

# General Maintenance Photovoltaic Arrays

Bauder BioSOLAR System



# General maintenance procedures

## Bauder BioSOLAR G2 PV System

The Bauder BioSOLAR G2 array should be maintained by trained professionals at fixed intervals and it is recommended that an inspection is carried out annually and the modules cleaned to maintain efficiency, with electrical maintenance occurring a minimum of every three years.

All maintenance ensures the PV array continues to perform, and that any potential problems are identified at an early stage. Any failures of the system resulting from a lack of maintenance may not be covered under the guarantee.

- Ensure safe access can be gained to the roof and that relevant Health and Safety procedures are followed.
- Ensure due care and attention is observed during inspection and maintenance of the array to prevent damage to the waterproofing system.

### Inspection should comprise checking:

- Dirt on the modules, the type and levels dirtiness.
- Security of the anchoring system including fixings and ballast.
- Condition of visible cable connectors, electrical connections, isolators and inverter.
- Establishment and condition of vegetation.

### Module maintenance

- Please follow module manufacturer's guidelines for specific maintenance requirements. If you are unsure regarding any aspect of maintenance, please contact the Bauder technical office to discuss requirements.

### Module cleaning

Cleaning the modules can increase yield. This particularly applies to dirt caused by fallen leaves or bird droppings which can lead to partial shading. Yield decreases due to snow are negligible since these take place during the months of lowest yield.

With the passage of time, dirt and dust may accumulate on the glass surface of the module, reducing the power output of the module. We recommend regular cleaning of modules to ensure maximum power output, especially in low rainfall areas.

- Modules should be cleaned using warm water. All types of soft foam materials, non-woven fabrics, soft sponges and soft brushes may be used.
- Avoid using tools, abrasive materials, abrasive chemicals and cleaning fluids.

### Maintaining the electrical system

An annual inspection of isolators and inverters is recommended. A full electrical health check to inspect connectors etc should be undertaken every 2-3 years. As a minimum the following should be carried out:

- Functionality of the electrical connections, isolators and inverters.
- Measurement of string voltage and currents.

### Maintaining the mounting system

The BioSOLAR G2 mounting system requires minimal maintenance and a visual inspection should be carried out to ensure the following:

- Bauder extensive substrate has not eroded and the correct depth of substrate is in place.
- All visible fixings are secure and there has been no movement of mounts/modules.
- Any vegetation growing around/through mount fixings is removed.

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### Green roof maintenance

#### Maintaining the vegetation - Bio-SOLAR seed mix and wildflower plug plants

The following is a guide to the maintenance necessary to keep a biodiverse green roof in good condition. The information relates to installations that have been completed for one full growing season and where establishment maintenance has been effective.

Establishment maintenance relates to the surface watering and weeding required for the first 10-12 weeks after installation until the planting has rooted into the growing medium, adapted to its location and can be considered established.

#### What to Expect from a Bauder Biodiverse Green Roof System

There is a common misconception that extensive green roofs and sedum plants in particular, are always green and that from ground level they resemble grass. This is misleading, as they consist mainly of low growing, drought tolerant sedums, wildflowers, grasses, moss, and herbs.

A variation in type and density of vegetation growth is expected beneath the BioSolar modules due to the shading impact of the panels. Our BioSolar planting mix is chosen specifically to allow the vegetation to adapt and thrive in these varying conditions.

For a complete copy of our Biodiverse green roof maintenance guidelines please visit [www.bauder.co.uk/technical-centre](http://www.bauder.co.uk/technical-centre)

#### General Vegetation Maintenance

The Bauder biodiverse green roofs designed to meet BREEAM requirements will include a species mix selected to provide a balanced plant community on the roof and will require basic maintenance if this is to be sustained in the long term.

Maintenance is best carried out annually, during spring and autumn. Some deposited leaf litter may be considered as contributory to the bio-diverse environment, which is acceptable so long as provision is made to ensure that this has no negative effect on other plants or the PV array.

**Note** - Specifically designated biodiversity areas should be disturbed as little as possible during maintenance so as not to upset any micro-habitats that may have colonised.

#### Preliminary Maintenance Procedures

- In the late autumn the vegetation is to be strimmed back to a 50-70mm height and the unwanted waste matter removed and lowered to ground level for composting/disposal. **Care must be taken to ensure that any solar cables are moved out of the way before any strimming/cutting takes place.**
- In the spring apply an 80g/m<sup>2</sup> dressing of Bauder Slow Release Organic Fertiliser to the vegetated surface.
- We recommend removing unwanted leaf litter that has fallen onto the roof surface in the spring and autumn, to ensure that this does not smother the vegetation beneath.
- Open the lids of all inspection chambers and ensure they are free from blockage and water can flow freely.
- Any vegetation which has encroached into drainage outlets, inspection chambers, walkways and the vegetation barriers (pebbles) should be removed. If movement/settlement of the pebble vegetation barrier has occurred, additional washed stone pebbles similar to the existing should be added.

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- Remove any weed growth that will exceed 30 mm in height, is invasive or undesirable (if necessary this can be sprayed with a Glyphosate based herbicide). Any vegetation that shades the modules, however thin **will** have an impact on PV output and must be cropped.
- Damage to the landscaping should be reported to the building owner.

### BAUDER GREEN ROOF MAINTENANCE SERVICE

Green roof maintenance service is carried out by Bauder's preferred maintenance providers. These experienced green roof maintenance companies have worked closely with Bauder carrying out maintenance services throughout mainland Britain for several years.

A typical maintenance programme includes:

- **Roof evaluation** - one of our expert team will perform a comprehensive review of your green roof to determine what remedial work, if any, needs to be done.
- **Removal of weeds and unwanted items** - over time a green roof can become congested with leaves, debris and other unwanted vegetation, which can be removed as part of our service.
- **Inspection** - inspection of roof outlets and removal of any encroaching vegetation to enable water to flow freely through rainwater pipes.
- **Application of fertiliser** - to help restore your green roof to its best, an organic slow release granular fertiliser will encourage growth.
- **Testing** - after all work has been performed, the irrigation system will be examined to ensure it works as expected.

This work can be undertaken by the companies below, who directly manage the maintenance of green roofs. This will cover all aspects of the service from quotations through to invoicing. Bauder and our preferred suppliers are committed to the arrangement and will ensure a continued high standard of expert care and advice for our customers.

### Green roof maintenance contractors currently recommended to maintain green roof elements for the Bauder BioSOLAR system

#### Green Maintenance in England and Wales:

##### The Urban Greening Company

Mr Mike Cottage  
105 Ridgeway  
Marlow  
Buckinghamshire SL7 3LH  
07515 887868  
greenmaintenance@tugc.co.uk  
tugc.co.uk

#### Green Maintenance in Scotland:

##### Urban Utopia Landscapes

Mr Gavin Gale  
Mayville Gardens East  
Edinburgh  
Lothian EH5 3DW  
0800 061 4353  
office@urbanutopialandscapes.com  
urbanutopialandscapes.com

If you would like Bauder to forward your details to one of the preferred maintenance companies, please email **c.rodick@bauder.co.uk** giving the details of the green roof and contact information with explicit permission for your detail to be shared with the preferred supplier.

# Electrical contractors currently recommended to maintain the array for Bauder BioSOLAR systems

Maintenance can be carried out by any suitably trained contactor/operative. The following list is a non-exhaustive list of recommended contractors:

## CJ Electrical

Unit 7 Edison Close,  
Ipswich,  
Suffolk, IP3 9GU  
01473 276688  
[www.cielectrical.co.uk/](http://www.cielectrical.co.uk/)

## PV Plus

3 Radcliffe Court,  
Southampton, SO14 0PH  
02380 170215  
[www.pv-plus.co.uk](http://www.pv-plus.co.uk)

## Envirolec Smart Energy Solutions

Unit 2 Hope Lane,  
Eltham,  
London, SE9 3TP  
020 8090 0270  
[www.envirolec-ses.co.uk](http://www.envirolec-ses.co.uk)

## Ren Energy

Woodbastwick Road,  
Blofield Heath,  
Norwich, NR13 4RR  
01603 713448  
[www.renenergy.co.uk](http://www.renenergy.co.uk)

## Greenbridge Renewables

27 Kendal Road,  
Kirkby,  
Liverpool, L33 2ED  
0151 345 6739  
[www.gb-r.co.uk/](http://www.gb-r.co.uk/)

## Solar Sense

Helios House,  
Brockley Lane,  
Backwell,  
Bristol, BS48 4AH  
01275 461800  
<http://www.solarsense-uk.com>

## Parker Technical Services

Head Office:  
Tannochside Business Park,  
4 Kilmartin Place,  
Uddingston, G71 5PH  
01698 381224  
[www.edwinjamesgroup.co.uk/businesses/ej-parker](http://www.edwinjamesgroup.co.uk/businesses/ej-parker)

## Pioneer Contracting

1 The Moorings,  
Worsley,  
Manchester, M28 2QE  
0161 950 2873  
[www.pioneercontracting.co.uk](http://www.pioneercontracting.co.uk)

## Bauder Limited

70 Landseer Road, Ipswich, Suffolk, IP3 0DH  
[bauder.co.uk](http://bauder.co.uk)

## Bauder Limited

O'Duffy Centre, Carrickmacross, Co.Monaghan  
[bauder.ie](http://bauder.ie)