

**Eleciserve Electrical**

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**Project Name:** Rivermead Leisure Complex

21/02/2023

## Your PV system from Eleciserve Electrical

**Address of Installation**

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Richfield Avenue  
Reading  
RG1 8EQ

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**Pellikaan**  
DESIGN ▪ BUILD ▪ OPERATE

**Project Description:**

Pv System

## Project Overview

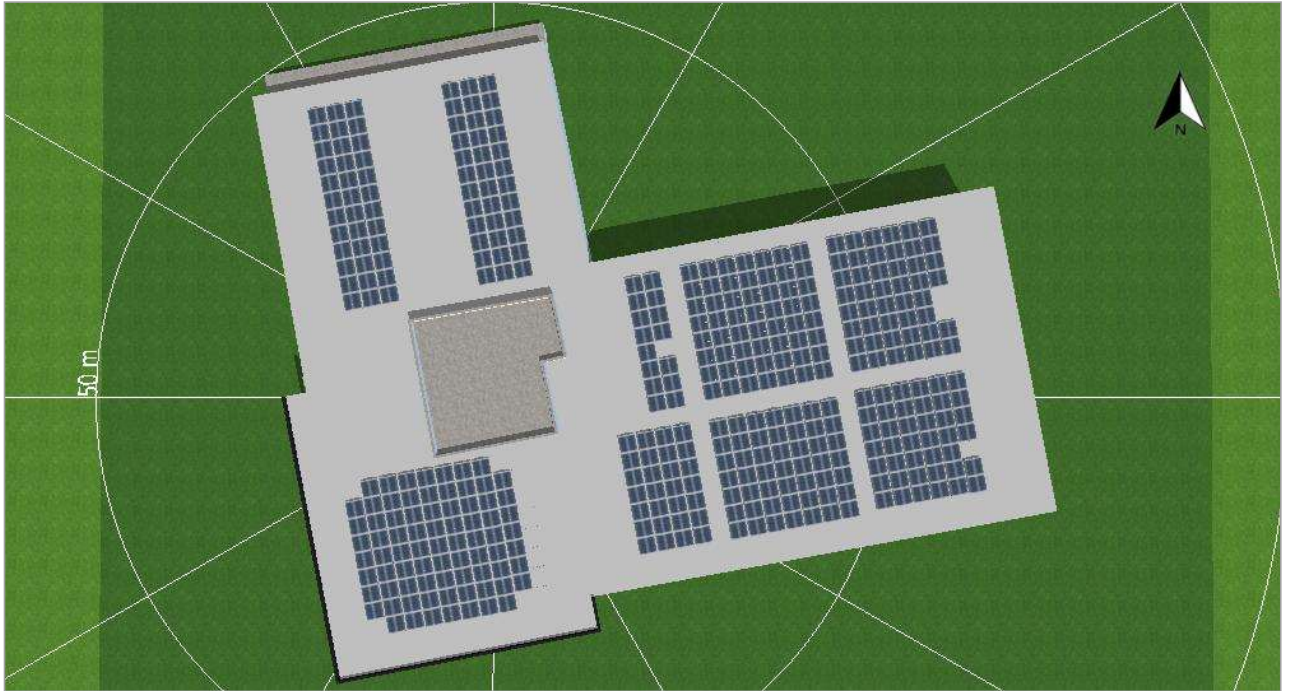


Figure: Overview Image, 3D Design

## PV System

### 3D, Grid-connected PV System

|                      |                            |
|----------------------|----------------------------|
| Climate Data         | Reading, GBR (1996 - 2015) |
| Values source        | Meteonorm 8.1(i)           |
| PV Generator Output  | 295.68 kWp                 |
| PV Generator Surface | 1,513.8 m <sup>2</sup>     |
| Number of PV Modules | 768                        |
| Number of Inverters  | 2                          |

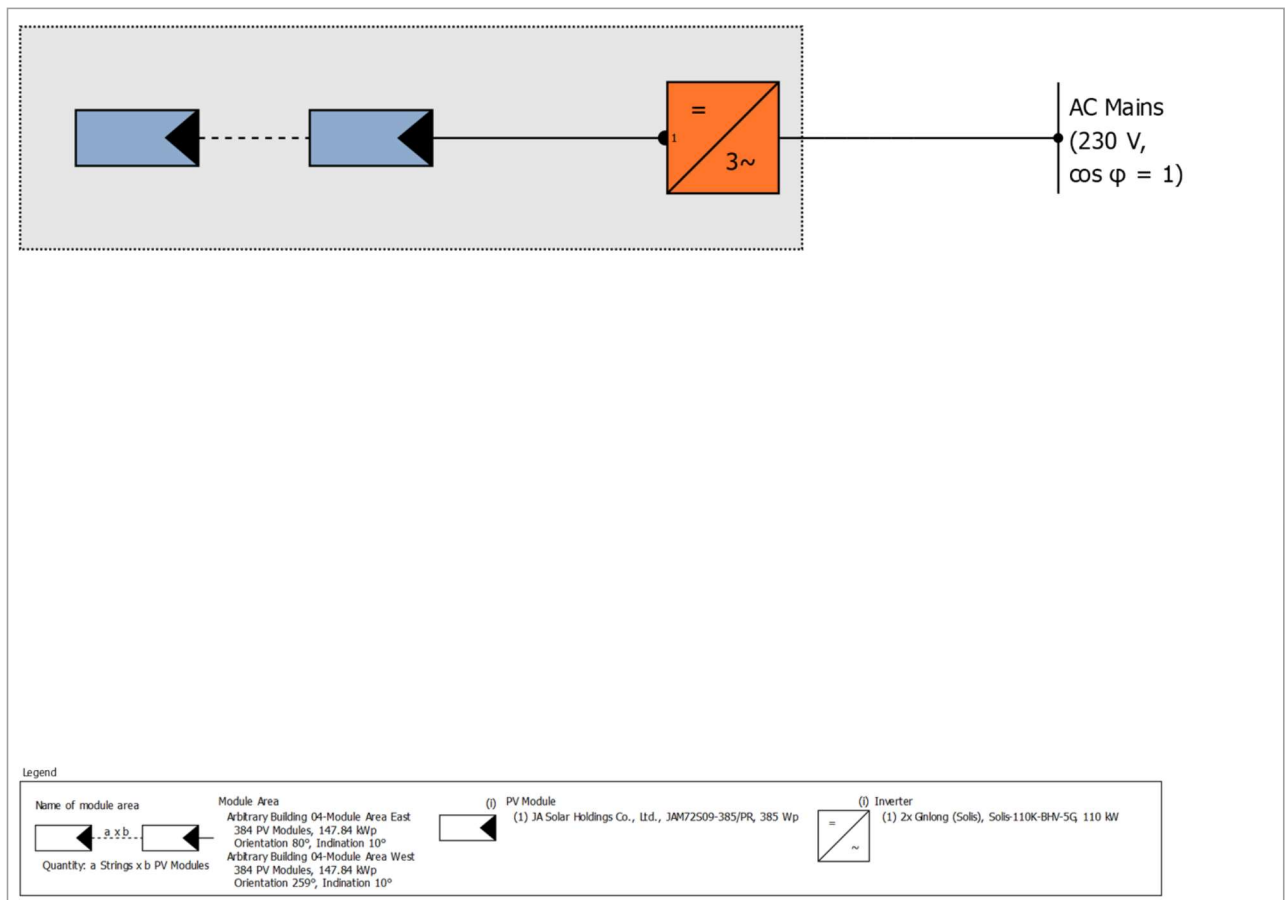


Figure: Schematic diagram

## Production Forecast

### Production Forecast

|                                                           |                   |
|-----------------------------------------------------------|-------------------|
| PV Generator Output                                       | 295.68 kWp        |
| Spec. Annual Yield                                        | 903.38 kWh/kWp    |
| Performance Ratio (PR)                                    | 89.68 %           |
| Yield Reduction due to Shading                            | 1.3 %             |
| Grid Feed-in                                              | 267,136 kWh/Year  |
| Grid Feed-in in the first year (incl. module degradation) | 267,136 kWh/Year  |
| Standby Consumption (Inverter)                            | 24 kWh/Year       |
| CO <sub>2</sub> Emissions avoided                         | 125,543 kg / year |

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

## Inverter configuration

### Configuration 1

|               |                                                                                 |
|---------------|---------------------------------------------------------------------------------|
| Module Areas  | Arbitrary Building 04-Module Area East + Arbitrary Building 04-Module Area West |
| Inverter 1    |                                                                                 |
| Model         | Solis-110K-BHV-5G (v2)                                                          |
| Manufacturer  | Ginlong (Solis)                                                                 |
| Quantity      | 2                                                                               |
| Sizing Factor | 134.4 %                                                                         |
| Configuration | MPP 1: 3 x 16                                                                   |
|               | MPP 2: 2 x 18                                                                   |
|               | MPP 3: 2 x 18                                                                   |
|               | MPP 4: 2 x 18                                                                   |
|               | MPP 5: 2 x 18                                                                   |
|               | MPP 6: 3 x 16                                                                   |
|               | MPP 7: 2 x 18                                                                   |
|               | MPP 8: 2 x 18                                                                   |
|               | MPP 9: 2 x 18                                                                   |
|               | MPP 10: 2 x 18                                                                  |

## 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

|                                                           |                   |
|-----------------------------------------------------------|-------------------|
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### Energy Flow Graph

Project: Rivermead Leisure Complex



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

Figure: Energy flow

## Data Sheets

## PV Module Data Sheet

PV Module: JAM72S09-385/PR (v1)

|              |                             |
|--------------|-----------------------------|
| Manufacturer | JA Solar Holdings Co., Ltd. |
| Available    | Yes                         |

**Electrical Data**

|                                     |                    |
|-------------------------------------|--------------------|
| Cell Type                           | Si monocrystalline |
| Half-cell module                    | No                 |
| Cell Count                          | 72                 |
| Number of Bypass Diodes             | 3                  |
| Loss voltage per bypass diode       | 1 V                |
| Integrated power optimizer          | No                 |
| Only Transformer Inverters suitable | No                 |

**I/V Characteristics at STC**

|                                                    |         |
|----------------------------------------------------|---------|
| MPP Voltage                                        | 39.9 V  |
| MPP Current                                        | 9.65 A  |
| Open Circuit Voltage                               | 49.04 V |
| Short-Circuit Current                              | 10.17 A |
| Increase open circuit voltage before stabilisation | 0 %     |
| Nominal output                                     | 385 W   |
| Fill Factor                                        | 77.2 %  |
| Efficiency                                         | 19.53 % |

**I/V Part Load Characteristics**

|                                    |                           |
|------------------------------------|---------------------------|
| Values source                      | Manufacturer/user-created |
| Irradiance                         | 200 W/m <sup>2</sup>      |
| Voltage in MPP at Part Load        | 39.08 V                   |
| Current in MPP at Part Load        | 1.955 A                   |
| Open Circuit Voltage (Part Load)   | 45.79 V                   |
| Short Circuit Current at Part Load | 2.11 A                    |

**Additional Parameters**

|                                 |              |
|---------------------------------|--------------|
| Temperature Coefficient of Voc  | -147.12 mV/K |
| Temperature Coefficient of Isc  | 6.1 mA/K     |
| Temperature Coefficient of Pmpp | -0.37 %/K    |
| Incident Angle Modifier (IAM)   | 98 %         |
| Maximum System Voltage          | 1000 V       |

**Mechanical Data**

|             |         |
|-------------|---------|
| Width       | 996 mm  |
| Height      | 1979 mm |
| Depth       | 35 mm   |
| Frame Width | 40 mm   |
| Weight      | 22.3 kg |

## Inverter Data Sheet

Inverter: Solis-110K-BHV-5G (v2)

|                                                                     |                 |
|---------------------------------------------------------------------|-----------------|
| Manufacturer                                                        | Ginlong (Solis) |
| Available                                                           | Yes             |
| <b>Electrical data - DC</b>                                         |                 |
| DC nominal output                                                   | 110 kW          |
| Max. DC Power                                                       | 187.2 kW        |
| Nom. DC Voltage                                                     | 720 V           |
| Max. Input Voltage                                                  | 1100 V          |
| Max. Input Current                                                  | 260 A           |
| Max. short circuit current                                          | 400 A           |
| Number of DC Inlets                                                 | 20              |
| <b>Electrical data - AC</b>                                         |                 |
| AC Power Rating                                                     | 110 kW          |
| Max. AC Power                                                       | 121 kVA         |
| Nom. AC Voltage                                                     | 312 V           |
| Number of Phases                                                    | 3               |
| With Transformer                                                    | No              |
| <b>Electrical data - other</b>                                      |                 |
| Change in Efficiency when Input Voltage deviates from Rated Voltage | 0.15 %/100V     |
| Min. Feed-in Power                                                  | 30 W            |
| Standby Consumption                                                 | 10 W            |
| Night Consumption                                                   | 1 W             |
| <b>MPP Tracker</b>                                                  |                 |
| Output Range < 20% of Power Rating                                  | 99.6 %          |
| Output Range > 20% of Power Rating                                  | 99.9 %          |
| Count of MPP Trackers                                               | 10              |
| <b>MPP Tracker 1-10</b>                                             |                 |
| Max. Input Current                                                  | 26 A            |
| Max. short circuit current                                          | 40 A            |
| Max. Input Power                                                    | 18.72 kW        |
| Min. MPP Voltage                                                    | 180 V           |
| Max. MPP Voltage                                                    | 1000 V          |

Plans and parts list  
Circuit Diagram

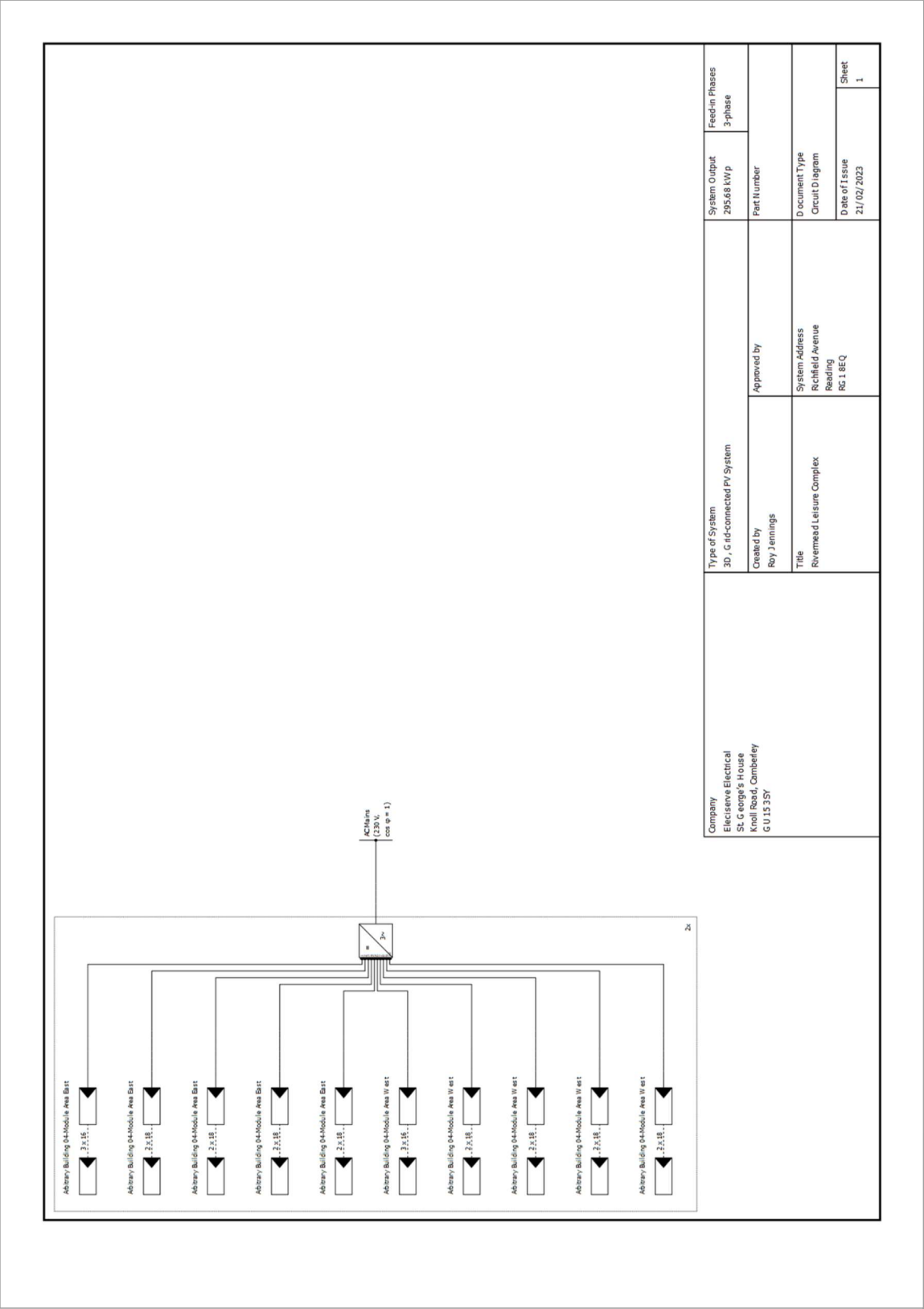


Figure: Circuit Diagram

## Screenshots, 3D Design Environment

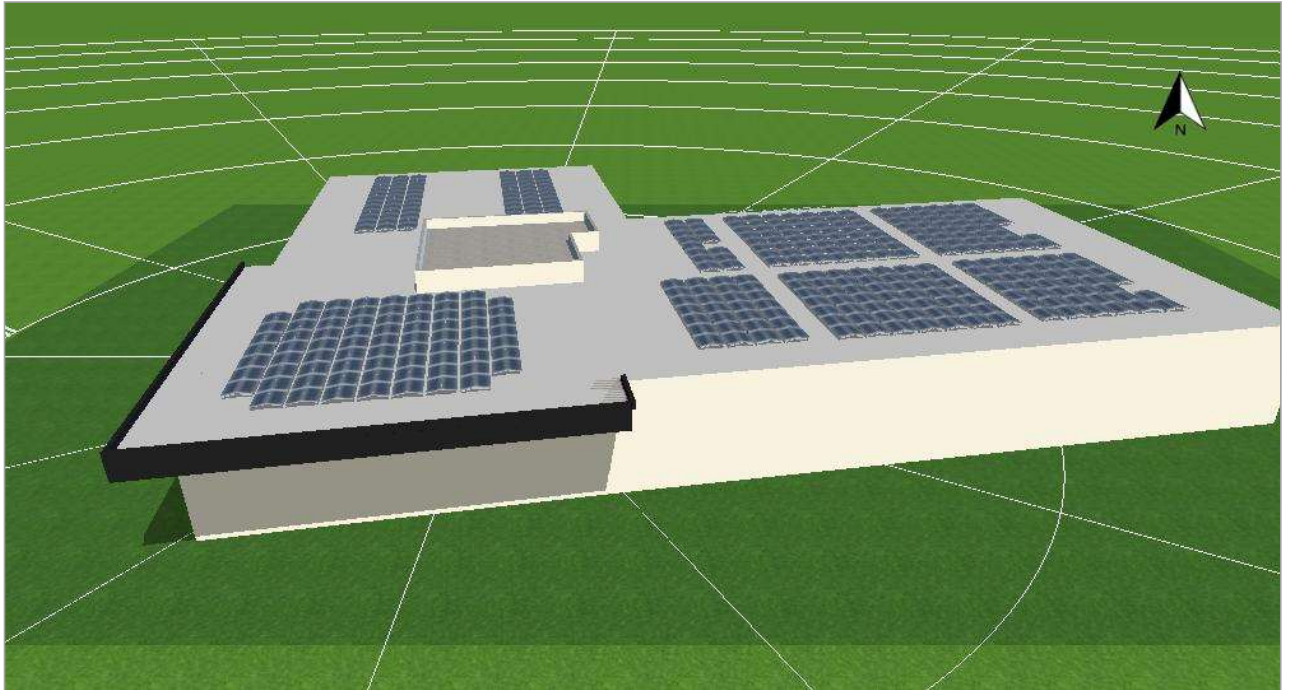


Figure: Screenshot04

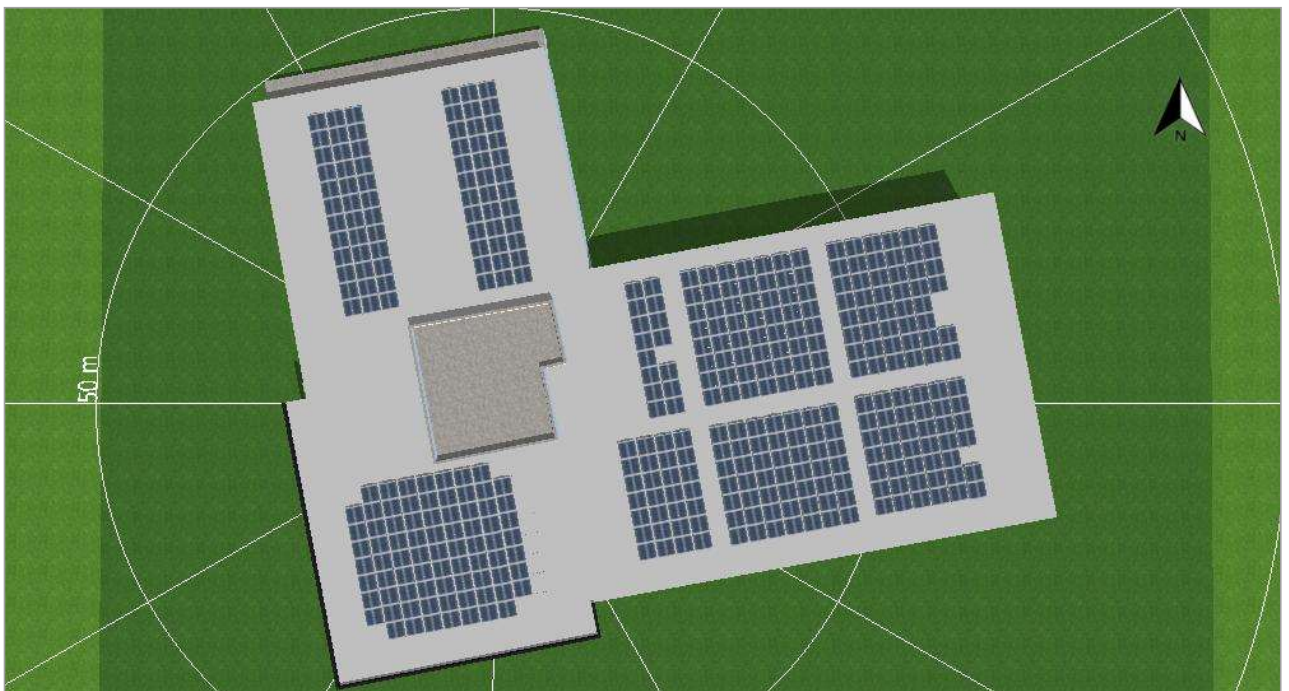


Figure: Screenshot05

## Configuration

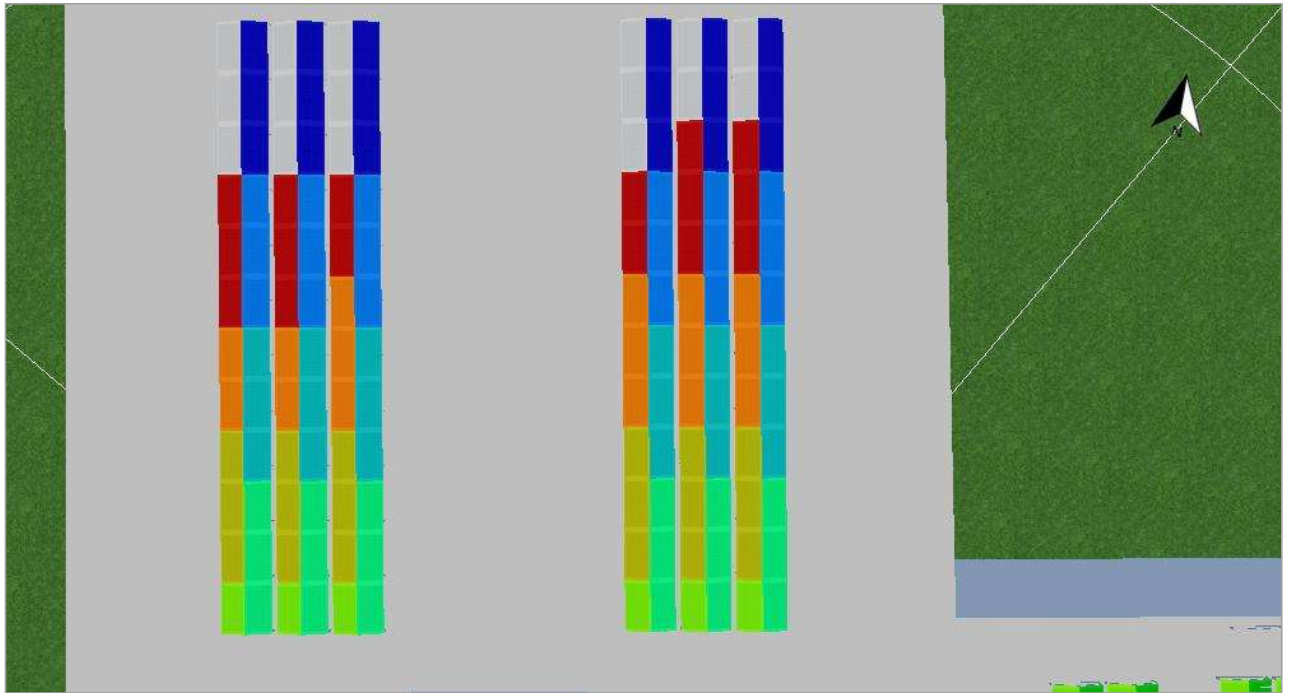


Figure: Screenshot01

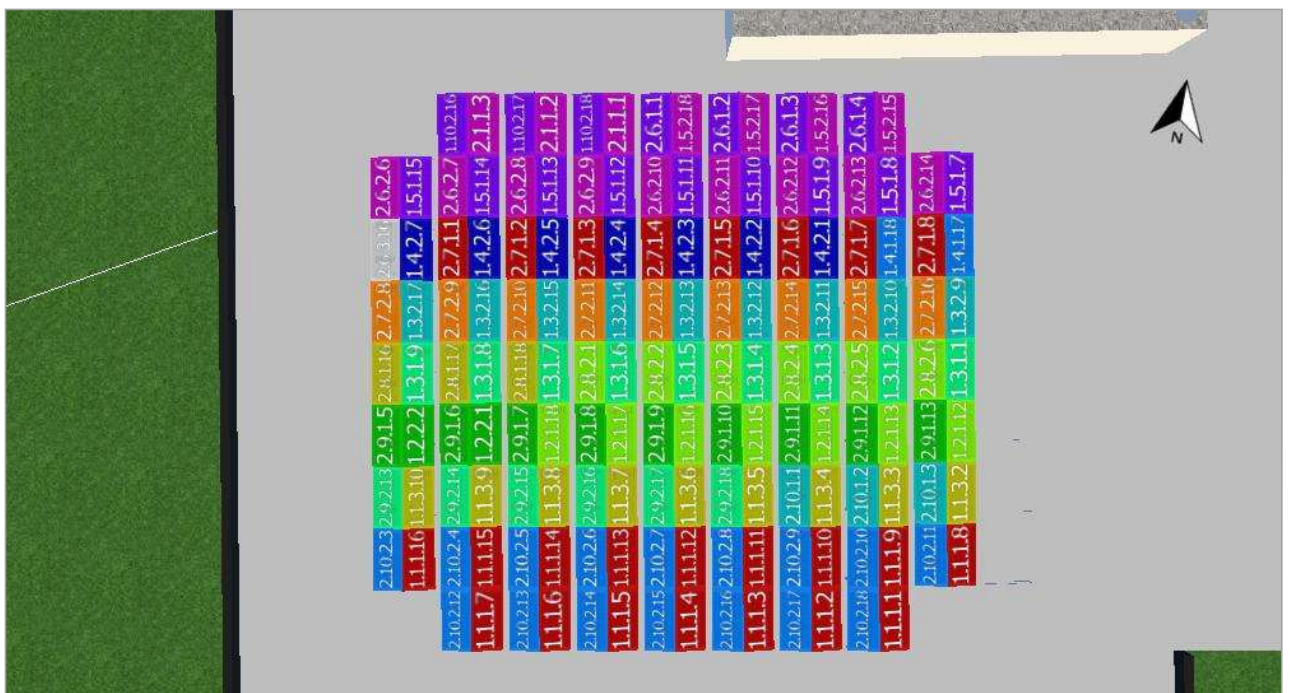


Figure: Screenshot02

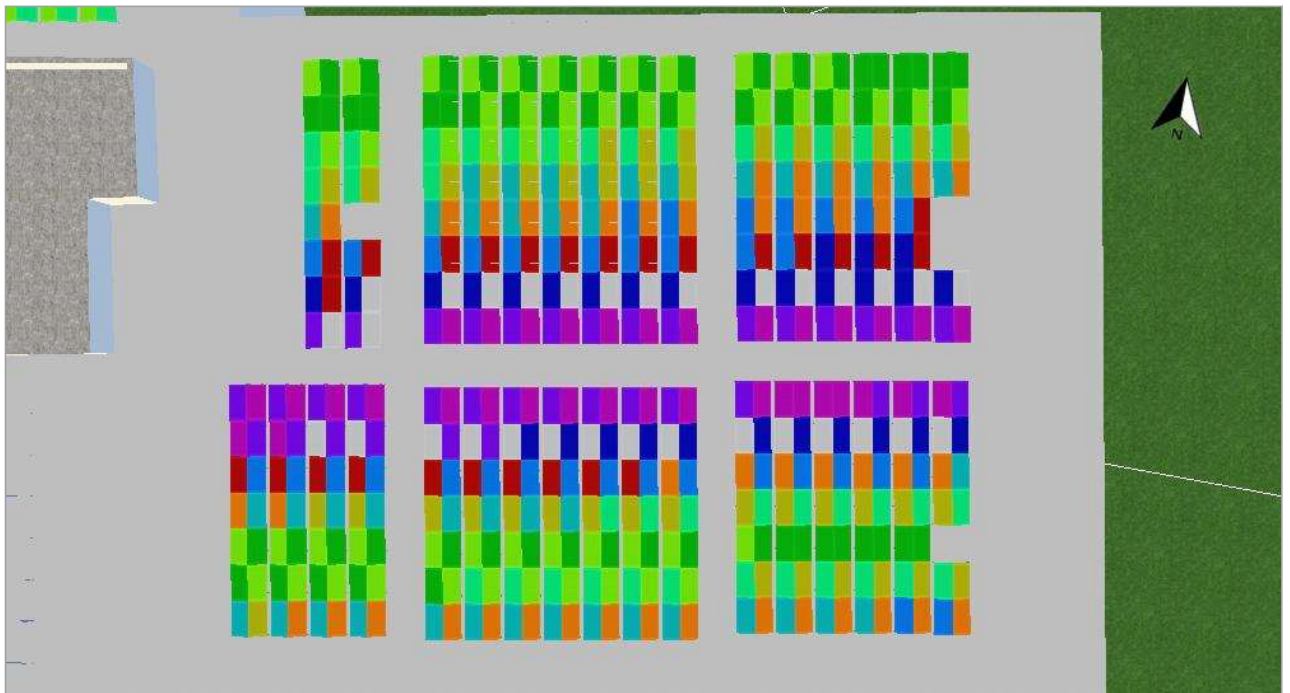


Figure: Screenshot03