Construction Method Statement – Roof 50kW

Project

The project involves the installation of Photovoltaic (PV) solar panels on the roof of the building, which will have an energy generation capacity of 50kW. The proposed works include: the erection of scaffolding, installation of mounting structures, PV panels, inverters and cabling.

Duration of Works

The expected duration is 1 – 2 weeks.

General Site Health and Safety

The Contractor will ensure

- Personnel have a responsibility to conduct work in a safe manner.
- Appropriate warning signs will be used on site were relevant – these may include, but are not limited to:
    - Hard Hats To Be Worn
    - No Entry to Unauthorised Persons
    - Works in Progress
- All operatives will be made aware of the site specific fire evacuation procedures during the site induction.
- All routes will be kept free of obstacles and trip hazards during the period of installation.
- Appropriate PPE will be worn by all individuals on site during the period of works, including hard hats, high visibility vests, and safety footwear, as well as gloves and goggles where required.
- Two or more people will carry larger or heavier items.
- The scaffolding will be checked weekly to ensure safety.
- All personnel are to sign in and out of the site.
- All areas of work will be left in a clean, orderly condition.
- All items of equipment are to be stored appropriately on site.

PV Specific Health and Safety

- A PV panel is live when exposed to light. A PV panel cannot be switched off.
- DC voltages are more hazardous than AC voltages due to the nature of the shock, which causes contraction and can lead to the victim of a shock holding onto the conductor.
- Arcs created when attempting to break a DC current can be alarming and can damage test equipment. Test leads with PV shielded connectors at one end must be used, not standard multimeter test probes.
- All persons overseeing the installation work will be experienced with, or have had specific training on, working with such systems.

Operatives / Competence

- All personnel on site will be required to show task specific CSCS, CPCS etc competency cards during the site induction;
- All electrical works to be undertaken by qualified electricians;

Scaffolding

The design of all working platforms, their supporting structures and means of protection from falling material or objects, used on this contract must comply with the Construction Health and Safety & Welfare Regulations 1996.

The Contractor will ensure that all working platforms, supporting structures and edge protection are erected by competent personnel who possess the adequate training, knowledge and experience. They must also ensure that the personnel who erected the scaffolding issues a handover certificate containing the following information:

- That the erected structure is complete and complies with the Construction (Health and Safety) Regulations 1996 and all relevant British Standards.
- The distribution loads permitted on the working platforms.
- That guard rails, working platforms, toe board braces and ties are complete and comply with the Construction (Health and Safety) Regulations 1996 and all relevant British Standards.
- That the Contractor using the platform is now responsible for their employees working on it and ensure the requirements under regulation 4 of the Construction (Health and Safety) Regulations 1996 are complied with.
- Lights, or coloured tapes, should be placed so that the public or other contractors are protected from accidentally damaging themselves or the scaffold.
- Each morning the scaffolding is to be checked to ensure it has not been interfered with.
- During dismantling, at no time is the scaffold to be left in an unstable condition.

All scaffolding is to be left at the end of each working day in a manner to prevent unauthorised access and use. Ladders are to be locked away or removed from site at the end of each working day.

Where there is an increased risk of children using scaffolds to climb to high levels, access at ground level should be prevented by a barrier at least 1.5m high.

Installation

Working Environment:

- The site is exposed to the elements, being outside.
- All personnel will be required to wear appropriate PPE to protect them from adverse weather conditions and will be encouraged to use sunscreen as required.
- Works should cease in bad weather (persistent heavy rain, storm, high winds) as instructed by the site manager.

Deliveries:

- The PV modules are delivered packaged in cardboard on pallets. The modules will be marked and identifiable into power bands.
- The framework will be delivered strapped together in bundles secured to pallets.
- All other goods will be delivered to the site secured and removable via tail lift or onsite plant.
- Deliveries will be made in a timely manner to avoid any delays in installation.

Distribution of Goods:

- PV modules should remain in their packaging until they are installed onto the support framework. All packaging will be removed from site daily.
- The support framework and modules will need to be manually handled; protective gloves should be used for this.

Storage:

- Solar modules and framework will be protected from the elements and securely stored.
- PV module packaging should be kept dry to avoid collapse or compression of the packaging which might lead to damage to the modules or other equipment.
- All other equipment will be stored and secured until ready to be installed.

Installation:

- Gloves are to be worn by personnel whilst installing the framework to protect against sharp edges and hot / cold surfaces and final connections to complete works.
- Cloves should be worn when lifting and carrying modules to protect against sharp edges and corners.
- Modules are fixed to the mounting structures.
- PV modules only weigh approximately 15kg, but have a large wind uplift area and so should be handled by 2 persons. Works may need to be discontinued in adverse weather conditions.
- PV modules are made of glass, and are there for at risk of fracture or cracking. Care of handling is to be a priority.
- Any damaged modules are to be wrapped and repackaged to avoid any further damage and risk of injury to persons. They are to be clearly marked as damaged and returned to a storage area. The site manager must be notified.
- Once a module is exposed to daylight, it generates a DC voltage.
- The modules are pre-wired with touch-proof connectors which isolate the current, but care must be taken not to interfere with or expose the terminals. The voltage generated from one module is not considered dangerous (approximately 48 Volts). As the modules are connected to each other, the voltage increases and so does the risk of a harmful shock.
- Before each module is fixed into the framework, a simple voltage check should be carried out to ensure that the module is operating.
- Any suspected faulty modules should be set aside for return.

- Protect the cables from stress (i.e. ensure they are not trapped or trodden on) during installation as well as during storage prior to installation.
- All cables must be fitted with multicontact shielded connectors at both ends before connection to the modules is made to prevent the possibility of personnel being exposed to bare live conductors.
- Keep the DC connectors dry where possible.
- As the modules are installed, they will be cabled up in series-connected 'strings'. As each string is connected, a string voltage and polarity check will be carried out to ensure that all connections are sound, and findings recorded on a DC test sheet.
- All DC cables are to be labelled at both ends with the string number.
- All DC cables will be tested and logged on test sheets.

Discovery of Asbestos Based Materials

Should any materials be discovered during the course of any works, which are considered to possibly contain asbestos fibres, then works in that area will stop immediately.

- No materials will be disturbed or removed by site personnel at any time.
- A specialist asbestos removal sub-contractor will be appointed to analyse and remove any asbestos based materials.
- The specialist contractor will also submit a site-specific method statement and risk assessment prior to commencing works on site.
- If asbestos based materials are found to be present on site the relevant notice will need to be issued to the Health and Safety Executive.

Amenity

- Noise: Best practice means to minimise noise and vibration from the site will be employed at all times, with special consideration given to Part 1, Section 5 of British Standard 5228: 1994 Noise Control on Construction and Open Sites, in particular:
    - Work will only be undertaken between the hours of 0800 and 1800, to avoid noise at unreasonable hours
    - Care will be taken when loading and unloading vehicles, installing and dismantling scaffolding, etc to minimise noise impact
- Waste: Contractors will remove all debris and rubbish from site, and dispose of it appropriately.
- Dust: The installation of PV panels on to the roof of the building is unlikely to result in a dust nuisance.