

North End/Park Corner Road  
Betsham  
Kent  
DA13 9LJ

**Customer No.:** Stop-24-CT21-4BL-2023-KASG-141-Q  
**Project Name:** Storefast Betsham  
**Offer no.:** Storefast-Solutions-DA13-9LJ-2023-139-SG-Q

14/08/2023

## Your PV system

### Address of Installation

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North End/Park Corner Road  
Betsham  
Kent  
DA13 9LJ

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## Project Overview

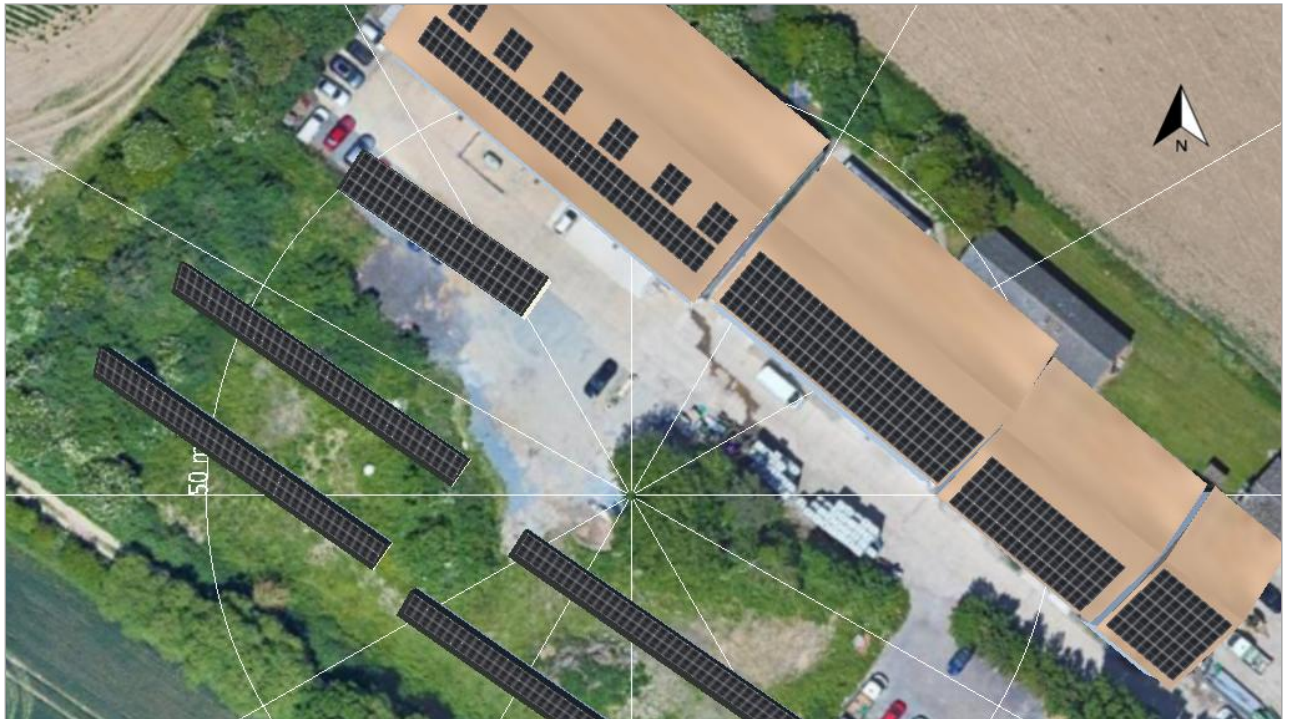


Figure: Overview Image, 3D Design

## PV System

### 3D, Grid-connected PV System with Electrical Appliances

Climate Data	South East England (SAP 2012), GBR (-)
Values source	SAP 2012
PV Generator Output	328.1 kWp
PV Generator Surface	1,497.6 m <sup>2</sup>
Number of PV Modules	772
Number of Inverters	13

# Storefast Betsham

Offer Number: Storefast-Solutions-DA13-9LJ-2023-139-SG-Q

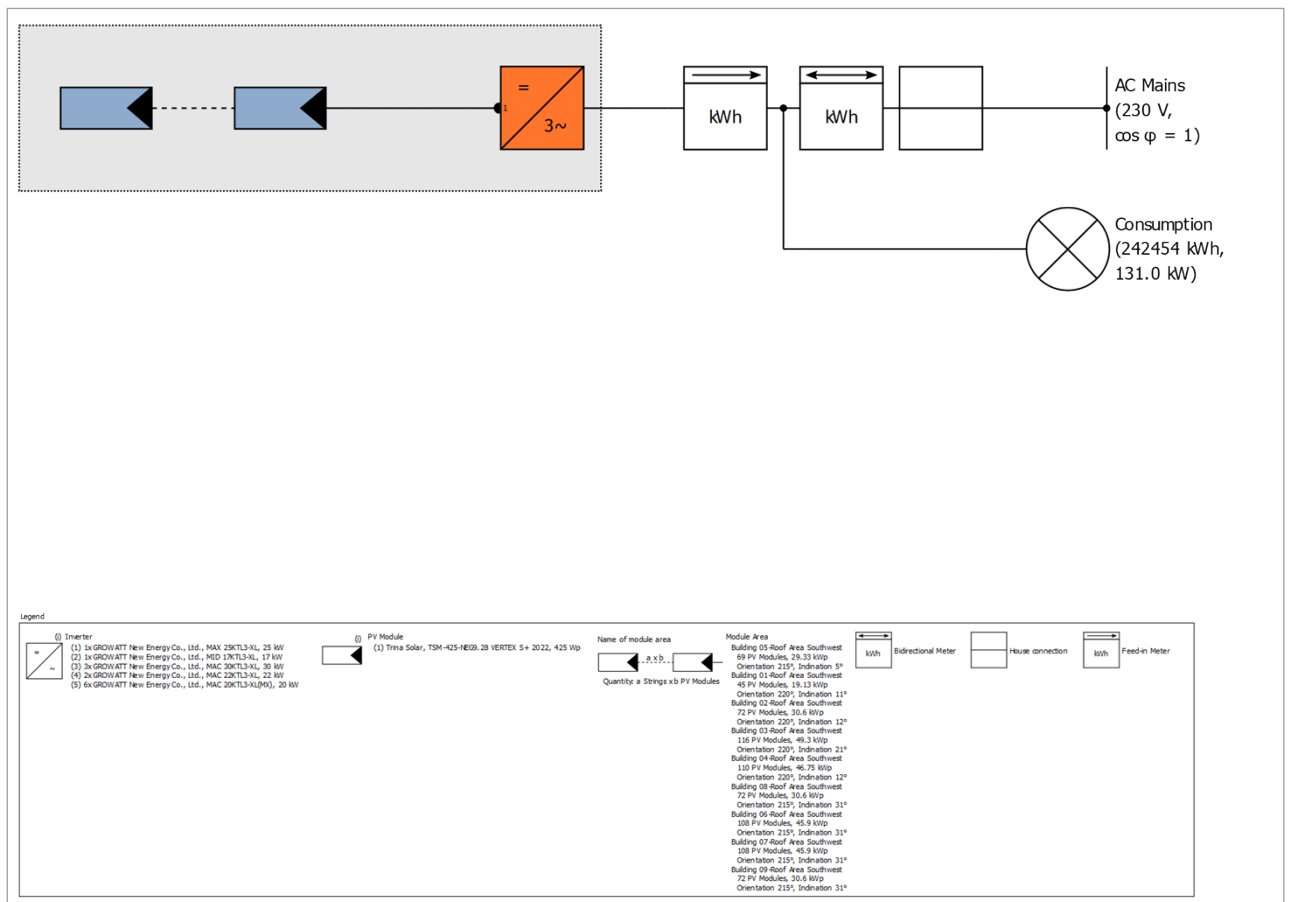


Figure: Schematic diagram

## Production Forecast

### Production Forecast

PV Generator Output	328.10 kWp
Spec. Annual Yield	1,057.39 kWh/kWp
Performance Ratio (PR)	93.40 %
Yield Reduction due to Shading	1.4 %
PV Generator Energy (AC grid)	347,044 kWh/Year
Own Consumption	130,162 kWh/Year
Down-regulation at Feed-in Point	0 kWh/Year
Grid Export	216,883 kWh/Year
Own Power Consumption	37.5 %
CO <sub>2</sub> Emissions avoided	163,057 kg / year
Level of Self-sufficiency	53.7 %

# Set-up of the System

## Overview

### System Data

Type of System	3D, Grid-connected PV System with Electrical Appliances
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### Climate Data

Location	South East England (SAP 2012), GBR ( - )
Values source	SAP 2012
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

### Consumption

Total Consumption	242454 kWh
Storefast Betsham	242454 kWh
Load Peak	131 kW

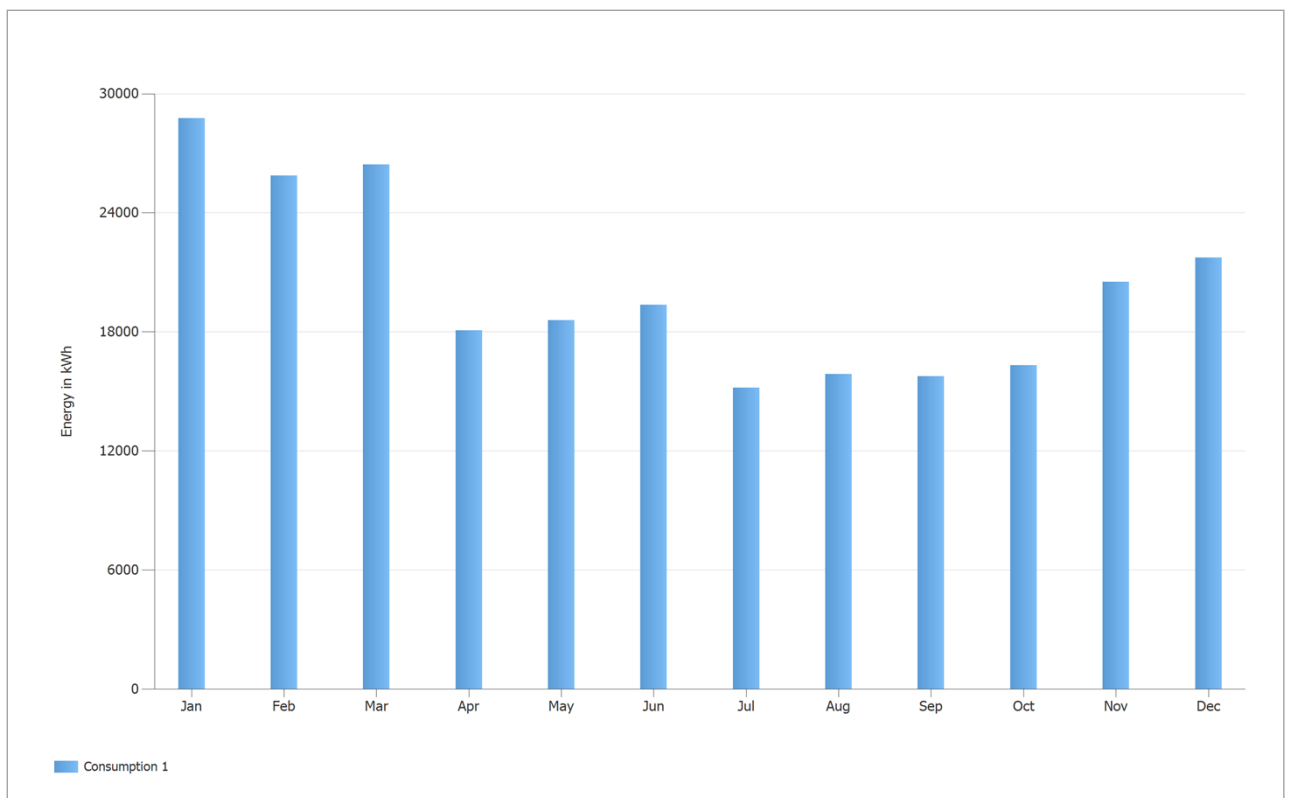


Figure: Consumption

## Module Areas

### 1. Module Area - Building 05-Roof Area Southwest

#### PV Generator, 1. Module Area - Building 05-Roof Area Southwest

Name	Building 05-Roof Area Southwest
PV Modules	69 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	5 °
Orientation	Southwest 215 °
Installation Type	Roof parallel
PV Generator Surface	133.9 m <sup>2</sup>



Figure: 1. Module Area - Building 05-Roof Area Southwest

### 2. Module Area - Building 01-Roof Area Southwest

#### PV Generator, 2. Module Area - Building 01-Roof Area Southwest

Name	Building 01-Roof Area Southwest
PV Modules	45 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	11 °
Orientation	Southwest 220 °
Installation Type	Roof parallel
PV Generator Surface	87.3 m²



Figure: 2. Module Area - Building 01-Roof Area Southwest



### 3. Module Area - Building 02-Roof Area Southwest

#### PV Generator, 3. Module Area - Building 02-Roof Area Southwest

Name	Building 02-Roof Area Southwest
PV Modules	72 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	12 °
Orientation	Southwest 220 °
Installation Type	Roof parallel
PV Generator Surface	139.7 m²

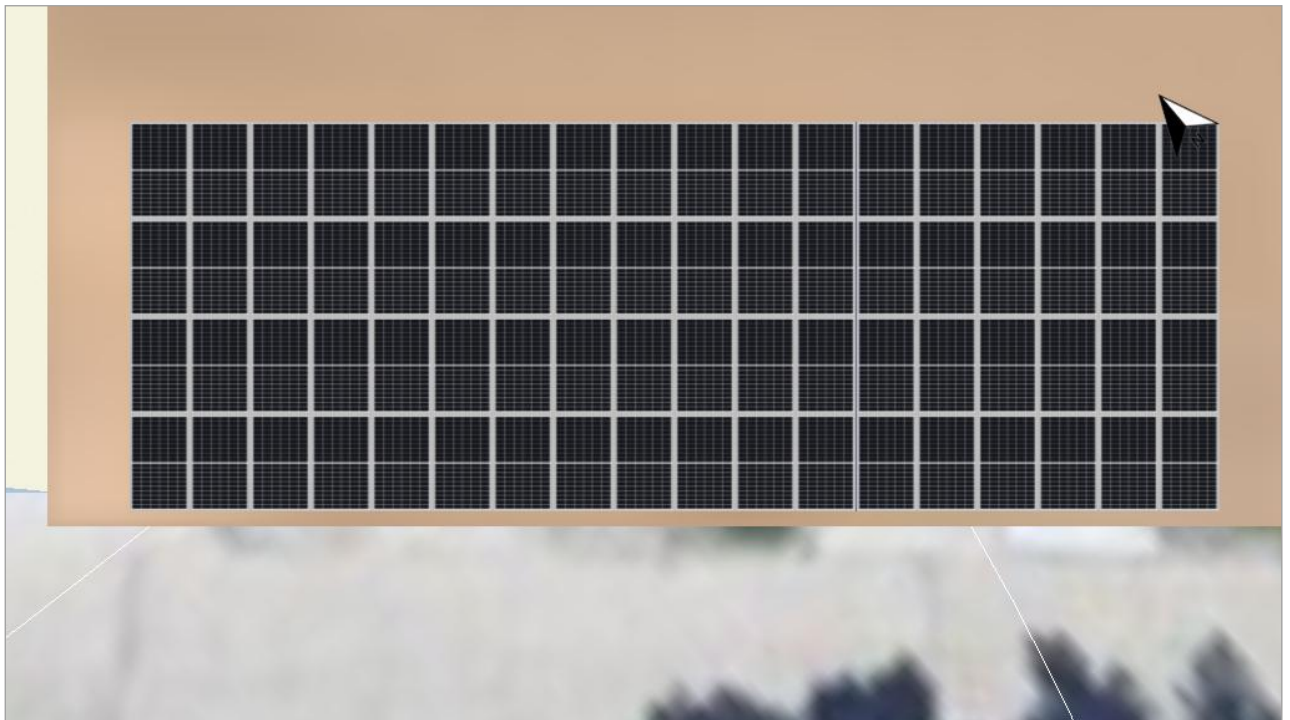


Figure: 3. Module Area - Building 02-Roof Area Southwest

### 4. Module Area - Building 03-Roof Area Southwest

#### PV Generator, 4. Module Area - Building 03-Roof Area Southwest

Name	Building 03-Roof Area Southwest
PV Modules	116 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	21 °
Orientation	Southwest 220 °
Installation Type	Roof parallel
PV Generator Surface	225.0 m <sup>2</sup>

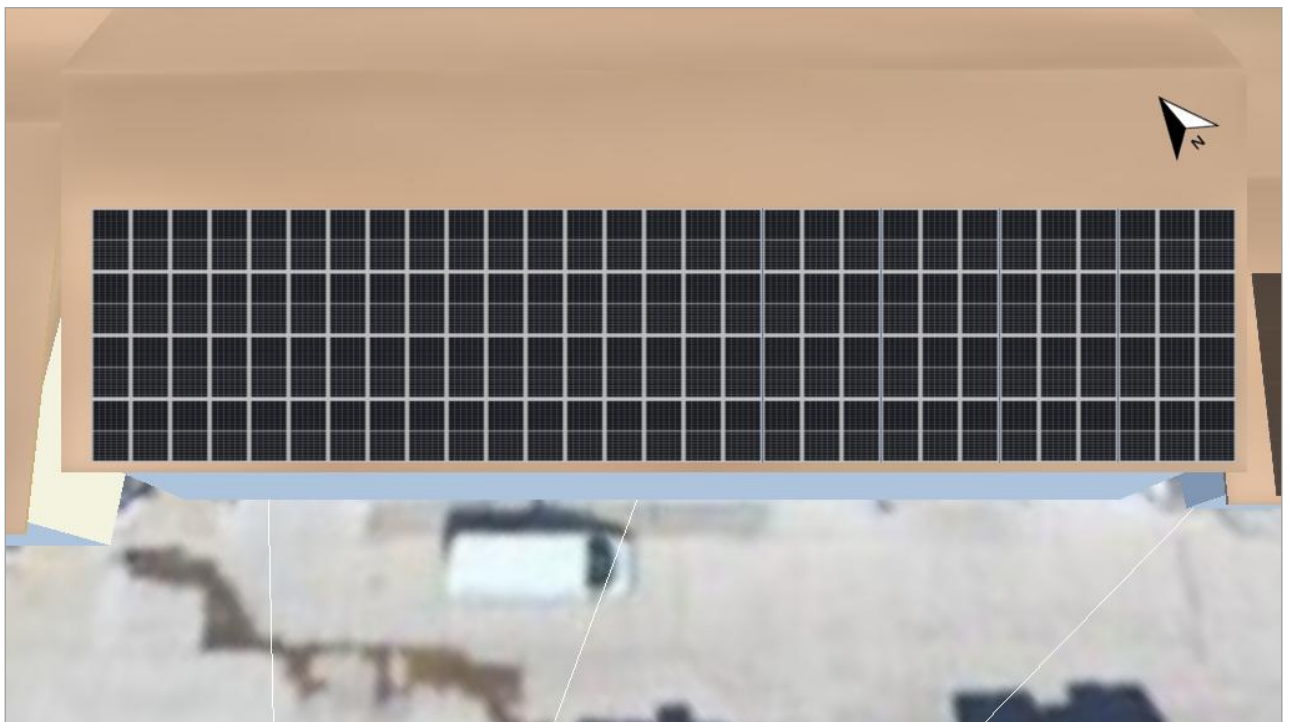


Figure: 4. Module Area - Building 03-Roof Area Southwest



## 5. Module Area - Building 04-Roof Area Southwest

### PV Generator, 5. Module Area - Building 04-Roof Area Southwest

Name	Building 04-Roof Area Southwest
PV Modules	110 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	12 °
Orientation	Southwest 220 °
Installation Type	Roof parallel
PV Generator Surface	213.4 m²

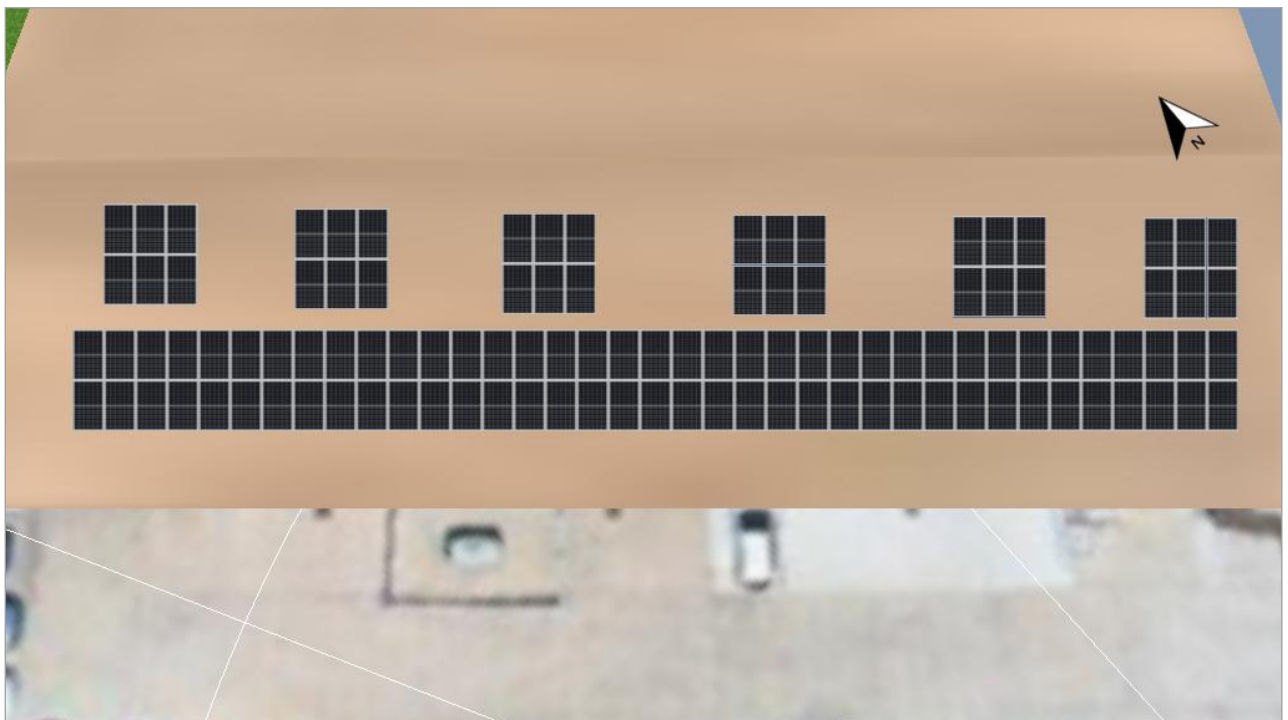


Figure: 5. Module Area - Building 04-Roof Area Southwest

### 6. Module Area - Building 08-Roof Area Southwest

#### PV Generator, 6. Module Area - Building 08-Roof Area Southwest

Name	Building 08-Roof Area Southwest
PV Modules	72 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	31 °
Orientation	Southwest 215 °
Installation Type	Roof parallel
PV Generator Surface	139.7 m²



Figure: 6. Module Area - Building 08-Roof Area Southwest

## 7. Module Area - Building 06-Roof Area Southwest

### PV Generator, 7. Module Area - Building 06-Roof Area Southwest

Name	Building 06-Roof Area Southwest
PV Modules	108 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	31 °
Orientation	Southwest 215 °
Installation Type	Roof parallel
PV Generator Surface	209.5 m²

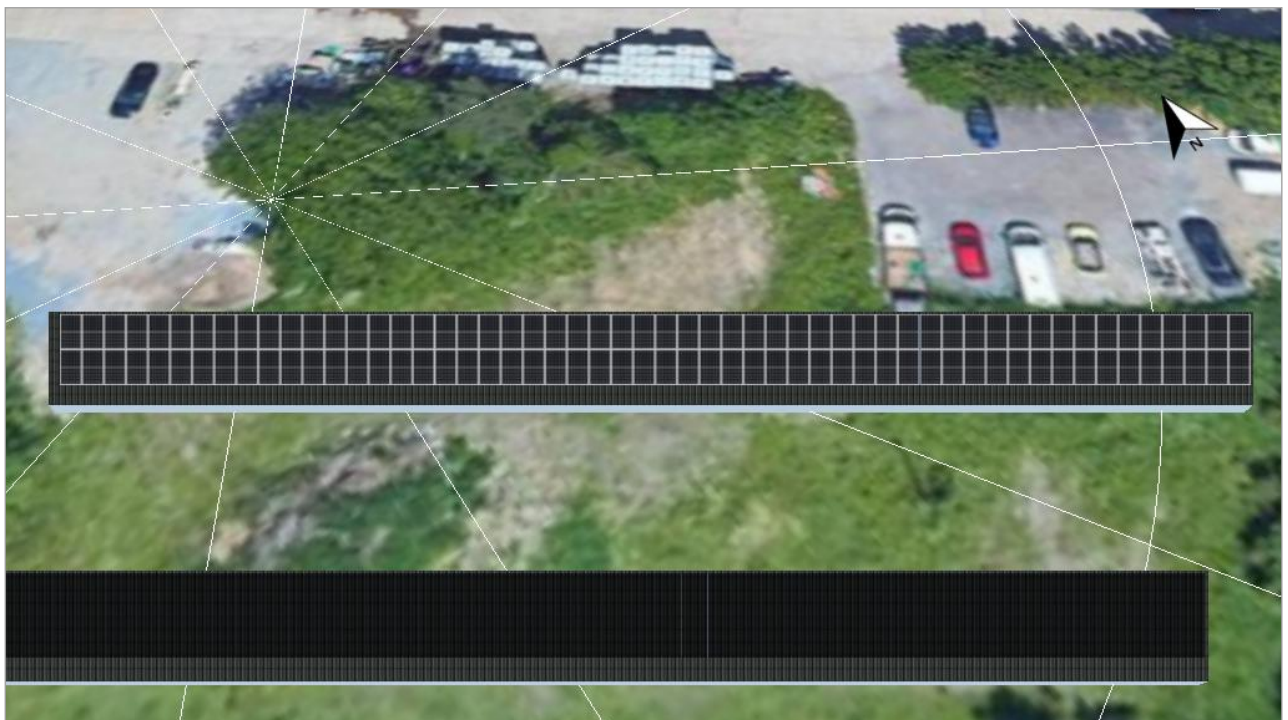


Figure: 7. Module Area - Building 06-Roof Area Southwest

## 8. Module Area - Building 07-Roof Area Southwest

### PV Generator, 8. Module Area - Building 07-Roof Area Southwest

Name	Building 07-Roof Area Southwest
PV Modules	108 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	31 °
Orientation	Southwest 215 °
Installation Type	Roof parallel
PV Generator Surface	209.5 m²



Figure: 8. Module Area - Building 07-Roof Area Southwest



## 9. Module Area - Building 09-Roof Area Southwest

### PV Generator, 9. Module Area - Building 09-Roof Area Southwest

Name	Building 09-Roof Area Southwest
PV Modules	72 x TSM-425-NEG9.28 VERTEX S+ 2022 (v1)
Manufacturer	Trina Solar
Inclination	31 °
Orientation	Southwest 215 °
Installation Type	Roof parallel
PV Generator Surface	139.7 m²

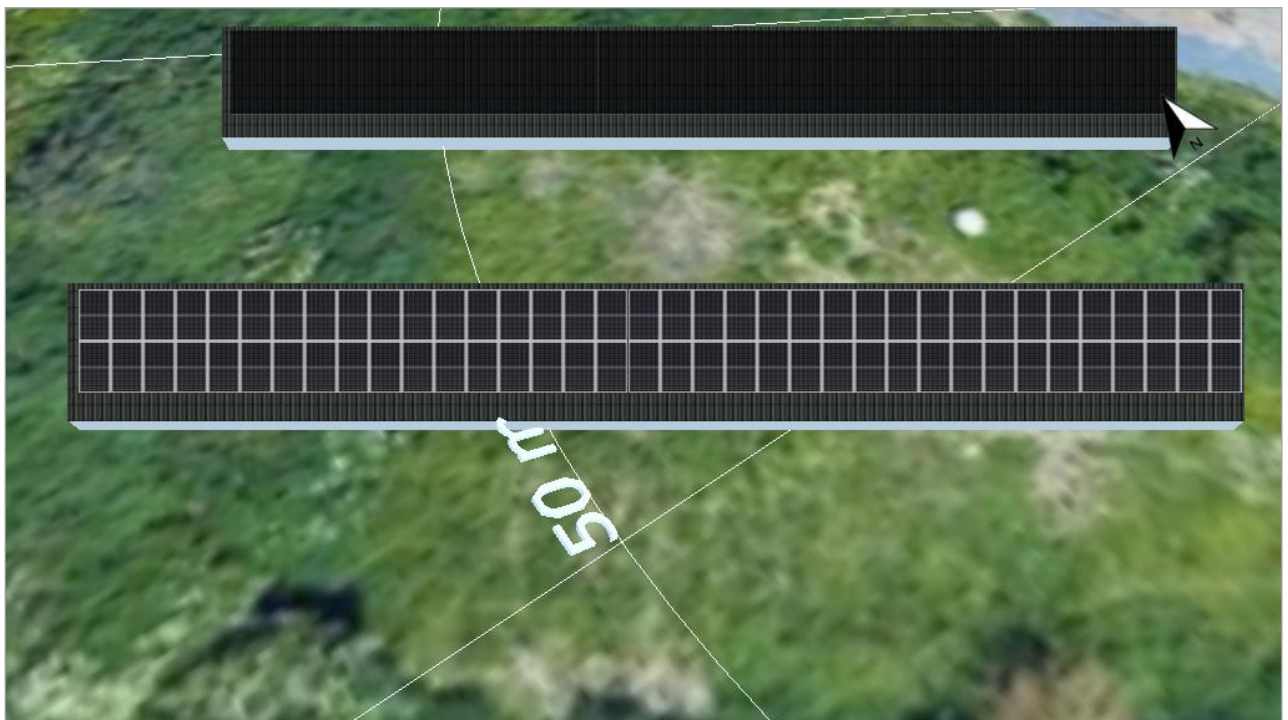


Figure: 9. Module Area - Building 09-Roof Area Southwest

## Horizon Line, 3D Design

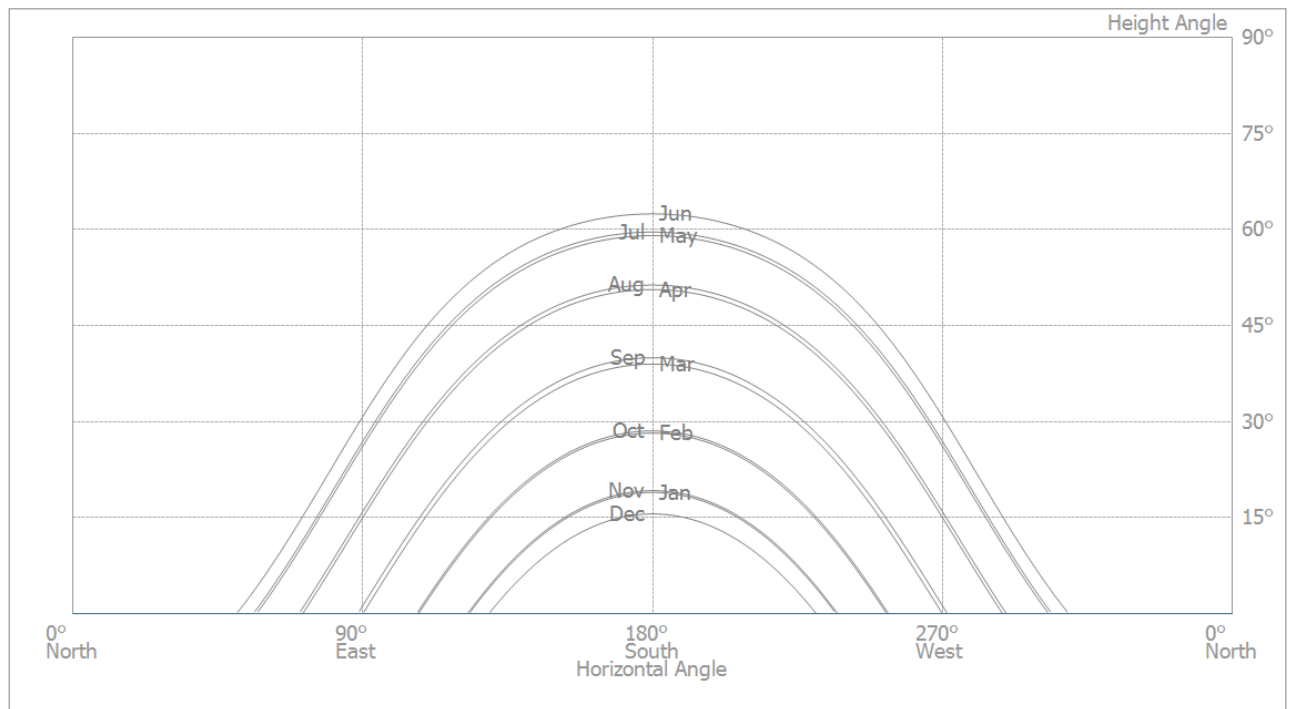


Figure: Horizon (3D Design)

## Inverter configuration

### Configuration 1

Module Area	Building 05-Roof Area Southwest
Inverter 1	
Model	MAX 25KTL3-XL (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	1
Sizing Factor	117.3 %
Configuration	MPP 1: 2 x 7
	MPP 2: 1 x 11
	MPP 3: 1 x 11
	MPP 4: 1 x 11
	MPP 5: 1 x 11
	MPP 6: 1 x 11

### Configuration 2

Module Area	Building 01-Roof Area Southwest
Inverter 1	
Model	MID 17KTL3-XL (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	1
Sizing Factor	112.5 %
Configuration	MPP 1: 1 x 12
	MPP 2: 1 x 11
	MPP 3: 1 x 11
	MPP 4: 1 x 11



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### Configuration 3

Module Area	Building 02-Roof Area Southwest
Inverter 1	
Model	MAC 30KTL3-XL (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	1
Sizing Factor	102 %
Configuration	MPP 1: 2 x 12
	MPP 2: 2 x 12
	MPP 3: 2 x 12

### Configuration 4

Module Area	Building 03-Roof Area Southwest
Inverter 1	
Model	MAC 22KTL3-XL (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	2
Sizing Factor	112 %
Configuration	MPP 1: 2 x 10
	MPP 2: 1 x 19
	MPP 3: 1 x 19

### Configuration 5

Module Area	Building 04-Roof Area Southwest
Inverter 1	
Model	MAC 20KTL3-XL(MX) (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	2
Sizing Factor	116.9 %
Configuration	MPP 1: 2 x 10
	MPP 2: 1 x 13
	MPP 3: 1 x 12
	MPP 4: 1 x 10

### Configuration 6

Module Area	Building 08-Roof Area Southwest
Inverter 1	
Model	MAC 30KTL3-XL (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	1
Sizing Factor	102 %
Configuration	MPP 1: 2 x 12
	MPP 2: 2 x 12
	MPP 3: 2 x 12

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### Configuration 7

Module Area	Building 06-Roof Area Southwest
Inverter 1	
Model	MAC 20KTL3-XL(MX) (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	2
Sizing Factor	114.8 %
Configuration	MPP 1: 2 x 10
	MPP 2: 1 x 13
	MPP 3: 1 x 11
	MPP 4: 1 x 10

### Configuration 8

Module Area	Building 07-Roof Area Southwest
Inverter 1	
Model	MAC 20KTL3-XL(MX) (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	2
Sizing Factor	114.8 %
Configuration	MPP 1: 2 x 10
	MPP 2: 1 x 13
	MPP 3: 1 x 11
	MPP 4: 1 x 10

### Configuration 9

Module Area	Building 09-Roof Area Southwest
Inverter 1	
Model	MAC 30KTL3-XL (v1)
Manufacturer	GROWATT New Energy Co., Ltd.
Quantity	1
Sizing Factor	102 %
Configuration	MPP 1: 2 x 12
	MPP 2: 2 x 12
	MPP 3: 2 x 12

## AC Mains

### AC Mains

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

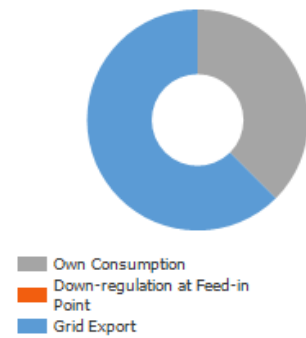
# Simulation Results

## Results Total System

### PV System

PV Generator Output	328.10 kWp
Spec. Annual Yield	1,057.39 kWh/kWp
Performance Ratio (PR)	93.40 %
Yield Reduction due to Shading	1.4 %
PV Generator Energy (AC grid)	347,044 kWh/Year
Own Consumption	130,162 kWh/Year
Down-regulation at Feed-in Point	0 kWh/Year
Grid Export	216,883 kWh/Year
Own Power Consumption	37.5 %
CO <sub>2</sub> Emissions avoided	163,057 kg / year

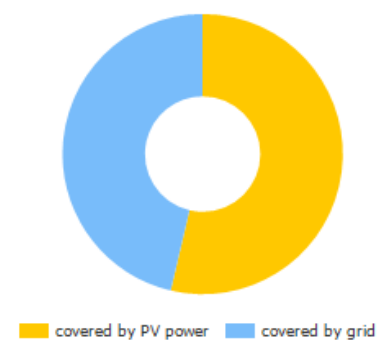
PV Generator Energy (AC grid)



### Appliances

Appliances	242,454 kWh/Year
Standby Consumption (Inverter)	115 kWh/Year
Total Consumption	242,569 kWh/Year
covered by PV power	130,162 kWh/Year
covered by grid	112,407 kWh/Year
Solar Fraction	53.7 %

Total Consumption



### Level of Self-sufficiency

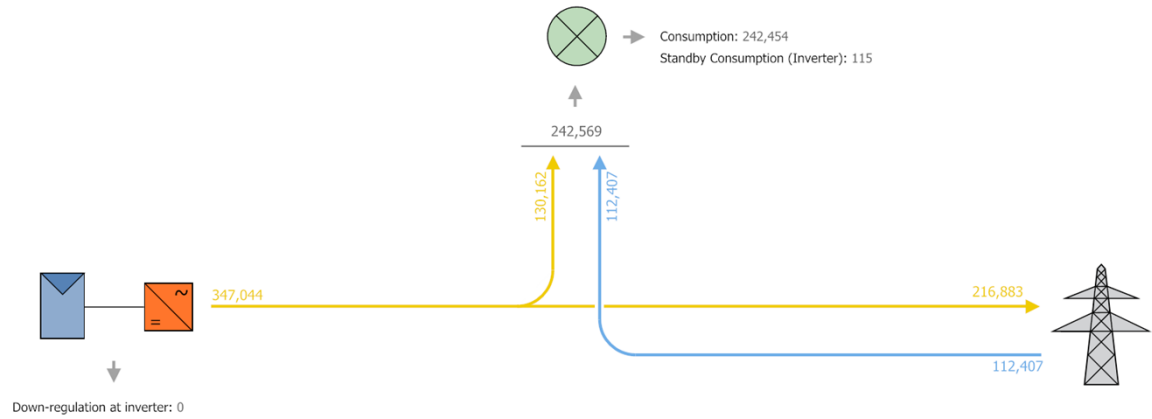
Total Consumption	242,569 kWh/Year
covered by grid	112,407 kWh/Year
Level of Self-sufficiency	53.7 %

## Storefast Betsham

Offer Number: Storefast-Solutions-DA13-9LJ-2023-139-SG-Q

### Energy Flow Graph

Project: Storefast Betsham



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

Figure: Energy flow

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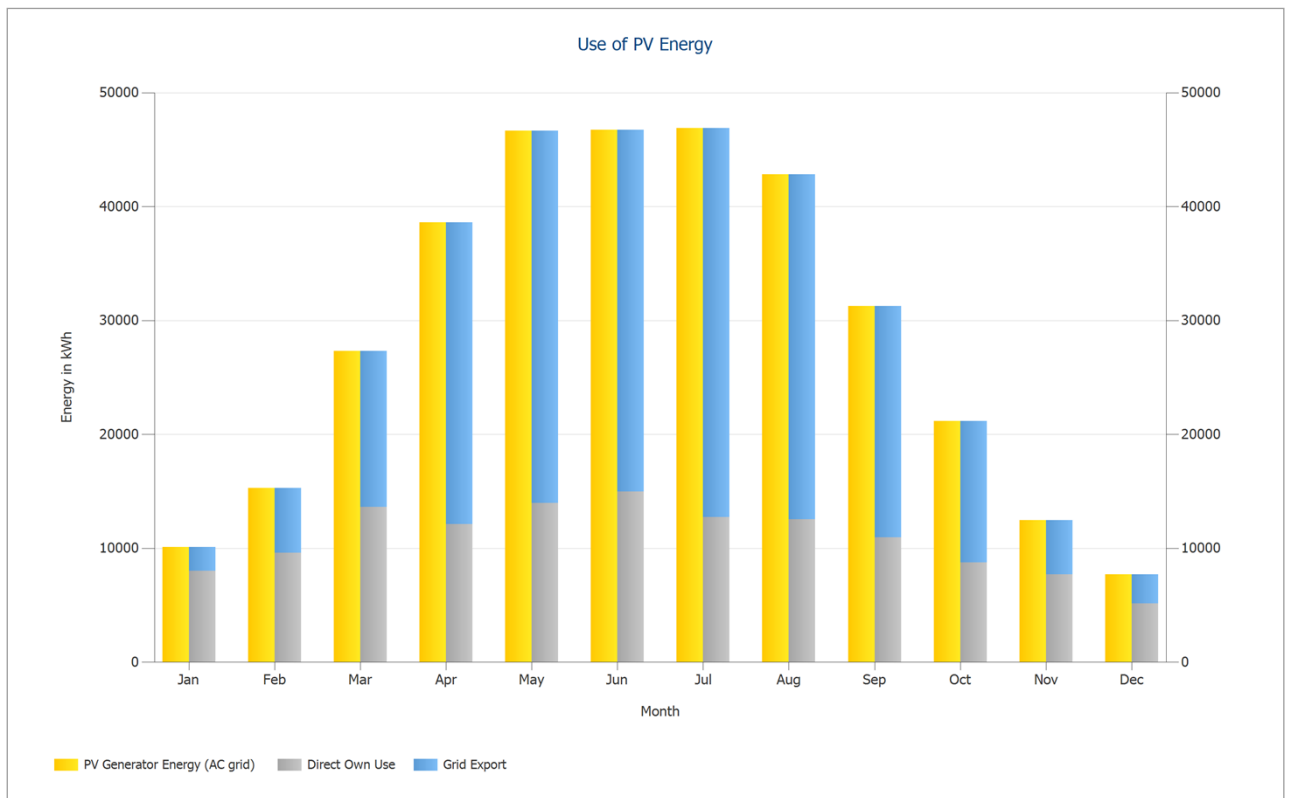


Figure: Use of PV Energy

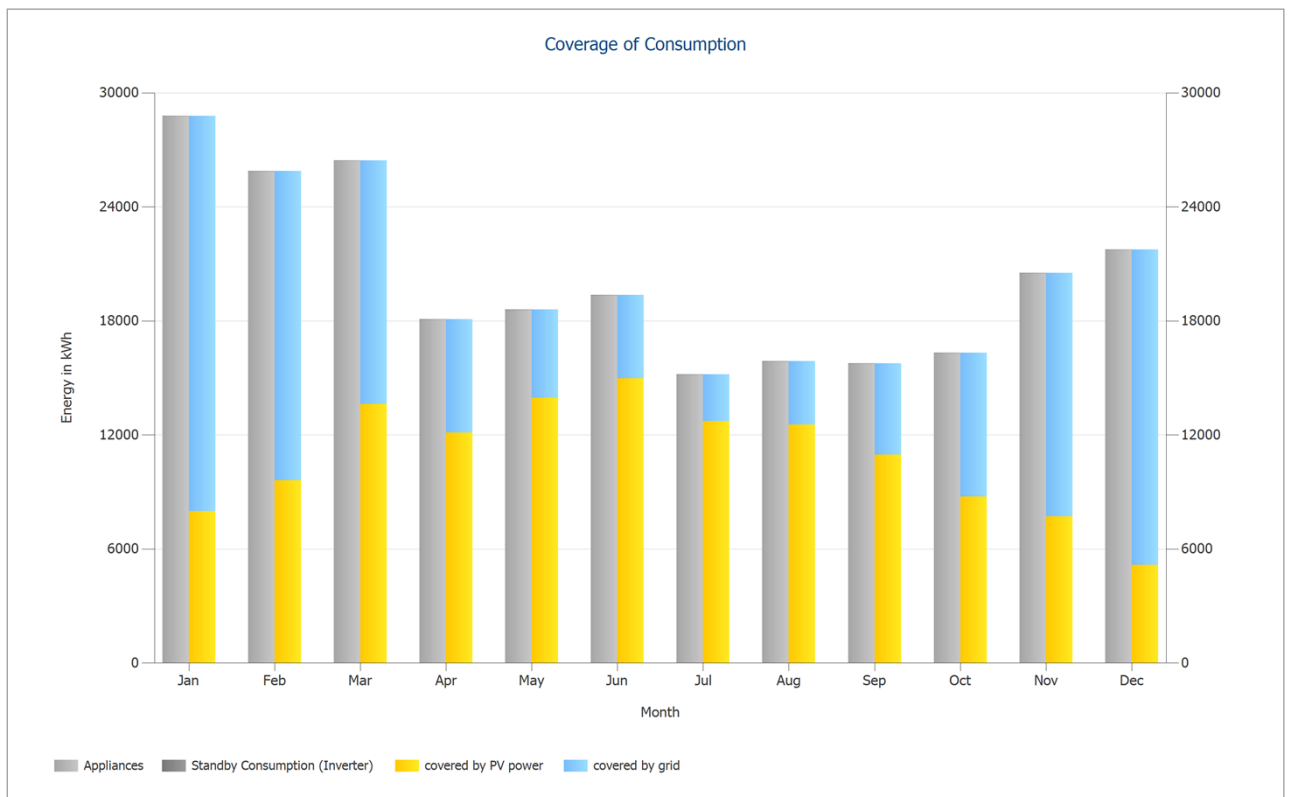


Figure: Coverage of Consumption

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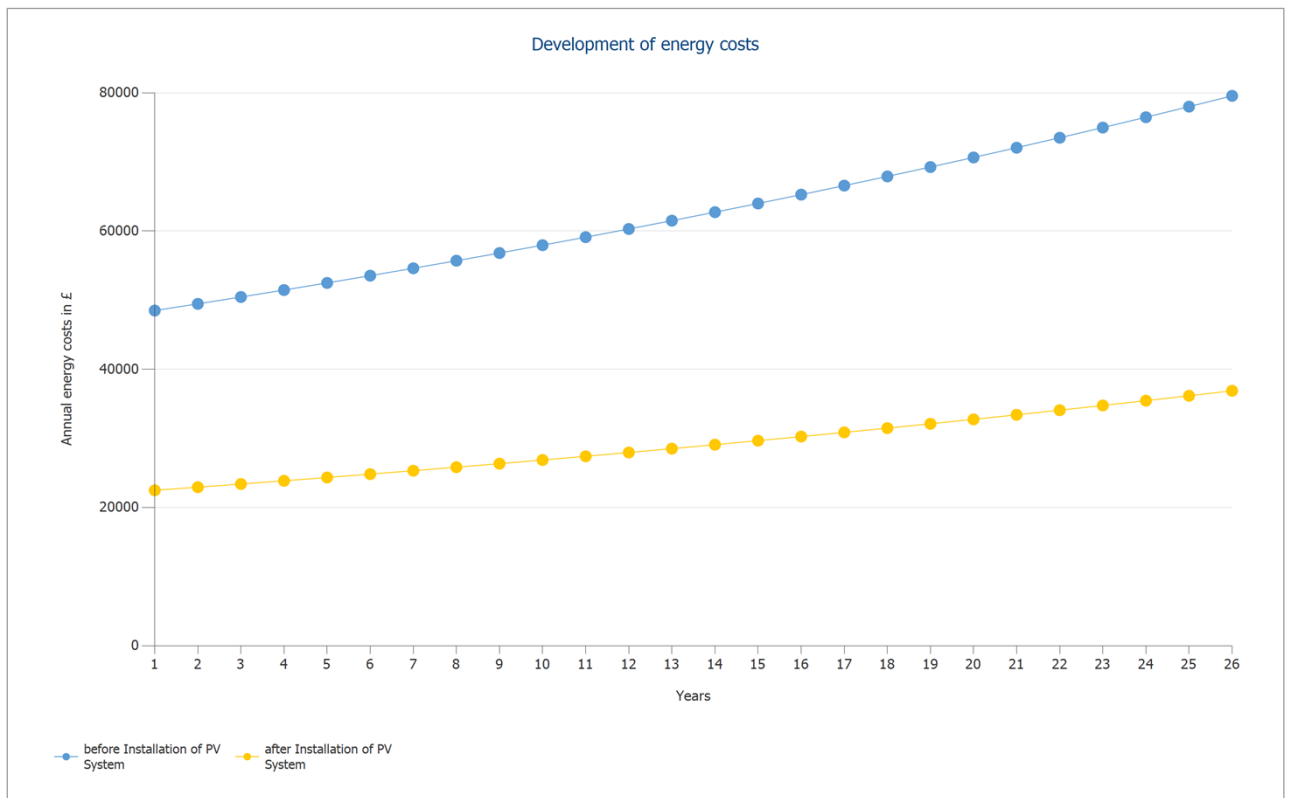


Figure: Development of energy costs



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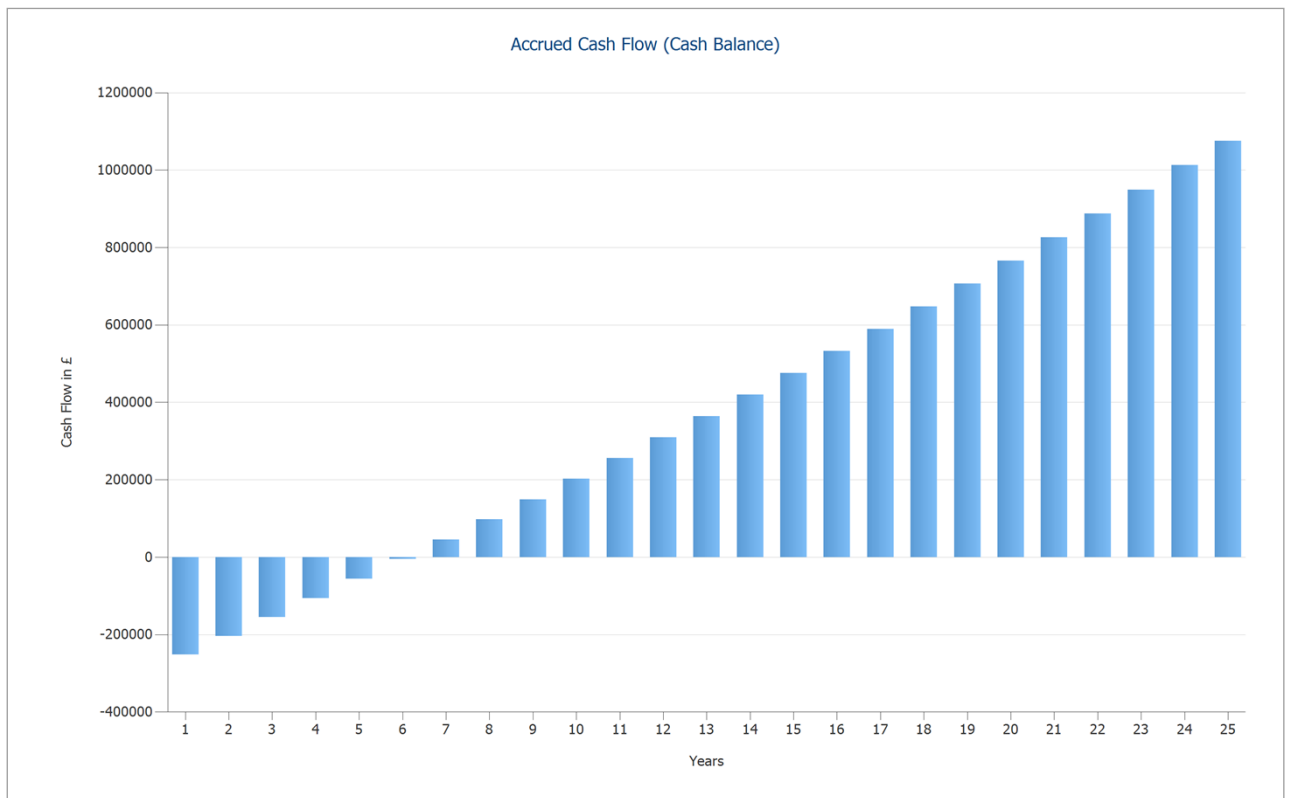


Figure: Accrued Cash Flow (Cash Balance)

Plans and parts list

Circuit Diagram

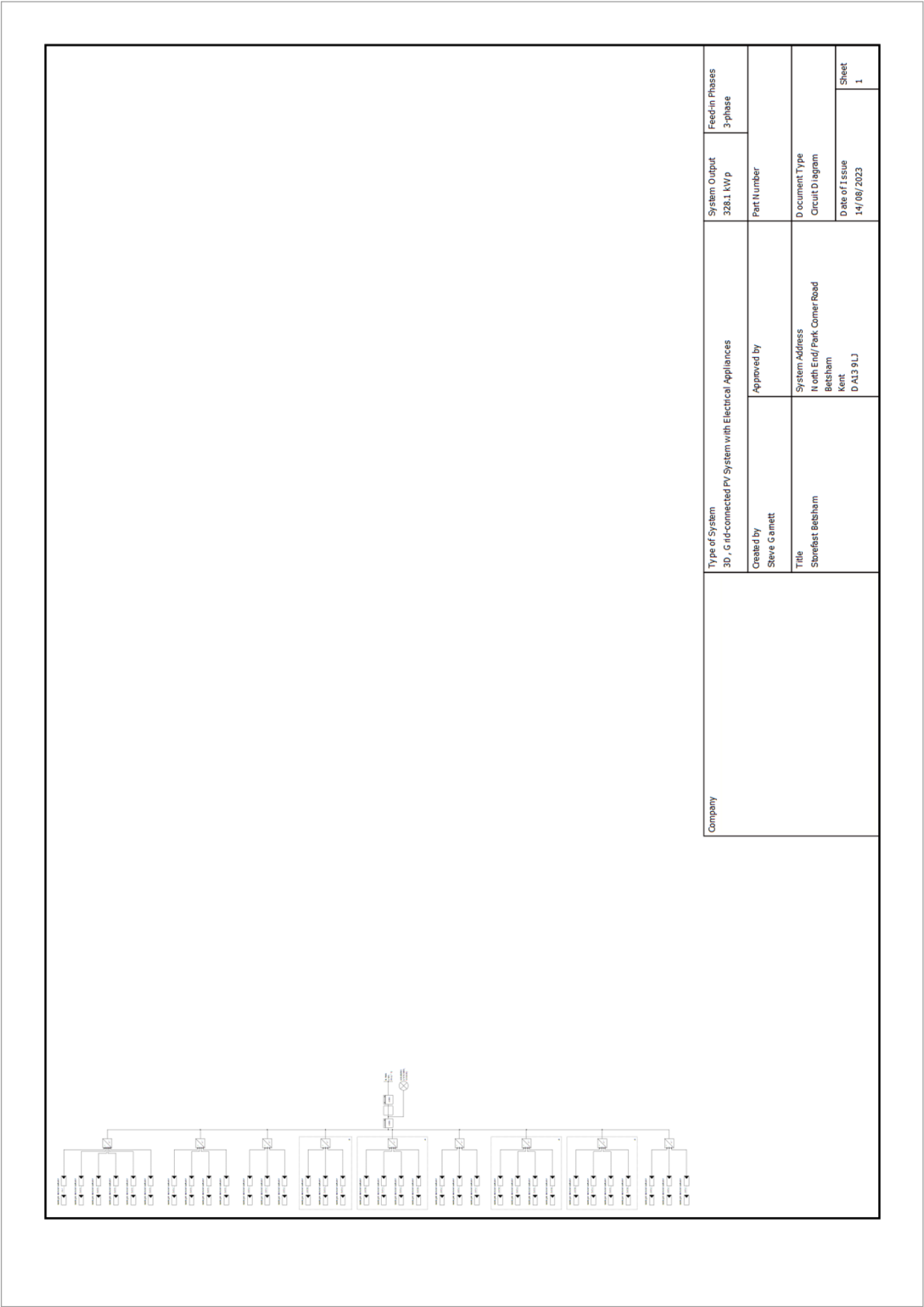


Figure: Circuit Diagram

## Overview plan

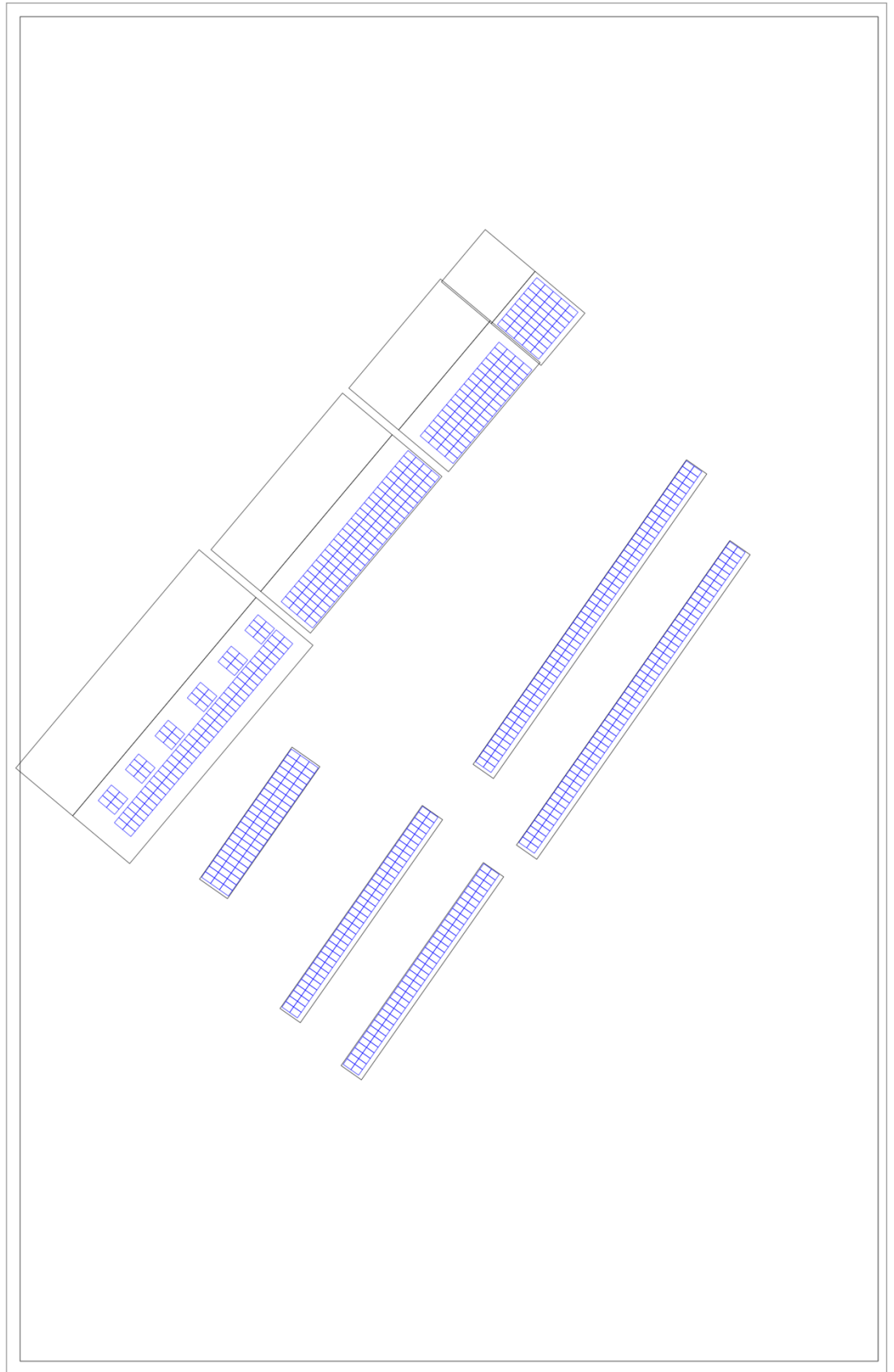


Figure: Overview plan

## Dimensioning Plan

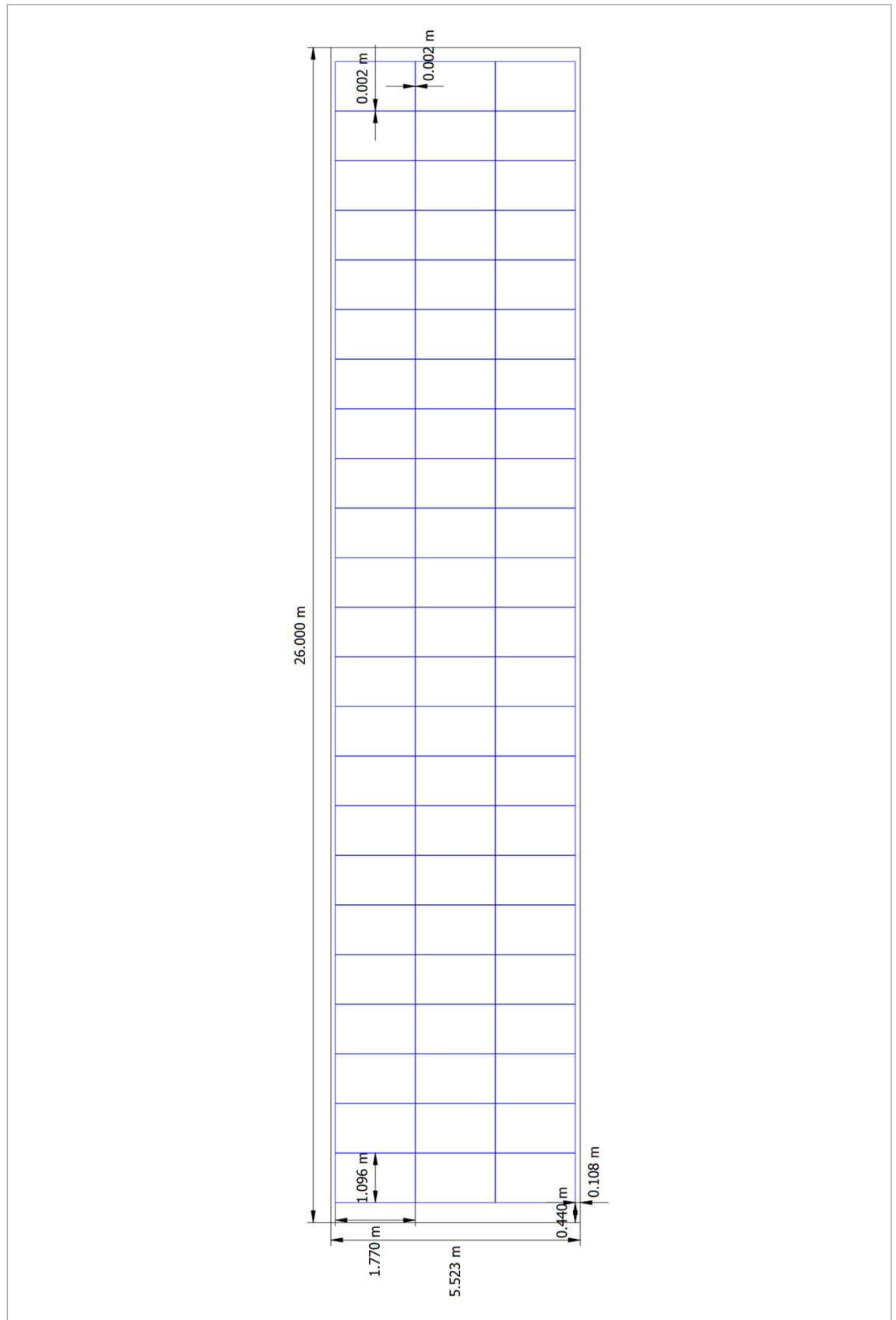


Figure: Building 05 - Roof Area Southwest

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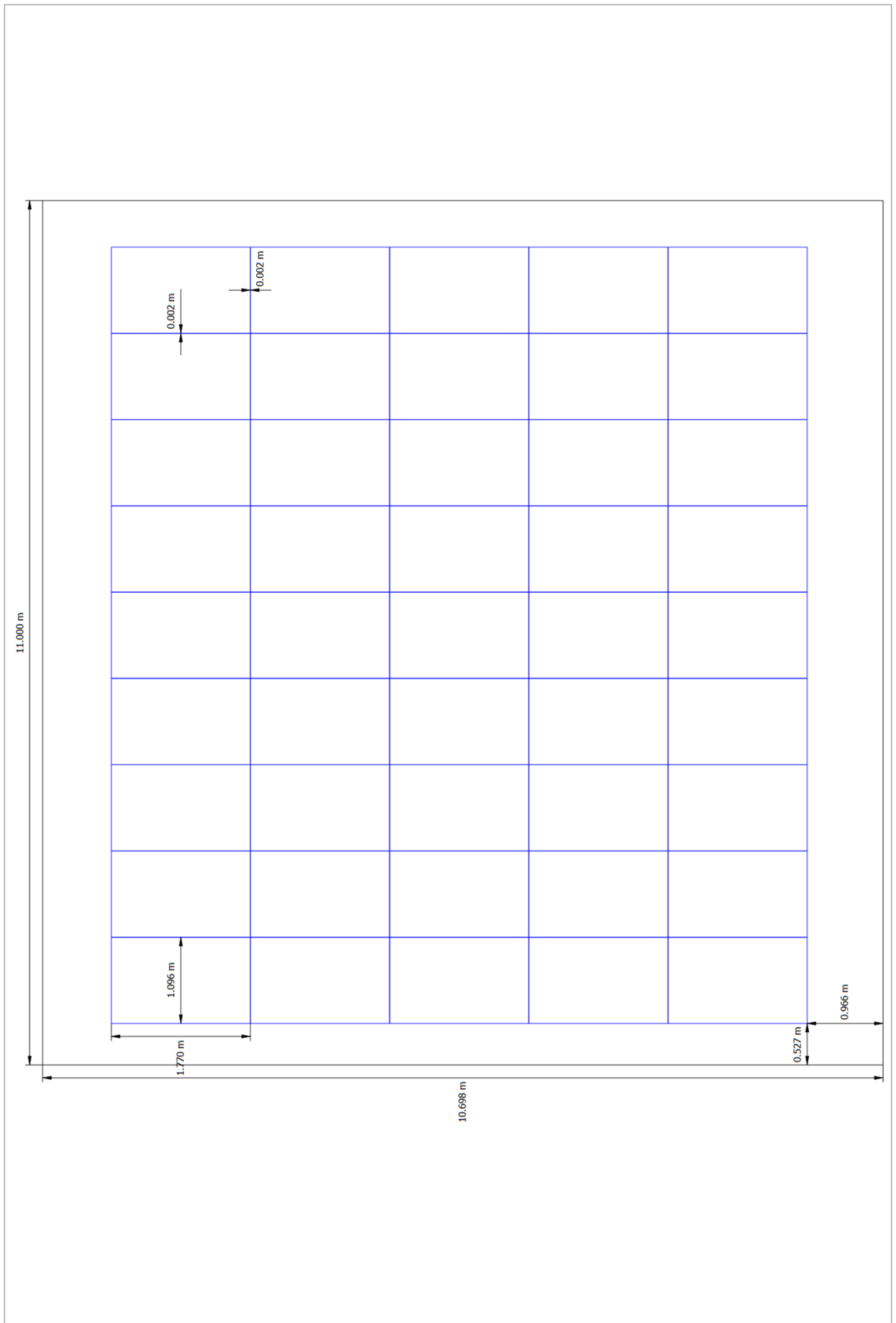


Figure: Building 01 - Roof Area Southwest

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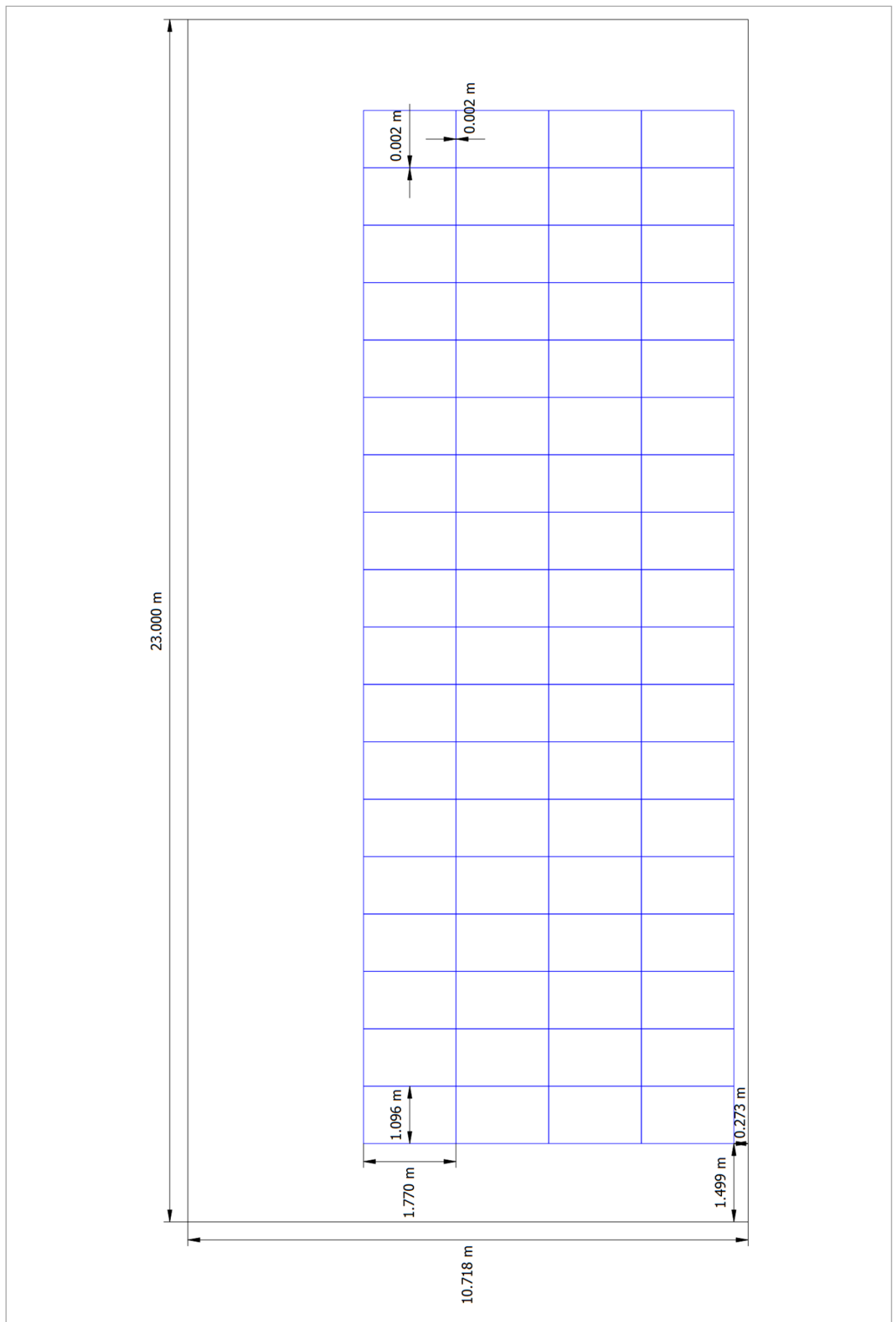


Figure: Building 02 - Roof Area Southwest



**Offer Number:** Storefast-Solutions-DA13-9LJ-2023-139-SG-Q

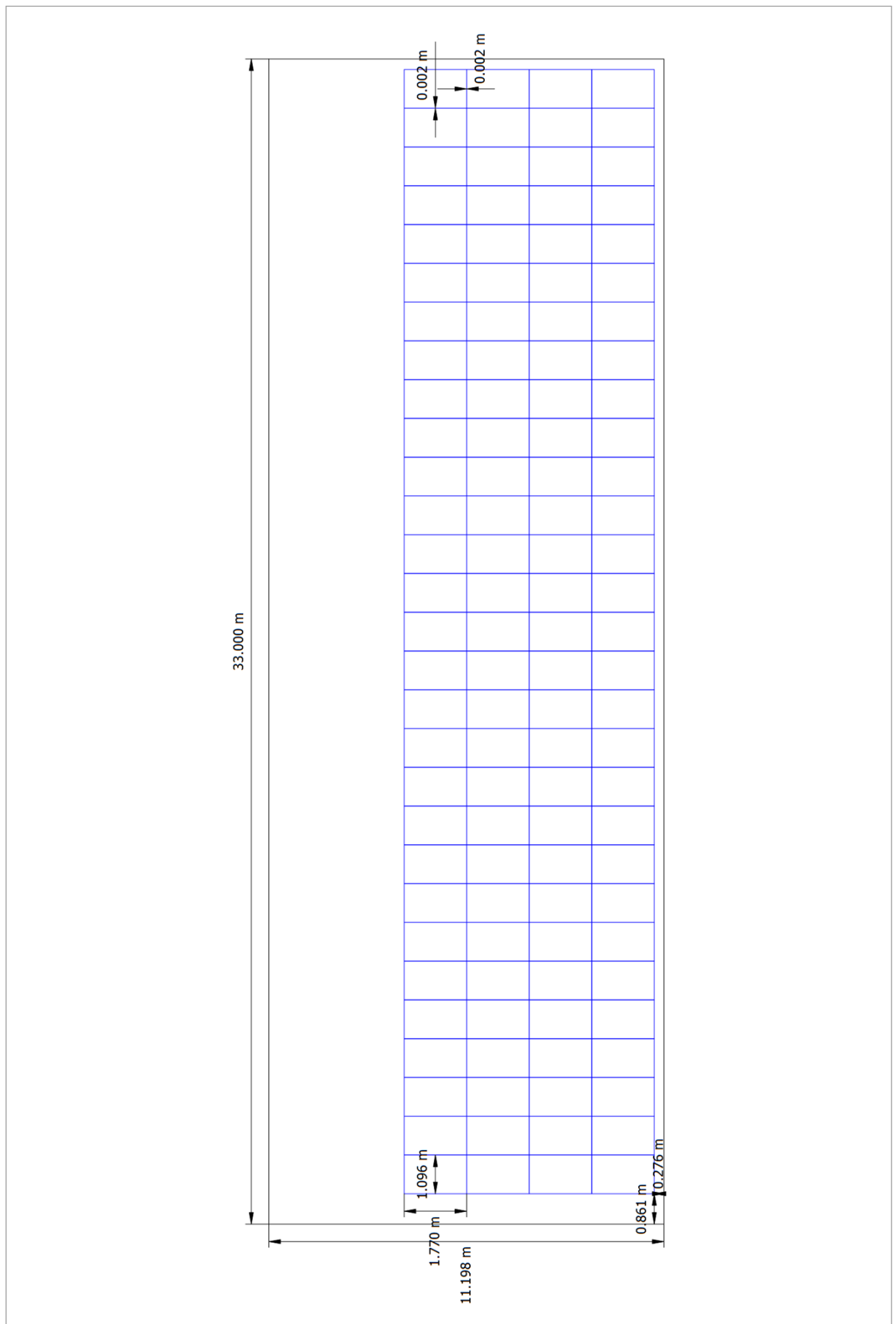


Figure: Building 03 - Roof Area Southwest

**Offer Number:** Storefast-Solutions-DA13-9LJ-2023-139-SG-Q



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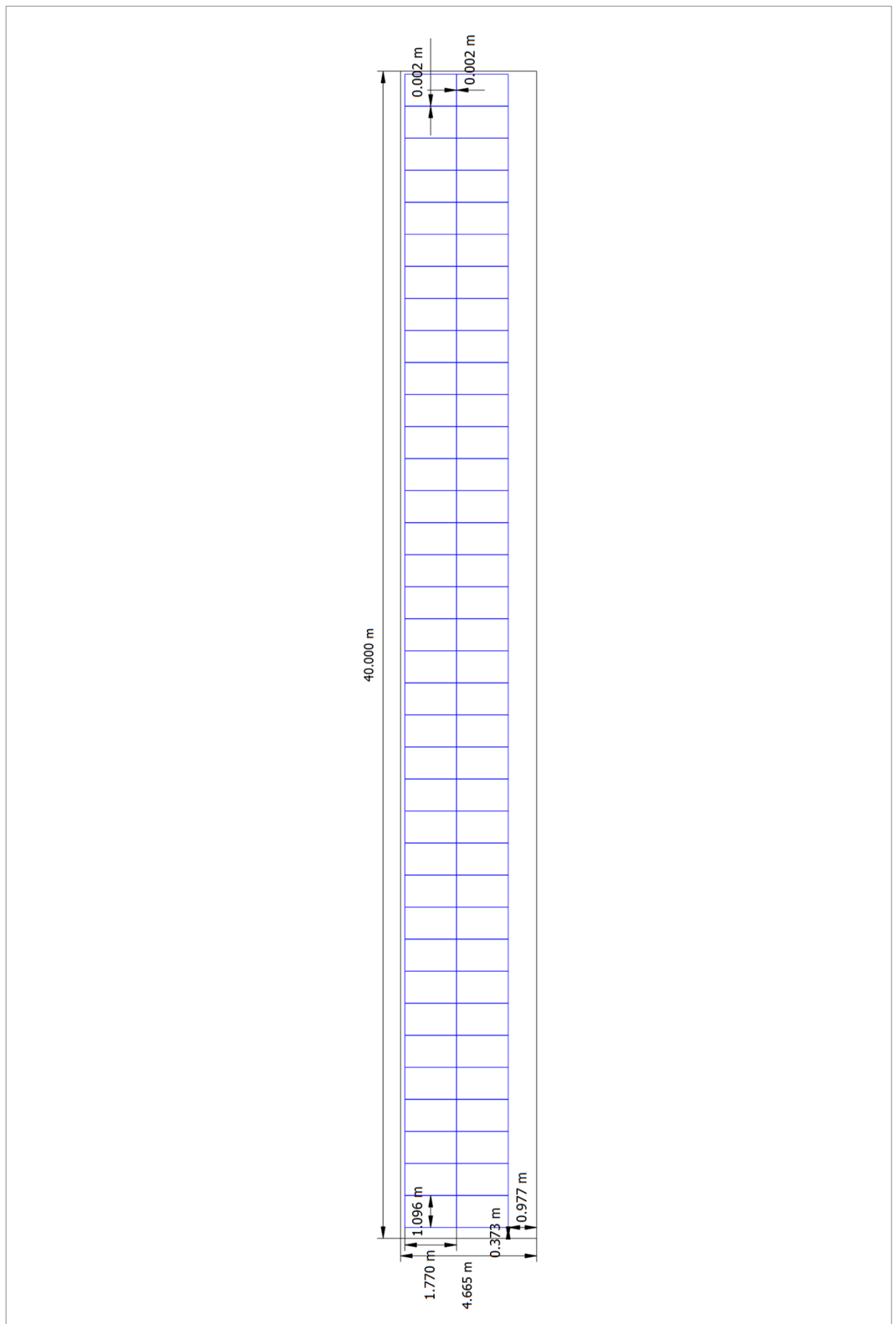


Figure: Building 08 - Roof Area Southwest

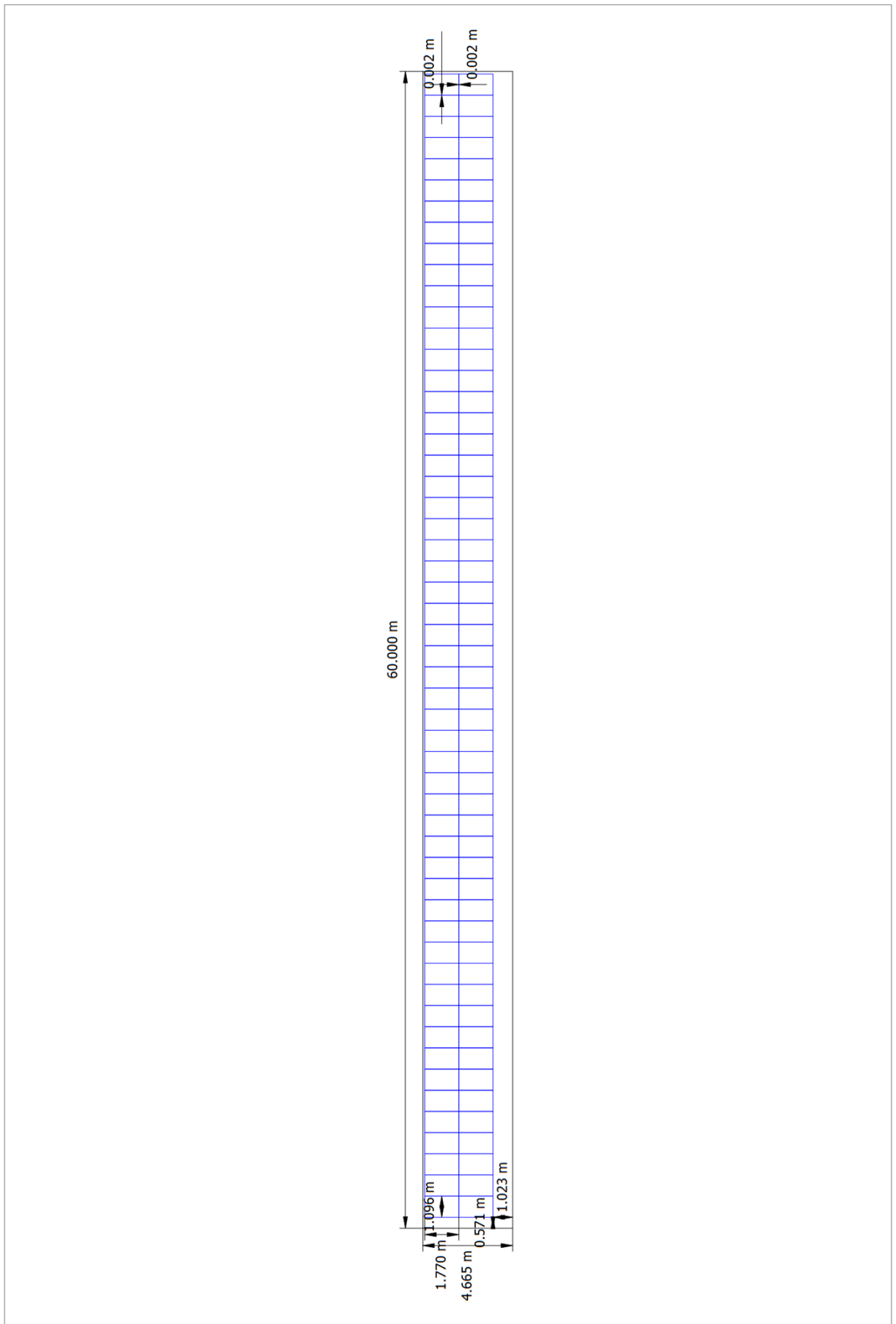


Figure: Building 06 - Roof Area Southwest

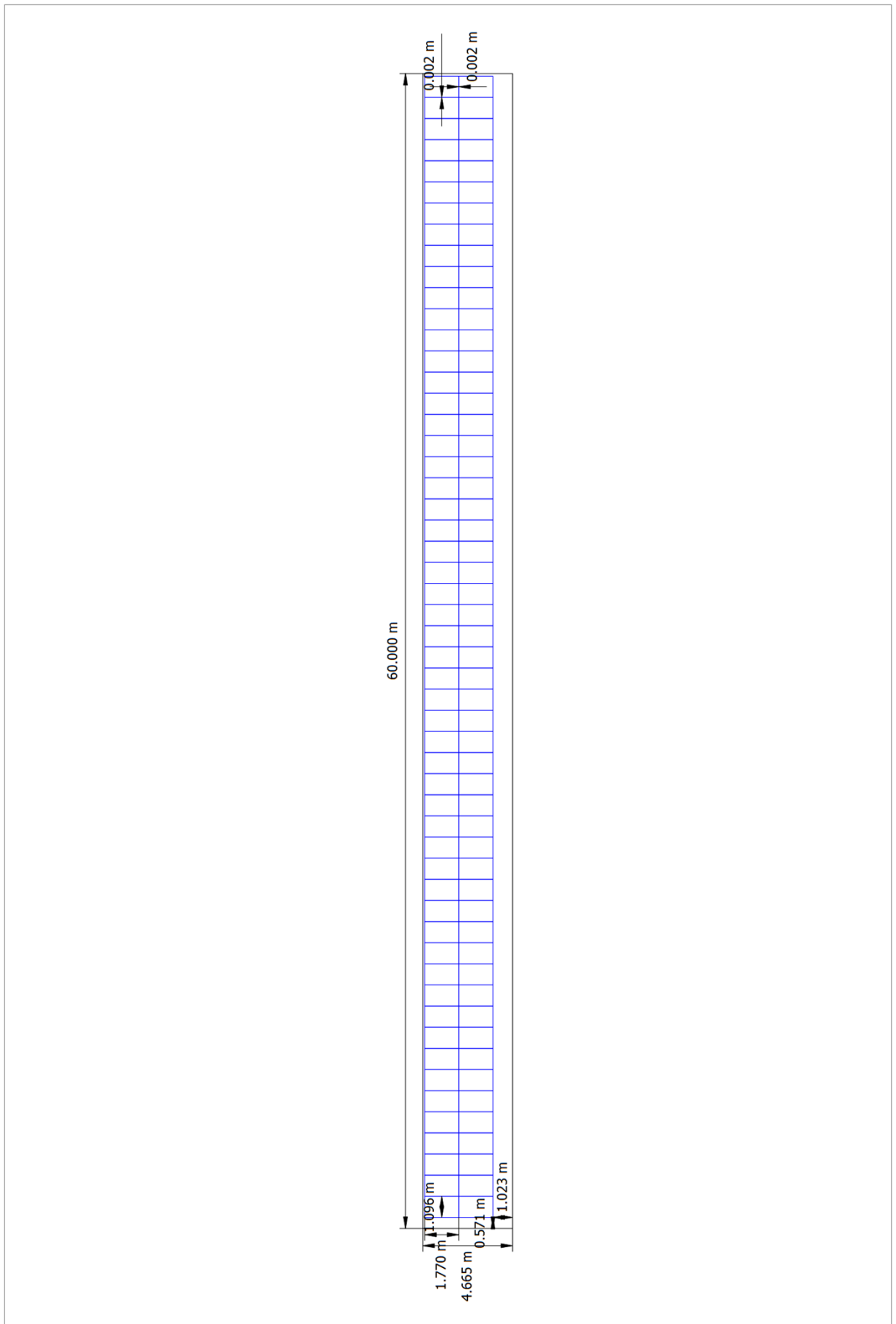
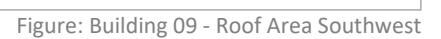


Figure: Building 07 - Roof Area Southwest

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## String Plan

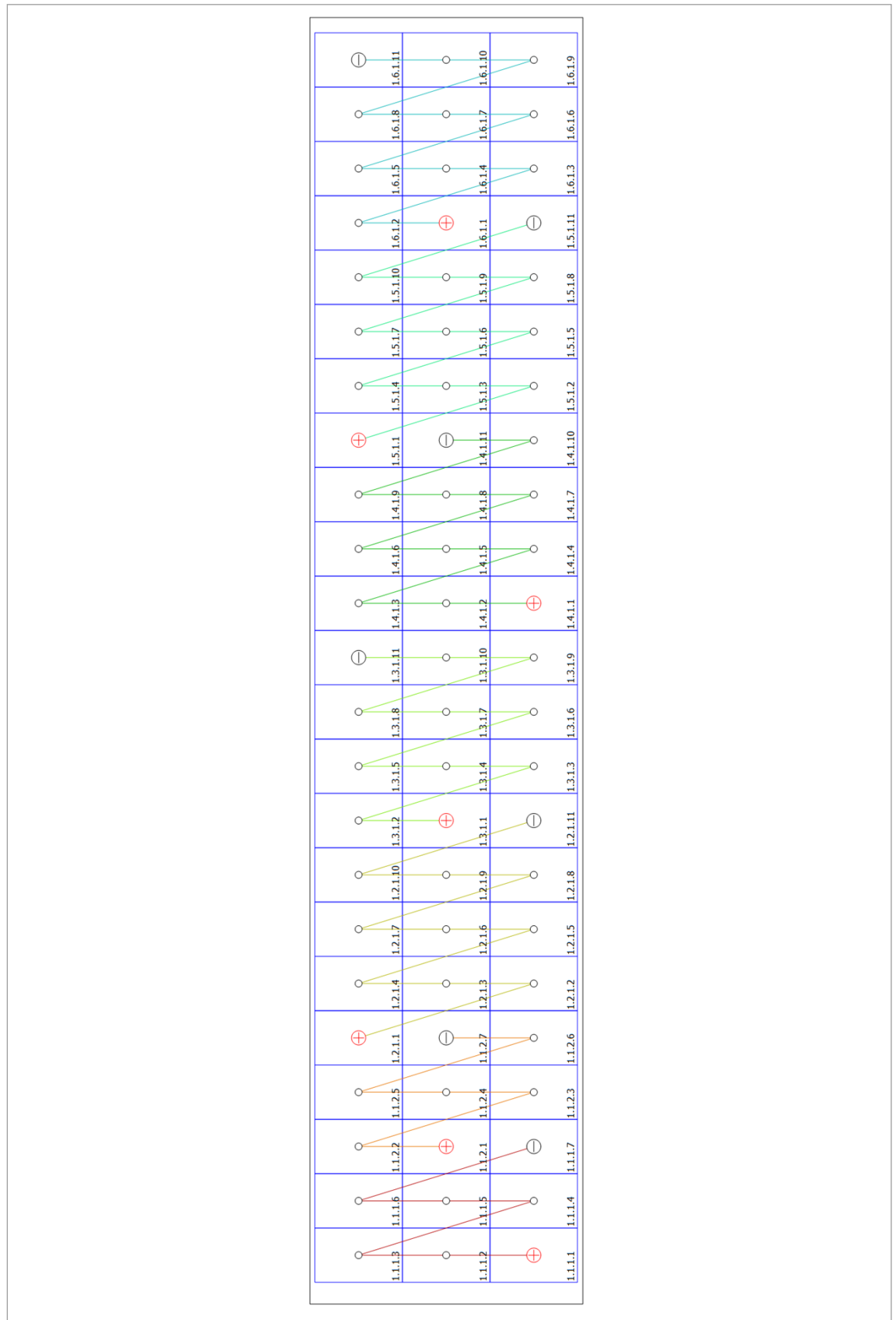


Figure: Building 05 - Roof Area Southwest

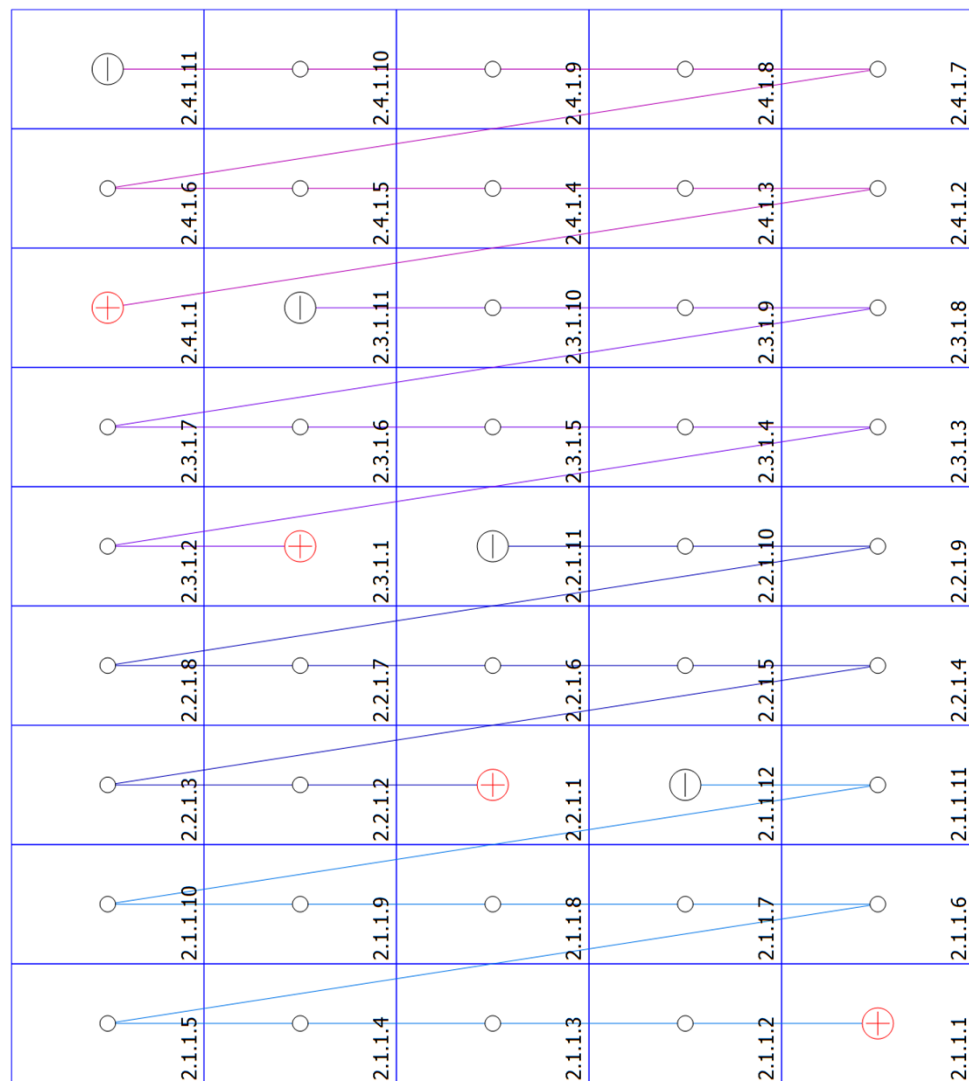


Figure: Building 01 - Roof Area Southwest

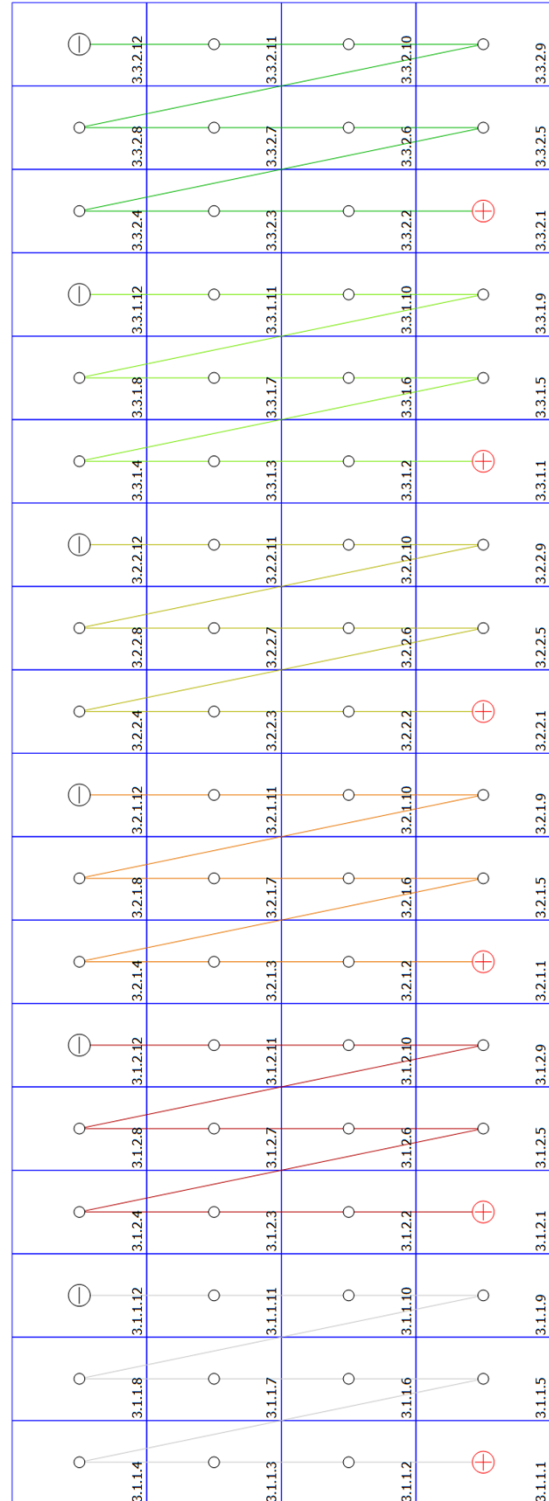


Figure: Building 02 - Roof Area Southwest

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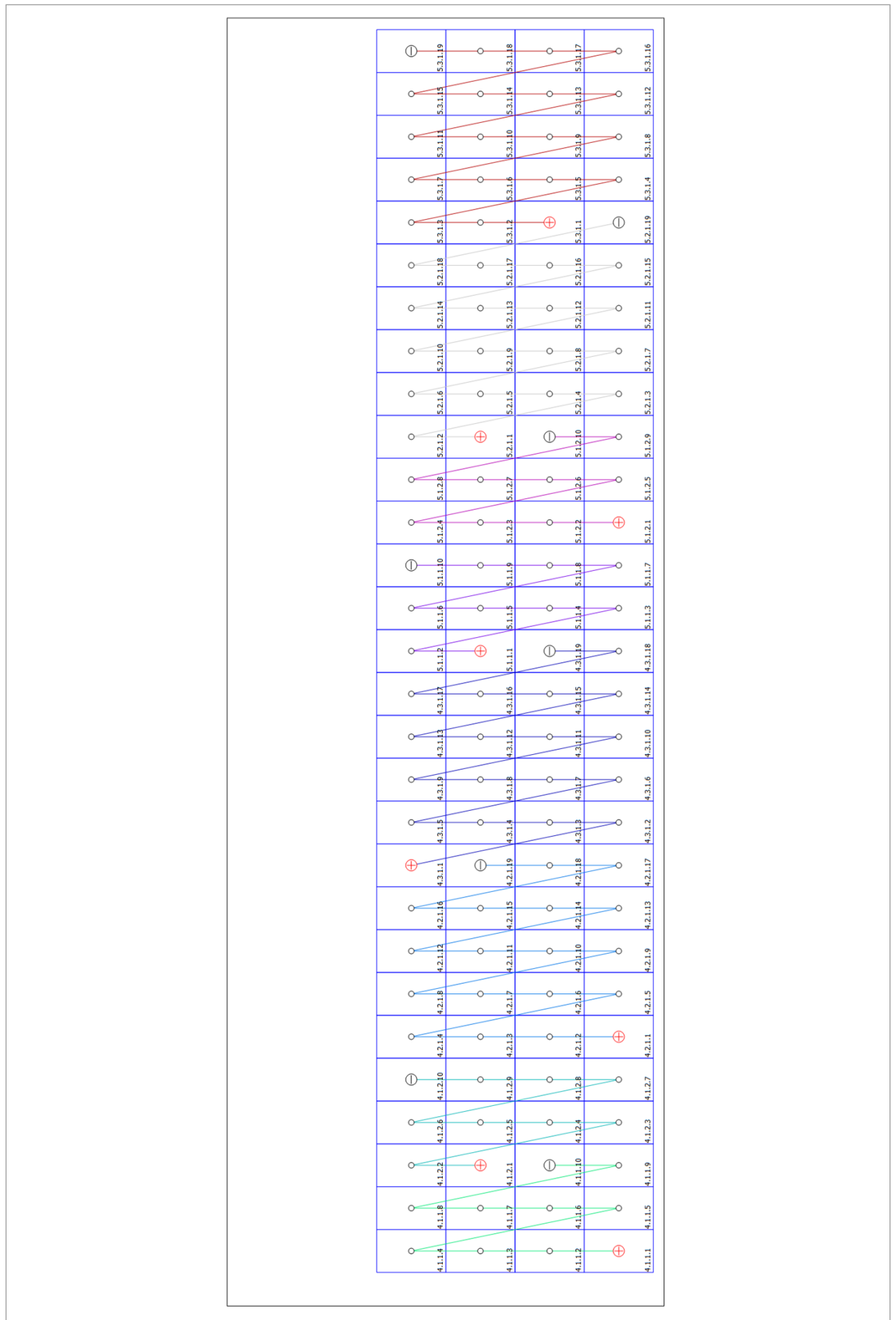


Figure: Building 03 - Roof Area Southwest

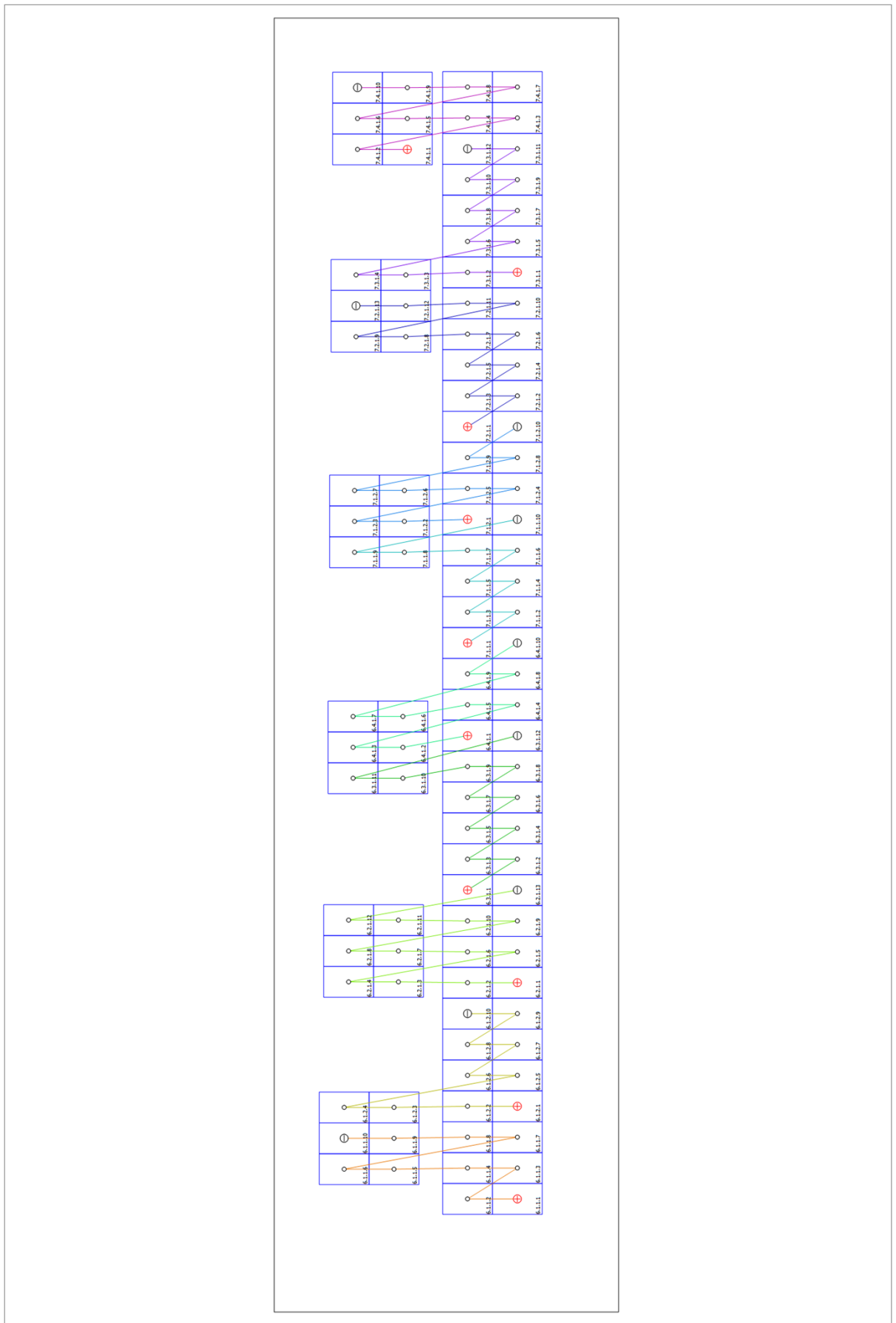


Figure: Building 04 - Roof Area Southwest

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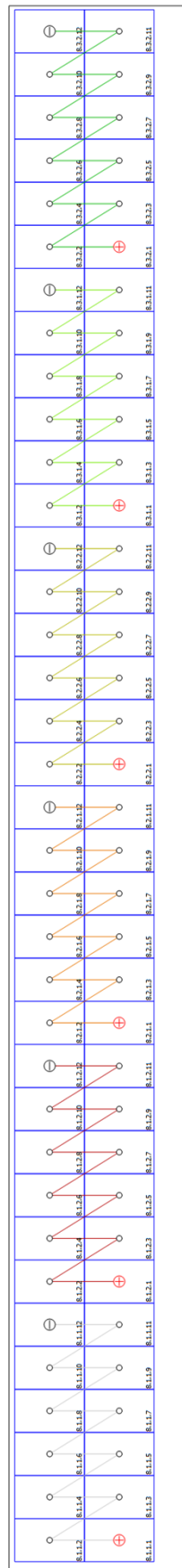


Figure: Building 08 - Roof Area Southwest

## Storefast Betsham

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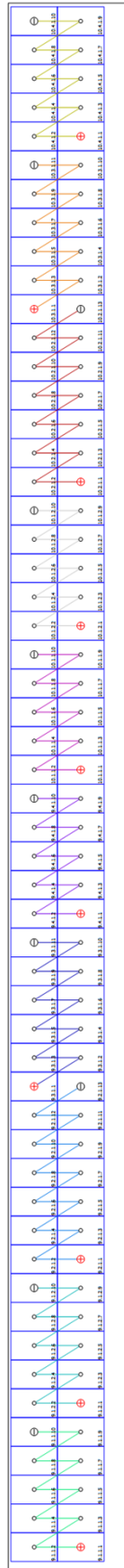


Figure: Building 06 - Roof Area Southwest

## Storefast Betsham

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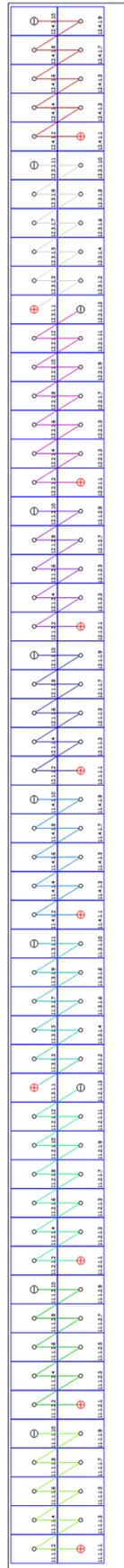


Figure: Building 07 - Roof Area Southwest



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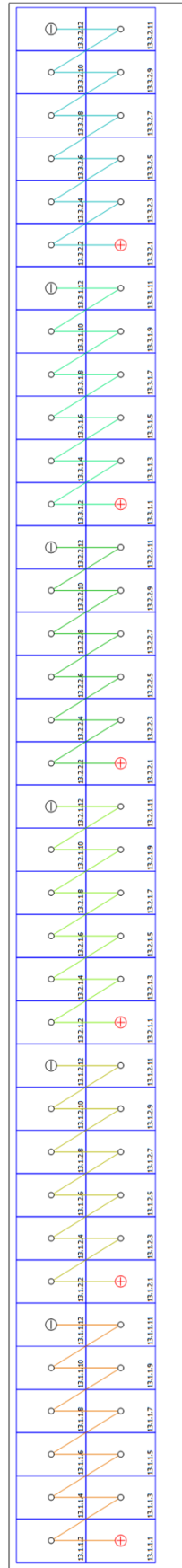


Figure: Building 09 - Roof Area Southwest

## Storefast Betsham

Offer Number: Storefast-Solutions-DA13-9LJ-2023-139-SG-Q

### Parts list

#### Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Trina Solar	TSM-425-NEG9.28 VERTEX S+ 2022	772	Piece
2	Inverter		GROWATT New Energy Co., Ltd.	MAX 25KTL3-XL	1	Piece
3	Inverter		GROWATT New Energy Co., Ltd.	MID 17KTL3-XL	1	Piece
4	Inverter		GROWATT New Energy Co., Ltd.	MAC 30KTL3-XL	3	Piece
5	Inverter		GROWATT New Energy Co., Ltd.	MAC 22KTL3-XL	2	Piece
6	Inverter		GROWATT New Energy Co., Ltd.	MAC 20KTL3-XL(MX)	6	Piece
7	Components			Feed-in Meter	1	Piece
8	Components			House connection	1	Piece
9	Components			Bidirectional Meter	1	Piece