BAUDER
making roofs secure.

BauderSOLAR G LIGHT

Installation Guide

BauderSOLAR G LIGHT Biosolar Mounting System Installation Guide

This guide describes the correct installation of the BauderSOLAR G LIGHT biosolar mounting system for Bauder green roofs.

Prerequisites

1. This guide must be read in conjunction with the Bauder specification to confirm the products used, installation method, and specific project array layout and dimensioned roof layout.
2. Understanding of all sections is mandatory.
3. Operatives carrying out installation of the BauderSOLAR G LIGHT system MUST be competent and trained in the specific system installation method.
4. Workmanship MUST comply with Bauder Ltd installation guidance.

Conditions

The Bauder guarantee may not be issued if:

1. There is no safe access to inspect the roof area(s).
2. The installation fails to meet final inspection standards.
3. Any specific component is substituted for an equivalent without hte written authority of Bauder Ltd

The information within this guide ONLY relates to the installation of the BauderSolar G LIGHT components and does NOT provide any guidance on solar photovoltaic (PV) electrical requirements such as inverter specification or electrical connectivity to the building. It is the responsibility of the electrical contractor to adhere to relevant electrical standards and best practice. Further information on electrical best practice can be found on the MCS website.

https://mcscertified.com

The Bauder PV array layout observes the standards and guidelines from:

o BS EN 1991-1-4 Wind Actions on Structures
o BRE Digest DG489 rev 2014

Confirmation should be sought from the correct authority if using associated standards pertaining to the installation of a solar PV array.

Technical support

If you require support or advice on the BauderSOLAR G LIGHT System or products within the specification, please contact:

■ **Bauder Technical Department**

+44 (0)1473 257671
technical@bauder.co.uk

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1 Symbols Used

CAUTION!

Non-compliance could result in serious property damage, or impairment to operational safety.

TIP!

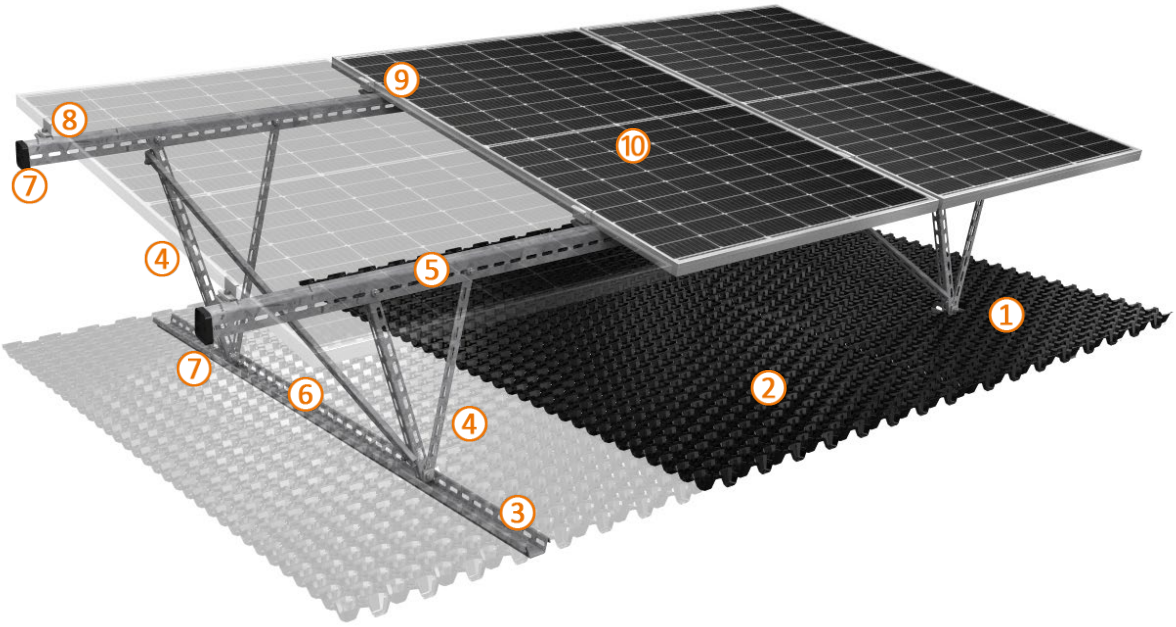
Useful information for installing the mounting system.

2 System Introduction

2.1 Overview

BauderSOLAR G LIGHT is designed for applications where both a green roof and solar PV solution are required on the same roof space. The green roof substrate and vegetation provide the ballast mechanism for the entire solution and removes the need for additional ballast or penetrating the waterproofing to secure the units to the roof, therefore maximising the available area for vegetation.

BauderSOLAR G LIGHT should be vegetated using our BauderGREEN Flora 3 seed mix which contains both drought and shade tolerant herb and wildflower species and is suitable for roofs with a fall of up to 5°.



1	Bauder DSE 40 Anchor Board	6	Diagonal support
2	Standard DSE 40 Drainage Board	7	Module rail end cap
3	Base rail	8	Module end clamp
4	Pre-assembled V-beam short (front) and long (back)	9	Module middle clamp
5	Module carrier rail	10	Photovoltaic module

2.2 Parts List

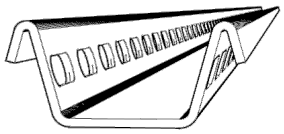
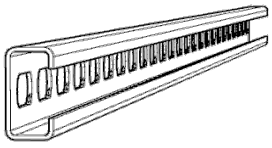
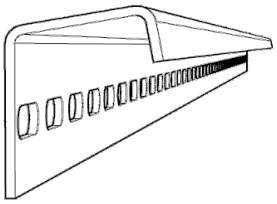
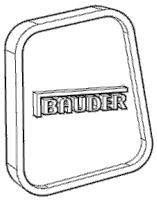
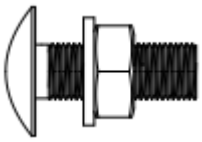
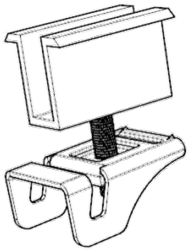
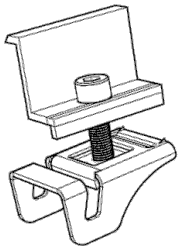
Image	Part name	Description
	**BauderSOLAR DSE 40**	**Pre-cored Anchor Board** HDPE; 1.04 x 2.03 x 0.04 m
	**BauderSOLAR BS-4** **BauderSOLAR BS-2**	**Base Rail** Profile rail 2000 mm or 4000 mm perforated, d = 3 mm, support surface 77 mm, S420GD + ZM310AC
	**BauderSOLAR VT 745** **BauderSOLAR VT 545**	**V-Beams** Pre-assembled long and short versions L-profiles 745 mm and 545 mm, 30 mm x 30 mm d = 2 mm perforated, hot-dip coated S250GD, ZM310 - zinc-magnesium alloy with adapter, spring lock washer and screw pre-assembled, can be folded out
	**BauderSOLAR DLE**	**Diagonal support profile** C-profile perforated L = 1.19 m, d = 1.5 mm Hot-dip coated S250GD, Z275 - zinc
	**BauderSOLAR MTR**	**Module carrier rail** Profile rail 4700 mm perforated, d = 3 mm, FVZS420GD + ZM310AC (zinc-magnesium)

Image	Part name	Description
	**BauderSOLAR EK-L (left) BauderSOLAR EK-R (right)**	**Bauder module rail end cap** End cap for module support rail, polypropylene (PP)
	**BauderSOLAR SSR 30**	**Buttonhead screw M10x30** Carriage bolt with square attachment self-locking in profile perforation, with washer; A2-70
	**BauderSOLAR MKL (mid)**	**Pre-assembled module clamping hook set with middle clamp** Module clamping hook with thread M8, L = 70 mm, aluminium, distance 19 mm - module height 35 mm with cylinder screw DIN 912 M8x35 hexagon socket, locking washer and counter holder with thread M8, zinc-magnelis coating with earthing
	**BauderSOLAR EKL (End)**	**Pre-assembled module clamping hook set with end clamp** Module clamping hook with thread M8, L = 70 mm, aluminium, distance 19 mm - module height 35 mm with cylinder screw DIN 912 M8x35 hexagon socket, locking washer and counter holder with thread M8, zinc-magnelis coating with earthing
	**BauderSOLAR MTRV**	**Module carrier Rail connector** FVZS420GD + ZM310AC (zinc-magnesium)

3 Packaging and Delivery

3.1 Packaging

BauderSOLAR G LIGHT will be delivered on recyclable wooden pallets.

Dependant on system size, items may be bundled together.

The following table provides information on unit weights and **maximum** pallet weight. Upon receipt of order our sales office will be happy to provide project specific delivery information.

BauderSOLAR Product Name		Product Dimensions (LxWxH in mm)	Pallet Length (mm)	Pallet Width (mm)	Pallet Height (mm)	Unit Weight (kg)	Max units per pallet	Total Weight Including Pallet (kg)
DSE 40	anchor board	2030 x 1040 x 40	2000	1030	1800	3.76	240	932.4
MTR	module mounting rail	4700 x 80 x 40	4700	500	450	14.8	84	1273.2
BS-2	base rail (short)	2000 x 80 x 40	200	500	450	5.78	84	515.52
BS-4	base rail (long)	4000 x 80 x 40	4100	500	450	11.54	84	999.36
***DLE**	diagonal support rail	1250 x 30 x 20	1250	500	450	0.84	84	100.56
***VT 545**	V-shaped carrier unit (short)	550 x 70 x 50	1250	1000	1000	0.88	500	470
***VT 745**	V-shaped carrier unit (long)	750 x 70 x 50	1200	1000	1000	1.16	500	610
***MKL**	mid clamp	70 x 60 x 40	600	400	320	0.1	1000	n/a
***EK**	end clamp	70 x 60 x 40	600	400	320	0.09	250	n/a
***EK-L / EK-R**	end cap	60 x 60 x 25	600	400	320	0.02	500	n/a
***SSR**	truss head screw set	25 x 25 x 25	800	400	320	0.04	15000	n/a

* Small parts will be bundled together and added to pallets of larger items

3.2 Checking delivery

Check delivery upon receipt of the goods against the accompanying delivery note. Bauder will not be liable for further costs in the case of subsequent deliveries if you later discover that any material is missing or damaged.

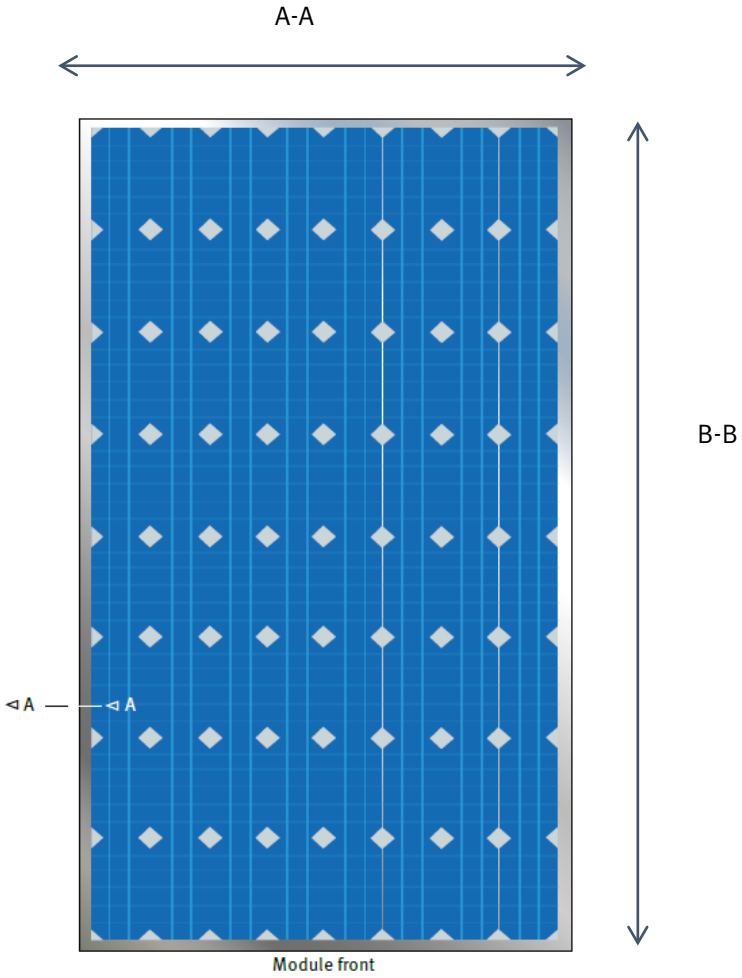
Check the goods visually for any external damage. Bauder must be contacted within 24 hours of receipt of delivery.

3.3 Transport and storage

The product can be used and stored in the temperature range of -40°C to +85°C, but must not be exposed in the packaging to moisture, direct weathering, or aggressive environments.

It is strictly prohibited to stack up the packaging units containing the BauderSOLAR DSE Anchor Boards. For shipping the product, only the original packing is to be used, and suitable load securing devices must be used on the transport vehicle. Lifting devices must be attached or applied only to the shipment base.

4 Module parameters



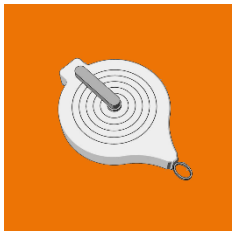
A-A = N/A

B-B = Maximum:

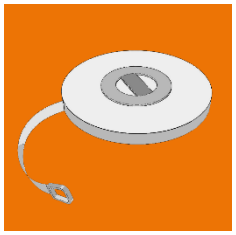
- East/West installations = 1.95m
- South facing = 1.8m

5 Required Tools

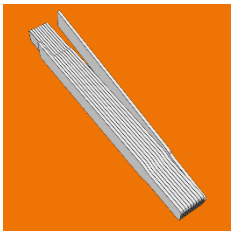
› Measuring and installation tools and accessories



Chalkline



Tape measure › 15 m



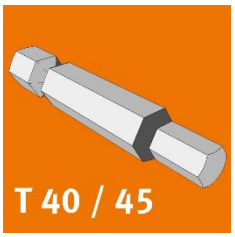
Folding rule

Pen / chalk / marker

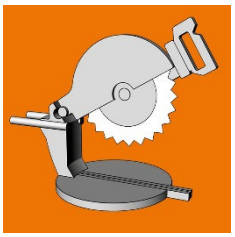
› Assembly Tools

Cordless screwdriver

Socket wrench size 16 (M10) for cordless screwdriver



Bit Allen screw 6 mm (M8)



Mitre saw

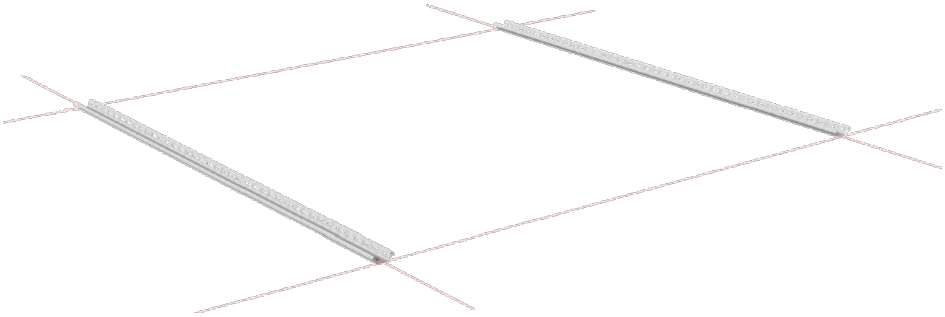
Torque wrench torque-setting type

Box nut wrench size 16 (M10) for torque wrench

6 Assembly

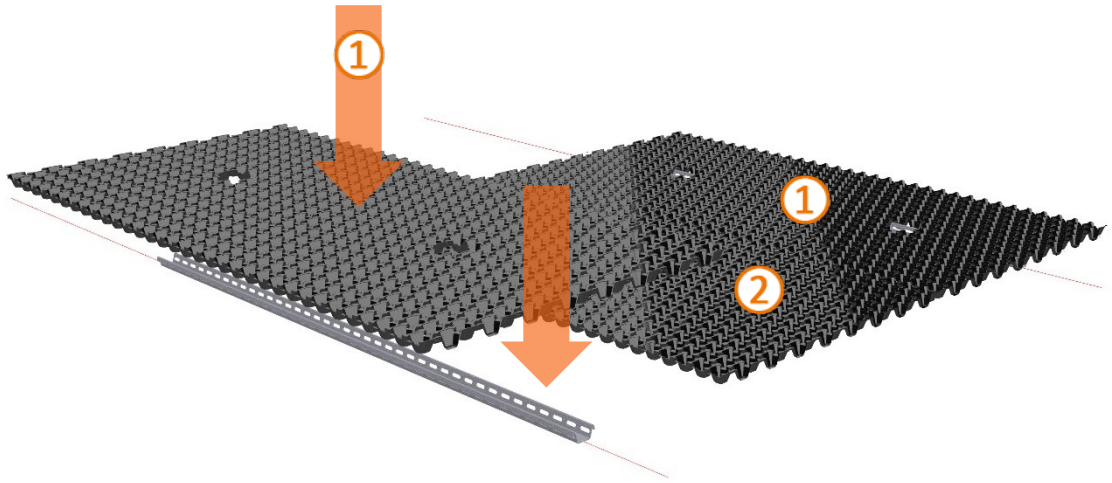
6.1 Levelling and alignment of base rails

- The roof should be clean of debris and coarse materials.
- Mark out the installation grid on the roof surface/protection layer using a chalk line and measure the distances to roof edges or existing roof installations.
- Align and measure out the base rails according to the project specific Bauder dimensioned roof layout.

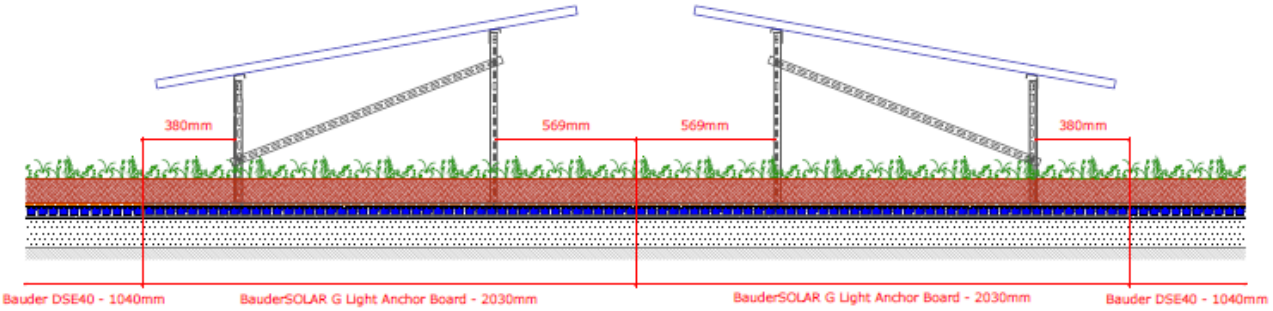


6.2 Laying the Bauder DSE 40 anchor board

- Refer to the Bauder dimensioned layout to establish in which orientation the anchor boards should be installed.
- Install DSE40 anchor boards over base rails (1) with holes centered over the base rails.
- If required, close any remaining gaps with the unperforated DSE40 boards (2).

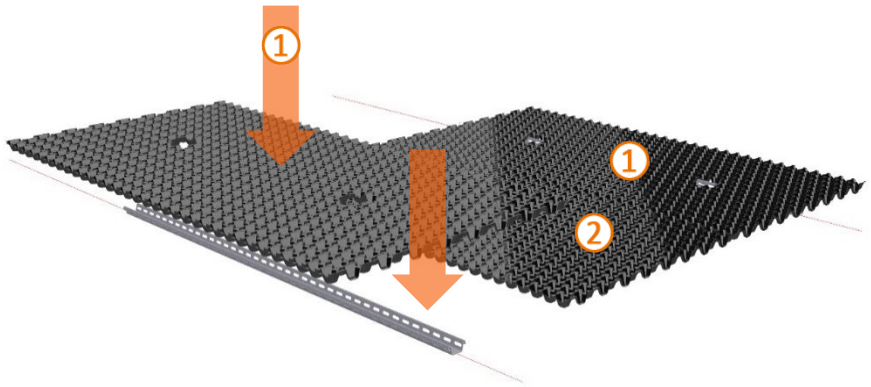


- The pre-cored holes cut into the DSE40 anchor board are not centred. The short V-beam will later be installed in the perforation located 39cm from the board edge. The long V-beam is 59 cm from the board edge.



6.3 Installing the DSE 40 green roof drainage boards between the DSE 40 anchor boards

- Where required, install DSE40 green roof boards **(2)** between DSE40 anchor boards.
- DSE40 drainage boards should be installed into gaps between DSE40 anchor boards to ensure entire green roof area is covered with drainage boards.
- DSE40 drainage boards to be butted against each other, not overlapped.

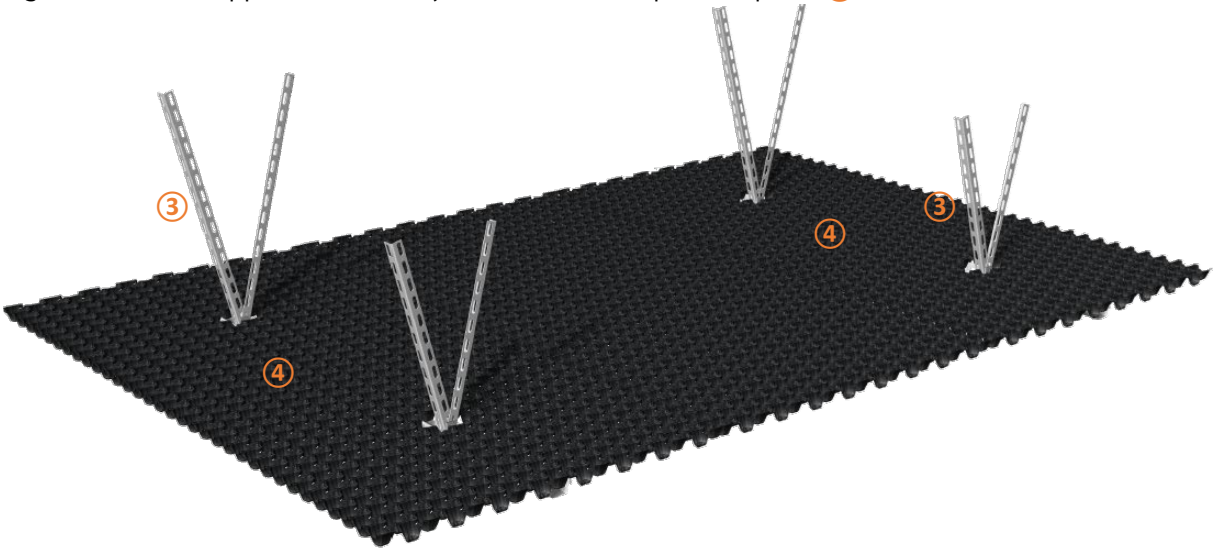


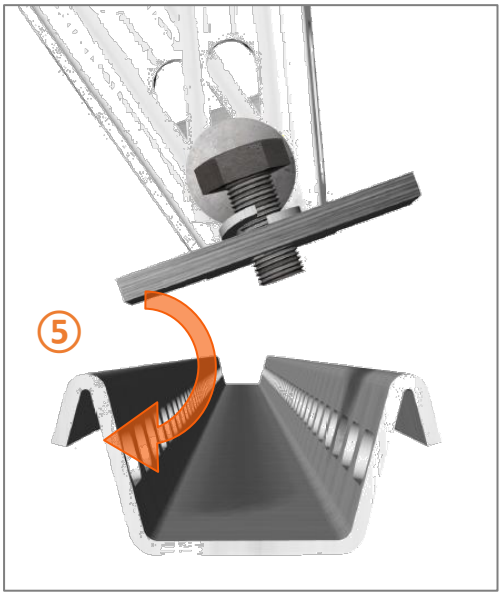
6.4 Installing BauderGREEN FV 125 100 filter fleece

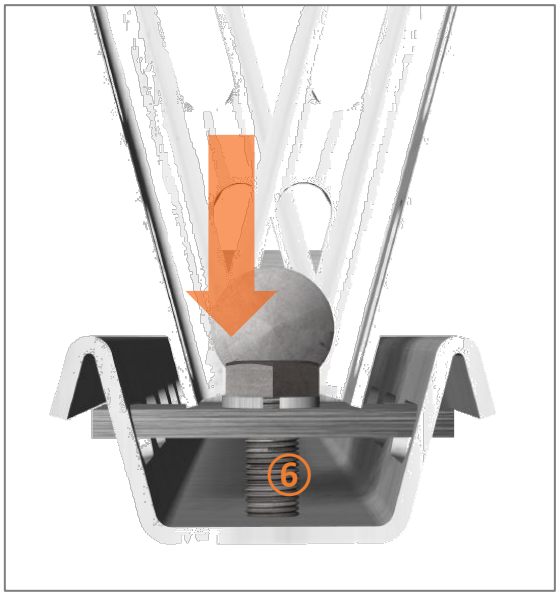
- Roll out BauderGREEN FV 125 100 filter fleece over entire roof area that will be covered with substrate lapping the BauderGREEN FV 125 100 Filter Fleece by 150mm on all joints.
- Ballast the BauderGREEN FV 125 100 Filter Fleece to prevent it lifting. This can be achieved using substrate bags or BauderSOLAR VT V-beams.
- Cut BauderGREEN FV 125 100 Filter fleece above BauderSOLAR DSE40 Anchor Board perforations.

6.5 Install V-beams into base rails

- Guide VT 545 (short V-beam) and VT 745 (long V-beam) ③ alternately through the openings of the Bauder DSE 40 anchor boards with perforation ④ sideways into the opposite elongated holes of the base rails ⑤.
- Tighten with the support screw until you reach final suspension point ⑥.



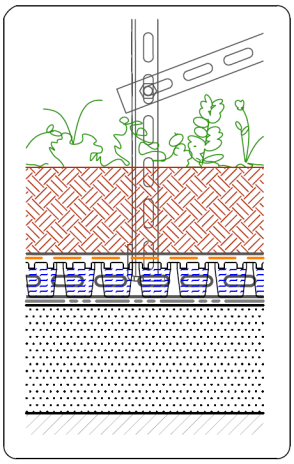




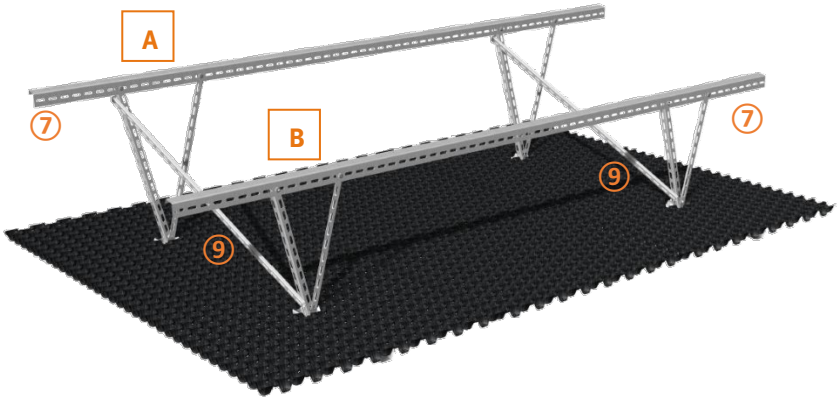
TIP!

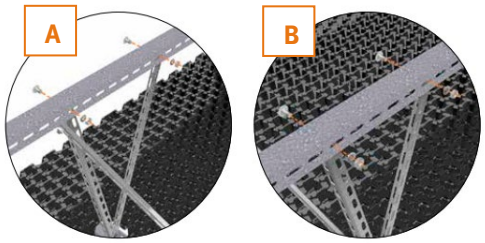
The pre-cored holes cut into the DSE40 anchor board are not centred. The short V-beam should be installed in the perforation located 39cm from the board edge (a). The long V-beam (b) is installed onto the perforation located 59cm from the board edge.

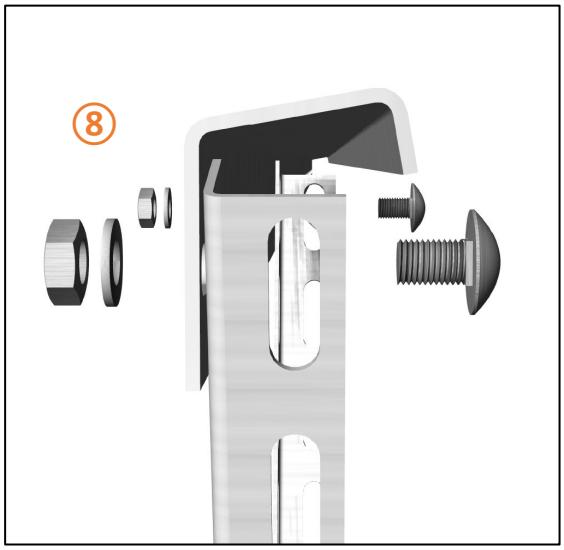
6.6 Mounting of the MTR module mounting rail and the DLE diagonal support

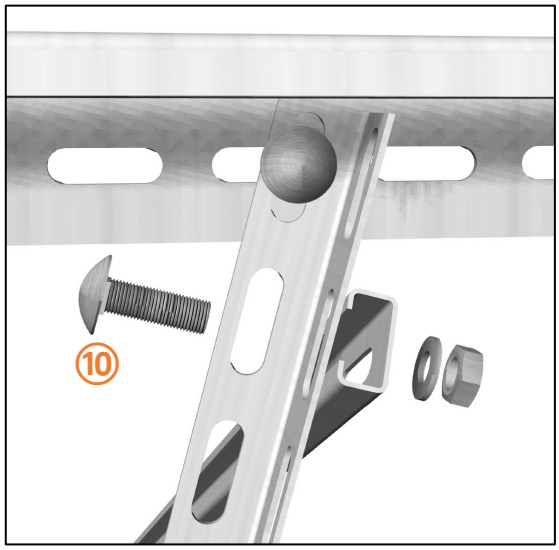


- Fasten the BauderSOLAR DLE diagonal support ⑨ to reinforce the supporting structure to the BauderSOLAR VTE 545/745 short and long V-beams with BauderSOLAR SSR button-head screws, and nuts through the overlapping elongated holes ⑩.
- BauderSOLAR DLE diagonal support fixing to be connected to VTE 545 (short V-beam) 4 or 5 No. eyelets from base bracket.
- BauderSOLAR DLE is then connected to VTE 745 in the second eyelet from the top ⑩
- Tightening torque 35 Nm.
- Fasten the MTR module mounting rail ⑦ to the VTE 545/745 V-beams through the overlapping elongated holes with BauderSOLAR SSR 30 button-head screws, and nuts ⑧.
    - Long v-beam separation **(A)** = 6 slotted holes on module rail
    - Short v-beam separation **(B)** = 4 slotted holes on module rail
- Tightening torque 35 Nm.



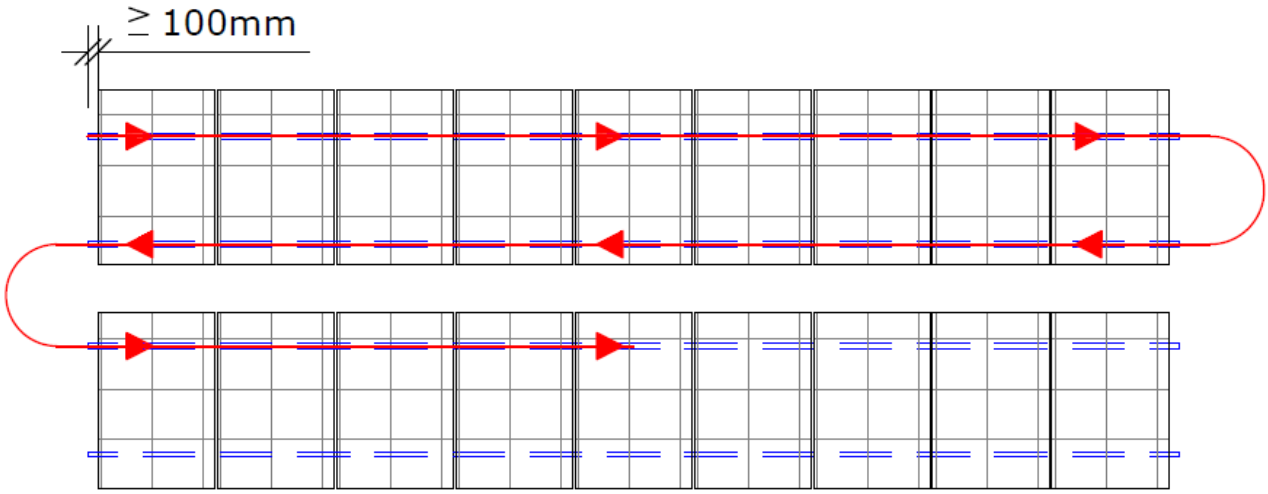






- BauderSOLAR MTR Module carrier rails should be installed to ensure as little wastage as possible.
- Lengths of MTR module mounting rail shorter than 1 m should be discarded or used as rail connectors.

6.7 Example BauderSOLAR MTR module carrier rail installation process



To calculate the length of MTR module mounting rail required, the following calculation can be applied:

(Module width + 20mm clamp) x module in row + 200mm

For example, in the image above, a row of 9 modules with a width of 1134mm would be calculated as follows:

1134 + 20 = 1154mm

1154 x 9 = 10.21m

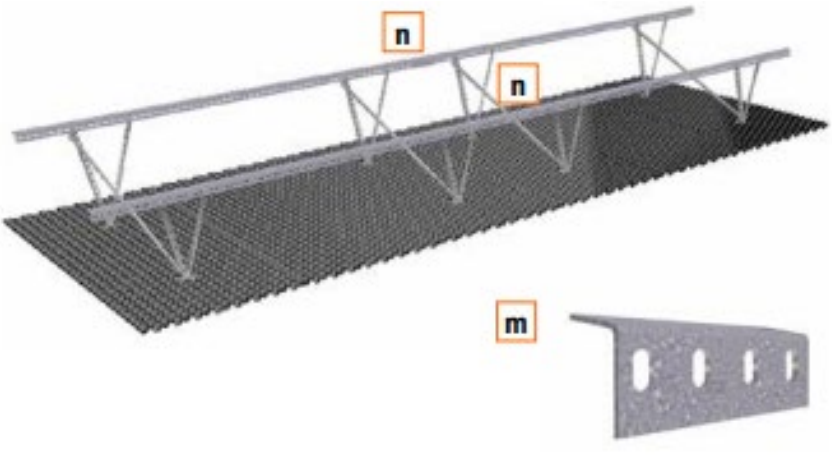
10.21m + 200mm = 10.41m

TIP!

The project specific Bauder dimensioned drawing will provide calculations for all required rail lengths

6.8 Install rail connectors for module carriers

- For longer module rows, the BauderSOLAR MTR module carrier rails must be connected to each other via a module rail connector **(n)**.
- For this purpose, BauderSOLAR MTRV module rail connectors **(m)** should be used.
- The BauderSOLAR G LIGHT MTRV connect 2 BauderSOLAR MTR carrier rails connected using 4No. BauderSOLAR SSR button head screws **(O)**.
- Tightening torque 35 Nm.



6.9 Installing BauderGREEN substrate above the BauderGREEN FV 125 100 filter fleece

- Attach BauderSOLAR EK-L & EK-R protective caps ⑫ to the ends of the MTR module mounting rail.
- Apply the substrate ⑪ evenly over the Bauder DSE 40 anchor/drainage boards at the appropriate depth according to the project-specific static ballast calculation.

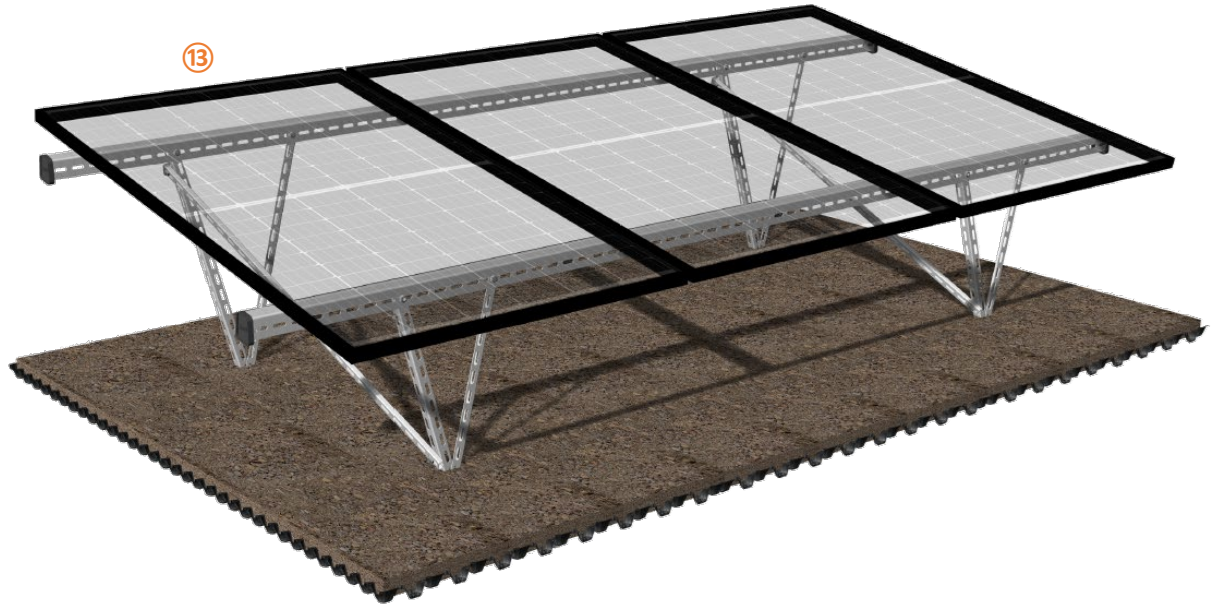
CAUTION!

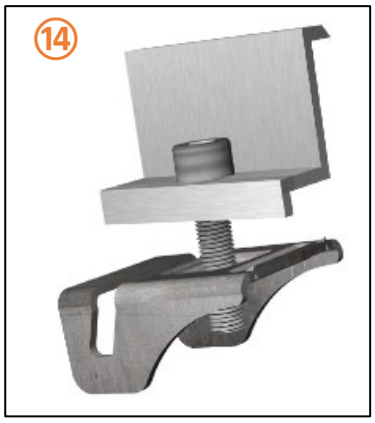
Wind uplift and ballast requirements

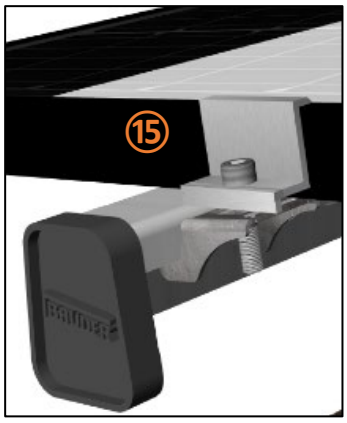
Refer to the BauderSOLAR G LIGHT ballast layout for confirmation of requirements as the volume/depth of substrate per unit area is project specific and will vary between different wind load zones.

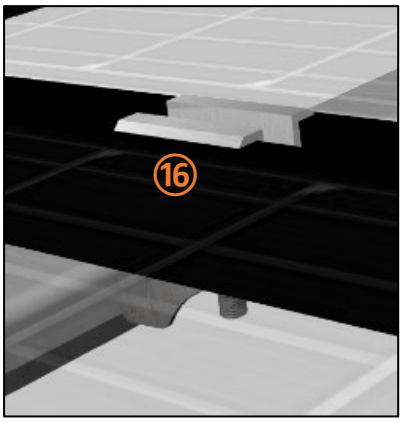
6.10 Fastening of solar modules with MKL and EKL module clamp set

- Fasten the solar modules ⑬ centred above the BauderSOLAR MTR module mounting rail, using BauderSOLAR MKL (mid) and BauderSOLAR EKL (End) module clamp set with ⑭ BauderSOLAR EKL end clamps ⑮ and BauderSOLAR MKL middle clamps ⑯ as appropriate.
- Guide the notch on the clamping hook in the BauderSOLAR MTR module mounting rail and tighten the module clamp using the screw connector.









CAUTION! **Tightening torque of module clamps**

When installing the module clamps, the tightening torque specified by the manufacturer of the solar modules should be followed.

Please follow manufacturer guidance for module installation

6.11 Applying BauderGREEN Flora 3 seed mix

- Ensure the substrate is at the correct level and is raked out to give a smooth finish.
- Water the substrate thoroughly prior to spreading the Seed Mix.
- Seed in two passes at 90° to each other, sow 50% of the mix in each direction to achieve sow rate of 100g/m².
- Do not water or rake afterwards.
- Do not traffic or disturb the seeded area otherwise germination of the seed will be affected.

For further information on BauderGREEN Flora 3 seed mix installation and establishment please see our Bauder Green Roof Installation Guide.

7 Maintenance

Ongoing, scheduled maintenance ensures the Solar PV system will continue 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.

As a minimum, annual inspections should comprise inspection of:

- Dirt on the modules, the type and levels dirtiness.
- Condition of visible cable connectors, electrical connections, isolators and inverter.
- Establishment and condition of vegetation.

For further information on maintenance please see our dedicated maintenance guide on our website bauder.co.uk/technical-centre

8 Disassembly and Disposal

The BauderSOLAR G LIGHT system is fully demountable, and all individual parts can be recycled according to local guidance.

Bauder does not currently provide a disposal service for any elements of our BauderSOLAR solutions. As the owner, when the product reaches the end of its service life, please ensure that the individual components are recycled wherever possible.

BAUDER
making roofs secure.

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