



Absolute
Powering The Future

Design and Equipment Specification

Outer Space Studios



Description of System

The proposed installation at Outer space comprises solar panels on 3 flat roofs and a containerised Energy Storage system (ESS) to the South East of the site. The installation for the ESS will involve burying a cable in the soft ground behind the buildings to the main LV switchboard for the site.

The solar inverters will be mounted externally behind the main LV kiosk for the two smaller roofs and it is proposed that they will be mounted on the external wall of the main studio building for the larger system.

Solar TIC = 605.7kWp
Solar DNC = 440kW
ESS = 187.5kW

DNO

The DNO offer has not been provided at this stage.

Equipment Schedule

Description	Manufacturer	Model
Solar Panels	Longi	LR4-72 HPH 450M
Solar Inverter	Solis	11 x 40k5G
Mounting Kit	Van der Valk	Valk Pro+
ESS	Alpha	Modular PCS
Generation meter	Elster	A1100
Cable Tray	TBC	Medium duty (covered when external)

Location of equipment

Energy Storage System (ESS)

Proposed location for the battery is the grass area to the East of the smaller buildings. It will be necessary to obtain services drawings for the area as there is a CCTV camera and manholes that can be seen on the surface. The bearing capacity of the ground will also have to be assessed to provide a foundation or ground anchor design to install the ESS container





Solar panels

The solar panels are to be installed on 3 flat roofs. Details of the proposed layout can be found in the drawing pack. The mounting kit required will be a standard ballasted flat roof kit. It may be necessary to install ballasted edge protection around the perimeter of the roofs or a mansafe system for maintenance





Point of Connection

The ESS will connect into the main LV switchboard in the substation kiosk. There are no spare sections large enough to install a suitably rated connection so it will be necessary to install an extension to the LV panel. Due to space constraints the most suitable location looks to be on top of the existing panel.

There are spare sections available in the main LV switchboard to connect the solar inverter for the 2 smaller roofs. Each will require to be fitted out with a new 160A MCCB. SWA cable will be terminated onto the bottom of the panel to match the existing installation.



There are 8 solar inverters in this location and 6 spare ways in the switchboard so it is proposed that the inverters will be connected in pairs into small Schneider Distribution Boards that will be supplied from 4 of the 160A supplies.

The inverters for the main studio roof will connect into a new distribution board that will be supplied by the Schneider panelboard (PB201) on the East side of the studio building.

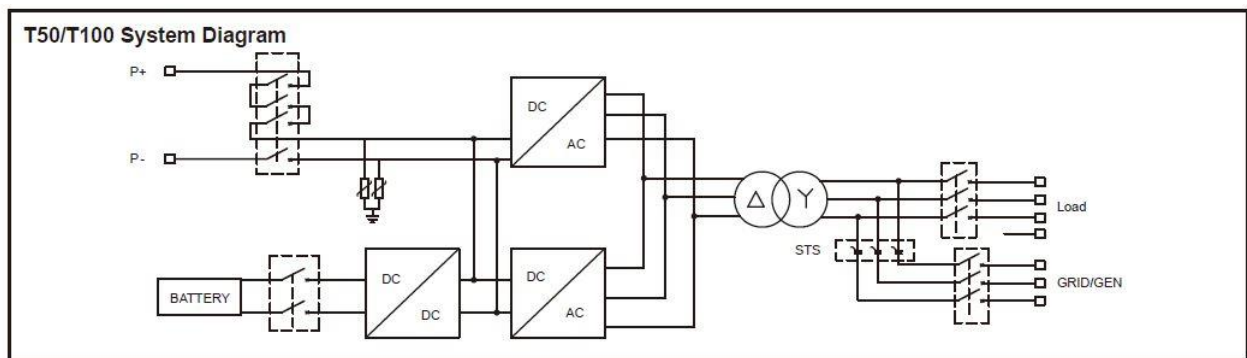




ESS Control and interface

With regard to integration into future Building management systems, the manufacturer is able to release their open source Modbus control protocols to any of your system integrators. The latest code sheet is included in the supporting documents for the ESS.

For standard settings the system can be controlled, if required, for time of use/ charge rates and SOC limits etc over the Alpha Portal. The system is controlled primarily by the grid meter and CT's. This needs to be installed in the main incoming tails to the main panel board. This monitors whether there is any import or export and reacts accordingly. Export=charge: Import = discharge. Where there is no export, the system can be configured to charge from green band times and discharge at red band, for example. The solar output is monitored directly via the PV combiner boxes and uploaded to the portal.



Cable Schedule

DESCRIPTION	No. of CORES	CABLE SIZE (mm ²)	CABLE TYPE
Solar PV String Cables	1c	4	Black H1Z2Z2-K
SolarDB Supply Cable (Armour as CPC)	4c	120	XLPE/LSF/SWA
40k Inverter Supply Cable from SolarDB	5c	16	XLPE/LSF/SWA
ESS Supply Cable (armour as CPC)	2 x 4c	185	XLPE/LSF/SWA

Main Studio

DESCRIPTION	No. of CORES	CABLE SIZE (mm ²)	CABLE TYPE
Solar PV String Cables	1c	4	Black H1Z2Z2-K
SolarDB Supply Cable	4c	95	XLPE/LSF/SWA
CPC for SolarDB	1c	35	6491B (H07Z-R) - LSZH
40k Inverter Supply Cable from SolarDB (Armour as CPC)	4c	25	XLPE/LSF/SWA





Cable Runs

DC Cabling From Solar on Roofs

- Solar PV string cabling to run under the panels attached to the mounting kit using cable ties. (see *figure 4 – cables tied to mounting frame*)
- When the cables are not fixed under the panels, they will be run on cable tray with protective cover. (see *figures 2 – perforated tray with cover*)
- The cable tray will be run on big foot supports on the flat roofs
- Metal Cable ties will be used every 1m of cable run.
- The DC string cables on the main studio roof will run to the inverters mounted beside the panels.
- The cables from the other buildings will be run over the edge of the roof using a cable tray riser (see *figure 6 - External Riser for Cable Tray*) and will be fixed on tray to the inverter location

AC Cabling

- AC cable from ESS will be buried in the soft ground along the back of the building. Cable to be buried with min 600mm cover, bedded in sand with warning tape at 300mm above the cable.
- AC cables from the solar inverters will run underground to the kiosk and will enter the kiosk as described below.
- AC cables from the inverters on the main Outer Space studio building will be run as per the description below.

Building Penetrations

Main Supply Kiosk

- Holes will be cored through the floor of the plant room at an angle in order to run the cables inside.
- Once the cables have been installed, the duct will be sealed using fire rated expanding foam.

Main Studio Building

- Holes will be cored through the wall of the studio in order to run the cables inside.
- Once the cables have been installed, the holes will be sealed using fire rated expanding foam.
- Cables will run internally on cable tray fixed with metal cable ties every 1m.





Example Diagrams



Figure 1 - Perforated Tray with Cover

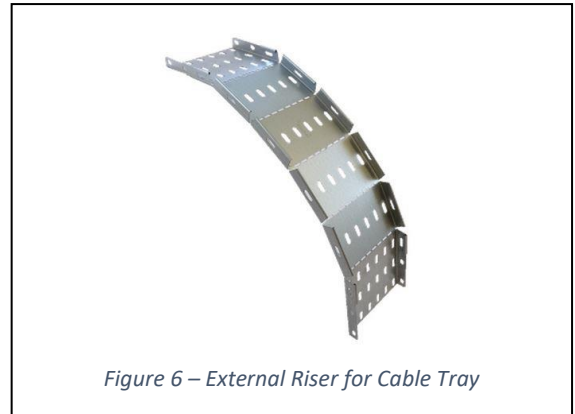


Figure 6 - External Riser for Cable Tray

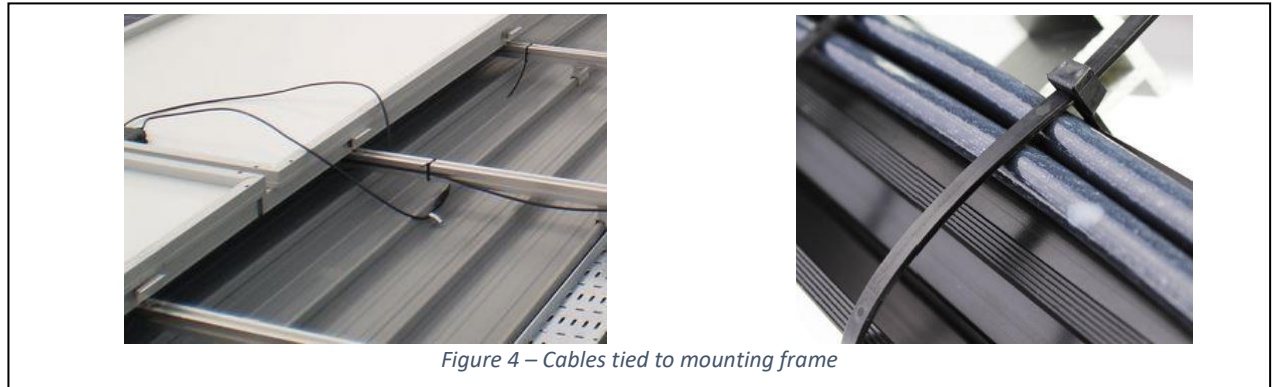


Figure 4 - Cables tied to mounting frame

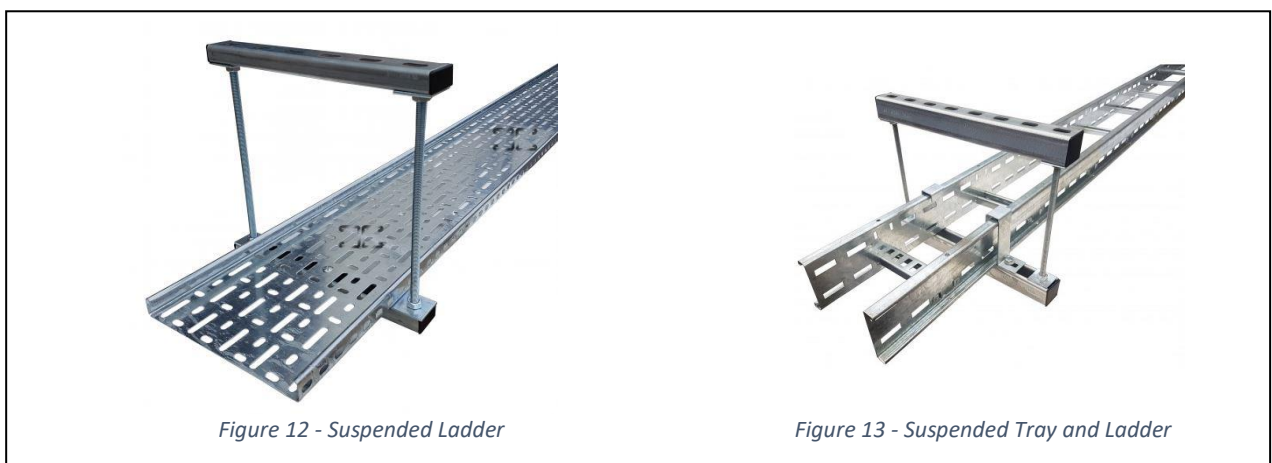


Figure 12 - Suspended Ladder

Figure 13 - Suspended Tray and Ladder

