# Your Contract

16th July, 2021

**Reference Number:** [redacted]

**System Version:** Version 3

**Robert Lindo**
13 Hampstead Lane,
London,
N6 4RT

Dear Mr Lindo,

We have now completed your survey and further to discussions with the surveyor, we would like to confirm your revised contract for a complete installation.

Your provisional installation date: To be confirmed

A few things to note:

- Your kit may be delivered the day before your installation.
- We will install a scaffold on the property to ensure we can install the system safely. This will be before your installation date.
- We will reach out to you 24 hours before the installation date to confirm you are still happy with the agreed date.
- We will carry out the installation on the date agreed with you. Someone will need to be home for the duration of the time, as our team cannot stay on your property without someone there.
- To set up remote monitoring for your installation, our team will need your Wi-Fi access password. If you do not have this available on the installation day, you may have to wait to access the monitoring of your new system.
- We will then be in touch to ensure you are happy with everything that has been installed. This is the best time to discuss any questions you may have.
- We will remove your scaffolding. This may be up for 7 days after the installation to allow our inspection teams to access the work.
- You will be sent your handover pack electronically after the installation. We do not send this out in paper format due to our environmental policies. However, under certain circumstances, we may be able to help with this.

# Your Contract

## Your original package

| Description | Original Selection |
|---|---|
| Solar Panel Installation | 20 Panel |
| Panel Type | Suntech 360W |
| Inverter Type | Fox Ess |
| Optional Storage Selected | Yes |
| Storage Type | DC Coupled |
| | Floor Mounted |
| Emergency Power Supply | No |
| Roof Type | Flat Roof |
| Number of Arrays | 1 |
| Separate Building | No |
| Scaffolding Type | Up to 2 Storeys 1 Side (Less than 9M Wide) |
| Scaffolding Extra | One Additional Elevation of Scaffolding |
| Scaffolding Extra | None |
| Scaffolding Extra | None |
| Scaffolding Extra | None |
| Bird Protection | No |
| Optimisers | Yes - Full |
| Power Diverter | No |
| EV Charger | Yes |
| Wifi Booster | No |

**Original Total Installation Cost inc VAT** [redacted]

## Your revised package after survey

| Description | Revised Selection |
|---|---|
| Solar Panel Installation | 6 Panel |
| Panel Type | Q-Cell 375W |
| Inverter Type | SolarEdge |
| Optional Storage Selected | Yes |
| Storage Type | AC Coupled |
| | Floor Mounted |
| Emergency Power Supply | No |
| Roof Type | Flat Roof |
| Number of Arrays | 2 |
| Separate Building | No |
| Scaffolding Type | Up to 2 Storeys 1 Side (Less than 9M Wide) |
| Scaffolding Extra | Three Additional Elevation's of Scaffoling |
| Scaffolding Extra | None |
| Scaffolding Extra | None |
| Scaffolding Extra | None |
| Bird Protection | No |
| Optimisers | Yes - Full |
| Power Diverter | No |
| EV Charger | No |
| Extra Cable - Per m | No |
| Wifi Booster | No |

**Revised Total Installation Cost inc VAT** [redacted]

The battery can be set to pull from the grid during your cheap night time tariff.
The installers can do this for you whilst on site.

**Green Energy Together**
+44 (0)20 3989 8987
solar.together@get-uk.com
www.get-uk.com/solar-together-london

# Your Contract

## Panel variation

Further to our conversation we would like to confirm that you are happy to go ahead with the change to the originally offered modules.

Per the terms of our Contract, in the event of availability issues with the selected panels, we may offer an equivalent or better alternative.

| | Original Panels | New Panels |
|---|---|---|
| Make and Type | LR4-60 360w Modules | Q-PEAK Duo BLK ML-G9 375w |
| Watt Peak | 360w | 375w |
| Warranty | 10 | 12 |
| Power Output Warranty | 25 years | 25 years |

At Green Energy Together we take the equipment we procure, and the methods used to manufacture the equipment extremely seriously and we want to provide you with reassurance in the sustainability of our supply chain.

Due to recent developments in the media surrounding the manufacture of some materials required to produce Solar Panels we have felt it appropriate to review the module which we had previously agreed to provide for Solar Together.

We have been working hard with our supply chain partners to identify a product that meets the Solar Together product requirements and is able to confirm no relationship with the allegations being faced in the XUAR region of China.

The module we will be supplying you is the **Q-Cell Q.Peak DUO BLK ML-G9 375W** Module which is widely regarded as one of the best manufacturers in the Solar Industry.

We, and Solar Together, condemn any use of forced labour in the solar supply chain and while these allegations are being investigated have sought to provide a quality alternative which also provides you with a higher output and a longer warranty.

The supply of this new module will actually increase the system output of your solar array so is to your benefit. Although clause 2.8.4.of your agreement would allow us to increase the agreed price of the system in light of this increase in power output, we will waive this cost.

# Your Contract

## Products datasheets:

**Panels:** Q.PEAK Duo BLK ML-G9 375w
**Inverter:** FoxESS Single-Phase Hybrid Inverter
F Series Dual MPPT Inverter
FoxESS Hybrid
Solar Edge Optimised option
HYD 3k-6k Single-Phase Integrated Inverter
**Battery:** FoxESS HV2600 Battery Module
Sofar Amasstore battery GTX2000
Sofar Amasstore battery GTX3000
Sofar Amasstore battery GTX5000
**Optimized Option:** Solar Edge Panel Power Optimisers
**Power Controller:** Eddi Eco-Smart Energy Diverter
**Optional Extra:** Enviroguard Panel Bird Exclusion
BrosTrend AC1200 WiFi Booster
Renusol Mounting System
EVIE Smart Home Charging

**Green Energy Together**
Unit 8 Peerglow Centre
Marsh Lane, Ware SG12 9QL

**Contact person:**
Alicia Moersdorf
[redacted]

[redacted]

Robert Lindo
13 Hampstead Lane
London
N6 4RT

02/07/2021

# Your PV system from Green Energy Together

## Address of Installation

13 Hampstead Lane
London
N6 4RT

Project Description:
Solar PV installation + 4.6 Battery

# Project Overview

Figure: Overview Image, 3D Design

## PV System

| 3D, Grid-connected PV System with Electrical Appliances and Battery Systems | |
|---|---|
| Climate Data | London, GBR (1991 - 2010) |
| PV Generator Output | 2.25 kWp |
| PV Generator Surface | 11.4 m² |
| Number of PV Modules | 6 |
| Number of Inverters | 1 |
| No. of battery systems | 1 |

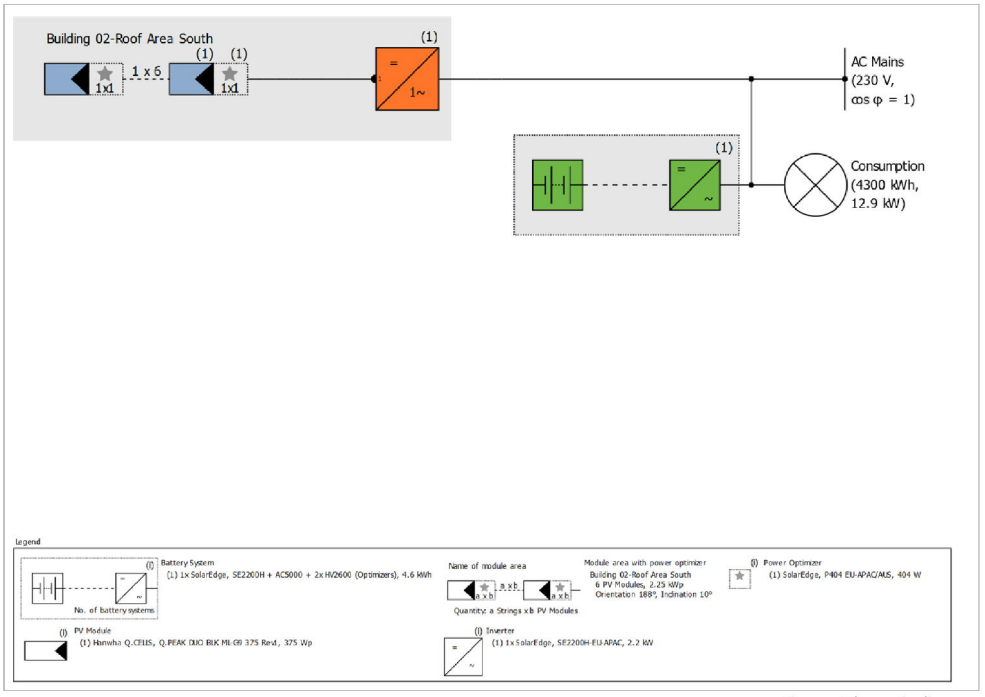



Figure: Schematic diagram

# The yield

| The yield | |
|---|---|
| PV Generator Energy (AC grid) | 1,886 kWh |
| Direct Own Use | 1,274 kWh |
| Battery Charge | 532 kWh |
| Grid Feed-in | 79 kWh |
| Down-regulation at Feed-in Point | 0 kWh |
| Own Power Consumption | 95.8 % |
| Level of Self-sufficiency | 38.9 % |
| Spec. Annual Yield | 833.36 kWh/kWp |
| Performance Ratio (PR) | 82.2 % |
| Yield Reduction due to Shading | 13.6 %/Year |
| $CO_2$ Emissions avoided | 1,044 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

## Overview

### System Data

| | |
|---|---|
| Type of System | 3D, Grid-connected PV System with Electrical Appliances and Battery Systems |
| Start of Operation | 02/07/2021 |

### Climate Data

| | |
|---|---|
| Location | London, GBR (1991 - 2010) |
| Resolution of the data | 1 h |
| Simulation models used: | |
| - Diffuse Irradiation onto Horizontal Plane | Hofmann |
| - Irradiance onto tilted surface | Perez |

### Consumption

| | |
|---|---|
| Total Consumption | 4300 kWh |
| Household, Load profile with low percentage of nighttime hours | 4300 kWh |
| Load Peak | 12.9 kW |

# Module Areas

## 1. Module Area - Building 02-Roof Area South

PV Generator, 1. Module Area - Building 02-Roof Area South

| | |
|---|---|
| Name | Building 02-Roof Area South |
| PV Modules | 6 x Q.PEAK DUO BLK ML-G9 375 Rev1 (v1) |
| Manufacturer | Hanwha Q.CELLS |
| Inclination | 10 ° |
| Orientation | South 188 ° |
| Installation Type | Mounted - Roof |
| PV Generator Surface | 11.4 m² |

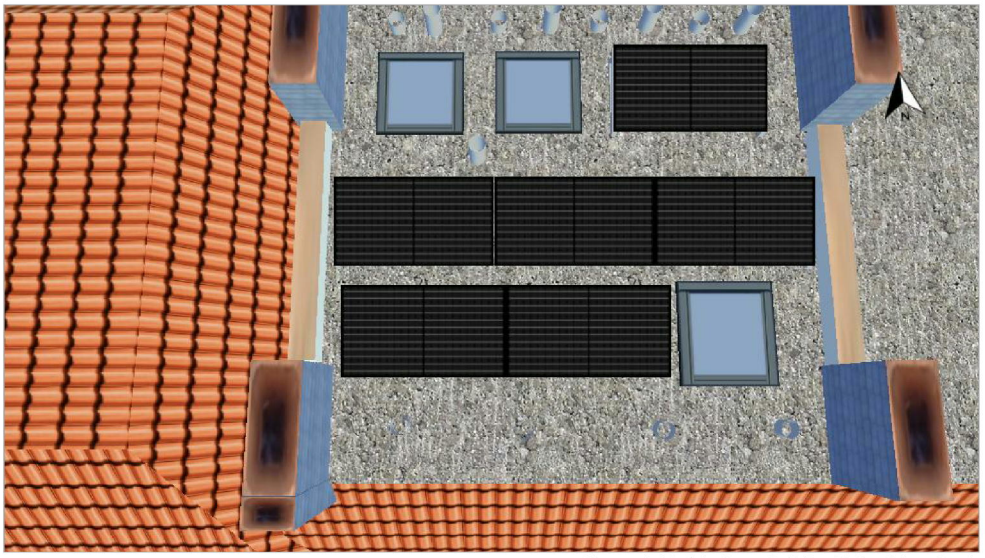


Figure: 1. Module Area - Building 02-Roof Area South

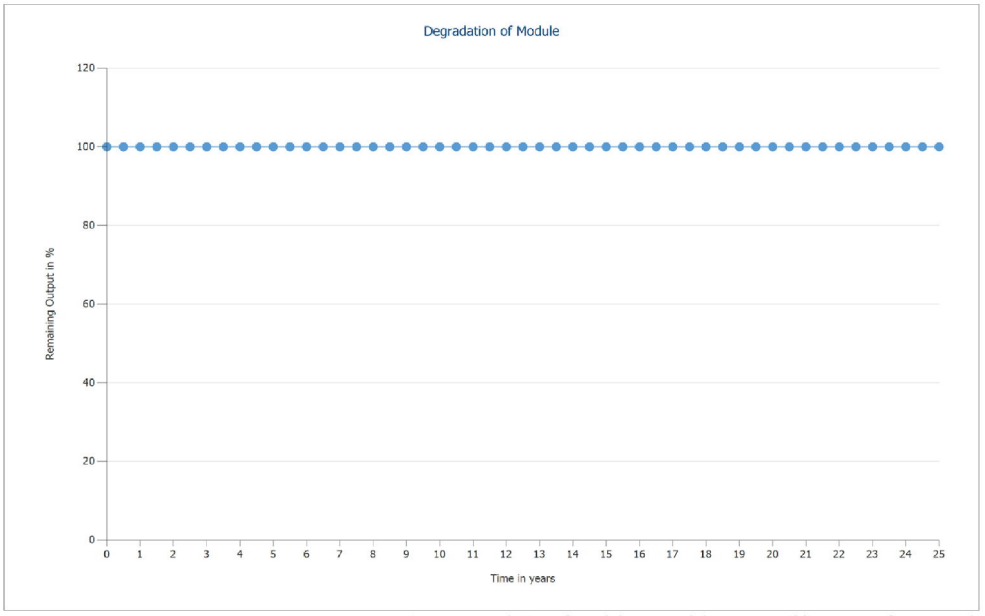



Figure: Degradation of Module, 1. Module Area - Building 02-Roof Area South

## Horizon Line, 3D Design

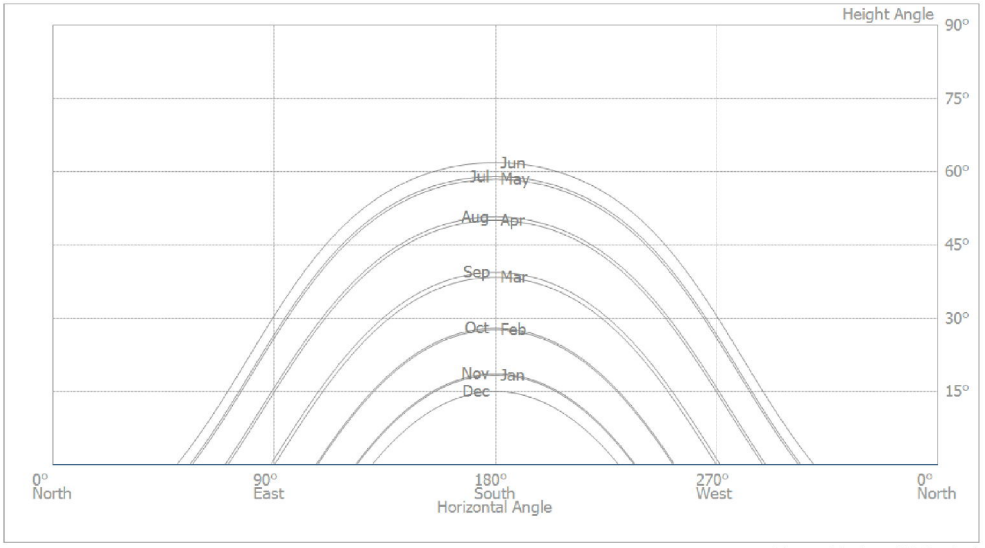



Figure: Horizon (3D Design)

# Inverter configuration

| Configuration 1 | |
|---|---|
| Module Area | Building 02-Roof Area South |
| Inverter 1 | |
| Model | SE2200H-EU-APAC (v1) |
| Manufacturer | SolarEdge |
| Quantity | 1 |
| Sizing Factor | 102.3 % |
| Configuration | MPP 1: 1 x 6☆ [1 x 1] |
| Power Optimizer 1 | |
| Model | P404 EU-APAC/AUS (v2) |
| Manufacturer | SolarEdge |
| Quantity | 6 |

# AC Mains

| AC Mains | |
|---|---|
| Number of Phases | 1 |
| Mains Voltage (1-phase) | 230 V |
| Displacement Power Factor (cos phi) | +/- 1 |

# Battery Systems

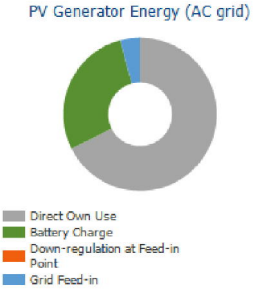
| Battery System | |
|---|---|
| Model | SE2200H + AC5000 + 2x HV2600 (Optimizers) (v2) |
| Manufacturer | SolarEdge |
| Quantity | 1 |
| Battery Inverter | |
| Type of Coupling | AC coupling |
| Nominal output | 5 kW |
| Battery | |
| Manufacturer | FoxESS |
| Model | HV2600 (v1) |
| Quantity | 2 |
| Battery Energy | 4.6 kWh |
| Battery Type | Lithium iron phosphate |

# Simulation Results

## Results Total System

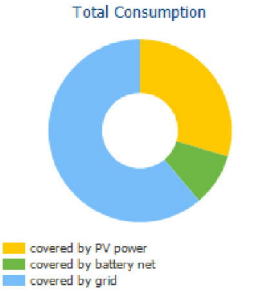
### PV System

| | | |
|---|---|---|
| PV Generator Output | 2.3 | kWp |
| Spec. Annual Yield | 833.36 | kWh/kWp |
| Performance Ratio (PR) | 82.2 | % |
| Yield Reduction due to Shading | 13.6 | %/Year |
| PV Generator Energy (AC grid) | 1,886 | kWh/Year |
| Direct Own Use | 1,274 | kWh/Year |
| Battery Charge | 532 | kWh/Year |
| Down-regulation at Feed-in Point | 0 | kWh/Year |
| Grid Feed-in | 79 | kWh/Year |
| Own Power Consumption | 95.8 | % |
| $CO_2$ Emissions avoided | 1,044 | kg / year |



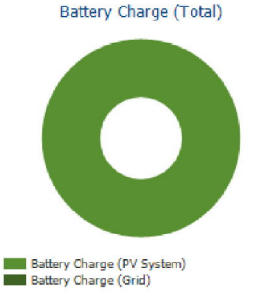

### Appliances

| | | |
|---|---|---|
| Appliances | 4,300 | kWh/Year |
| Standby Consumption (Inverter) | 11 | kWh/Year |
| Total Consumption | 4,311 | kWh/Year |
| covered by PV power | 1,274 | kWh/Year |
| covered by battery net | 402 | kWh/Year |
| covered by grid | 2,635 | kWh/Year |
| Solar Fraction | 38.9 | % |




### Battery System

| | | |
|---|---|---|
| Charge at beginning | 5 | kWh |
| Battery Charge (Total) | 532 | kWh/Year |
| Battery Charge (PV System) | 532 | kWh/Year |
| Battery Charge (Grid) | 0 | kWh/Year |
| Battery Energy for the Covering of Consumption | 402 | kWh/Year |
| Losses due to charging/discharging | 128 | kWh/Year |
| Losses in Battery | 7 | kWh/Year |
| Cycle Load | 1.7 | % |
| Service Life | >20 | Years |




### Level of Self-sufficiency

| | | |
|---|---|---|
| Total Consumption | 4,311 | kWh/Year |
| covered by grid | 2,635 | kWh/Year |
| Level of Self-sufficiency | 38.9 | % |

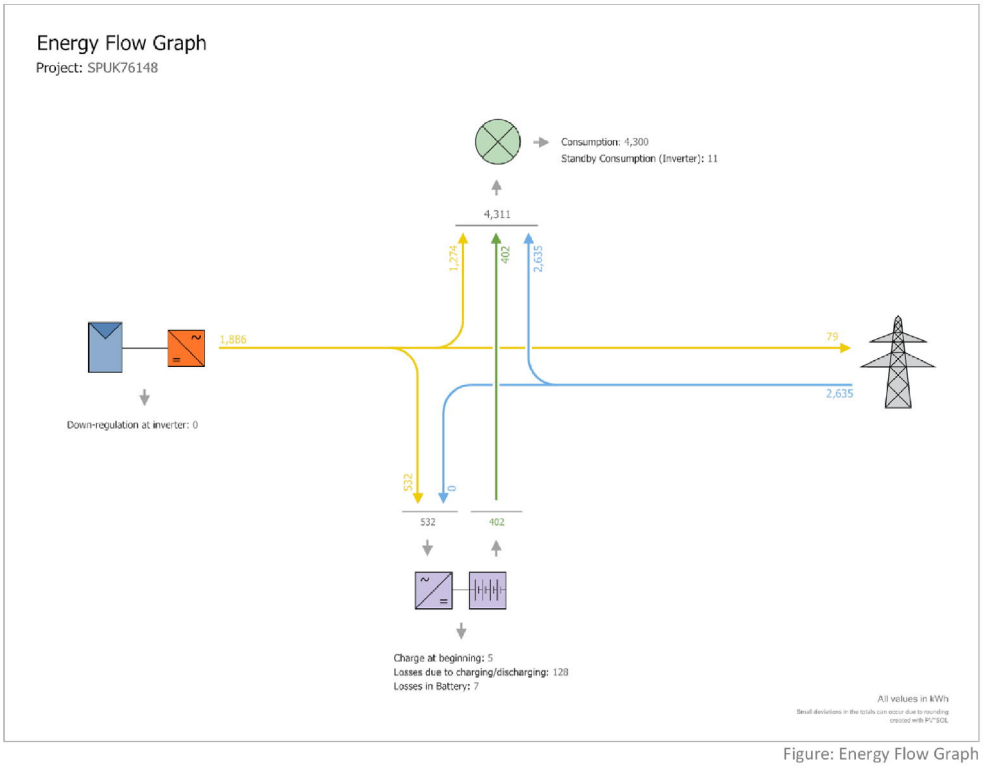



Figure: Energy Flow Graph

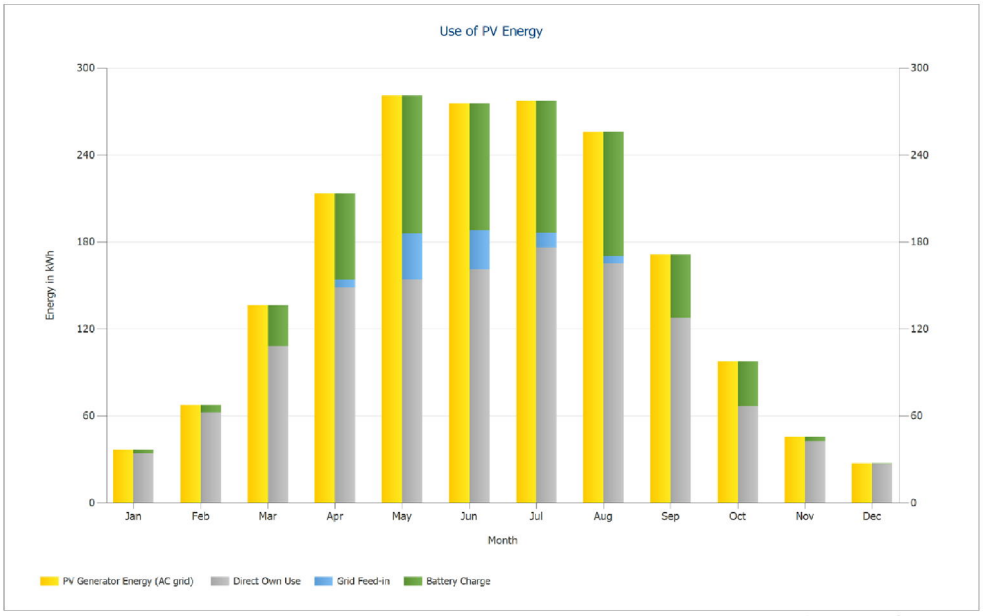



Figure: Use of PV Energy

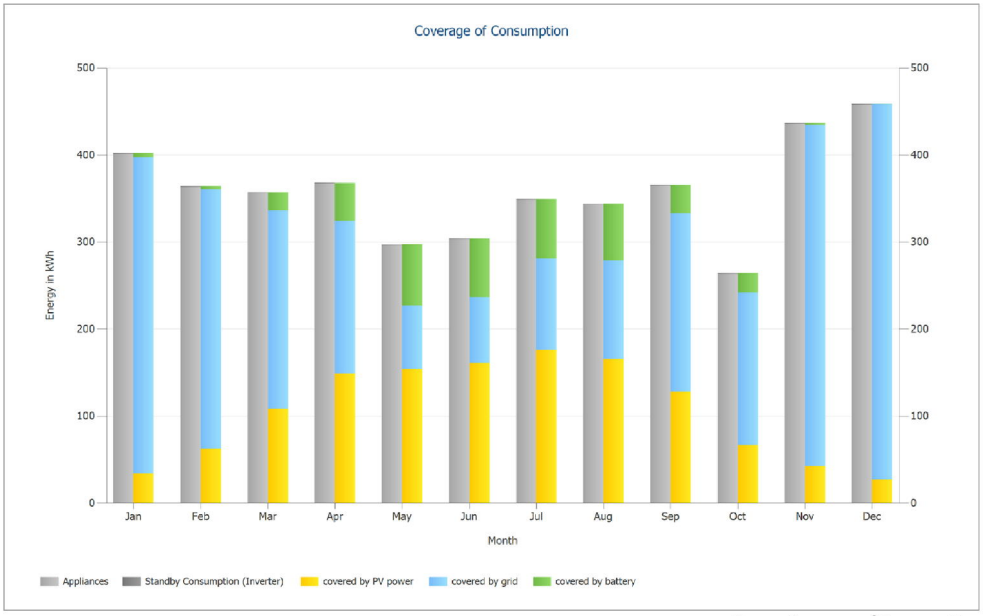



Figure: Coverage of Consumption

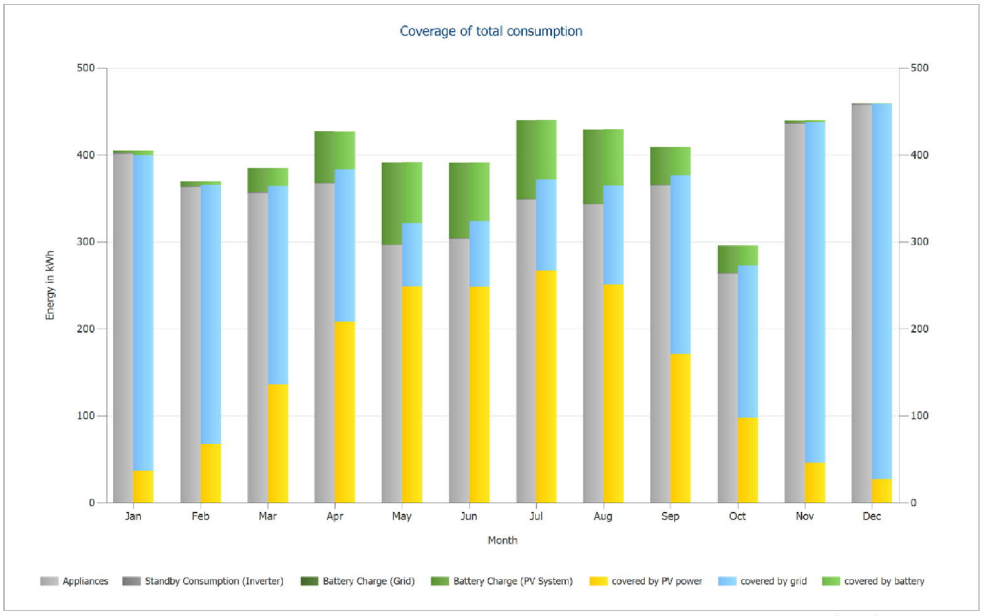



Figure: Coverage of total consumption

# Plans and parts list

## Circuit Diagram

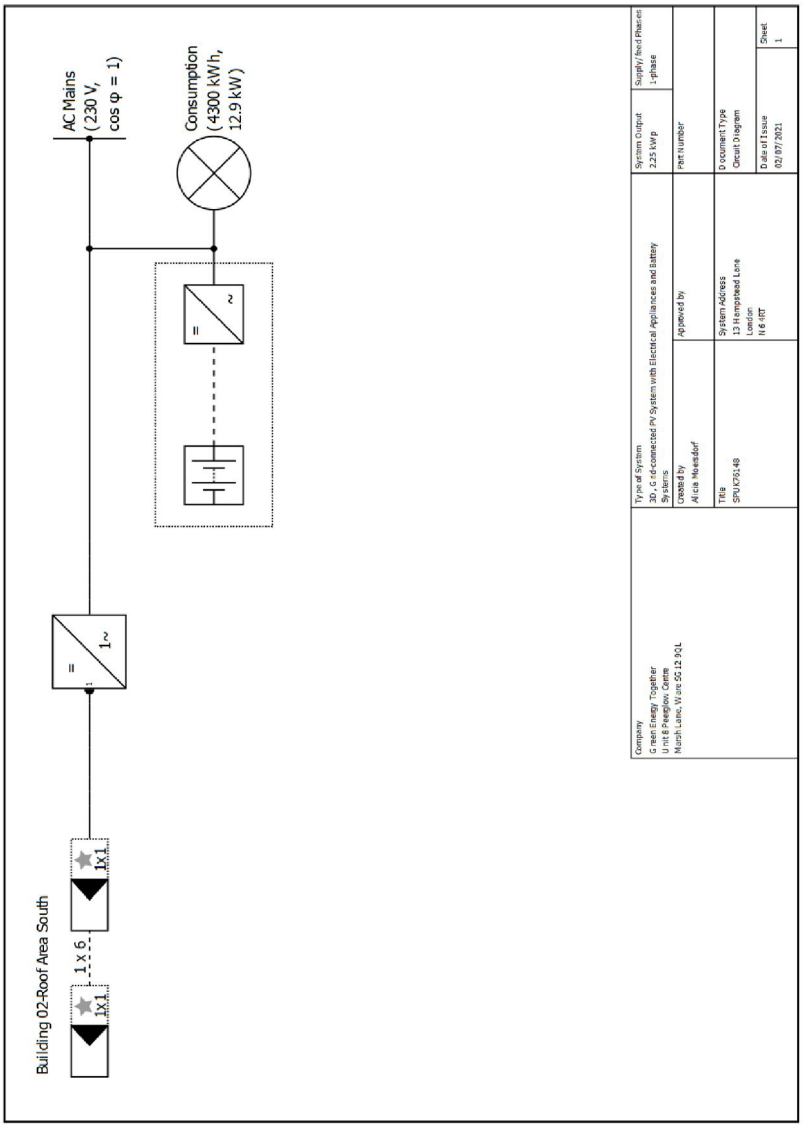



Figure: Circuit Diagram

# Dimensioning Plan

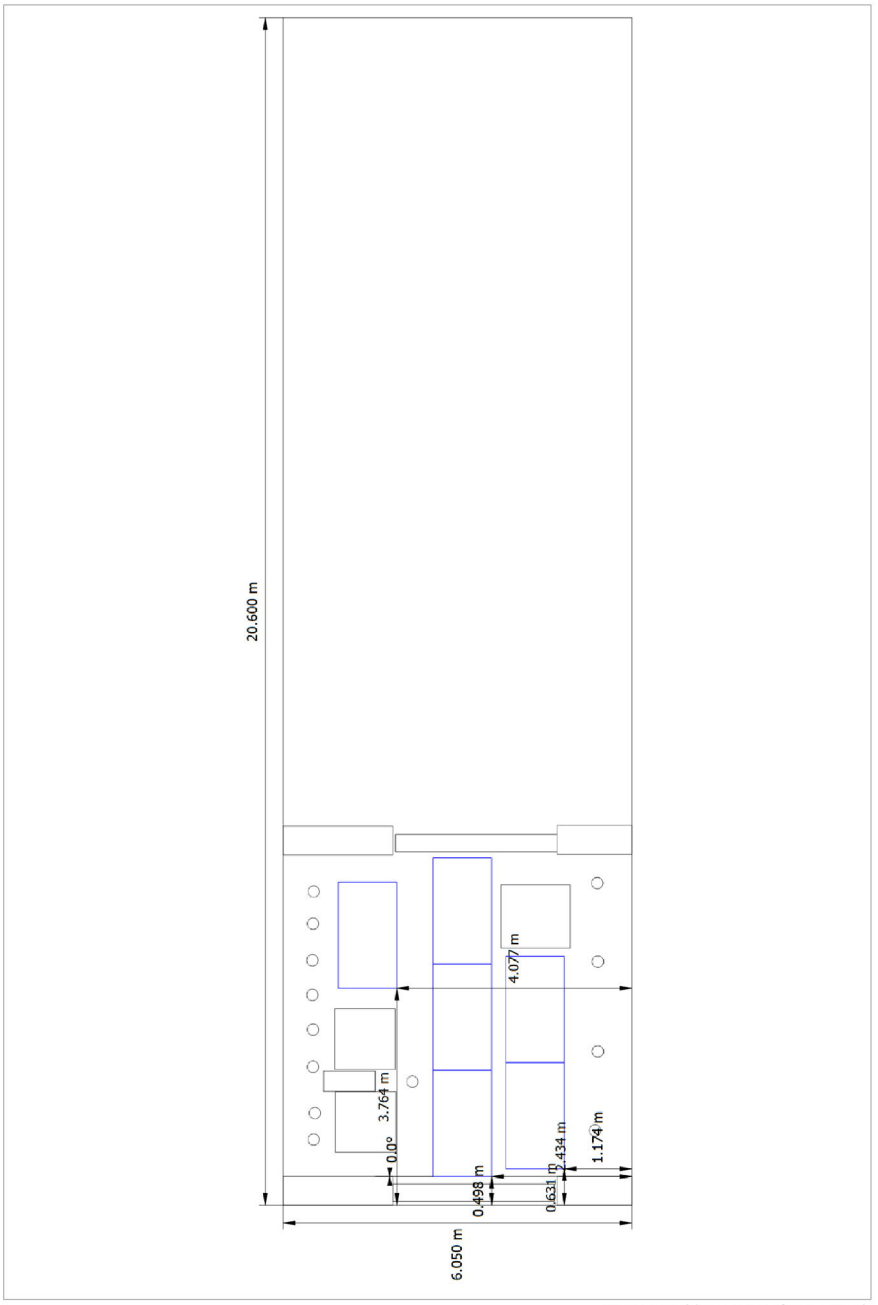



Figure: Building 02-Roof Area South

# String Plan

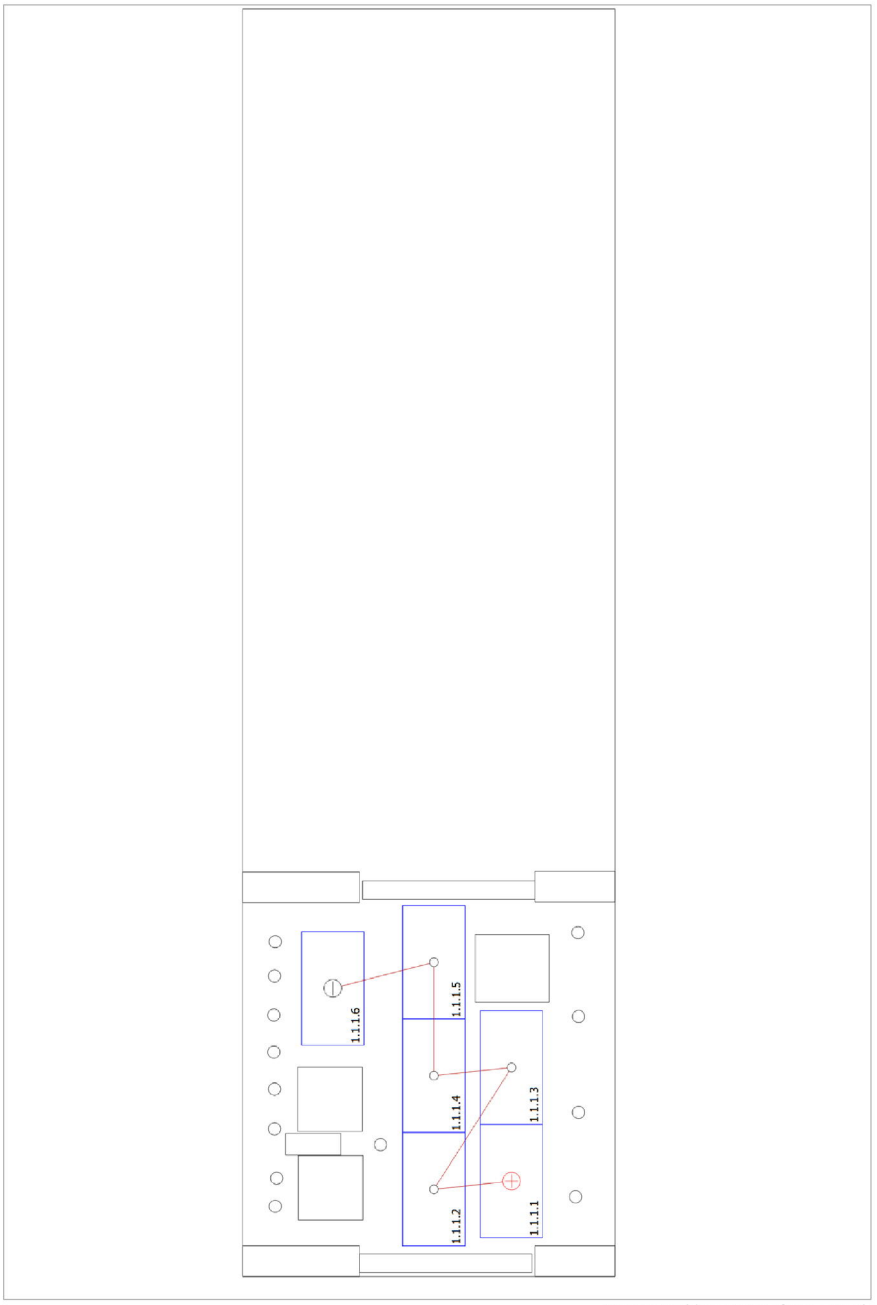



Figure: Building 02-Roof Area South

# Parts list

Parts list

| # | Type | Item number | Manufacturer | Name | Quantity | Unit |
|---|---|---|---|---|---|---|
| 1 | PV Module | | Hanwha Q.CELLS | Q.PEAK DUO BLK ML-G9 375 Rev1 | 6 | Piece |
| 2 | Inverter | | SolarEdge | SE2200H-EU-APAC | 1 | Piece |
| 3 | Power Optimizer | | SolarEdge | P404 EU-APAC/AUS | 6 | Piece |
| 4 | Battery System | | SolarEdge | SE2200H + AC5000 + 2x HV2600 (Optimizers) | 1 | Piece |

# Screenshots, 3D Design

## Environment

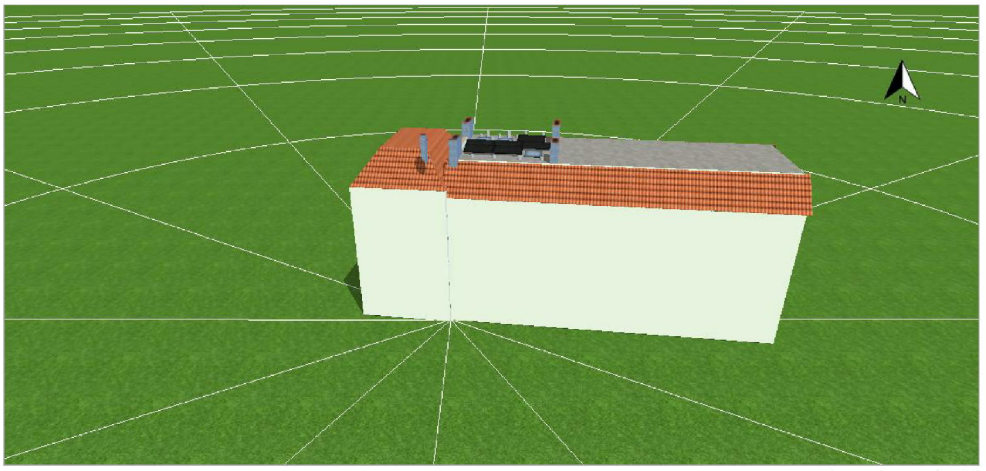


Figure: Screenshot03

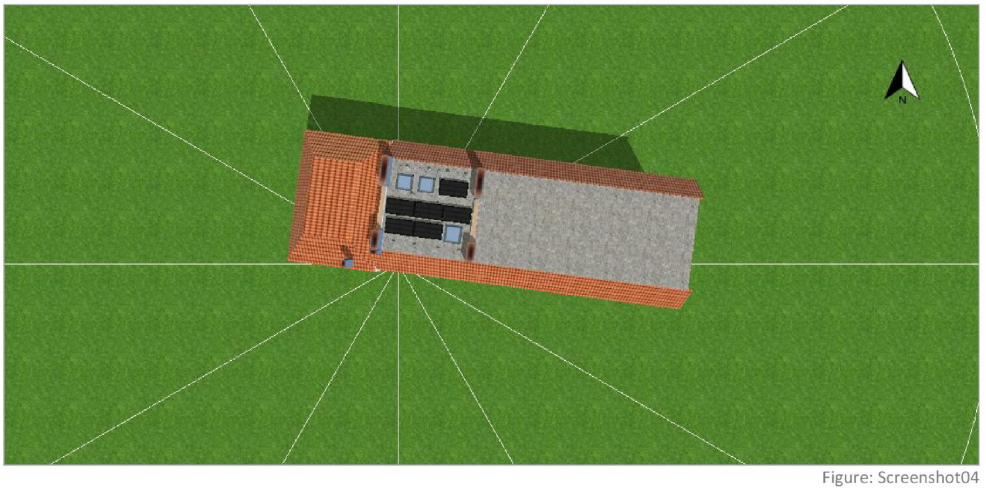


Figure: Screenshot04

## Configuration

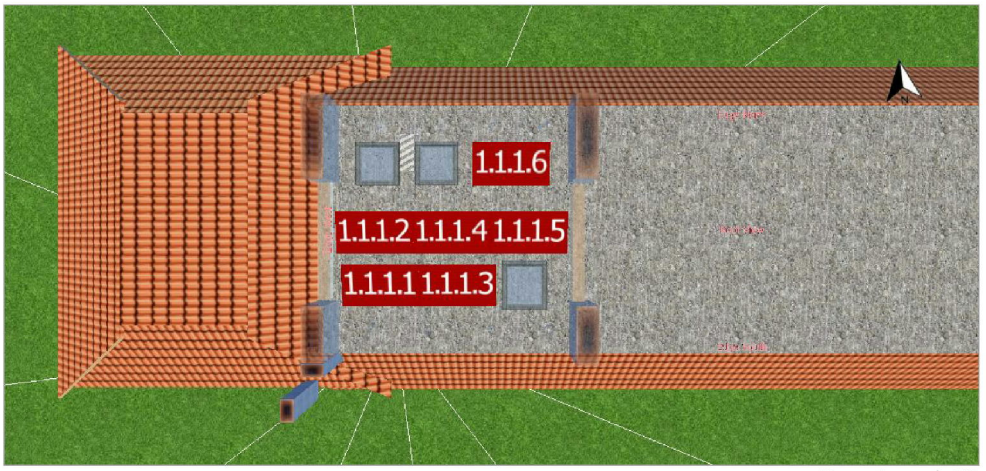



Figure: Screenshot02

## Shading

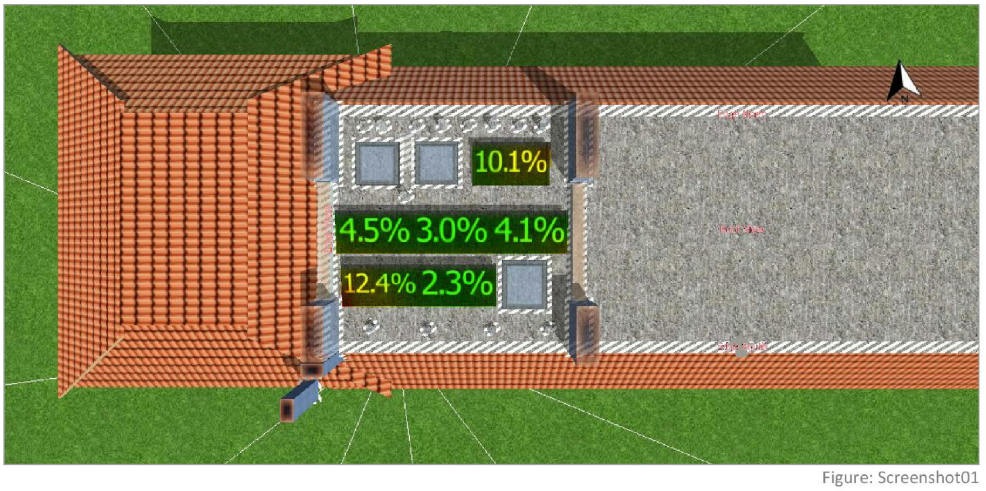



Figure: Screenshot01

## Site Details

Save Next >

Client Reg Id.

[redacted]

Date of Survey

01/07/2021

House Name/ Number

13

Street Name

HAMPSTEAD LANE

Town/City

London

Post Code

N64rt

Customer/Tenant Name

Robert Lindo

Email Address

Mobile Number

[redacted]

Additional Telephone Number

EPC Number *

[redacted]

Building Type *

House

## Initial Outside Area Check

< Previous | Save | Next >

Immovable obstacles that restrict entry, equipment off-loading or easi-dec setup such as fish ponds, swimming pools, unstable or uneven ground, porches,extensions, lean-to, out-buildings, delicate flower beds, conservatories, etc.

Using a magnetic compass, identify the most southerly roof areas planned for installation of panels. It is recommended a magnetic compass is used rather than mobile electronic device sensors which can have azimuth errors introduced may be influenced by nearby objects.

Observing the surrounding areas, create an aerial view sketch to identify all objects that could cast shadow onto the panels once installed. Ensure their distance, size, height and azimuth are all noted.

Initial approach to the property

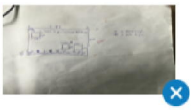
Identity the most southerly roof areas

Observing the surrounding areas

Insert Photos of Property Approach / Front Garden / Driveway *

Insert Photos of Target Roof areas suited for Panels *

Insert Photos and scaled aerial view sketches of objects that could cause shading *



Sunpath Shading Evaluation

Create a Sunpath shading chart using a Blank Template and the methods described in the sunpath shading evaluation and recording documents *

Area photo for delivery

Additional Photo

## Easi-Dec Access System

< Previous | Save | Next >

Ensure target roof area is accessible via an Easi-Dec system and there is an area suitable to erect it.
Allow for a clear floor space minimum 3m wide area x 3m long to erect it.
If the target roof area is accessed through the property (for example rear roof) ensure there is a clear route to bring the Easi-Dec system through.

### Ensure target roof is accessible

Insert Photos of proposed Easi-Dec location and route it *

Additional Photo

Are there any obstructions (Sky dish, boiler flue , etc. ) prutruding from the wall that would restrict easi-dec erection ? *

Yes ☐ No ☑

Is it possible to carry out the entire installation from an Easi-Dec system ? *

Yes ☐ No ☑

Is is possible to carry out the entire installation from a Tower Scaffold? *

Yes ☐ No ☑

If the above answers are 'NO' will scaffolding be required to carry out the install? *

Yes ☑ No ☐

## External Roof Area Data

< Previous | Save | Next >

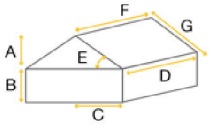
**Building Type** *

| Pitched | Hipped | Half-Hipped | Pavilion | Mansard |
|---|---|---|---|---|
| ☑ | ☐ | ☐ | ☐ | ☐ |

**Tile Type** *

| Concrete | Rosemary | Slate | other | If Others, Give Details |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☑ | flat |

**Property Dimensions**




| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A * | 0 | mm | B * | 0 | mm | C * | 6050 | mm | D * | 5820 | mm |
| E * | 0 | ° | F * | 5820 | mm | G * | 0 | mm | Azimuth * | 180 | ° |

**External Roof Comments**

**Target Roof Photos and Sketches** *

Insert Photos of Target Roof - in particular Obstacles and shading issues *

Insert Sketch of roof area with obstacles sizes and positions *

Insert Photos of Roof Tile Type *

## External Roof Area Data

< Previous | Save | Next >

| Roof Check Questions | Answer | | Roof Check Questions | Answer | |
|---|---|---|---|---|---|
| Any loose or missing tiles visible | * Yes ☐ | No ☑ | Any visible existing damage or signs of rot? | * Yes ☐ | No ☑ |
| Any signs of sagging | * Yes ☐ | No ☑ | Any recent roof repairs visible? | * Yes ☐ | No ☑ |
| Is a Durgo Valve required | * Yes ☐ | No ☑ | Any existing or recent leaks? | * Yes ☐ | No ☑ |
| Any roof guarantee in existence | * Yes ☐ | No ☑ | | | |

Is the external roof suitable for installation of solar PV panels ? *

Yes ☑ No ☐

If NO, describe all issues:

## Internal Roof and Access Checks

Sample Roof Reference | < Previous | Save | Next >

| Roof Check Questions | Answer | Roof Check Questions | Answer |
|---|---|---|---|
| Is there a loft ladder? * | Yes ☐ No ☑ | Is the diagonal opening of the loft hatch greater than 550mm? * | Yes ☐ No ☑ |
| Are loft crawl boards required? * | Yes ☐ No ☑ | Has the loft been boarded to walk on? * | Yes ☐ No ☑ |
| Has the loft been converted to living space? * | Yes ☐ No ☑ | Is the felt in good condition? * | Yes ☐ No ☑ |
| Is there any signs of Bats, Birds, Butterflies or Doormice within the loft space * | Yes ☐ No ☑ | | |

Rafter Depth (mm) * 0

Clear Span (L1) (mm) * 0

Are there any roof purlins? * Yes ☐ No ☑

Purlin Depth (mm) *

Rafter thickness (B) (mm) * 0

Clear Span (L2) (mm) * 0

Purlin Breadth (mm) *

Clear span of purlins between supports (mm) *

Rafter span (distance between centres) (mm) * 0

Angle (A2) * 0

Insert photo of Purlin Sketch if required +

Notes:

Physical Survey 1 July



## Internal Roof and Access Checks

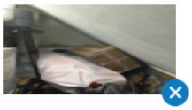
< Previous Save Next >

Please attempt to illuminate the loft space as brightly as possible for the below photographs

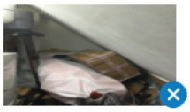
Insert photo of as much roof space as possible. (Use panaromaic if necessary)... *

Insert Close-up photo of Rafters *

Insert photo of Suitable loft area/ wall for mounting inverter *



Insert photos of any visible issues



Please describe in detail below:

Is the internal roof suitable for installation of solar PV panels? *

Yes ☑ No ☐

If No, Please describe why :

## Electrical Checks - Visual

See Sample Photos | < Previous | Save | Next >

In metres how long is the required AC run ? * 35 Metre

Do you require Mini Trunking for AC route ? * Yes ☐ No ☑

1 What rating is the DNO fuse? * 100 amp Amps

2 What is the Import Meter? * Other

If OTHER, give details: smart

3 Size of main tails in mm * 25 mm

5 Is there a Double Pole Isolator (DPI) installed? * Yes ☐ No ☑

7 Is earth bonding on all the main services? (gas, elec, oil, etc) * Yes ☑ No ☐

9 Make and Model of consumer unit * MK

Do you require Conduit for AC route ? * Yes ☑ No ☐

1 Are there intact seals on the Supplier fuse/ cut-out? * Yes ☑ No ☐

2 Are there intact seals on the Supplier import meter ? * Yes ☑ No ☐

4 Type of Earthing System * TN-C-S(PME)

If OTHER, give details: TN-C-S(PME)

4 Size of main earthing conductor in mm * 10mm mm

6 Is there enough room to install our equipment? * Yes ☑ No ☐

8 Customers MPAN number (if obtainable) Last 13 digits

9 Does the consumer unit have a NON-RCD protected * Yes ☐ No ☑

## Electrical Checks - Visual

< Previous | Save | Next >

9

Location of customers consumer unit * cellar

Electricity supplier (if known)

Installation Problem 1 * Yes ☑ No ☐

Installation Problem 2 * Yes ☐ No ☑

If YES, give details:

5 storey building in regards to Schafold can we use flat roof on 3rd floor balcony

If YES, give details:

Additional Photos 1:

Additional Photos 2:

Physical Survey 1 July



## Electrical Checks - Visual

Sample MPAN Photo | < Previous | Save | Next >

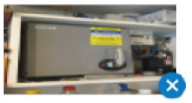
Insert photo of mains fuse / cut-out showing sealing point *

Insert close up photo of DNO meter *

Insert photo of consumer unit and potential spare way *

Insert close-up photo of CU protective device *

Insert a photo of DPI



Insert a photo of the customers electricity bill with MPAN number HERE if obtainable.

## SURVEYOR'S STATEMENT

< Previous | Save | Finish

I have carried out an inspection of the structure and condition of the roof at the premises stated in accordance with MIS 3002 and the MCS "New PV Guide" and I believe that the roof structure and fabric are suitable to accept an installation of a solar PV system which is appropriate for this property; provided that the system is installed in compliance with the manufactures specifications and warranties and MIS 3002 and the MCS "New PV Guide" it is capable of achieving a 25 year life span without detriment to the original fabric or construction of the roof upon which it is to be mounted.

Surveyor's Name(s) *

Dylan Jones

Date *

01/07/2021

Surveyor's Signature *

Clear