ENSTALL

Project plan

Kellen Aps ,

Roof 1



Location: Briscoe Ln, Manchester M40, UK

Calculation date: 09-09-2025

FlatFix Fusion

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Scan the code for the product manual.

Overview

General

Generated by	Thomas Collinson (tom@solarsitesystems.co.uk)*

* This person can open this project in the calculator via https://calculator.eu.enstall.com/3293522/4276220.

Location

Address	Briscoe Ln, Manchester M40, UK
Basic wind speed ($v_{b,map}$)	22.5 m/s*
Fundamental value of basic wind speed	24.19 m/s
Terrain category	Town*
Distance to coast	50.0 km*
Distance to city boundary	0.4 km*
Wind pressure	657.78 N/m²
Snow zone	3*
Characteristic value of snow on the ground	0.45 kN/m²
Snow load on the roof	452.38 N/m²
Altitude above sea level	75.0 m*
Consequence class	CC1
Reference period	15 years
Calculation date	09-09-2025

* Automatically determined based on the address.

Roof specification

Roof height	10.0 m
Parapet height	100 mm
Edge zone depth short side	1.8 m
Edge zone depth long side	2.02 m
Roof pitch	0.0°
Roofing material	Bitumen insulated
Roof orientation from north	0.0°

System specification

Panel model	LONGi LR5-54HTB 415~435M (415 - 435Wp) Hi-MO X6 Explorer
Panel dimensions	1722 mm x 1134 mm x 30 mm
Panel weight	20.0 kg

Panel count	64
Panel angle of inclination landscape	11.3°
Configuration	Single
Orientation	Landscape
Row distance	1,457 mm
Grounding/bonding option	OFF
Segment count	2
Panel power	435 Wp
Total power	27.840 kWp

Complete list of materials

Total roof bill of materials

Article number	Description	Amount
1000612	Mounting screw M6 x 12mm	144
1000655	Mounting screw M6 x 55mm	144
1003022	Universal mid clamp with bonding	112
1004330	FlatFix end clamp 30mm	32
1007011	FlatFix Fusion base plate bracket	18
1007012	FlatFix Fusion base plate	198
1007022	FlatFix Fusion - Low base	72
1007031	FlatFix Fusion high base	72
1007042*	MLPE Clip Lightweight up to 2kg	64
1007137	FlatFix Fusion base profile 370mm	54
1007196	FlatFix Fusion base profile 1077mm	72
1007209	FlatFix Fusion wind deflector rear 1700	64
1007210	FlatFix Fusion ballast container 1700	35
1007226	FlatFix Fusion wind deflector left (base profile 1030mm - 1077mm)	8
1007227	FlatFix Fusion wind deflector right (base profile 1030mm - 1077mm)	8
1008085	Self-tapping sheet metal screw 6,0x25 mm SW10 HEX/T30	68

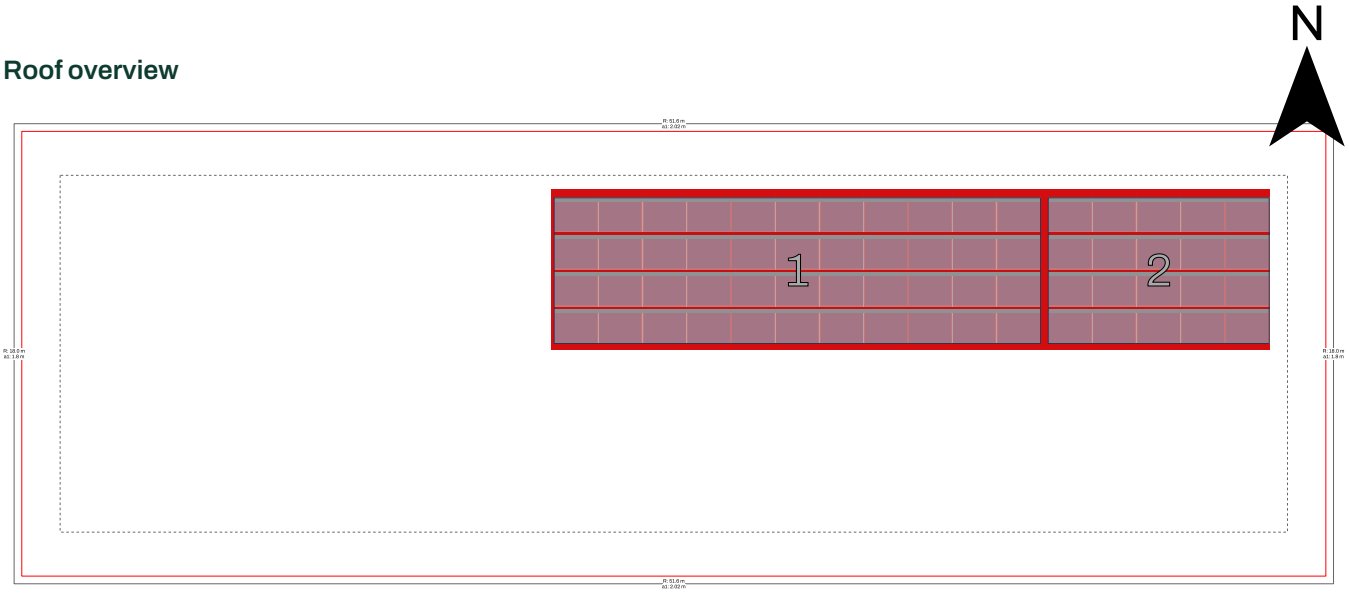
* Optional article

Number of ballast units

Number of bricks (210 mm x 105 mm x 80 mm, 4.0 kg/pc)	208

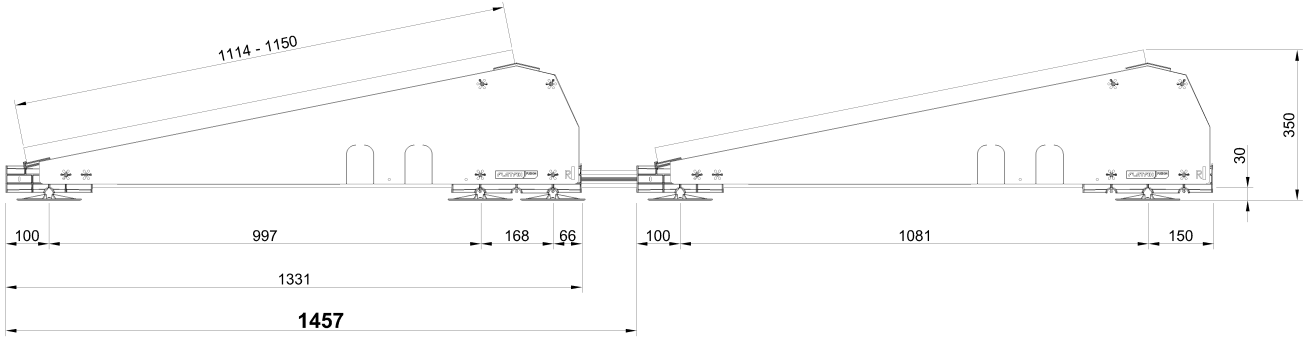
Assembly

Roof overview

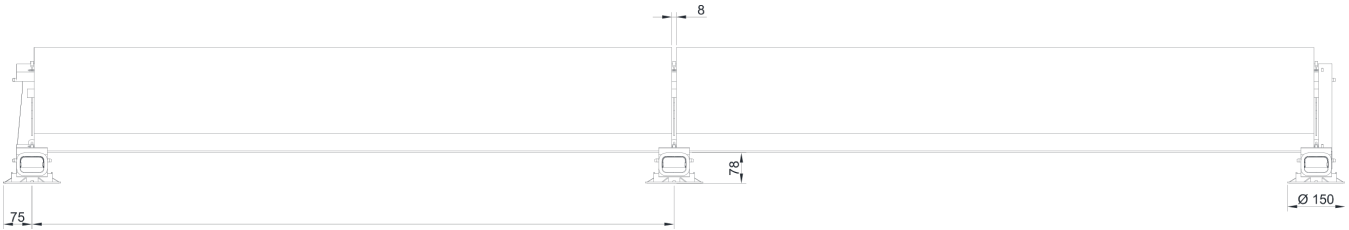


R: XXm	Length of outer roof side
	No-Go zone width (30cm)
a1: XXm	Edge zone width from roof edge

Single landscape configuration with row distance of 1,457 mm



Rear view



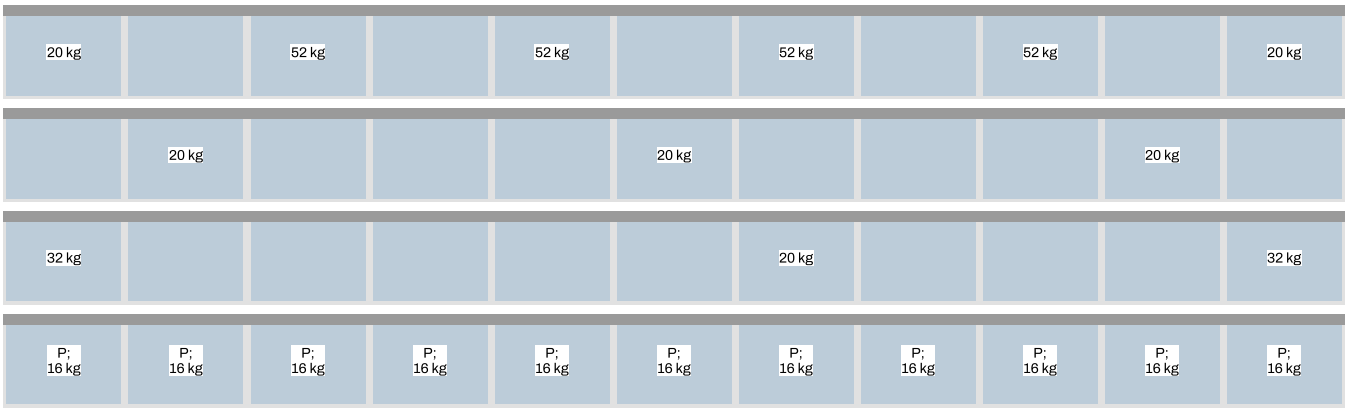
Segment 1



Panel count	44
Total power	19.140 kWp
Configuration	Single
Orientation	Landscape
Row distance	1,457 mm
Grounding/bonding option	OFF

This assembly plan is applicable for the highlighted segments

Ballast



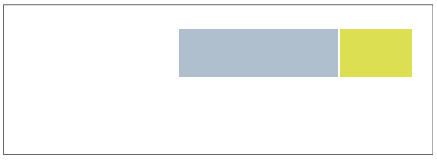
Check the manual for more information on the exact (perimeter) positions of the ballast containers.

Weight per ballast unit	4.0 kg
Number of ballast units	142

Materials

Article number	Description	Amount
1000612	Mounting screw M6 x 12mm	96
1000655	Mounting screw M6 x 55mm	96
1003022	Universal mid clamp with bonding	80
1004330	FlatFix end clamp 30mm	16
1007011	FlatFix Fusion base plate bracket	12
1007012	FlatFix Fusion base plate	132
1007022	FlatFix Fusion - Low base	48
1007031	FlatFix Fusion high base	48
1007042	MLPE Clip Lightweight up to 2kg	44
1007137	FlatFix Fusion base profile 370mm	36
1007196	FlatFix Fusion base profile 1077mm	48
1007209	FlatFix Fusion wind deflector rear 1700	44
1007210	FlatFix Fusion ballast container 1700	23
1007226	FlatFix Fusion wind deflector left (base profile 1030mm - 1077mm)	4
1007227	FlatFix Fusion wind deflector right (base profile 1030mm - 1077mm)	4
1008085	Self-tapping sheet metal screw 6,0x25 mm SW10 HEX/T30	40

Segment 2



This assembly plan is applicable for the highlighted segments

Panel count	20
Total power	8.700 kWp
Configuration	Single
Orientation	Landscape
Row distance	1,457 mm
Grounding/bonding option	OFF

Ballast

20 kg		36 kg	36 kg	20 kg
		8 kg		
32 kg				32 kg
P; 16 kg	P; 16 kg	P; 16 kg	P; 16 kg	P; 16 kg

Check the manual for more information on the exact (perimeter) positions of the ballast containers.

Weight per ballast unit	4.0 kg
Number of ballast units	66

Materials

Article number	Description	Amount
1000612	Mounting screw M6 x 12mm	48
1000655	Mounting screw M6 x 55mm	48
1003022	Universal mid clamp with bonding	32
1004330	FlatFix end clamp 30mm	16
1007011	FlatFix Fusion base plate bracket	6
1007012	FlatFix Fusion base plate	66
1007022	FlatFix Fusion - Low base	24
1007031	FlatFix Fusion high base	24
1007042	MLPE Clip Lightweight up to 2kg	20
1007137	FlatFix Fusion base profile 370mm	18
1007196	FlatFix Fusion base profile 1077mm	24
1007209	FlatFix Fusion wind deflector rear 1700	20
1007210	FlatFix Fusion ballast container 1700	12
1007226	FlatFix Fusion wind deflector left (base profile 1030mm - 1077mm)	4
1007227	FlatFix Fusion wind deflector right (base profile 1030mm - 1077mm)	4
1008085	Self-tapping sheet metal screw 6,0x25 mm SW10 HEX/T30	28

Calculations

Input

Address	Briscoe Ln, Manchester M40, UK
Basic wind speed ($v_{b,map}$)	22.5 m/s*
Altitude factor (c_{alt})	1.07
Fundamental value of basic wind speed	24.19 m/s
Terrain category	Town*
Distance to coast	50.0 km*
Distance to city boundary	0.4 km*
Air density	1.23 kg/m³
Wind exposure factor (c_e)	2.19
Town terrain exposure correction factor ($c_{e,T}$)	0.97
Displacement height (h_{dis})	3.0 m
Orography factor	1.0
Wind pressure	657.78 N/m²
Snow zone	3*
Characteristic value of snow on the ground	0.45 kN/m²
Snow exposure factor C_e	1.0
Snow load form coefficient	1.0
Snow load on the roof	452.38 N/m²
Altitude above sea level	75.0 m*
Consequence class	CC1
Reference period	15 years
Roof height	10.0 m
Parapet height	100 mm
Edge zone depth short side	1.8 m
Edge zone depth long side	2.02 m
Roof pitch	0.0°
Roof area	928.8 m²
Roofing material	Bitumen insulated
Friction Coefficient	0.7
Roof orientation from north	0.0°

High building safety factor	1.01
Panel model	LONGi LR5-54HTB 415~435M (415 - 435Wp) Hi-MO X6 Explorer
Panel dimensions	1722 mm x 1134 mm x 30 mm
Panel weight	20.0 kg
Panel count	64
Panel angle of inclination landscape	11.3°
Configuration	Single
Orientation	Landscape
Row distance	1,457 mm
Grounding/bonding option	OFF
Segment count	2
Panel power	435 Wp
Total power	27.840 kWp

* Automatically determined based on the address.

Enstall's FlatFix Fusion calculation is certified by Peutz. The certificate show that Enstall has correctly applied the wind tunnel measurements for FlatFix Fusion, combined with results of mechanical lift tests and that all results have been correctly and safely processed in the Enstall calculator. The results of the studies and their translation into a method for calculating ballast have been tested against the standards CUR Recommendation 103: 2005, NEN 7250: 2021 and the Eurocodes EN 1990 and EN 1991-1-4 with their corresponding national annexes.

Roof loads

Total weight	2,574.12 kg
Total ballast weight	832.0 kg
Total system weight	462.12 kg
Total panel weight	1,280.0 kg
Number of ballast units (210mm x 105mm x 80mm)	208
Roof area (gross)	928.8 m²
System area (projected area)	158.54 m²
Average load over roof area	2.77 kg/m²
Average load over system area	16.24 kg/m²
Max load over panel area	33.24 kg/m²
Max static point load (at base plate)	11.87 kPa*, 21.39 kg/base plate
Max dynamic point load (at base plate)	46.62 kPa*, 83.99 kg/base plate

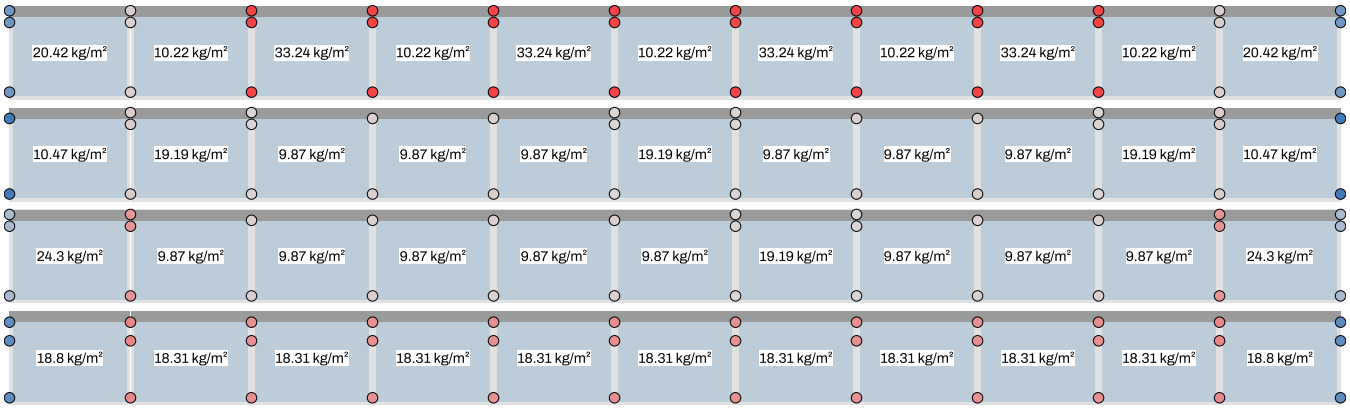
* Irregularities in the roof can cause deviating point pressures

Roof loads for segment 1

Total weight	1,755.45 kg
Total ballast weight	568.0 kg
Total system weight	307.45 kg
Total panel weight	880.0 kg
System area (projected area)	108.86 m²
Average roof load over system area	16.13 kg/m²
Max static point load (at base plate)	9.7 kPa*, 17.47 kg/base plate
Max dynamic point load (at base plate)	46.29 kPa*, 83.38 kg/base plate

* Irregularities in the roof can cause deviating point pressures

3.73 kPa  9.7 kPa

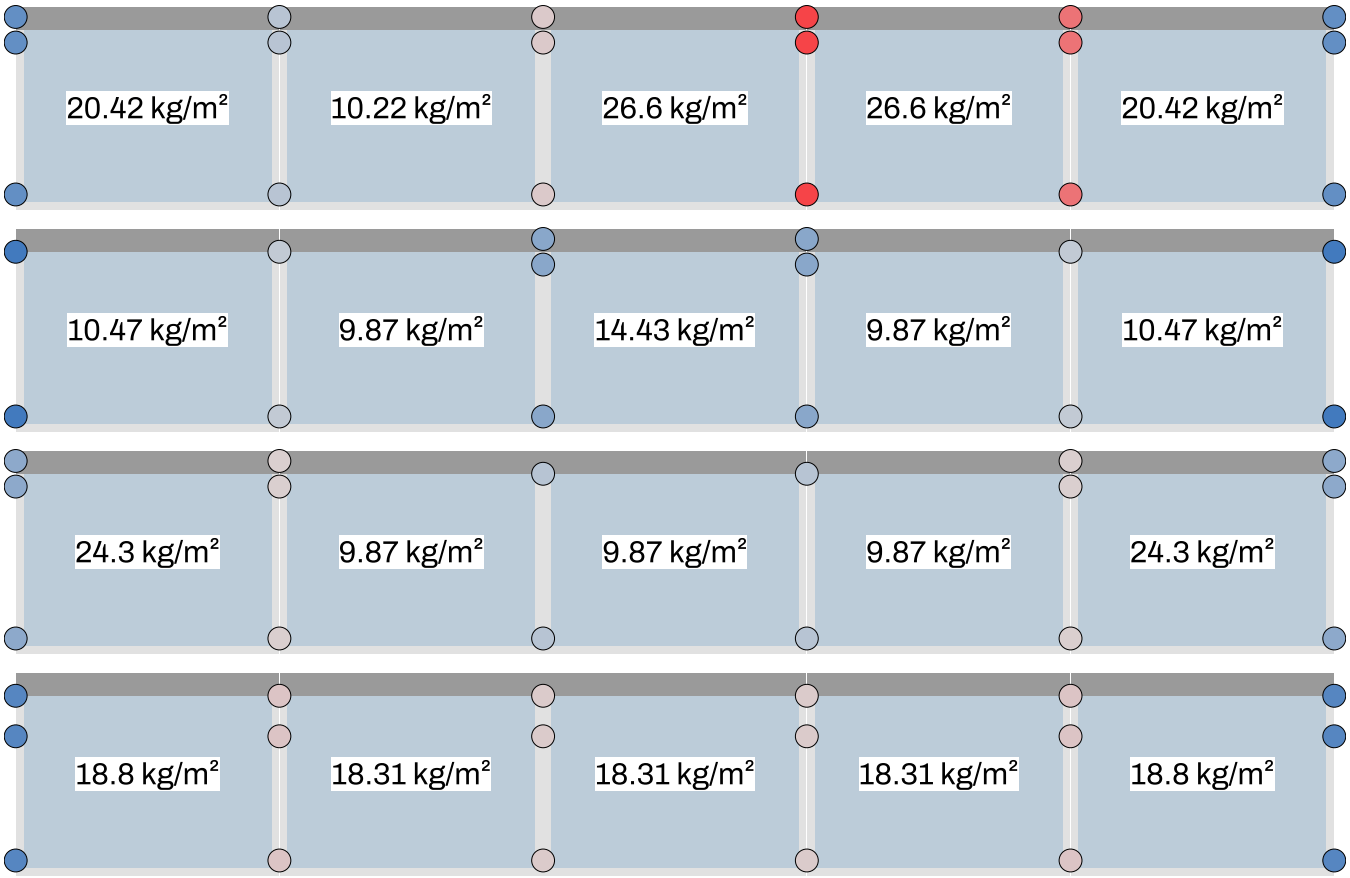


Roof loads for segment 2

Total weight	818.67 kg
Total ballast weight	264.0 kg
Total system weight	154.67 kg
Total panel weight	400.0 kg
System area (projected area)	49.68 m²
Average roof load over system area	16.48 kg/m²
Max static point load (at base plate)	11.87 kPa*, 21.39 kg/base plate
Max dynamic point load (at base plate)	46.62 kPa*, 83.99 kg/base plate

* Irregularities in the roof can cause deviating point pressures

3.73 kPa  11.87 kPa



Disclaimer

Please read this information carefully before starting with the design and installation of the PV system.

The output for the design of the PV system is generated by using the calculator tool made available through the website of Enstall Europe B.V. ("**Enstall**") at www.enstall.com (the "**Calculator**"). The responsibility for the correct application of the output derived from the Calculator lies with the user of the Calculator and/or the installer or any other person responsible for the installation of the PV system, which output may be subject to or impacted by many different variables and factors. The installation of a PV system onto an existing building can for example impact the existing building loads (e.g., as a result of snow and wind) or the building construction. To avoid personal injury and/or property damages, the installer or any other person responsible for the installation of a PV system should ensure that the static calculations applicable to the existing building are reviewed and confirmed beforehand by a qualified technician. Any applicable regulations, including (but not limited to) NEN 7250, EN 1990, EN 1991-1-3, EN 1991-1-4 and relevant national annexes, should be observed and adhered to. Failure to obtain such confirmation or observe and adhere to applicable regulations may, amongst others, lead to failure of the roof load-bearing structure of the building. It is advisable to consult with the insurer of the building in case of the intention to install a PV system or in case of any other intended changes to the building.

The installer or any other person responsible for the installation of a PV system should also consider, confirm or control applicable design elements which include (but are not limited to):

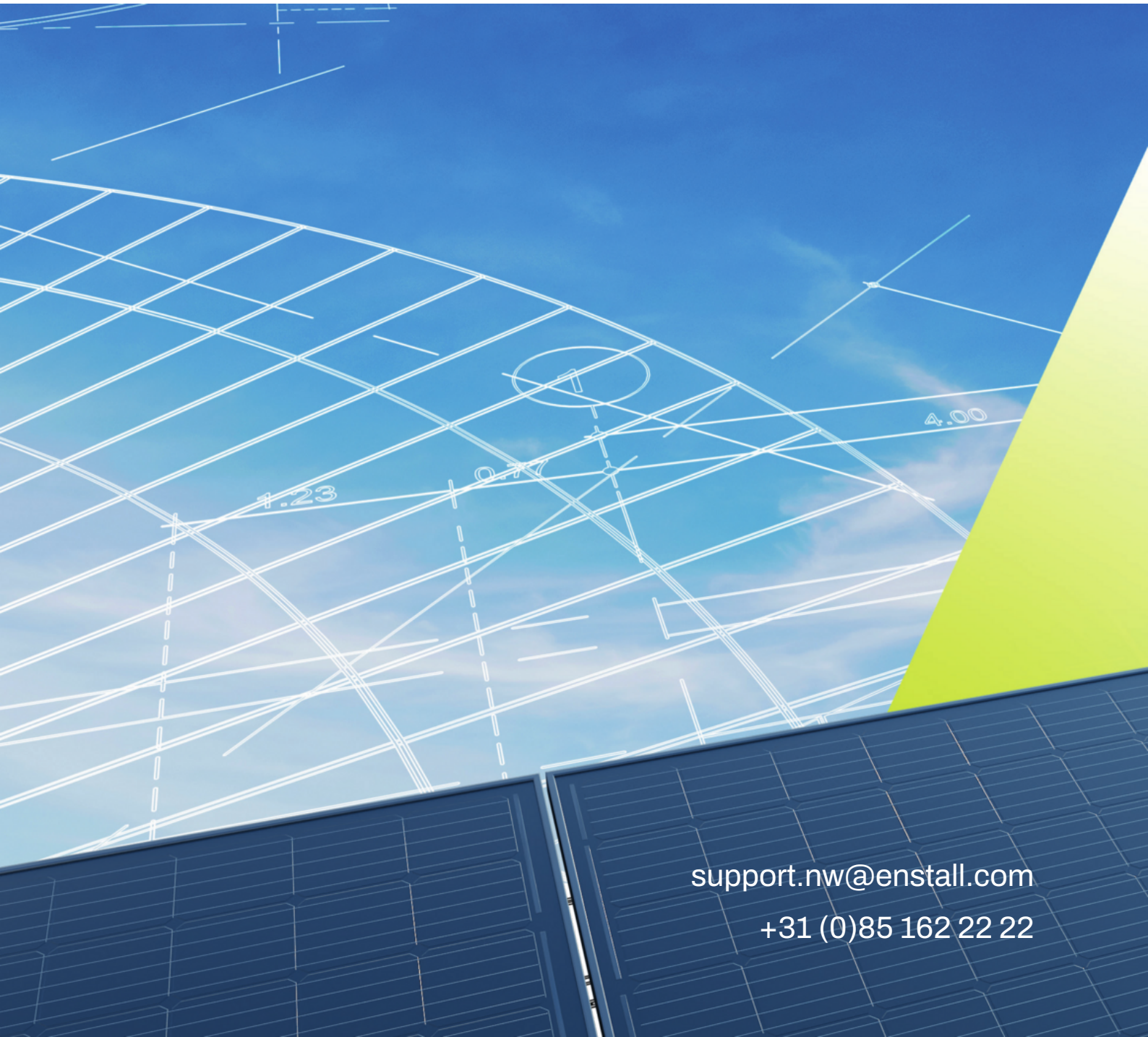
a. changes as a result of the additional weight of the complete PV system on the building;
b. changes as a result of the changed geometry of the building's roof;
c. changes as a result of the dynamic wind pressure and possible accumulation of rain or any other precipitation on the building;
d. the loads occurring during installation on the building, roofing material and insulation;
e. the compatibility of the insulation and roofing material at the location of the contact points of the long-term PV-system's support structure, as a result of the pressure point;
f. the compatibility of the roofing material in combination with the support structure at the location of the contact points;
g. the effect of thermal performance of the building on the PV system and vice versa; and/or
h. the effect of any movement and vibrations of the roof on the PV system and vice versa.

In addition, the installer or any other person responsible for the installation of a PV system should confirm the compatibility of any third party products, components or materials (including PV panels) used in conjunction with Enstall's products, if such third party products, components or materials have not been provided for such use by or on behalf of Enstall or the use of which has not been expressly authorized by Enstall. Reference to a third party product in the Calculator should not be deemed an express or implied authorization by Enstall. Enstall's products should always be used in accordance with instructions set out in the most recent version of the applicable manual, available via www.enstall.com.

Prices in the Calculator are indicative and are subject to change resulting from, amongst others, fluctuations in commodity prices.

To generate output from the Calculator Enstall relies solely on the input and information that was submitted by the user of the Calculator. Enstall is under no obligation to confirm or verify such input or information. Enstall assumes no responsibility or liability of any kind in relation to, or resulting from, such input and/or information, and/or any risks, consequences or damages (including, but not limited to, indirect or consequential losses) resulting from incorrect, inaccurate, or incomplete input and/or information that was submitted through the Calculator or resulting from the improper use of Enstall's products. Any such responsibilities and liabilities are solely for the account of the user of the Calculator and/or any other person responsible for the installation of a PV system, as applicable.

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