area - Arbitrary Building 04-Mounting Surface South

PV Generator, 30. Module Area - Arbitrary Building 04-Mounting Surface South

Name	Arbitrary Building 04-Mounting Surface South
PV Modules	24 x Q.PEAK DUO BLK M-G11 400 Rev1 (v1)
Manufacturer	Hanwha Q.CELLS
Inclination	1 °
Orientation	South 170 °
Installation Type	Roof parallel
PV Generator Surface	46.0 m²

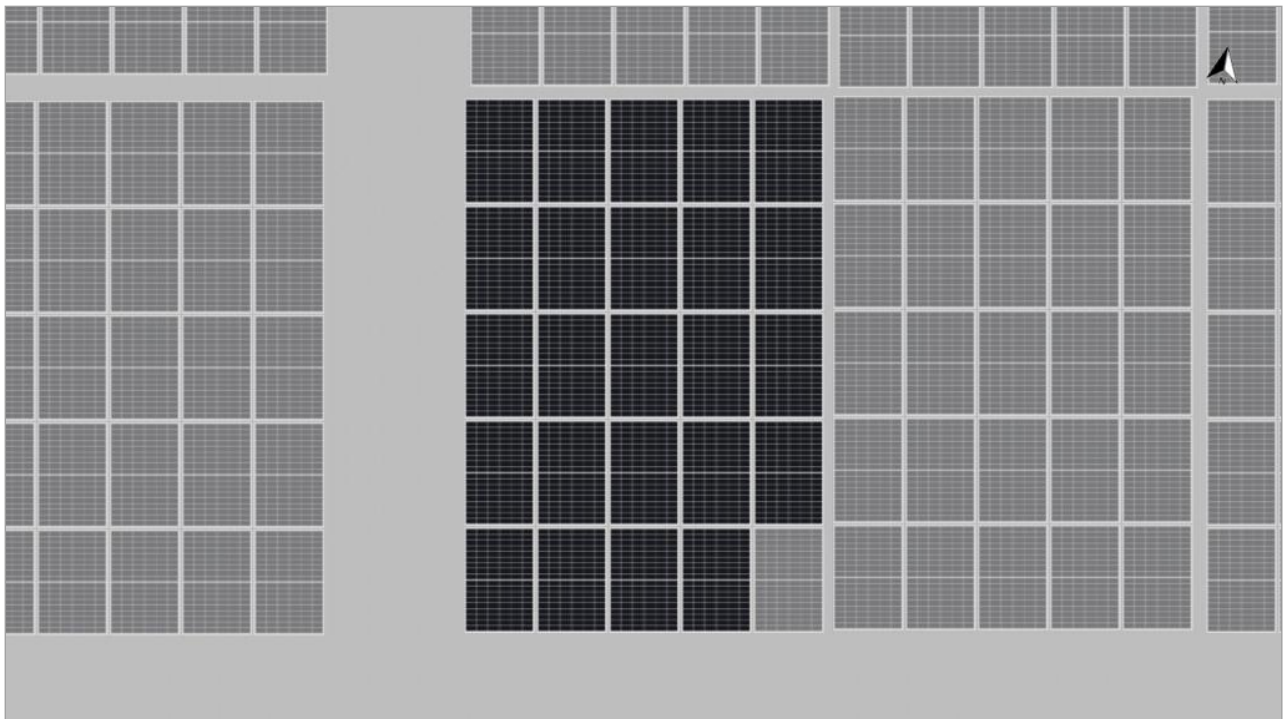


Figure: 30. Module Area - Arbitrary Building 04-Mounting Surface South

Horizon Line, 3D Design

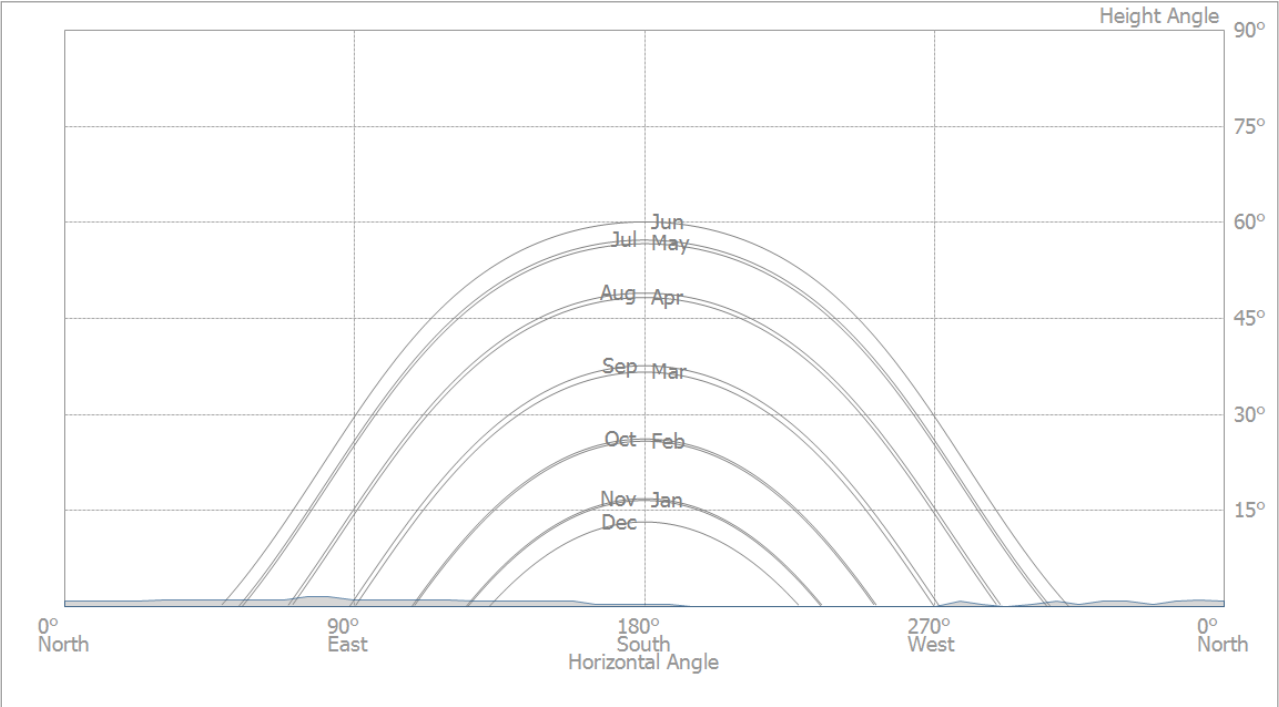


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Area	Arbitrary Building 03-Mounting Surface North	
Inverter 1		
Model	Sunny Tripower CORE2 (v2)	
Manufacturer	SMA Solar Technology AG	
Quantity	1	
Sizing Factor	149.1 %	
Configuration	MPP 1: 2 x 22	
	MPP 2: 2 x 22	
	MPP 3: 2 x 22	
	MPP 4: 2 x 22	
	MPP 5: 2 x 22	
	MPP 6: 2 x 22	
	MPP 7: 2 x 22	
	MPP 8: 2 x 24	
	MPP 9: 2 x 18	
	MPP 10: 1 x 18	
	MPP 11: not allocated	
	MPP 12: not allocated	

Configuration 2

Module Area	Arbitrary Building 03-Mounting Surface North
Inverter 1	
Model	Sunny Tripower CORE2 (v2)
Manufacturer	SMA Solar Technology AG
Quantity	1
Sizing Factor	148.7 %
Configuration	MPP 1: 2 x 24
	MPP 2: 1 x 18
	MPP 3: 2 x 20
	MPP 4: 2 x 15
	MPP 5: 2 x 21
	MPP 6: 2 x 21
	MPP 7: 2 x 21
	MPP 8: 2 x 21
	MPP 9: 2 x 21
	MPP 10: 2 x 21
	MPP 11: 1 x 21
	MPP 12: not allocated

Configuration 3

Module Areas	Arbitrary Building 03-Mounting Surface North + Arbitrary Building 03-Mounting Surface North + Arbitrary Building 03-Mounting Surface North + Arbitrary Building 03-Mounting Surface North
Inverter 1	
Model	Sunny Tripower CORE2 (v2)
Manufacturer	SMA Solar Technology AG
Quantity	1
Sizing Factor	151.3 %
Configuration	MPP 1: 2 x 21
	MPP 2: 2 x 21
	MPP 3: 2 x 21
	MPP 4: 2 x 21
	MPP 5: 2 x 21
	MPP 6: 2 x 21
	MPP 7: 2 x 21
	MPP 8: 2 x 20
	MPP 9: 2 x 20
	MPP 10: 1 x 20
	MPP 11: 1 x 22
	MPP 12: not allocated

Co-op Live Building

Configuration 4

Module Areas	Arbitrary Building 03-Mounting Surface North + Arbitrary Building 03-Mounting Surface North	
Inverter 1		
Model	Sunny Tripower CORE2 (v2)	
Manufacturer	SMA Solar Technology AG	
Quantity		1
Sizing Factor		148.4 %
Configuration	MPP 1: 2 x 22	
	MPP 2: 2 x 22	
	MPP 3: 2 x 22	
	MPP 4: 2 x 22	
	MPP 5: 2 x 22	
	MPP 6: 2 x 22	
	MPP 7: 2 x 24	
	MPP 8: 2 x 24	
	MPP 9: 2 x 24	
	MPP 10: not allocated	
	MPP 11: not allocated	
	MPP 12: not allocated	

Configuration 5

Module Areas	Arbitrary Building 03-Mounting Surface North + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South	
Inverter 1		
Model	Sunny Tripower CORE2 (v2)	
Manufacturer	SMA Solar Technology AG	
Quantity		1
Sizing Factor		147.6 %
Configuration	MPP 1: 1 x 22	
	MPP 2: 2 x 18	
	MPP 3: 2 x 18	
	MPP 4: 2 x 18	
	MPP 5: 2 x 18	
	MPP 6: 2 x 18	
	MPP 7: 2 x 18	
	MPP 8: 1 x 18	
	MPP 9: 2 x 21	
	MPP 10: 2 x 18	
	MPP 11: 2 x 18	
	MPP 12: 2 x 18	

Co-op Live Building

Configuration 6

Module Areas	Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South	
Inverter 1		
Model	Sunny Tripower CORE2 (v2)	
Manufacturer	SMA Solar Technology AG	
Quantity	1	
Sizing Factor	149.8 %	
Configuration	MPP 1: 2 x 23	
	MPP 2: 2 x 20	
	MPP 3: 2 x 20	
	MPP 4: 2 x 22	
	MPP 5: 1 x 21	
	MPP 6: 2 x 18	
	MPP 7: 2 x 18	
	MPP 8: 1 x 9	
	MPP 9: 2 x 21	
	MPP 10: 2 x 21	
	MPP 11: 2 x 21	
	MPP 12: 1 x 14	

Configuration 7

Module Areas	Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South	
Inverter 1		
Model	Sunny Tripower CORE2 (v2)	
Manufacturer	SMA Solar Technology AG	
Quantity	1	
Sizing Factor	148.7 %	
Configuration	MPP 1: 2 x 21	
	MPP 2: 2 x 21	
	MPP 3: 1 x 21	
	MPP 4: 1 x 24	
	MPP 5: 2 x 20	
	MPP 6: 2 x 20	
	MPP 7: 2 x 20	
	MPP 8: 2 x 20	
	MPP 9: 2 x 20	
	MPP 10: 2 x 20	
	MPP 11: 2 x 20	
	MPP 12: not allocated	

Configuration 8

Module Areas	Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04- Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04-Mounting Surface South + Arbitrary Building 04- Mounting Surface South	
Inverter 1		
Model	Sunny Tripower CORE2 (v2)	
Manufacturer	SMA Solar Technology AG	
Quantity	1	
Sizing Factor	147.3 %	
Configuration	MPP 1: 2 x 24	
	MPP 2: 2 x 24	
	MPP 3: 2 x 24	
	MPP 4: 2 x 16	
	MPP 5: 1 x 24	
	MPP 6: 2 x 15	
	MPP 7: 1 x 21	
	MPP 8: 2 x 21	
	MPP 9: 2 x 22	
	MPP 10: 2 x 22	
	MPP 11: 1 x 24	
	MPP 12: not allocated	

AC Mains

AC Mains

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

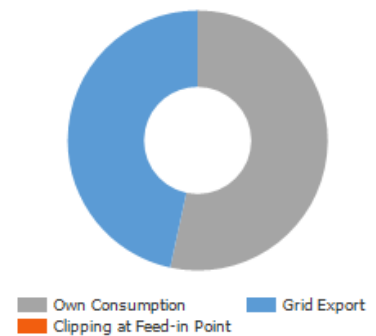
Simulation Results

Results Total System

PV System

PV Generator Output	1,310.00 kWp
Spec. Annual Yield	732.66 kWh/kWp
Performance Ratio (PR)	84.59 %
Yield Reduction due to Shading	0.3 %
PV Generator Energy (AC grid)	959,984 kWh/Year
Own Consumption	512,505 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	447,478 kWh/Year
Own Power Consumption	53.4 %
CO ₂ Emissions avoided	451,101 kg / year

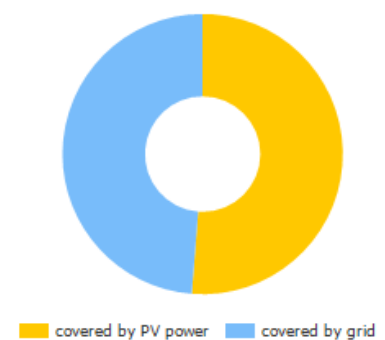
PV Generator Energy (AC grid)



Appliances

Appliances	1,000,000 kWh/Year
Standby Consumption (Inverter)	195 kWh/Year
Total Consumption	1,000,195 kWh/Year
covered by PV power	512,505 kWh/Year
covered by grid	487,690 kWh/Year
Solar Fraction	51.2 %

Total Consumption

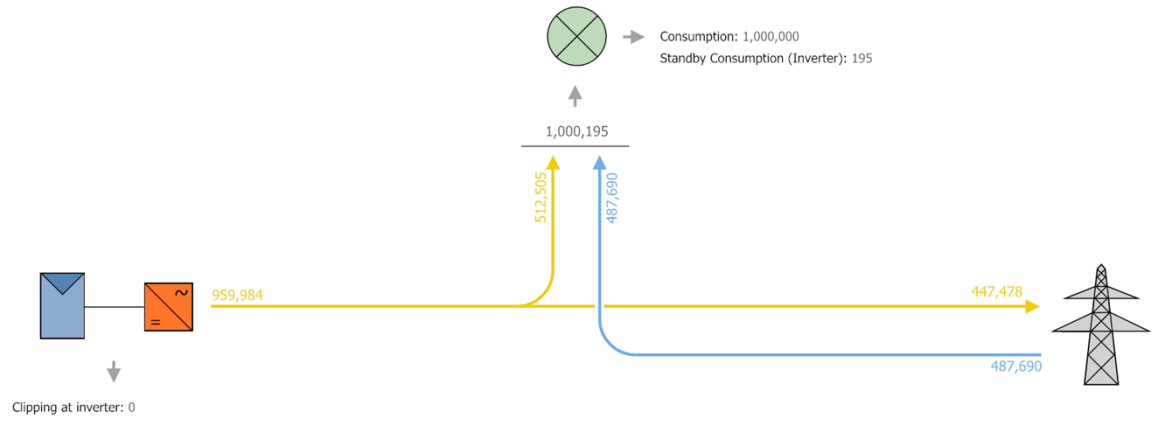


Level of Self-sufficiency

Total Consumption	1,000,195 kWh/Year
covered by grid	487,690 kWh/Year
Level of Self-sufficiency	51.2 %

Energy Flow Graph

Project: Co-op Live Building



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

Figure: Energy flow

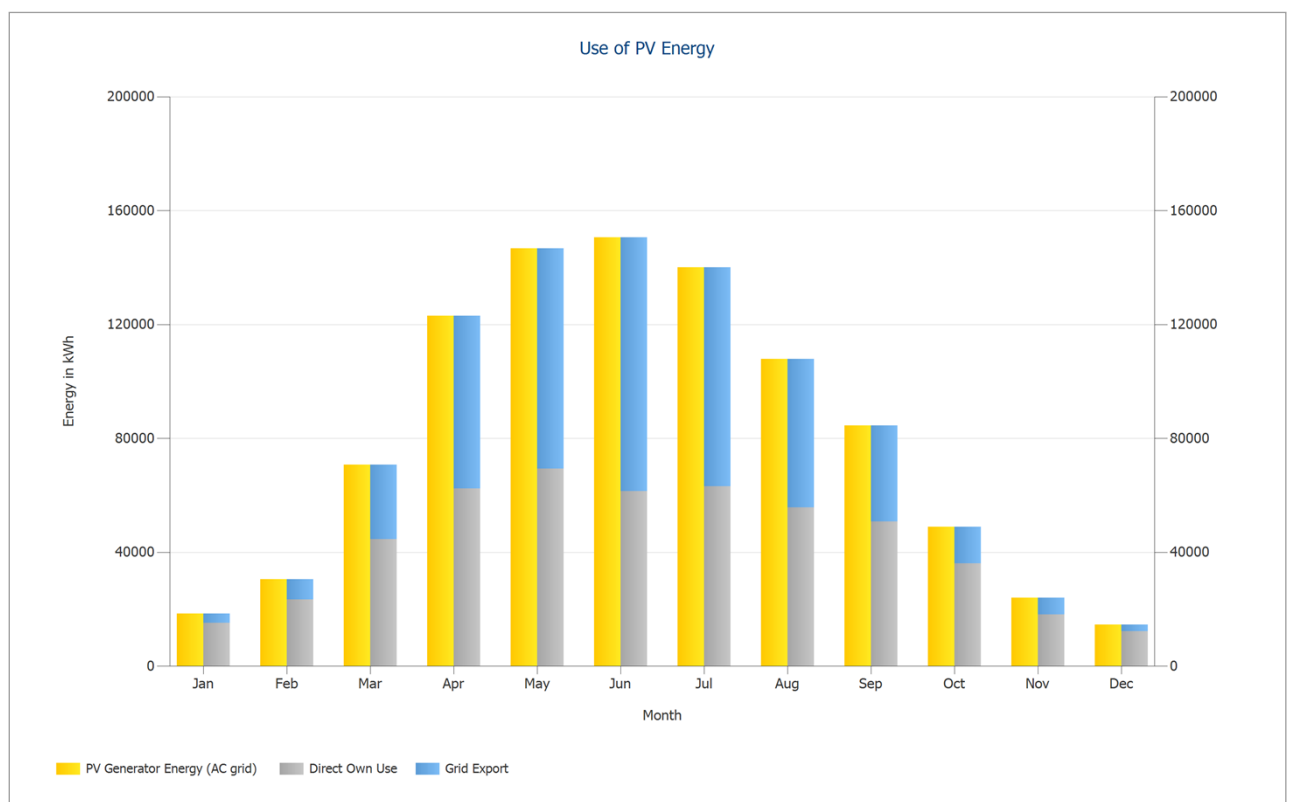


Figure: Use of PV Energy

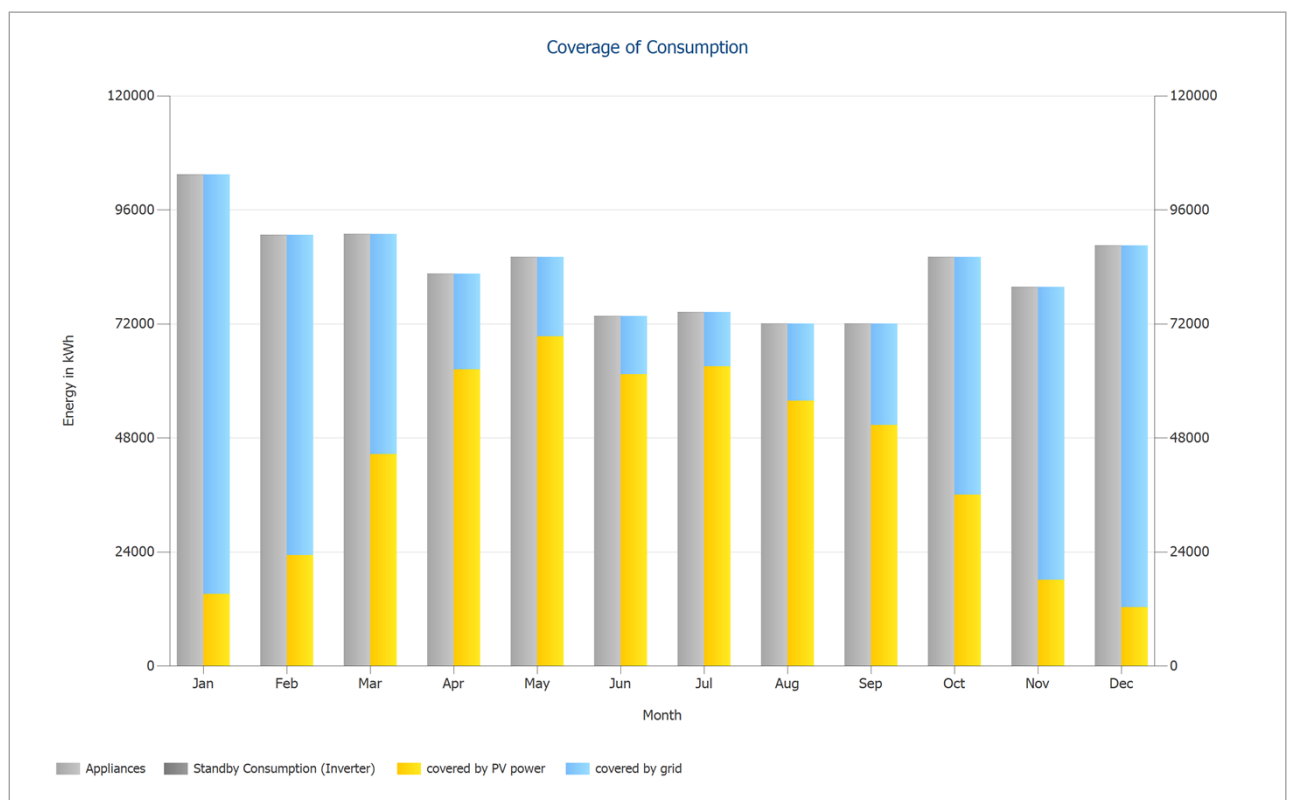


Figure: Coverage of Consumption

Financial Analysis

Overview

System Data

Grid Export in the first year (incl. module degradation)	441,956 kWh/Year
PV Generator Output	1310 kWp
Start of Operation of the System	04/05/2022
Assessment Period	25 Years
Interest on Capital	0 %

Economic Parameters

Internal Rate of Return (IRR)	21.43 %
Accrued Cash Flow (Cash Balance)	4,416,793.29 £
Amortization Period	4.8 Years
Electricity Production Costs	0.0363 £/kWh

Payment Overview

Specific Investment Costs	664.00 £/kWp
Investment Costs	869,840.00 £
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	53,362.80 £/Year
First year savings	125,976.40 £/Year

Octopus Export PPA 12p - Solar

Validity	04/05/2022 - 03/05/2042
Specific feed-in / export Remuneration	0.12 £/kWh
Feed-in / Export Tariff	53362.797 £/Year
Inflation Rate for Feed-in / Export Tariff	2.00 %/Year

Commercial (Example)

Energy Price	0.25 £/kWh
Inflation Rate for Energy Price	3.5 %/Year

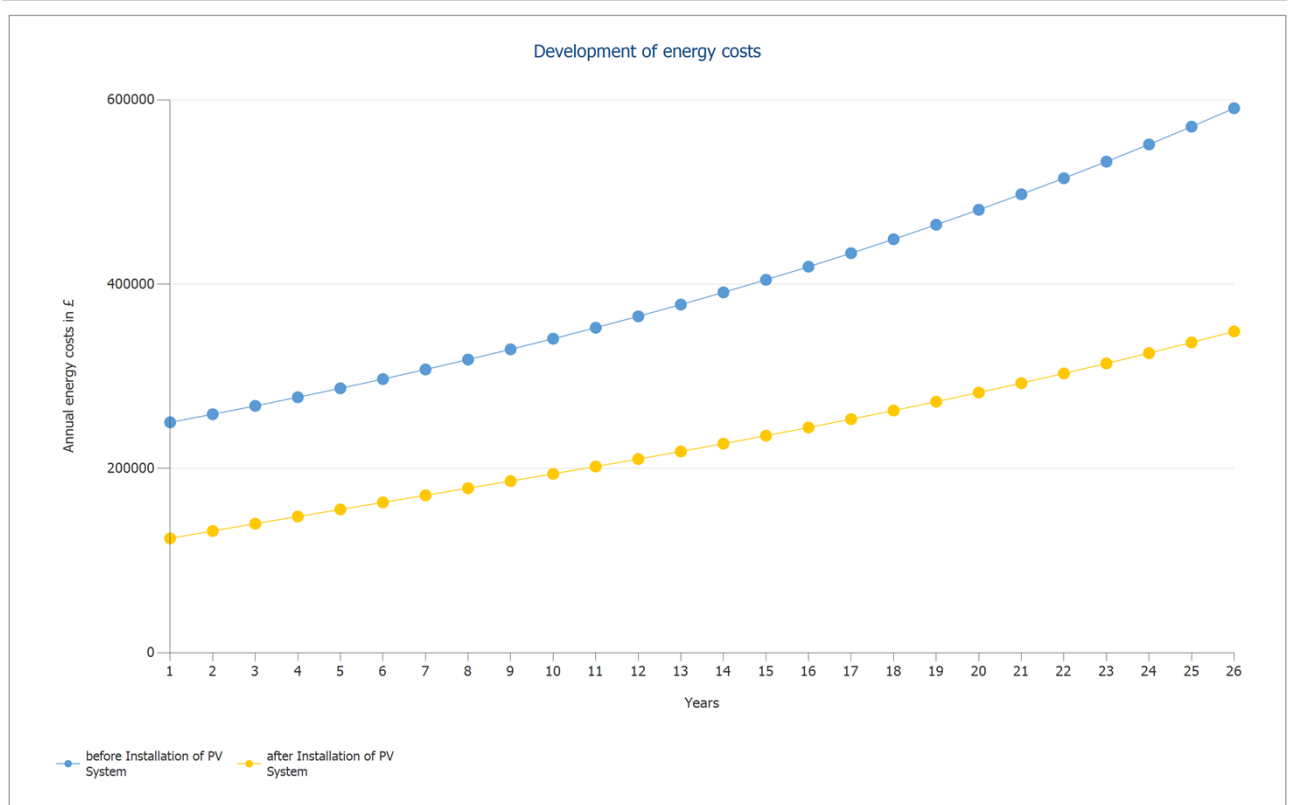


Figure: Development of energy costs

Cash flow

Cash flow

	Year 1	Year 2	Year 3	Year 4	Year 5
Investments	-£869,840.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£52,466.65	£52,863.93	£52,564.36	£52,440.28	£52,471.12
Electricity Savings	£125,610.85	£126,675.32	£127,844.87	£129,447.86	£131,452.25
Annual Cash Flow	-£691,762.50	£179,539.26	£180,409.22	£181,888.14	£183,923.36
Accrued Cash Flow (Cash Balance)	-£691,762.50	-£512,223.24	-£331,814.02	-£149,925.88	£33,997.49

Cash flow

	Year 6	Year 7	Year 8	Year 9	Year 10
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£52,639.10	£52,928.84	£53,327.09	£53,822.40	£54,404.89
Electricity Savings	£133,830.55	£136,559.38	£139,618.84	£142,992.25	£146,665.64
Annual Cash Flow	£186,469.64	£189,488.22	£192,945.94	£196,814.65	£201,070.54
Accrued Cash Flow (Cash Balance)	£220,467.13	£409,955.35	£602,901.29	£799,715.94	£1,000,786.48

Cash flow

	Year 11	Year 12	Year 13	Year 14	Year 15
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£55,066.08	£55,798.65	£56,596.35	£57,453.80	£58,366.40
Electricity Savings	£150,627.79	£154,869.39	£159,383.35	£164,164.25	£169,208.48
Annual Cash Flow	£205,693.87	£210,668.05	£215,979.70	£221,618.05	£227,574.88
Accrued Cash Flow (Cash Balance)	£1,206,480.35	£1,417,148.39	£1,633,128.10	£1,854,746.15	£2,082,321.03

Cash flow

	Year 16	Year 17	Year 18	Year 19	Year 20
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£59,330.24	£60,342.00	£61,398.86	£62,498.46	£63,638.80
Electricity Savings	£174,513.54	£180,078.50	£185,903.60	£191,989.90	£198,339.82
Annual Cash Flow	£233,843.78	£240,420.50	£247,302.46	£254,488.36	£261,978.63
Accrued Cash Flow (Cash Balance)	£2,316,164.81	£2,556,585.31	£2,803,887.77	£3,058,376.13	£3,320,354.76

Cash flow

	Year 21	Year 22	Year 23	Year 24	Year 25
Investments	£0.00	£0.00	£0.00	£0.00	£0.00
Feed-in / Export Tariff	£0.00	£0.00	£0.00	£0.00	£0.00
Electricity Savings	£204,956.50	£211,843.77	£219,006.66	£226,450.33	£234,181.26
Annual Cash Flow	£204,956.50	£211,843.77	£219,006.66	£226,450.33	£234,181.26
Accrued Cash Flow (Cash Balance)	£3,525,311.26	£3,737,155.04	£3,956,161.70	£4,182,612.03	£4,416,793.29

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

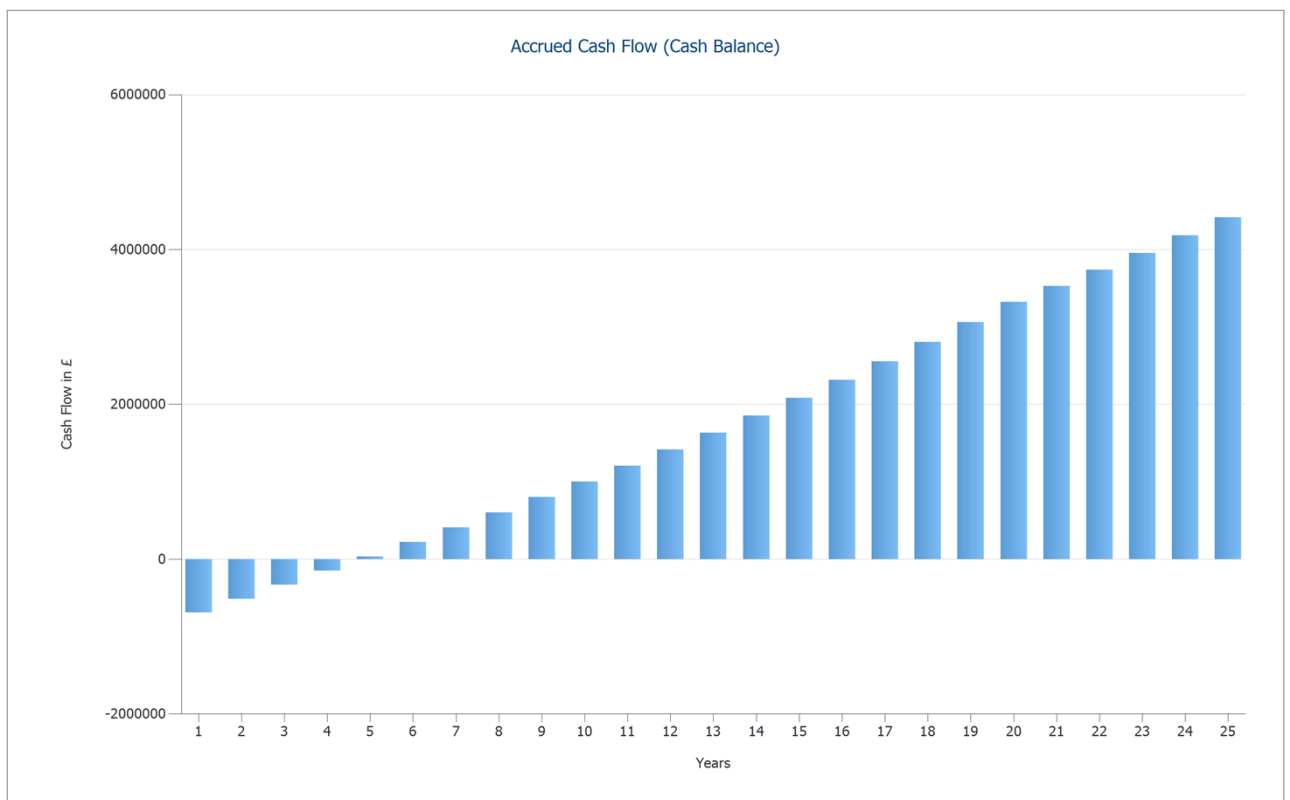
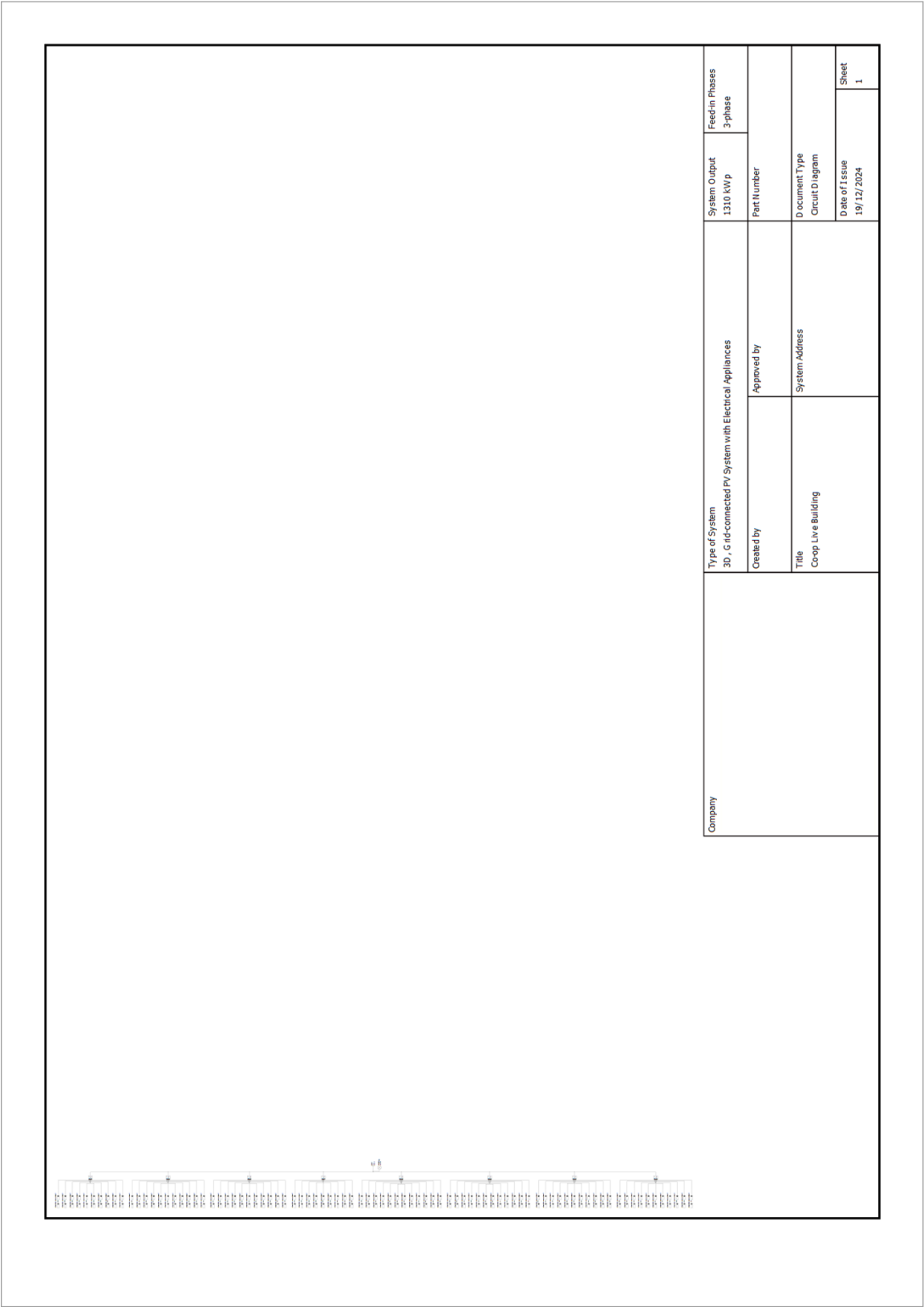


Figure: Accrued Cash Flow (Cash Balance)

Plans and parts list

Circuit Diagram



Company	Type of System 3D / Grid-connected PV System with Electrical Appliances		System Output 1310 kWp	Feed-in Phases 3-phase
	Created by	Approved by	Part Number	
	Title Coop Live Building	System Address	Document Type Circuit Diagram	
			Date of Issue 19/12/2024	Sheet 1

Figure: Circuit Diagram

Overview plan

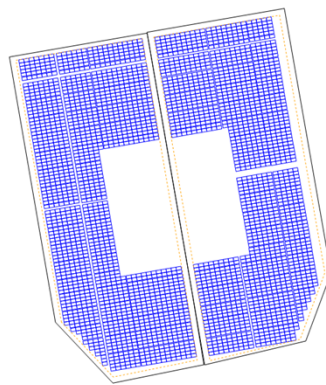


Figure: Overview plan

Dimensioning Plan

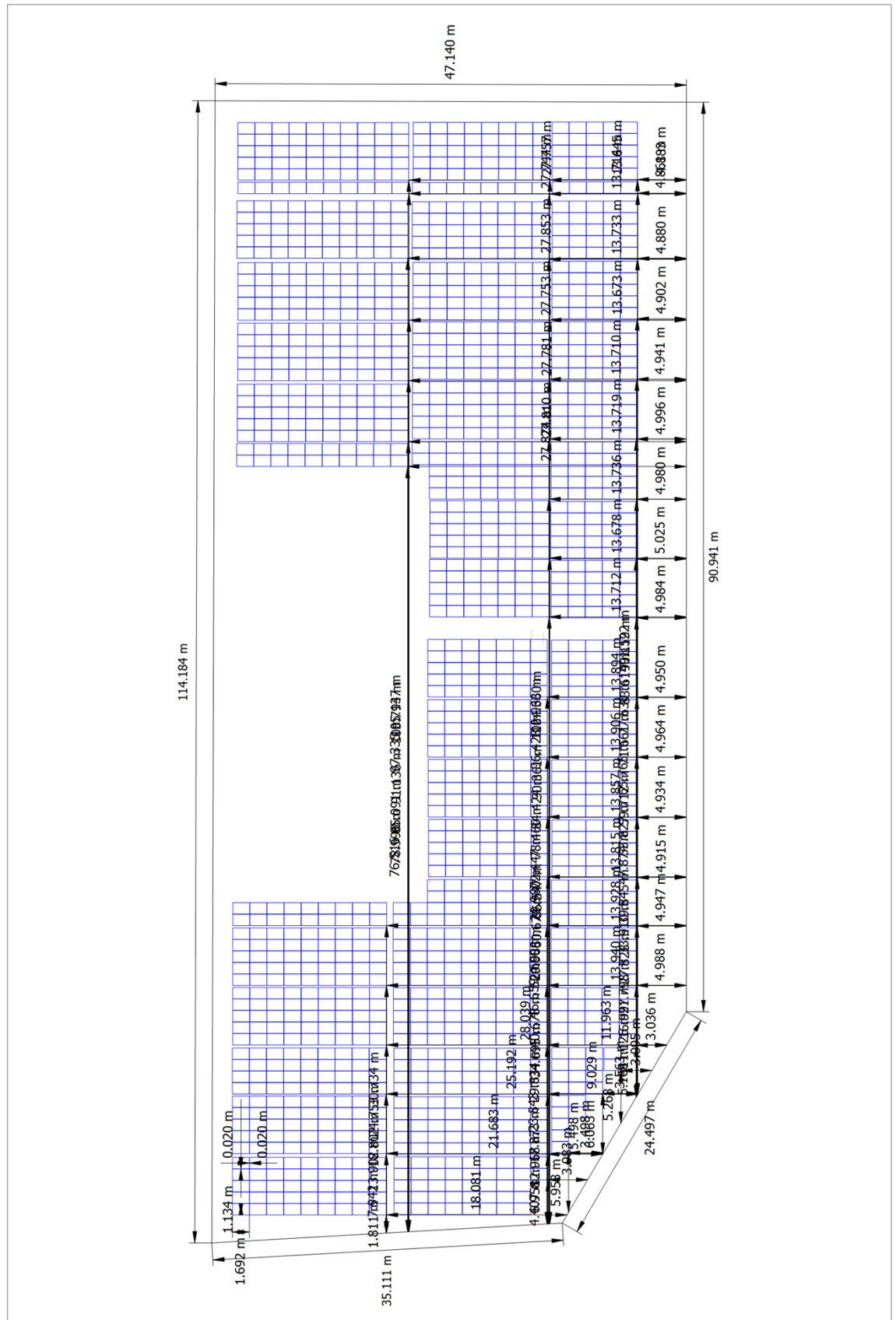


Figure: Arbitrary Building 04 - Mounting Surface South

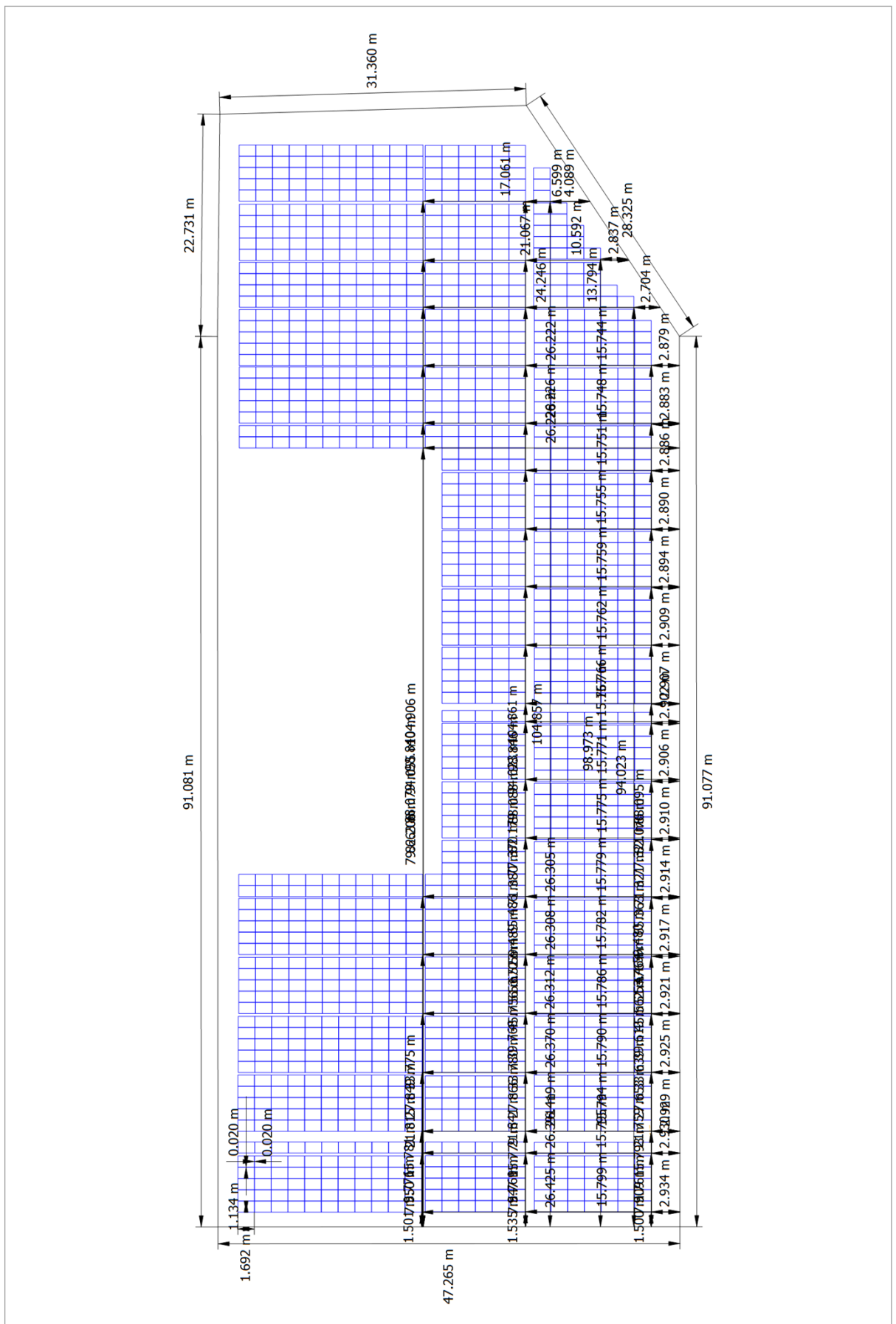


Figure: Arbitrary Building 03 - Mounting Surface North

String Plan

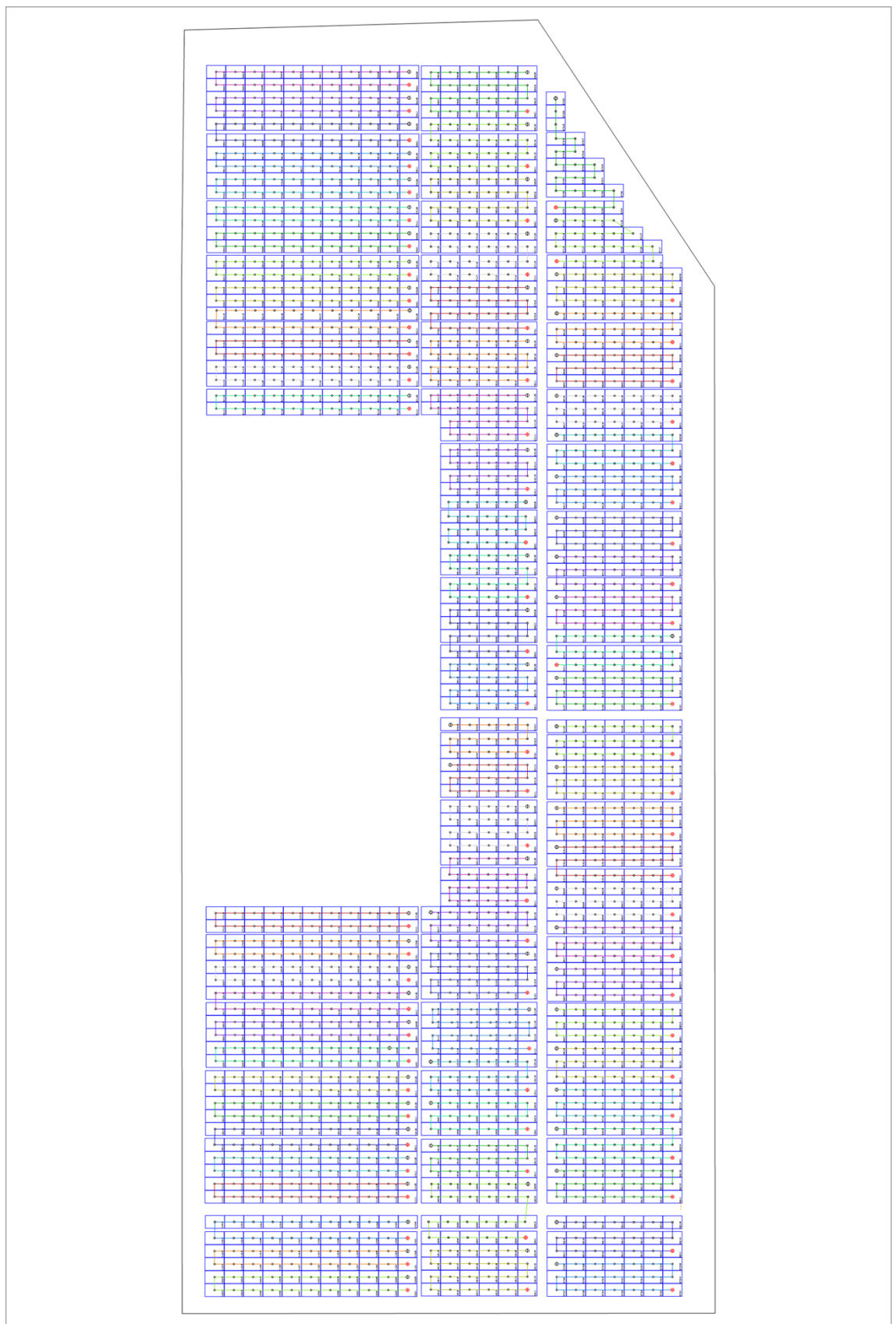


Figure: Arbitrary Building 03 - Mounting Surface North

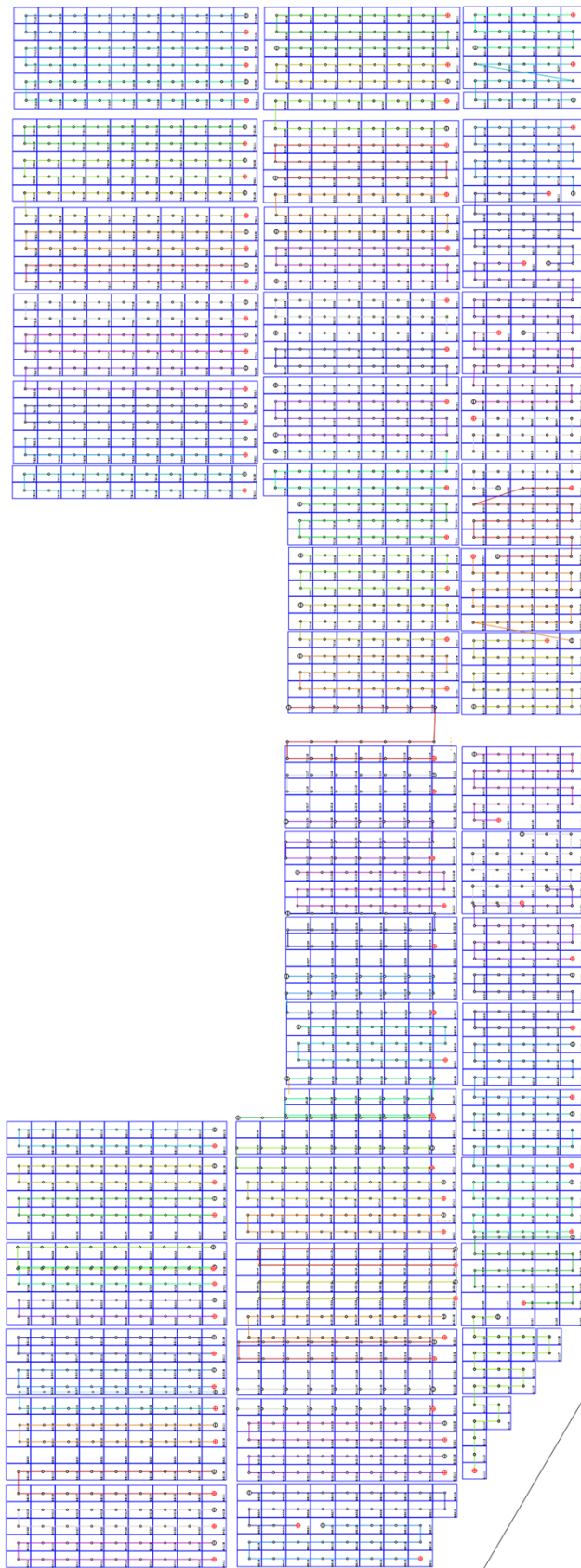


Figure: Arbitrary Building 04 - Mounting Surface South

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Hanwha Q.CELLS	Q.PEAK DUO BLK M-G11 400 Rev1	3275	Piece
2	Inverter		SMA Solar Technology AG	Sunny Tripower CORE2	8	Piece

Screenshots, 3D Design Environment

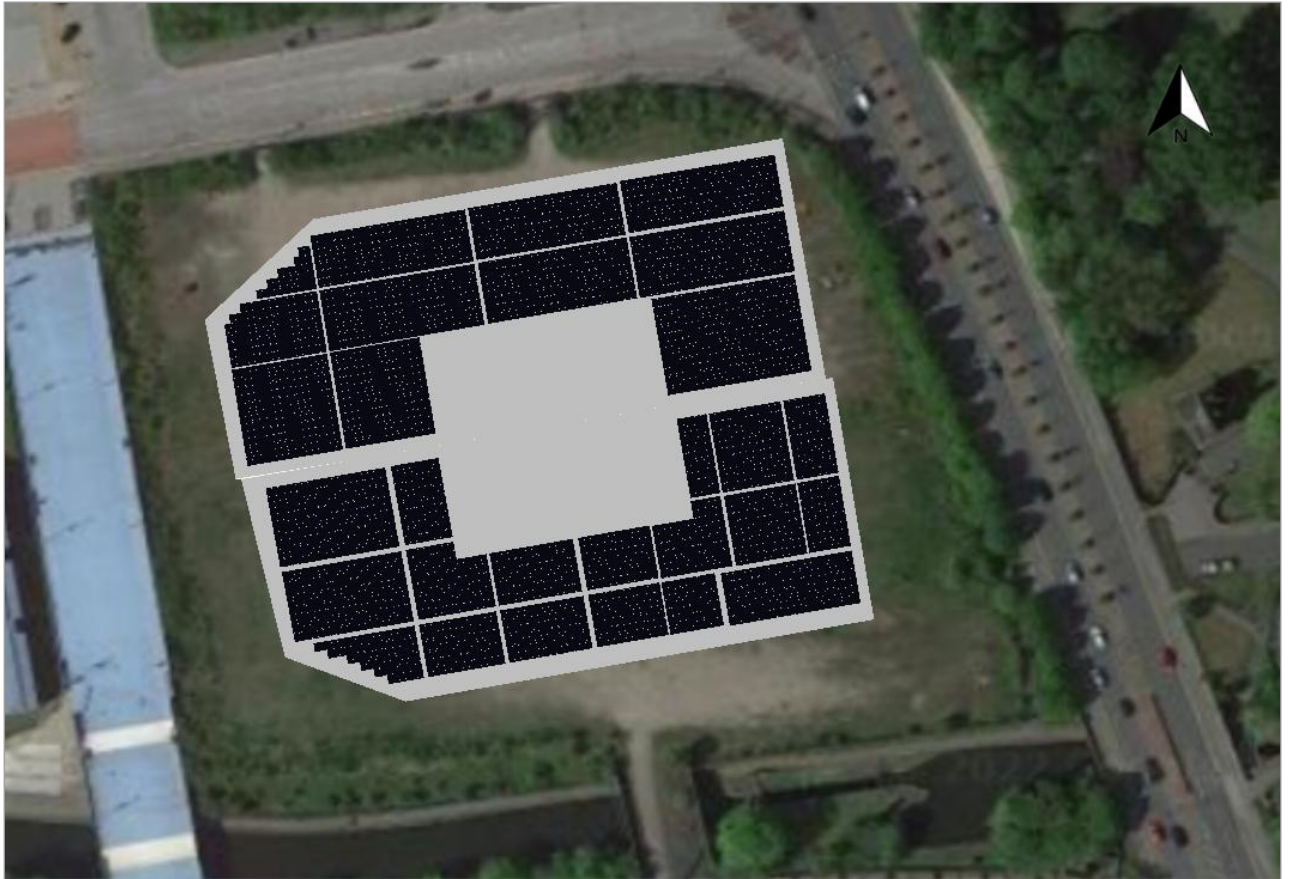


Figure: Screenshot01