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	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	92

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	40.020 kWp

Complete list of materials

Total roof bill of materials

Article number	Description	Amount
1000612-B	Mounting screw M6 x 12mm - black	208
1000655-B	Mounting screw M6 x 55mm - black	208
1003022-B	Universal mid clamp with bonding - Black	160
1004430	FlatFix end clamp 30mm Black	48
1006500	Colour cap black	48
1007011	FlatFix Fusion base plate bracket	18
1007012	FlatFix Fusion base plate	260
1007022	FlatFix Fusion - Low base	104
1007031	FlatFix Fusion high base	104
1007042*	MLPE Clip Lightweight up to 2kg	92
1007196	FlatFix Fusion base profile 1077mm	104
1007209-B	FlatFix Fusion Wind deflector rear 1700 Black	92
1007210	FlatFix Fusion ballast container 1700	31
1007226-B	FlatFix Fusion wind deflector left black (base profile 1030mm - 1077mm)	12
1007227-B	FlatFix Fusion wind deflector right black (base profile 1030mm - 1077mm)	12
1007637	FlatFix Fusion base profile 370mm black	90
1008085	Self-tapping sheet metal screw 6,0x25 mm SW10 HEX/T30	84

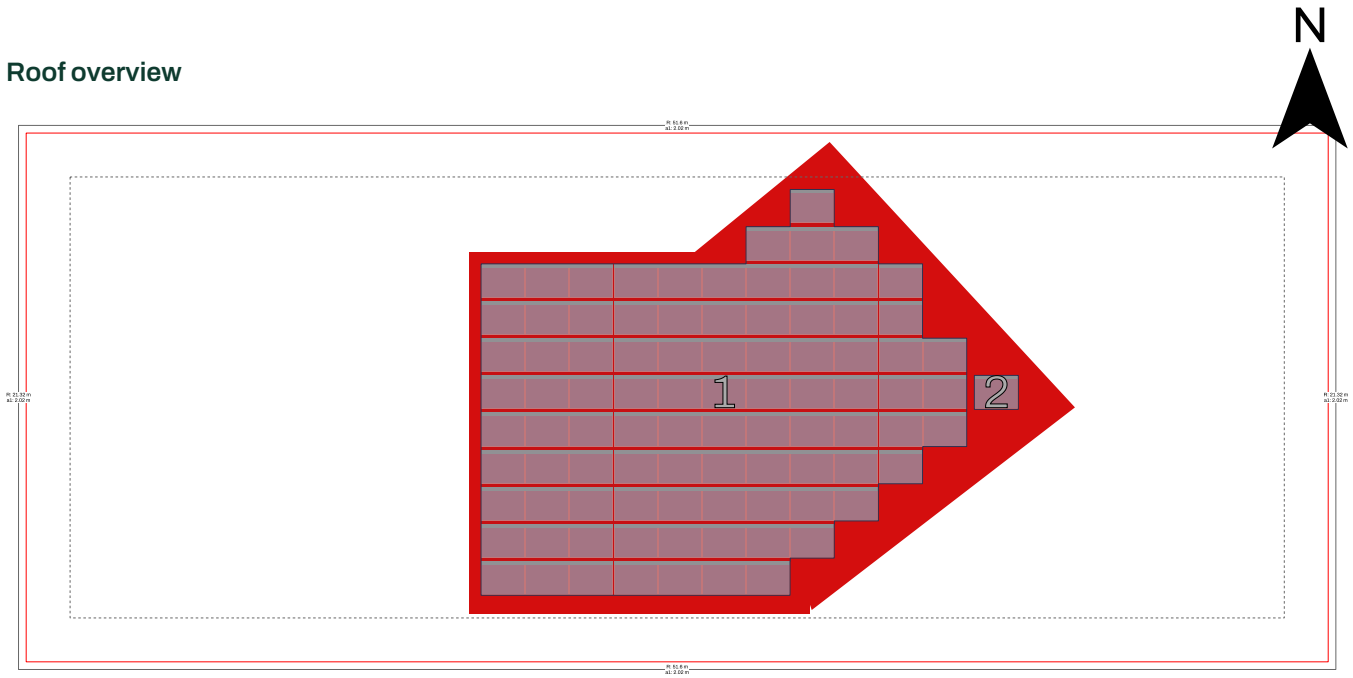
* Optional article

Number of ballast units

Number of bricks (210 mm x 105 mm x 80 mm, 4.0 kg/pc)	124

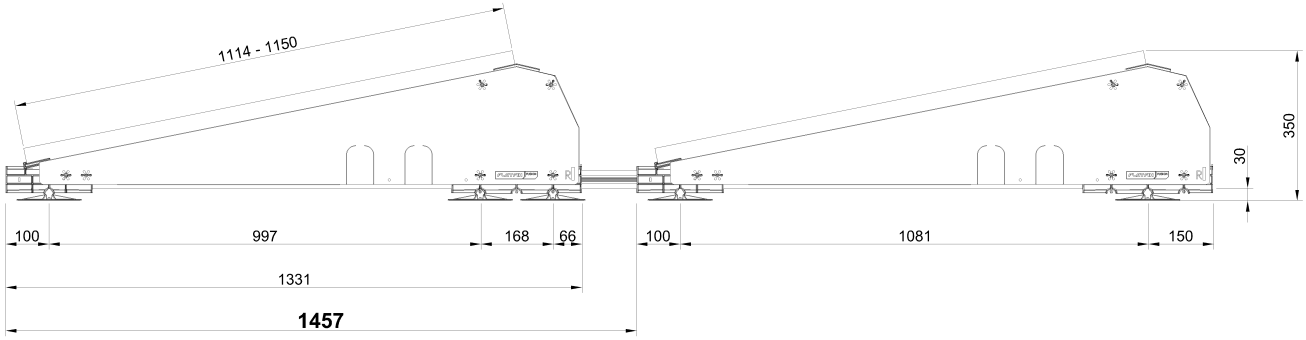
Assembly

Roof overview

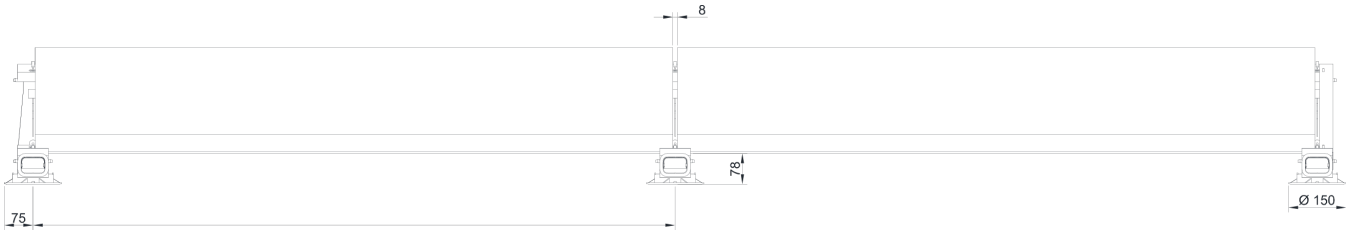


R: XXm	Length of outer roof side
	No-Go zone width (30cm)
a1: XXm	Edge zone width from roof edge

Single landscape configuration with row distance of 1,457 mm

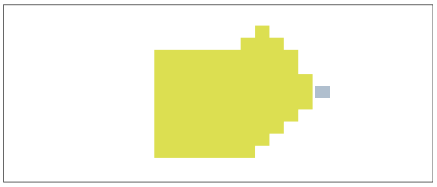


Rear view



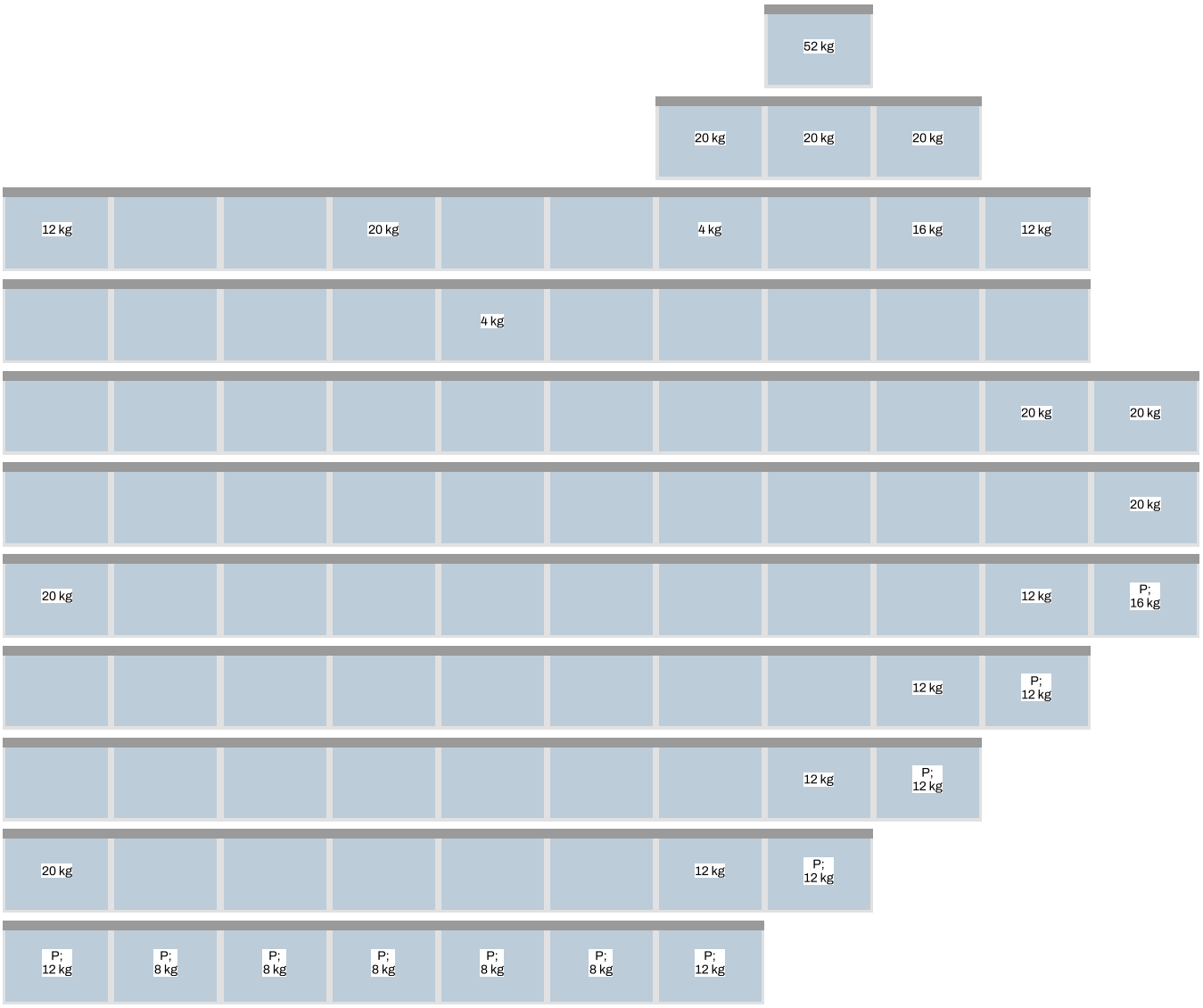
Segment 1

Panel count	91
Total power	39.585 kWp
Configuration	Single
Orientation	Landscape
Row distance	1,457 mm
Grounding/bonding option	OFF



This assembly plan is applicable for the highlighted segments

Ballast



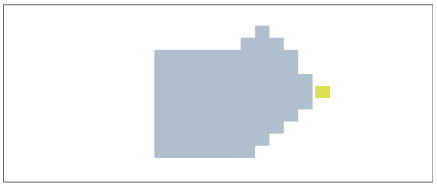
Check the manual for more information on the exact (perimeter) positions of the ballast containers.

Weight per ballast unit	4.0 kg
Number of ballast units	111

Materials

Article number	Description	Amount
1000612-B	Mounting screw M6 x 12mm - black	204
1000655-B	Mounting screw M6 x 55mm - black	204
1003022-B	Universal mid clamp with bonding - Black	160
1004430	FlatFix end clamp 30mm Black	44
1006500	Colour cap black	44
1007011	FlatFix Fusion base plate bracket	16
1007012	FlatFix Fusion base plate	254
1007022	FlatFix Fusion - Low base	102
1007031	FlatFix Fusion high base	102
1007042	MLPE Clip Lightweight up to 2kg	91
1007196	FlatFix Fusion base profile 1077mm	102
1007209-B	FlatFix Fusion Wind deflector rear 1700 Black	91
1007210	FlatFix Fusion ballast container 1700	30
1007226-B	FlatFix Fusion wind deflector left black (base profile 1030mm - 1077mm)	11
1007227-B	FlatFix Fusion wind deflector right black (base profile 1030mm - 1077mm)	11
1007637	FlatFix Fusion base profile 370mm black	90
1008085	Self-tapping sheet metal screw 6,0x25 mm SW10 HEX/T30	76

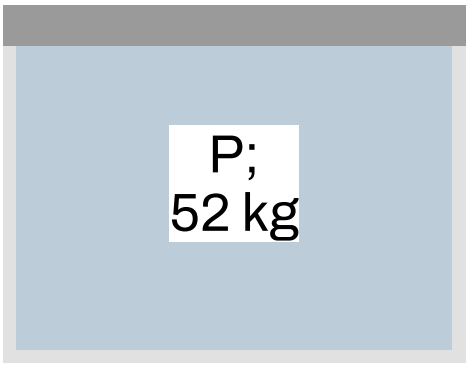
Segment 2



This assembly plan is applicable for the highlighted segments

Panel count	1
Total power	0.435 kWp
Configuration	Single
Orientation	Landscape
Row distance	1,457 mm
Grounding/bonding option	OFF

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	13

Materials

Article number	Description	Amount
1000612-B	Mounting screw M6 x 12mm - black	4
1000655-B	Mounting screw M6 x 55mm - black	4
1004430	FlatFix end clamp 30mm Black	4
1006500	Colour cap black	4
1007011	FlatFix Fusion base plate bracket	2
1007012	FlatFix Fusion base plate	6
1007022	FlatFix Fusion - Low base	2
1007031	FlatFix Fusion high base	2
1007042	MLPE Clip Lightweight up to 2kg	1
1007196	FlatFix Fusion base profile 1077mm	2
1007209-B	FlatFix Fusion Wind deflector rear 1700 Black	1
1007210	FlatFix Fusion ballast container 1700	1
1007226-B	FlatFix Fusion wind deflector left black (base profile 1030mm - 1077mm)	1
1007227-B	FlatFix Fusion wind deflector right black (base profile 1030mm - 1077mm)	1
1008085	Self-tapping sheet metal screw 6,0x25 mm SW10 HEX/T30	8

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	2.02 m
Roof pitch	0.0°
Roof area	1,100.11 m²
Roofing material	Bitumen insulated
Friction Coefficient	0.7
Roof orientation from north	0.0°
High building safety factor	1.0

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	92
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	40.020 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	2,935.19 kg
Total ballast weight	496.0 kg
Total system weight	599.19 kg
Total panel weight	1,840.0 kg
Number of ballast units (210mm x 105mm x 80mm)	124
Roof area (gross)	1,100.11 m²
System area (projected area)	230.33 m²
Average load over roof area	2.67 kg/m²
Average load over system area	12.74 kg/m²
Max load over panel area	35.18 kg/m²
Max static point load (at base plate)	9.11 kPa*, 16.42 kg/base plate
Max dynamic point load (at base plate)	46.62 kPa*, 83.99 kg/base plate

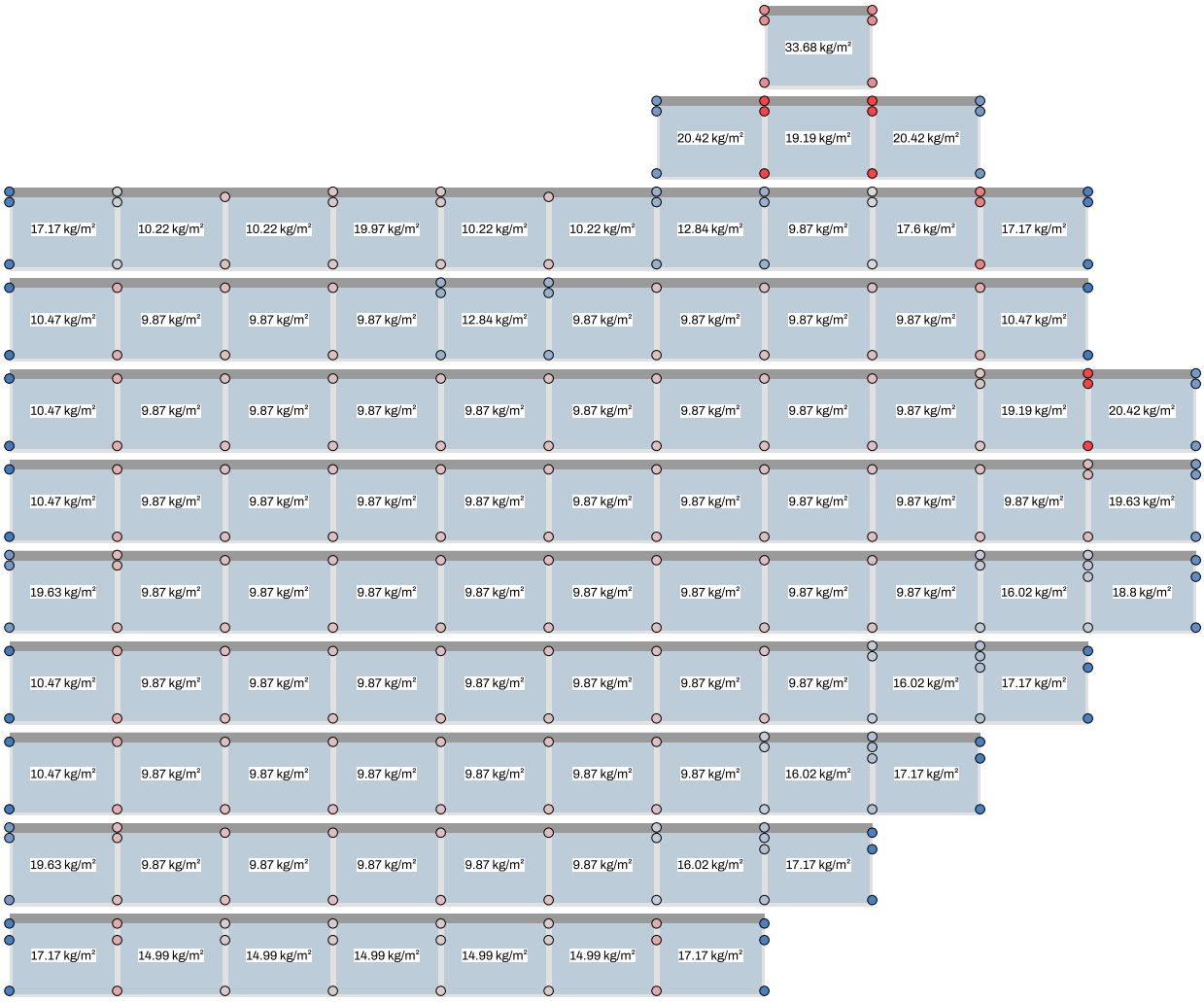
* Irregularities in the roof can cause deviating point pressures

Roof loads for segment 1

Total weight	2,850.76 kg
Total ballast weight	444.0 kg
Total system weight	586.76 kg
Total panel weight	1,820.0 kg
System area (projected area)	227.95 m²
Average roof load over system area	12.51 kg/m²
Max static point load (at base plate)	9.11 kPa*, 16.42 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  9.11 kPa

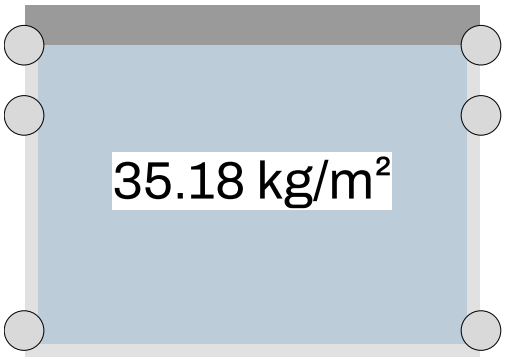


Roof loads for segment 2

Total weight	84.42 kg
Total ballast weight	52.0 kg
Total system weight	12.43 kg
Total panel weight	20.0 kg
System area (projected area)	2.39 m²
Average roof load over system area	35.4 kg/m²
Max static point load (at base plate)	7.76 kPa*, 13.98 kg/base plate
Max dynamic point load (at base plate)	22.07 kPa*, 39.75 kg/base plate

* Irregularities in the roof can cause deviating point pressures





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):

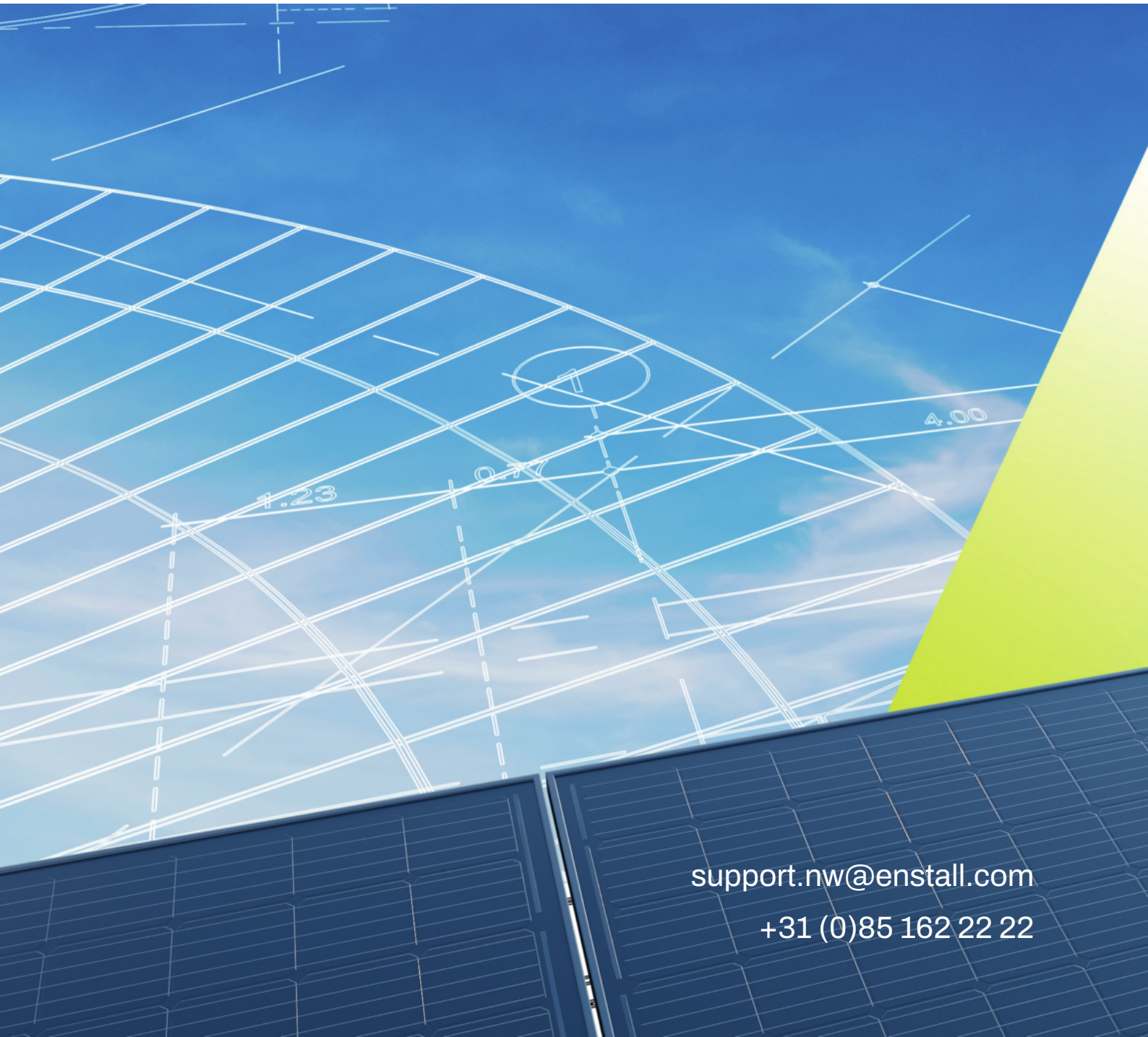
a. changes as a result of the additional weight of the complete PV system on the building;
b. changes as a result of the changed geometry of the building's roof;
c. changes as a result of the dynamic wind pressure and possible accumulation of rain or any other precipitation on the building;
d. the loads 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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