



GOVERNMENT OF BERMUDA

Department of Planning

Policy Clarifications and Updates for Solar PV Applications & Installations

September 20, 2024

The Department of Planning has been continuing to review the policy related to the rooftop installation of solar PV and the relevant planning and building code items. The majority of these requirements have already been implemented, therefore the following is intended to confirm and formalize the requirements going forward.

Roof Mounted Conduits and Equipment particularly for Solar PV installations

The policy related to the positioning of items of equipment and/or materials which impede the collection of water and cause degradation of the roof catchment related to trapping of detritus is not new. Although not explicitly specified in the code, it follows on from various Department of Health requirements related to catchment and cleaning of roofs and tanks. Therefore, the installation of conduits which make direct contact with the roof does not meet this requirement.

Class V of the General Development Order 1999 (GDO) sets out the circumstances under which the installation of a solar energy system would constitute “permitted development”. Proposals which meet these criteria can be considered through the Permitted Development Permit (PDP) process. Proposals which fall outside of the scope of works permitted by the GDO will require a planning application and will be subject to a full assessment by technical officers, who will assess the application against the provisions of the Bermuda Plan 2018 and make a recommendation to the Development Applications Board (DAB) or the Director of Planning for determination of the application.

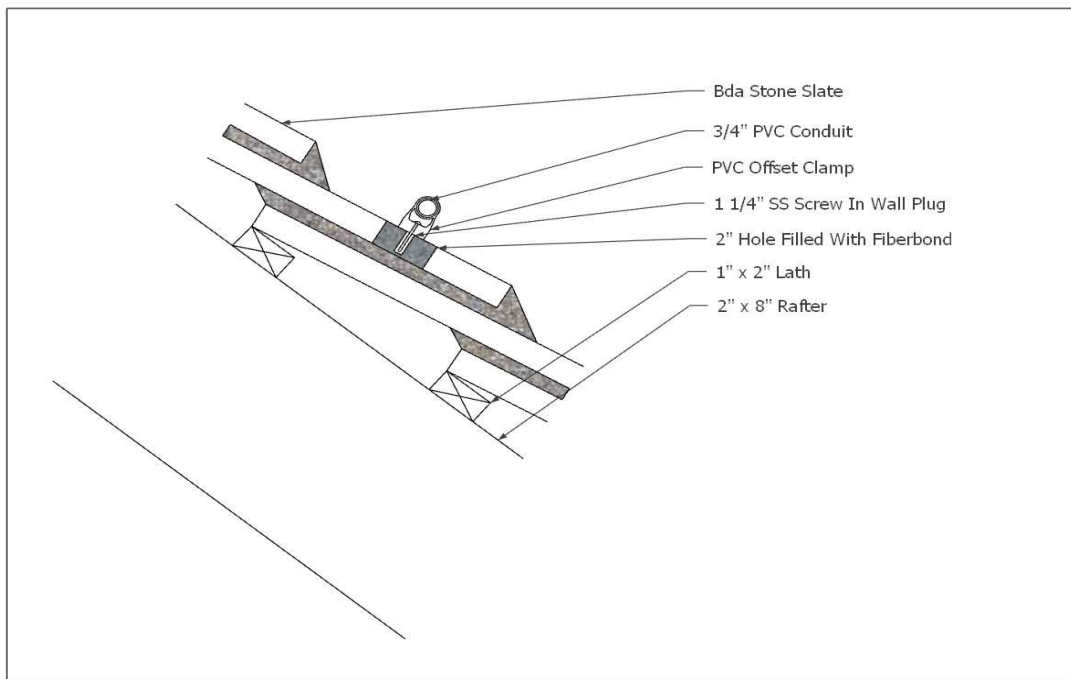
Policies within the Bermuda Plan 2018 require development proposals to be sensitive to and compatible with the ‘Bermuda Image’ and avoid adverse impacts on visual amenity and, where applicable, on the fabric, character and appearance of listed buildings and Historic Protection Areas.

Roof mounted conduit and electrical fittings are required to meet the requirements of the Bermuda Building Code, specifically as it relates to hurricanes. Whilst the mounting of the roof panels is well established, the conduit runs, junction boxes etc. are not and may require strengthening to be compliant. Previous installations that have been installed, in the absence of guidance, do not appear to have taken these into account, with conduit and fittings being held in place by pipe straps, cable ties or simply being laid on the roof surface. Some locations may also be susceptible to stress or damage through repeated cycles of movement such as installed in contact with gutter stones.

Furthermore, the NEC 2011 refers to various further requirements, beyond the securing of conduits. The conduits are determined by the code to be exposed in a wet location as it is an unprotected location exposed to the weather. Therefore Section 300.9 applies which requires conductors and cables to be rated per 310.10 (C). Also, according to the NEC, where thermoplastic insulation is used on DC circuits, electroendosmosis may occur between the conductor and insulation. In addition, non-metallic equipment (raceways etc.) shall be specifically listed as sunlight resistant per 310.10(D).

Based on the above considerations, the formalized policy, effective September 20, 2024, shall be as follows:

1. All surface mounted roof conduits and equipment shall meet all requirements of the NEC 2011.
2. Proposed surface mounted roof conduits and equipment shall be shown on the relevant Planning or Permitted Development Permit (PDP) application.
3. All surface mounted roof conduits and equipment shall be kept to a practical minimum.
4. All surface mounted roof conduits and equipment in areas which form part of the water catchment or are not aligned with gravitational flow of water (vertically down the roof) shall be installed a minimum of 1" above the roof plane by fastenings which will withstand the code requirements for hurricane damage to minimize the likelihood of build-up of detritus. As much as possible it is recommended that they are run below the gutter stone, that is away from the catchment area.



5. All surface mounted roof conduits and equipment shall be compliant with GDO 1999 Section 20 (1)(b)(i-vi).

6. All surface mounted roof conduits and equipment shall be painted white to match the roof.

Solar PV Battery Systems

The presence of increased numbers of battery storage systems for domestic solar PV systems also requires some attention. When battery storage systems (including “plug & play” systems) are added, the PV system shall have a manual emergency shut-off switch to be activated in the event of a fire or other emergency to protect first responders. The emergency cut-off switch shall be external to the building; visible and accessible. Location near an external BELCO meter is recommended.

In addition, the system shall not back-feed to the electrical grid in any case where the mains feed has been cut-off (for example following a hurricane). This requirement is **mandatory** and shall be tested on final inspections for existing systems which contain batteries, as well as new installations.

Revised Solar Photovoltaic (PV) & Battery Application requirements

PV Permit descriptions shall include the following information:

‘PV Solar System XX panels @ XXX W/panel; XX sq ft/ panel; Total system area XXX sq ft; Total DC Output XXX kW; Annual Output XXX kWh; Total AC Output XX kW’

Permits including batteries shall include the following information:

‘Energy storage system total power rating (kW); energy storage capacity (kWh)’

In recent years there has been a significant increase in the total capacity of distributed solar generation in Bermuda. In order that the integrity of the grid is maintained and to facilitate a smoother interconnection and start-up of the system following the issuance of a completion certificate, we shall require a confirmation from BELCO that the proposed system is compatible with their distribution network. This confirmation letter (issued by BELCO after the customer has provided the entire standard contract to BELCO for review) shall be submitted as part of the PV and/or battery application from **01 Oct 2024**.

Solar Photovoltaic (PV) & Battery Application requirements (reminder)

In addition to the revised requirements above, PV Permitted Development Permit (PDP) applications shall include/ demonstrate the following:

- Typical cross section (showing the panel does not project more than 10” from the surface of a pitched roof or 48” from the surface of a flat roof)
- plan indicating distance to the hip/ edge of gable or flat roof
- plan showing proposed panels do not prevent the harvesting of potable water from the roof surface to which it is mounted and are not within a designated setback
- all technical information and specifications