

### **Functional Standard: 2.8. Domestic**

Standard 2.8 (Spread from neighbouring buildings) states: “Every building must be designed and constructed in such a way that in the event of an outbreak of fire in a neighbouring building, the spread of fire to the building is inhibited.”

#### **Verifier**

Inverclyde Council

#### **Technical Context**

The subject of the view relates to photovoltaic (PV) roof-mounted solar panel installations to the housing development (comprising 19 houses and 24 flats).

- For block 1 and 2 the photovoltaic (PV) roof mounted solar panel area is approximately 45 m<sup>2</sup> which equates to 7.5% of the overall roof area. For all remaining blocks, there is approximately 2 m<sup>2</sup> area of solar panel per plot which equates to 3% of the roof area per plot.
- The concrete roof tiles which form the roof covering of the buildings have an external fire classification of Broof(t4) and a reaction to fire classification A1 (non-combustible). This satisfies the low vulnerability criteria contained in Technical Handbook Annex 2.C for a roof covering not more than 6m from of a boundary.

Clause 2.8.0 of the Technical Handbook states “Solar roof panels should be regarded as forming part of the roof covering and as such should be able to resist ignition from an external source. Most solar panels are glazed and their ability to inhibit fire spread can be determined by the thickness of glass which makes up the panel (see table to Annex 2.C).” Annex 2.C states that “glass at least 4 mm thick” will achieve a low vulnerability classification. The proposed PV modules have 3.2 mm thick glass.

Further, both British Standard and European fire tests cited in Annex 2C of the Technical Handbooks provide a test methodology and classification for external fire exposure to roofs coverings, roof lights, roof windows, and for example, integrated PV panels used in place of or forming part of the roof covering. **The fire tests specified in the handbooks do not cover roof mounted PV panels.** The guidance in the handbooks is not mandatory and other guidance or fire test evidence may be put forward to demonstrate compliance with the building standards. It has been necessary for BSD to contact the PV module manufacturers to obtain additional technical information in order to provide this Ministerial View.

#### **The view of Scottish Ministers**

On behalf of Scottish Ministers, the BSD has considered all the information in this case and the view of Scottish Ministers is set out below.

- The photovoltaic (PV) roof mounted solar panels are located above concrete roof tiles with an external fire exposure classification of Broof(t4) and a reaction to fire classification A1 (non-combustible) which satisfies the low vulnerability criteria contained in Technical Handbook Annex 2.C for a roof covering not more than 6m from of a boundary.
- The PV panels / modules have been tested in accordance with ANSI/UL 790. The aim of the spread of flame test is to evaluate the flame spread on the upper surface and between the roof covering and the PV element when exposed to wind.

- The PV panels / modules are also subjected to the burning brand test ANSI/UL 1703 which evaluates whether an external fire can cause the test specimen to burn or to burn through.
- According to IEC 61730-2, the PV panels/ modules achieve a Class C rating. This means:
  - The PV panels were subjected to a burner rating of approximately 325 kW and the flame exposure period of 4 minutes as well as the burning brand test;
  - No glowing or burning part of the PV modules fell from the test rig;
  - The spread of flame did not exceed 3.9 m; and
  - The lateral flame spread was limited.

**Having carefully considered all the information submitted in this case, it is the view of Scottish Ministers that the proposal does meet the requirements of Standard 2.8.**