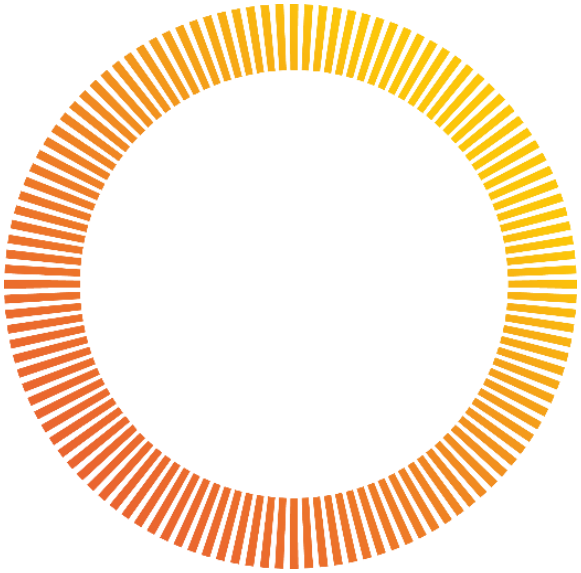
REVISION – 3.0 V2

Eco2Solar PV Site Guide

Standard Installations up to 3.6kW



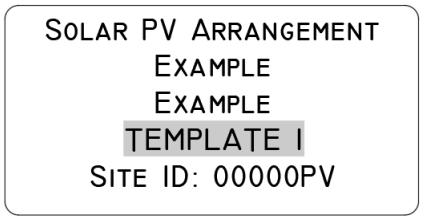
Contents

Summary

Note that there is a MINIMUM 4 WEEK CALL OFF (from design approval) for 1st fixes for standard In-roof installations.

2nd fixes also require a MINIMUM of 4 WEEK CALL OFF following 1st fix

Please quote your unique Site PV reference when calling off plots. This is located on the site drawing pack provided by our design team.



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northeast.scheduling@eco2solar.co.uk

northwest.scheduling@eco2solar.co.uk

northmidlands.scheduling@eco2solar.co.uk

midlands.scheduling@eco2solar.co.uk

south.scheduling@eco2solar.co.uk

yorkshire.scheduling@eco2solar.co.uk

Note that the following **MUST** be in place prior to Eco2Solar attending any plots for 1st or 2nd fix;

1st Fix

Roof preparation requirements

- For traditional trussed roof installs, the roof must be at felt and batten build stage but left clear of tiles
- For Cassette roofs, please contact Eco2Solar directly for cable entry points as these will need to be drilled by your contractors prior to our attendance

2nd Fix

Standard Loft

- There must be operational permanent mains power supplied by the Distribution Network Operator (DNO) to the plot **(generator supply is not safe to work with)**
- A 1.2 x 1.2 meter working platform must be provided to allow safe access & egress for the electrician and maintenance personnel in the future (This is in line with the NHBC Standard 7.2.17)
- A fixed structure of 2 x vertical timber upstands needs to be provided within 1 meter of the loft hatch, 600mm apart to allow us to fix the fireproof board/inverters to

2.5 Storey (Room in Roof)

- Access to make DC connections
- A purpose-built cupboard, minimum dimensions W1000 x H1100 x D450 mm
- (Steel Wire Armoured) PV Ultra Cable® (product code: PV-ULTRA**C4.0SWA) from top roof void or Eaves (This is predetermined, please see Room in Roof section) to inverter location with minimum 2000mm coil at both ends **(Standard SWA Cable is not acceptable and will prevent 2nd fix)**

All plots

- A 6mm² Twin & Earth 6242Y cable running from the consumer unit to the inverter location for PV systems up to 3.6kW. Any systems above 4kw will require a bespoke schematic and cable specification
- A CAT5/6 shielded twisted pair (STP) running from the DNO utility meter (service head) to the inverter location
- A high integrity consumer unit fitted with a 16A double pole, Bi-directional B curve RCBO Type A, in accordance with BS 7671 amendment 3 July 2024

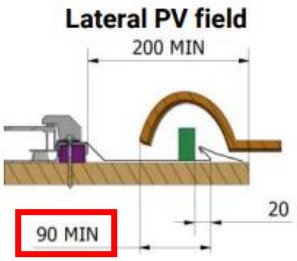
Further detail drawings for these requirements are available in this document.

We will confirm with site, prior to attending, that all the above requirements are in place. If we attend and the plot is not ready for us to complete our work, a 'plot not ready' charge of £350 per plot will be chargeable.

The onsite roofing contractor

Your roofing contractor is responsible for the following:

- Roof preparation requirements as on page 3
- Cutting of tiles to as close to panels as possible ensuring full coverage of side and top flashings the minimum coverage of the side flashing is 90mm

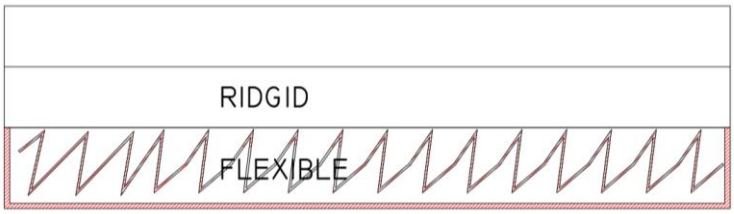


- Trimming the foam to suit the tile type (minimum 20mm to remain) we will supply the site office with a spare roll of foam should replacements be required
- Side flashing storm return can be bent SLIGHTLY to suit the tile type but it MUST not be flattened
- Utilise the adjustable tile supports to ensure correct support of roof tiles across the top of the array
- Clean down flashings that have become discoloured due to tile cutting and site dust
- Do not stand on the PV Panels they are made of glass

Flashing Dressing Video

- To correctly dress the self-adhesive bottom flashing to the tiles, ensure the tiles are as dry and free of debris as possible. Minimum temperature for application is 5°C

- Use the provided additional adhesive (in a skeleton applicator gun) to ensure a secure finish. Cut the nozzle to maximum 5mmØ. Please apply as shown below – a *constant bead around the outer edge [applied to the flashing] and zigzag application in the middle [applied to the tile]*:



- 1 tube of adhesive will cover at least two flashings (Half tube per flashing)
- Use a weighted roller to assist with the dressing down
- Use a lead hammer to form the shape on roll tiles – Ensure initial forming of the flashing is done whilst the release paper is still attached. This stops the adhesive becoming too thin on the stretched areas
- Ensure a small bead of seepage is visible all the way around the flashing. This is for quality control
- It is recommended to wear gloves to avoid the adhesive coming into contact with skin
- Ensure the roof tiling is complete before sticking down the bottom flashing
- Take your time

Post Eco2Solar 1st Fix

The onsite electrical contractor

Prior to work commencing Eco2Solar will have provided the following to the developer which needs to be passed onto their Electrical Contractor:

- Specification of works
- Drawings
- Technical Plot Schedule

AC Cable Requirements

To ensure compliance with BS7671 and the Electricity at Work Regulations 1989 (HSR25) the house builder shall observe the following:

- The site electrical contractor shall Install a continuous **6mm²** twin & earth 6242Y (unless otherwise specified) from the consumer unit leaving a loop out in the desired AC Isolator location and then to the inverter location
- Leave approximately 300mm of cable inside the consumer unit. Please do not terminate, Eco2Solar will do this during T&C of the system
- The local loop needs to project out 300mm so our electricians can install the AC isolator and Generation Meter
- Please leave approximately 2000mm of slack cable clipped above the insulation at the inverter location
- The PV system shall be installed on its own dedicated circuit where no other current using equipment is permitted
- The site electrical contractor shall also run a CAT5/6 shielded twisted pair (STP) from the DNO utility meter (service head) to the inverter location

Room in Roof electrical details

Room in roof plots present their own set of bespoke cabling requirements due to the lack of space in the loft area. In the case of room in roof plots the inverter will need to be located in a cupboard on the Ground, First or Second floor. This will require a PV Ultra SWA cable between the PV Panels DC entry point and the inverter location.

The DC entry point was specified by your group or your divisional office depending on your company, please note that our drawing pack will show the DC entry point in reference to the pre agreed location and your electrical contractors are to follow this when undertaking their first fix and installing the PV Ultra SWA cable.

It is imperative that the drawing is followed as our first fix team will install our DC cables in this location and there will be additional cost if the PV Ultra has been installed to a different location

This will be one of two options;

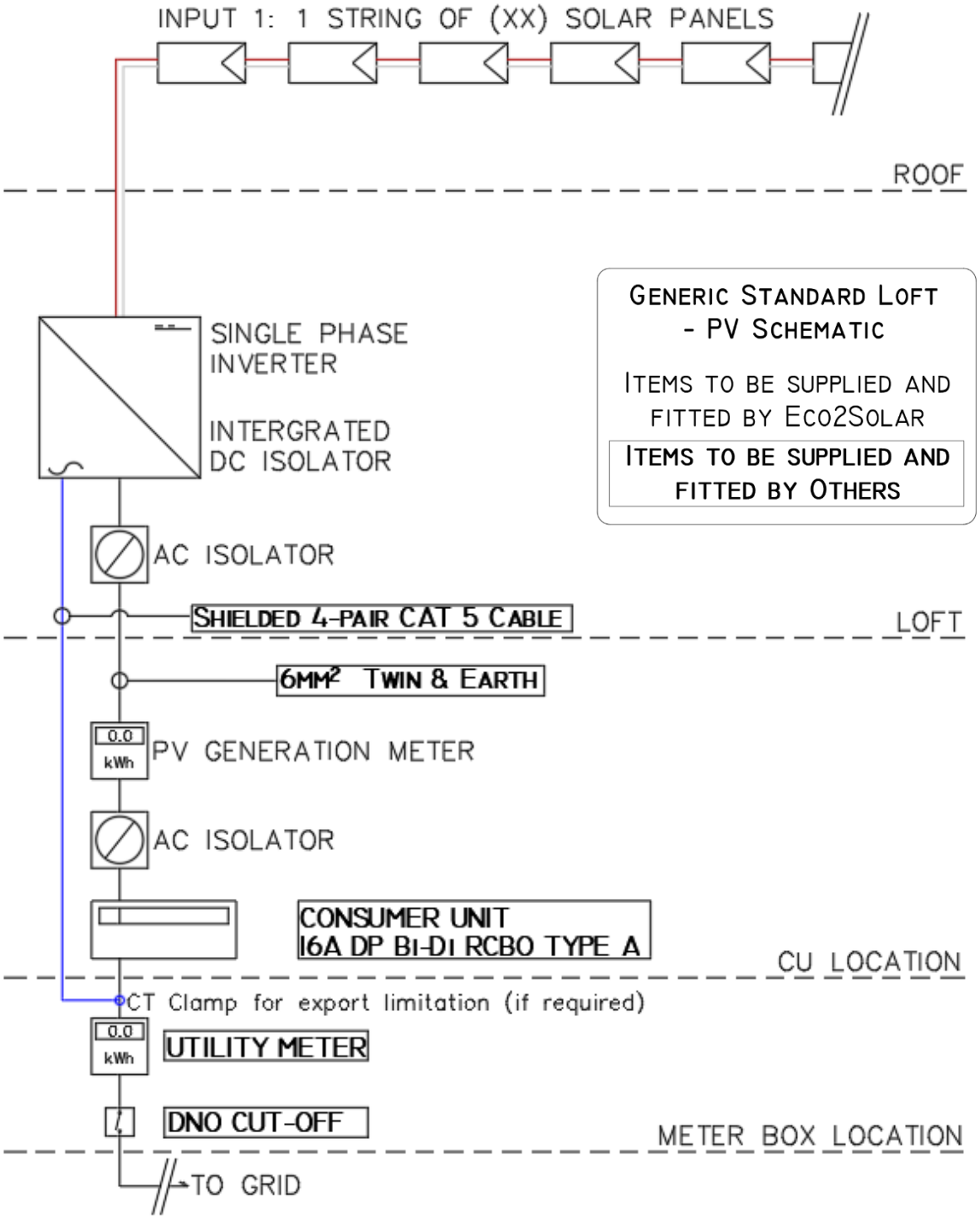
DC cable entry to top loft – 4 core 4mm² PV-ULTRA4C4.0SWA

DC cable entry to eaves cupboards – 2 core 4mm² PV-ULTRA2C4.0SWA

Please note whichever option has been agreed will require access for our electricians to make the maintenance free connections.

The specific schematics for these plots will be included within the drawing pack.

Solar PV Schematic for standard installations



Regulations

Building regulations

Both Viridian and GSE systems comply with Approved Document B in relation to The European classification of BRoof T4 for fire safety and roof coverings.

It is not permitted to install inverters in protected stair core loft areas. Only electrical meters are permitted to be within protected stair cores.

All Eco2Solar electrical installations are notified in line with Approved Document P.

Wiring regulations

In order to be compliant with BS7671 18th Edition (Latest Amendment) please note the following requirements:

- 16A double pole, Bi-directional B curve RCBO Type A
- PV Ultra SWA Cable (Double insulated) for extended DC cables

Regulation 132.12 – refers to the requirement for clear access platform for maintenance and repairs.

BS 5839-6 Clause A.6 Annex A

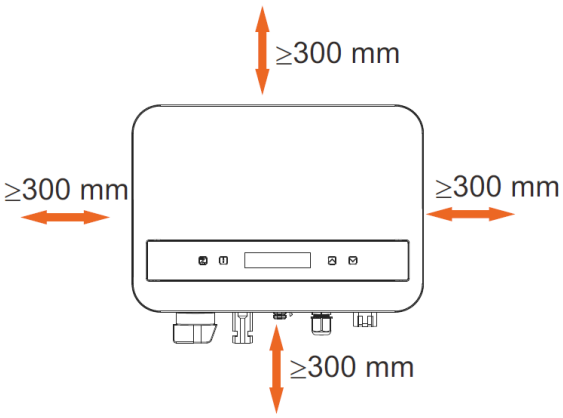
Refers to the requirement for smoke detection for electrical equipment mounted in the loft. Eco2Solar are not responsible for installing smoke detection.

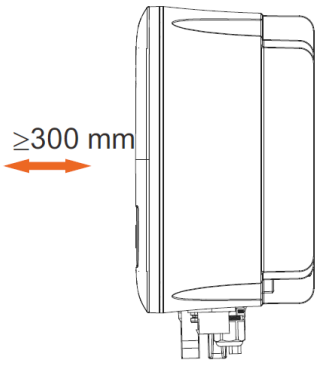
NHBC Standards

Refer to NHBC Standards 8.2.1 Solar photovoltaics.

Inverter Regulations

Ventilation requirements for the inverters are as below (300mm all around)





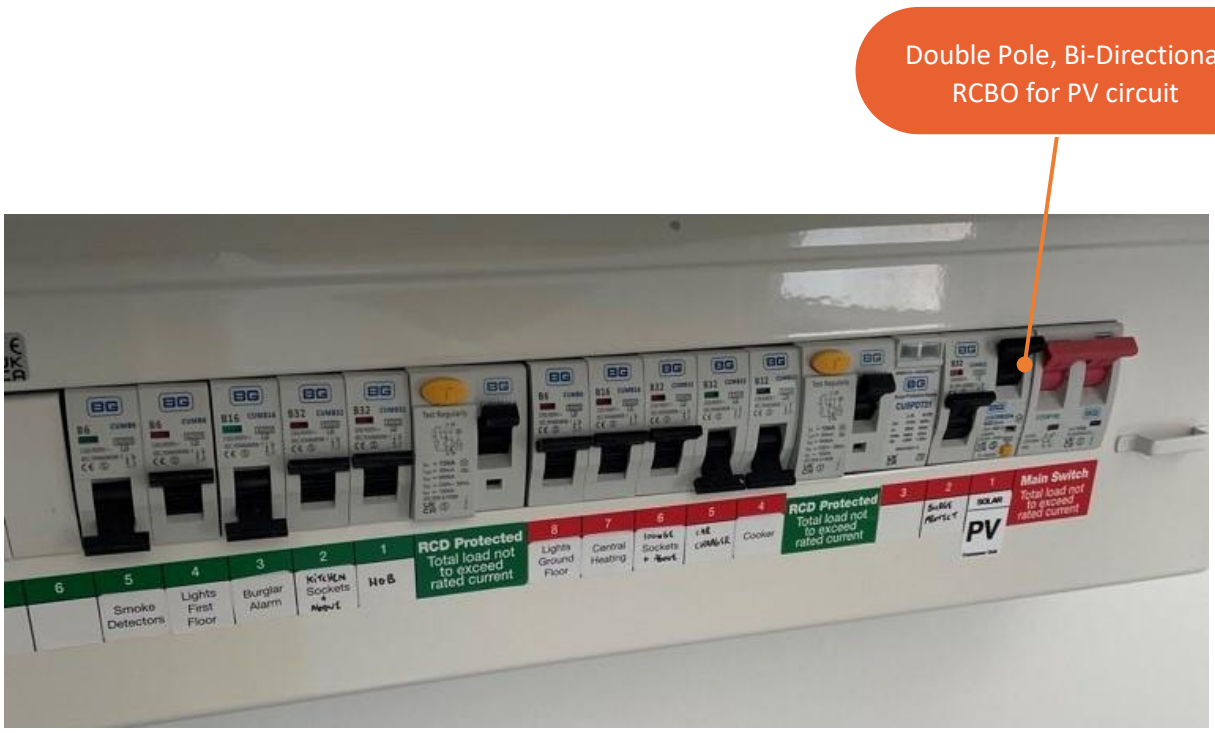
Inverters installed outside are required to not be in direct rain or sunlight. Inverters therefore require at a minimum a canopy when installed outside.

PAS 63100

PAS 63100 currently not regulation however is likely to form regulation in the future relates to the safe installation of BESS (Battery Energy Storage Systems). Please refer to the specific guidance for full details or contact our Technical Department. Generally, the guidance means that no BESS systems can be installed in loft spaces or on or adjacent to any escape routes from the building. Eco2Solar support the guidance and will install BESS systems according to this guidance.

Consumer Unit & Protective Device

- Site are to provide a High Integrity consumer unit or similar fitted with a **16A Double Pole, Bi-Directional RCBO Type A** (unless otherwise specified) ready for the Eco2solar second fix.
- The installation of a high integrity consumer unit complies with BS 7161 Amendment 3 July 2024 *(32 &, 531.3.2)* and the MCS/ECA guidance *(2.3.1)*. Regulations state that every installation shall divide circuits to reduce the risk of unwanted tripping and to minimise any inconvenience.
- Note: RCBO Type AC Shall **not** be used where a load current contains DC components *(531.3.3)* i.e. Solar PV, EV charging etc…
- A High Integrity consumer unit will also future proof the installation should an EV charge point be required.



Solar PV and the Distribution Network Operator (DNO)

Every site Eco2Solar installs PV on requires a Distribution Network Operator (DNO) application to request that the load generated from the PV systems can be connected to the grid.

Eco2Solar will submit this application to the DNO on the developer's behalf.

In order to submit this application, the developer needs to provide us with postal addresses, MPANs and a signed letter of authority for the site. If they do not issue us with the postal addresses and MPANS, we CANNOT submit the application.

IMPORTANT: The developer must ensure that PV has been included within their Point of Connection (POC) application, regardless of export limitation or not. Failure to include this may result in further delays and additional costs that will be passed onto the developer.

The DNO approval process can take up to 60 days from acknowledgement of application and a further 65 working days should this need to be sent upstream for further review. Therefore, we need to submit the DNO application at least 60 days before the first plot is due to be completed.

DNO – Locked Off Systems

The DNO may issue a network study fee to allow connection. This cost will be passed directly to the developer for payment.

Note: We cannot connect the PV arrays to the grid without payment of these charges.

In the event that we do need to connect the PV arrays prior to receiving approval, then we will 'Lock Off' the systems at the isolation switch using a padlock. We include a QR Code sticker to provide information to the homeowner about why the padlock is in place. This padlock can be removed only once the DNO have confirmed formal approval to connect. As soon as we receive approval, we will provide you with a code to remove the padlock and you can turn on the PV system using the isolator switch.

Note that the solar PV system has been fully installed, tested and commissioned by our professional engineers prior to being locked off.

LEGAL NOTICE: Please note that forced or unauthorised removal of the Solar PV padlock may lead to a DNO prosecution in court.

Post Commissioning

Once a plot has been commissioned, Eco2Solar will supply the nominated MCS contact for the developer with the following documents:

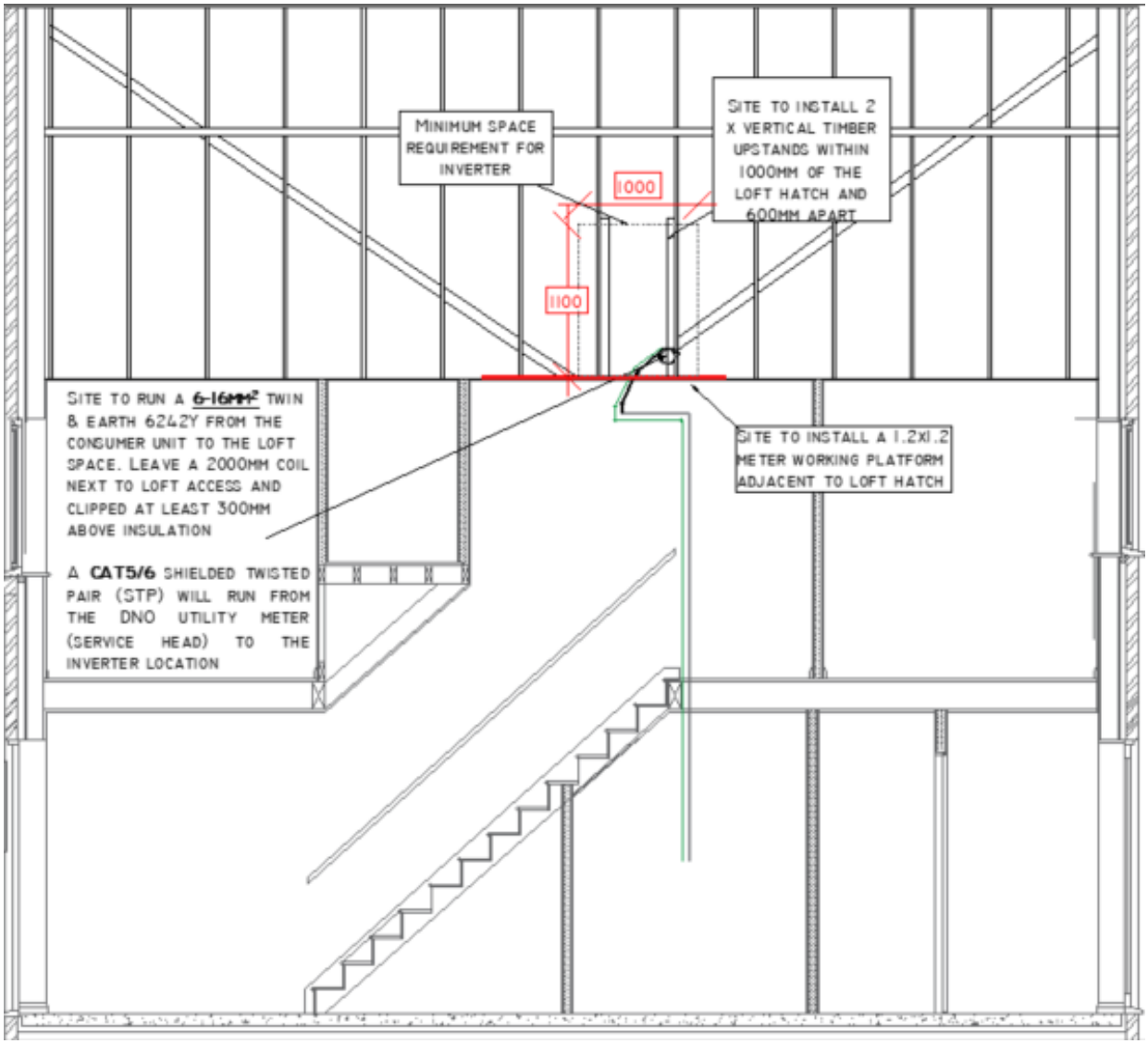
- MCS Certificate
- User Manual
- Installation Detail Sheet
- G98/G99 Commissioning Certificate
- Electrical Installation Certificate (for the PV circuit only)

From the date of commissioning, Eco2Solar has 10 days to generate the MCS Certificate. Any changes required to MCS Certificates AFTER the certificate has been generated will be subject to additional charges.

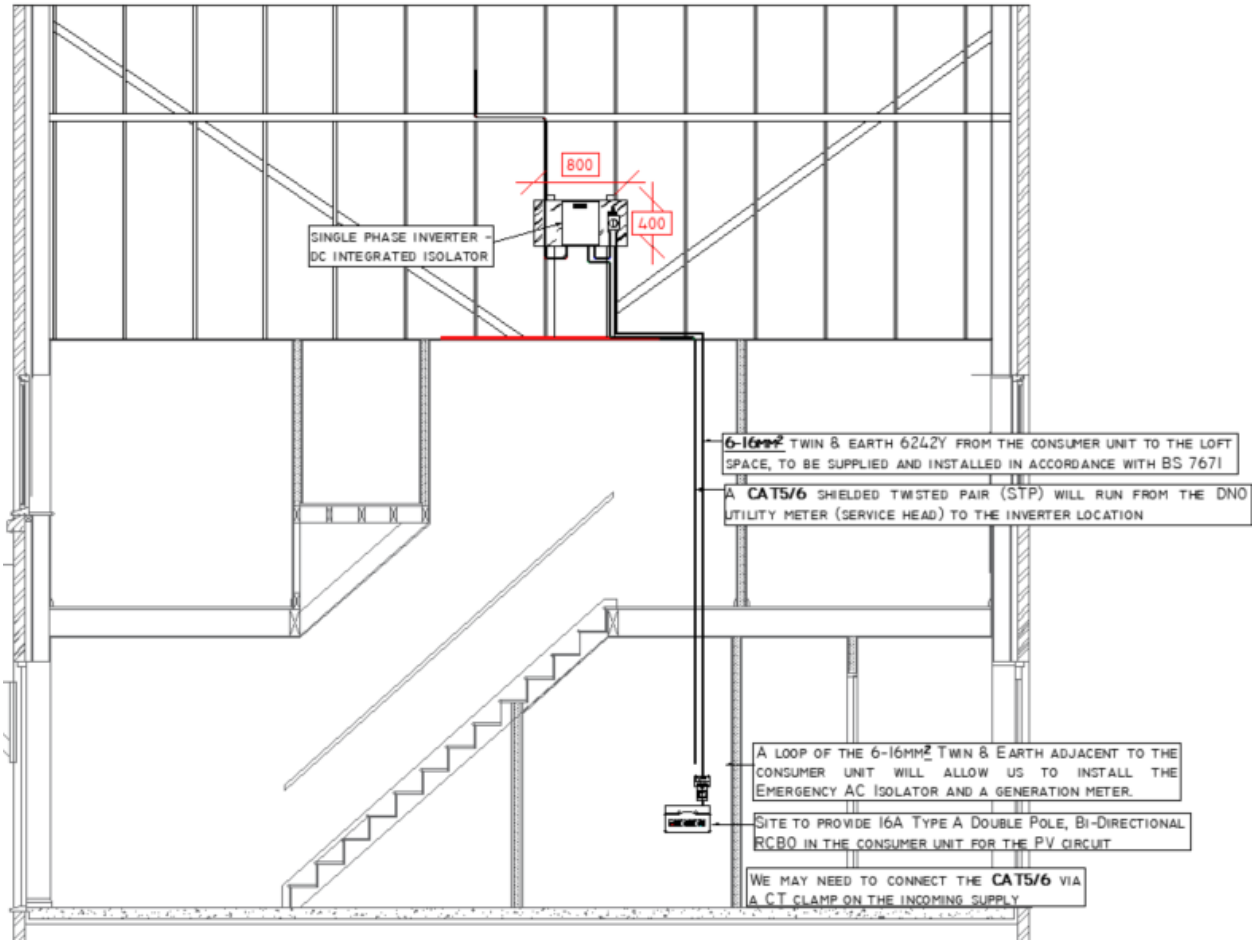
Eco2Solar will notify the DNO of plot commissioning within 28 days of connection.

Photovoltaic Electrical Layout – Standard installation

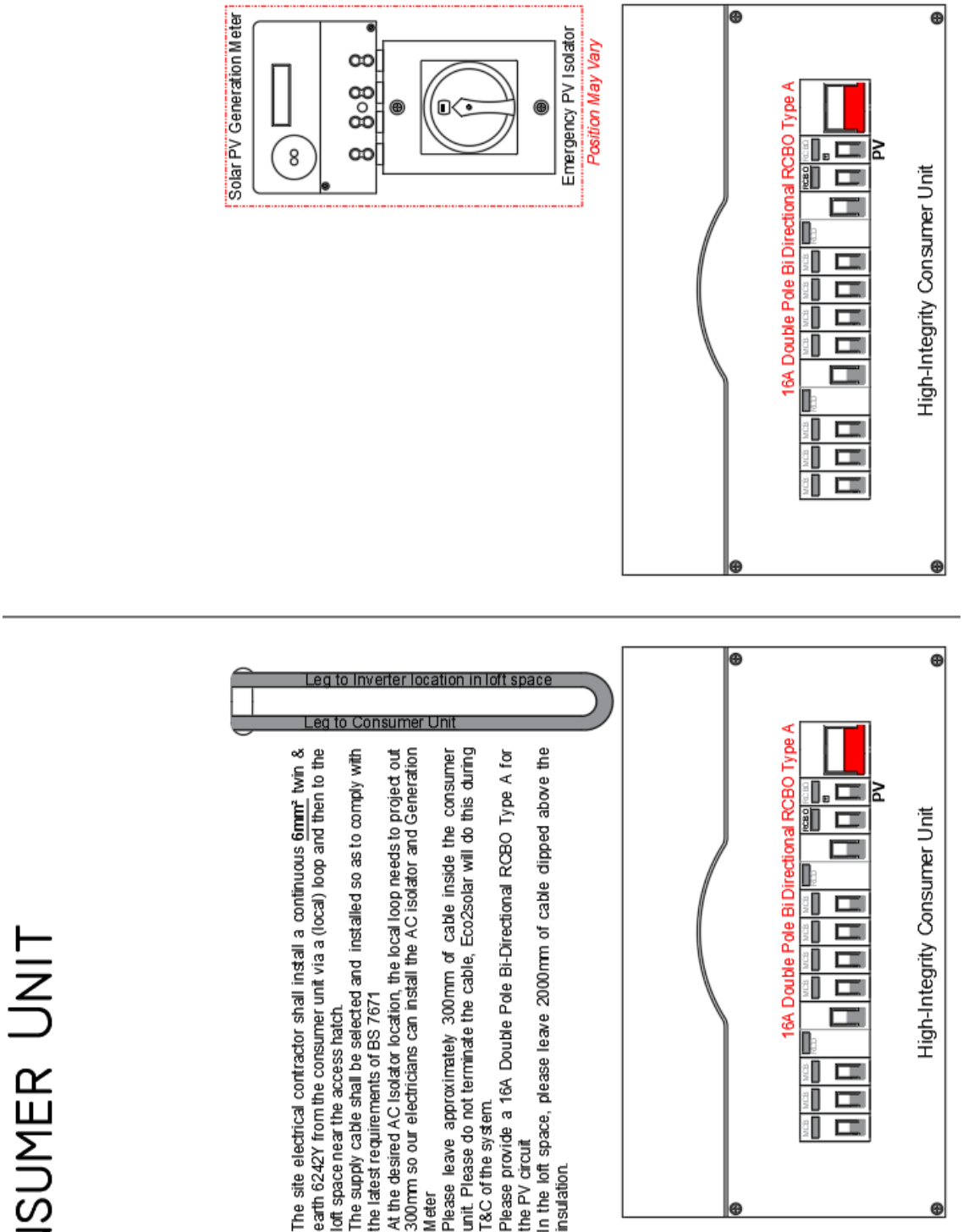
Before 2nd Fix



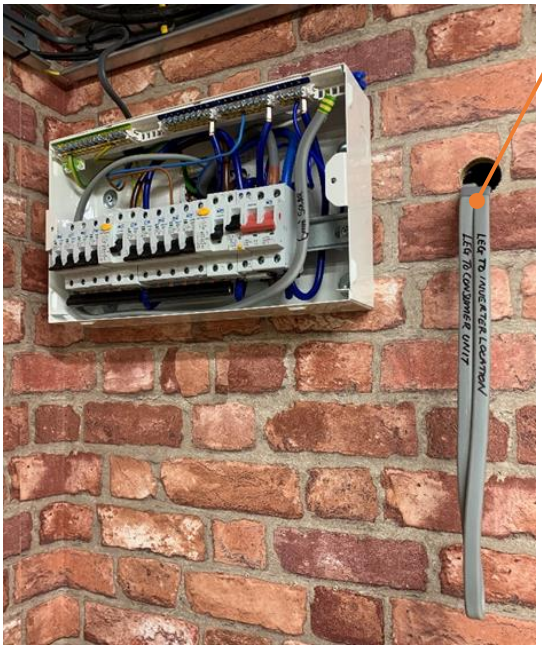
After 2nd Fix



Consumer Unit



Typical Consumer Unit, AC Isolator & Generation Meter Layouts



Local loop left for isolator and meter

Eco2Solar Inclusions & Exclusions Table

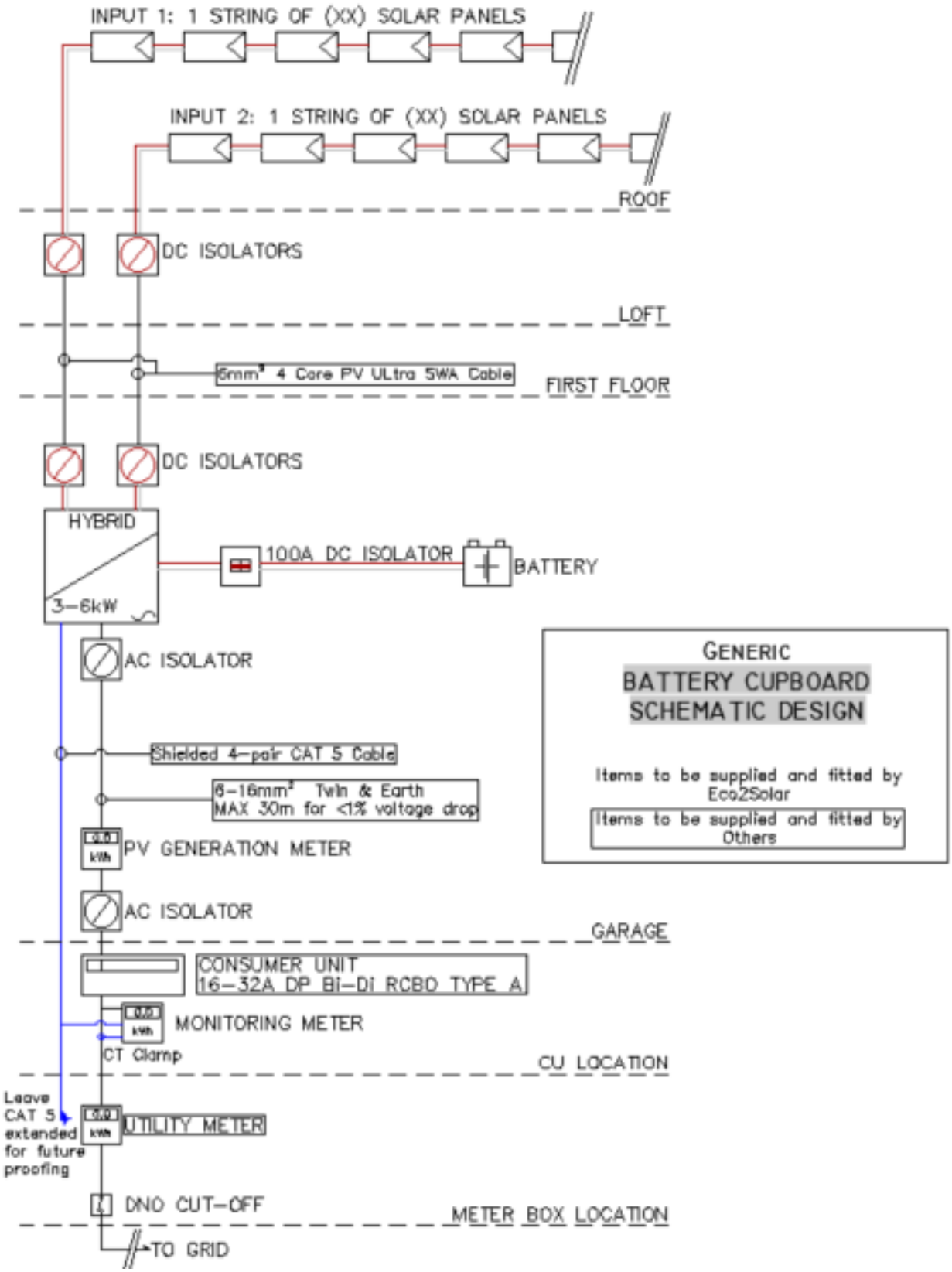
Inclusions/Exclusions	Supplied and Installed By	
	eco2solar	Others
MCS approved PV Panels	✓	
MCS approved fixing system for System Quoted	✓	
Single Core DC Cable	✓	
DC Isolators	✓	
Grid approved inverters	✓	
Generation Meter	✓	
AC Isolators x 2	✓	
DC works fully installed by Eco2Solar *	✓	
Commissioned by Eco2Solar	✓	
Full working drawings	✓	
DNO Application	✓	
User Manuals/Handover packs	✓	
Export limitation devices or cable (if required) at additional cost	✓	
6mm² AC supply cable installed from Consumer Unit (CU) /Distribution Board (DB) to inverter location		✓
* Supply & Install of DC extension cables in PV Ultra SWA where required		✓
CAT5/6 STP cable installed from DNO Utility meter to inverter location		✓
Type A Double Pole Bi Di RCD/RCBO (see specification & schematic for Curve and Current rating)		✓
1.2m x 1.2m landing deck/platform next to the loft hatch		✓
Site to provide 2 x vertical timber upstands next to loft hatch 600mm apart to allow us to brace inverters to		✓
SWA or DC cable containment within the building		✓
Connection charges or network study costs from DNO		✓
Heat/Smoke Detectors in lofts		✓
Production of BS7671 certificate for AC cable installed by others		✓
Lightning protection and surge protection for the PV system		✓
Sacrificial layer/membrane (if needed) on flat roof		✓
Cable entry provided by roofing contractors		✓
Installation of import/export meter or GSM meter		✓
Structural assessment / calculations to confirm roof can support the loads from the PV system		✓
Application for planning and building control approval		✓
Choice of electricity supplier, informing electricity supplier of installation or negotiation of SEG		✓
Safe working environment (scaffolding/edge protection)		✓
Site access/lifting equipment/banksman/slinger/signaller		✓
Off-loading facilities		✓
Site welfare & Parking		✓

Battery Systems and Hybrid Inverters

New Installation of Hybrid Inverters and batteries. Please note that some brands of hybrid inverters and batteries may require a different electrical configuration.

Item	Supplied and Installed By	
	eco2solar	Others
Hybrid Inverter	√	
Battery (if applicable)	√	
EM115 bidirectional meter	√	
Monitoring/ Internet dongle	√	
DC double pole 100A MCB (may be integral to battery)	√	
6mm2 Twin & Earth 6242Y supply from consumer unit toinverter location		√
CAT5/6 STP cable installed from external meter box, via CU to inverter location		√
High integrity Consumer unit to allow for a Double Pole Bi-Directional RCBO or a dedicated RCD for the PV system		√
Hybrid 3.0kW/3.6kW/ C20A 30mA Double Pole RCBO (Type A) Hybrid 5.0kW/6.0kW C32A 30mA Double Pole RCBO (Type A) Note: Hybrid inverters must have their own RCD protection, not shared with any other circuits.		√
Suitable wall/ surface to mount the inverter capable of holding 35kg, with 400mm ventilation clearance on all sides.		√
Battery units must be within 1m of the inverter and will require a firm base to stand on due to their weight (minimum load bearing required 150kg)		√

Solar PV Schematic for Battery-ready systems



Revision Table

Revision Number	Changes	Date	By
3.0 V1	Updated with new updated regulations and requirements	Jan 25	TH