

Potential solar green roof – Calthorpe Project

Introduction

GIC have been commissioned by the Calthorpe Project to work with Repowering London to undertake an inspection of the Calthorpe green roof. This inspection included a structural assessment of the roof by Engineering Design & Analysis of the current capacity of the roof. The purpose of the inspections and reports was to assess the viability of whether solar arrays could be installed on the existing green roof. This short statement provides a review of the findings and recommendations



Calthorpe Green roof

The current green roof is in a good condition. However, due to the structural capacity if solar panels were to be installed, sections of the green roof will have to be removed. Currently

there is not enough capacity for both the green roof and the solar panels to be installed together.

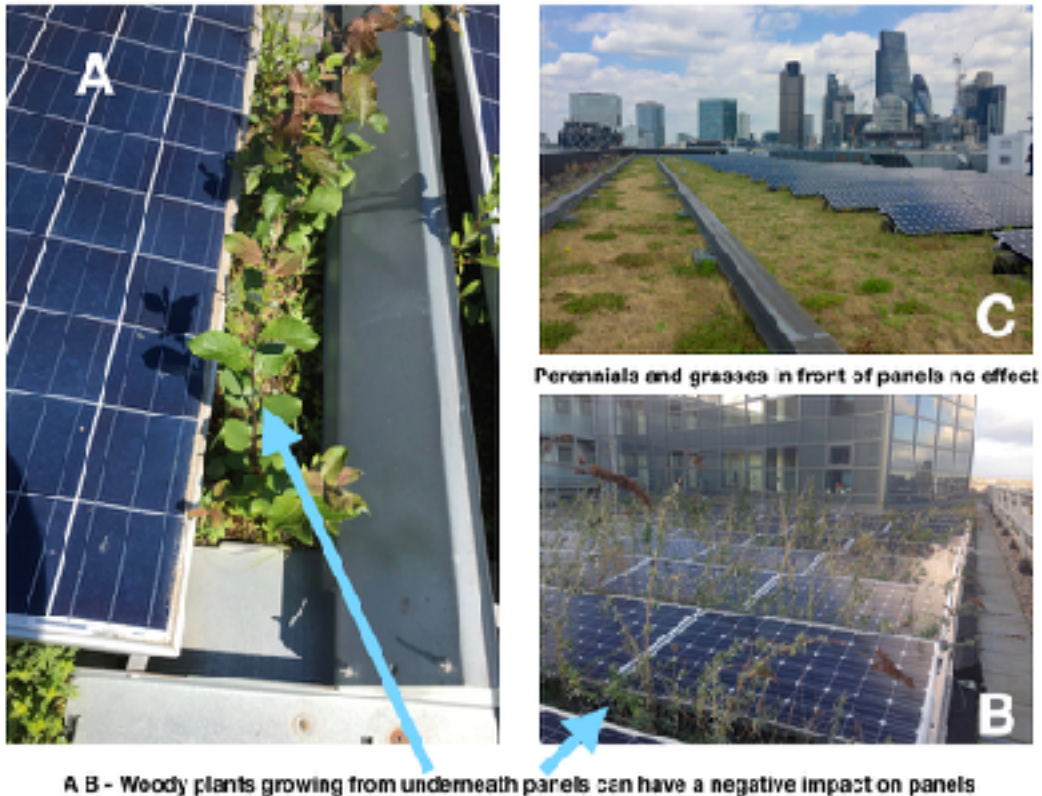


Solar roof potential

If the green roof were to be removed there will be capacity to fix solar panels to the current roof. There is capacity on the roof for ballasting the solar panel units if the green roof is removed. Unfortunately the capacity does not allow for the green roof element to be used for ballasting. This is likely to be an alternative form of ballasting.

Potential Issues with solar roof on a green roof without an integrated system

Using an integrated green roof solar panel system provides certain benefits. In particular such systems restrict the potential for woody stemmed plants to have a negative impact on the solar panels. As an integrated system will not be able to be used at the Calthorpe project, the design and choice of how the solar panels are to be mounted needs to take this potential issue into consideration.



A B - Woody plants growing from underneath panels can have a negative impact on panels

Perennials and grasses in front of panels no effect

Space between the solar panels and the surface of roof have the potential to allow woody stemmed plants to take root. Although the ballast used for the solar arrays is likely to be organically inert it is recommended that the space between the panels and the surface is as narrow as possible. Ideally the panels would sit directly onto the ballast. This will limit the ability of such woody stemmed plants as willow species (*Salix sp.*), birch (*Betula*) and especially *buddleja* to take up root. Woody stemmed plants have the potential to shade out a panel thus causing a negative impact on the the whole array. This negative impact can be seen in the image above. The panels in A (Cambridge) and B (Caledonian Road, London) have woody stemmed plants growing up from beneath the panels.

It is important to note that the current green roof consists of low growing sedums in the main. However, there are some perennials and grasses that have established. Perennials and grasses, although they may grow in front of the panels, will have **no negative** impact in regarding shading, on the panels. In the image above roof C (Nomurra, the City of London) has perennials growing in front of the panels with no impact on the functioning of the solar arrays.

Recommendations - remediation of green roof after installation of solar arrays

Whilst the green roof surface will be removed in areas where the solar arrays will be installed, there is likely to be a negative impact on the green roof areas that will remain. It is recommended that the installer:

- limit, as much as possible walking and trafficking on the green roof areas that remain

- covering the green roof strips with fabric material during installation of each array would limit the damage to the green roof that is to remain in that area. Covering the green roof for a few hours or even a day will not overly affect the vegetation below.
- it is recommended that prior to removal of green roof areas that **sedum cuttings** are taken from the green roof. Sedum is quite robust. By pulling sedums out of the green roof, these can be stored to be spread around any bare areas that are created during the installation on the green roof that is to remain. The sedum cuttings that are removed should be stored in the open and not in bags or boxes.



- Once each array is installed bare areas should be covered with sedum cuttings and then tamped in. This is easily done by lightly treading the cuttings in so that they have good contact with the substrate.
- It is also recommended that a light seeding of any bare areas with a seed mix ([ER1F](#) supplied by Emorsgate seeds is recommended). Although it is recommended at 1gm/m², in this situation 2gm/m² would be appropriate.
- A light watering of the areas of the bare areas that have had cuttings spread and seeds sown is recommended.
- Sowing seed and spreading cuttings will limit the ability for budleja to colonise. Budleja does not like competition.

