



| Connecting Strength

K2 Base Report

SDH - South Newton Main Block

Customer	JCI
Project address	Glenside Manor, Warminster Rd, South Newton, Salisbury SP2 0QD, UK
Planned installation date	18/05/2026
Company	Revolution Energy Services Ltd
Address	CHANGE_ME CHANGE_ME, 96598, CHANGE_ME
Planner	Ed McGloin
Issue date	22/04/2026
Version	K2 Base Version 3.2.86.0



Contents

Project overview	4
Front Roof	7
Assembly plan	9
Results	12
Structural analysis report	15
Bill of material	19
Middle Roof	21
Assembly plan	23
Results	26
Structural analysis report	29
Bill of material	33
Rear Roof	35
Assembly plan	37
Results	40
Structural analysis report	43
Bill of material	47
Bill of material	48

About us

K2 Systems. Innovative mounting system from a strong team.

Since 2004 we have been developing pioneering and highly functional mounting system solutions for photovoltaic installations around the world. Our systems are designed in our own product development department where we continually optimize and adapt mounting systems to the ever-changing market.

A knowledgeable and friendly team

Just like a mountain climbing team, K2 Systems is built on mutual trust. This applies to our customer service as well as within the company itself, because we believe a trusting partnership leads to successful photovoltaic projects.

Our employees place total focus on the needs and wishes of our customer. This is true in all company departments.

10 locations and worldwide sales network

In our international team, everyone works together to provide customers with competent, comprehensive and entirely personalized service.

This is especially true in the constant training our employees undergo with regards to product optimization, quality assurance, or innovations in construction techniques.

Quality management and certificates

K2 Systems stands for Connecting Strength, the highest quality, and precision-crafted and customized components. Our customers and business partners deeply appreciate all of these factors. Three independent authorities have tested, confirmed, and certified our skills and components. External authorities are not the only ones to have put K2 Systems to the test. Our internal quality control ensures that all our products are subject to a constant review process.

These measures all ensure the outstanding quality standards that exemplify products from K2 Systems, and which we maintain through largely exclusive "Made in Germany" or "Made in Europe" practices.



Product guarantee

K2 Systems offers a 12-year product warranty on all products in its integrated range. The use of high quality materials and a three-level quality inspection ensure these standards.

In a nutshell

As roof-top specialists, we offer effective and economical solutions for roofs all around the world and provide professional, fast and reliable support for our customers in the solar industry.

The static report is not including module and building verification.



Project overview

Roofs

Roof	System	Module	Height	Quantity	Total power
Front Roof  Tile	SingleRail	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	10.00 m	46	20.47 kWp
Middle Roof  Tile	SolidRail	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	12.00 m	32	14.24 kWp
Rear Roof  Tile	SolidRail	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	12.00 m	44	19.58 kWp
Total				122	54.29 kWp

Project information

Address	Glenside Manor, Warminster Rd, South Newton, Salisbury SP2 0QD, UK
Planned installation date	18/05/2026
Customer	JCI
Contact person	Joe Puddick
Author	Ed McGloin

Load settings

Design method	BS EN
Failure consequence class (CC)	CC2
Design working life	25 years
Terrain category	Country Terrain
Basic wind speed	22.0 m/s
Distance to shoreline	25.00 km
Snow load zone	1
Snow load on ground level	0.30 kN/m²

Material values

For material information refer to the product catalogue:
[K2 Catalogue \(k2-systems.com\)](https://k2-systems.com)



THE PROJECT IS VERIFIED.
 please check the warning(s)!

SDH - South Newton Main Block

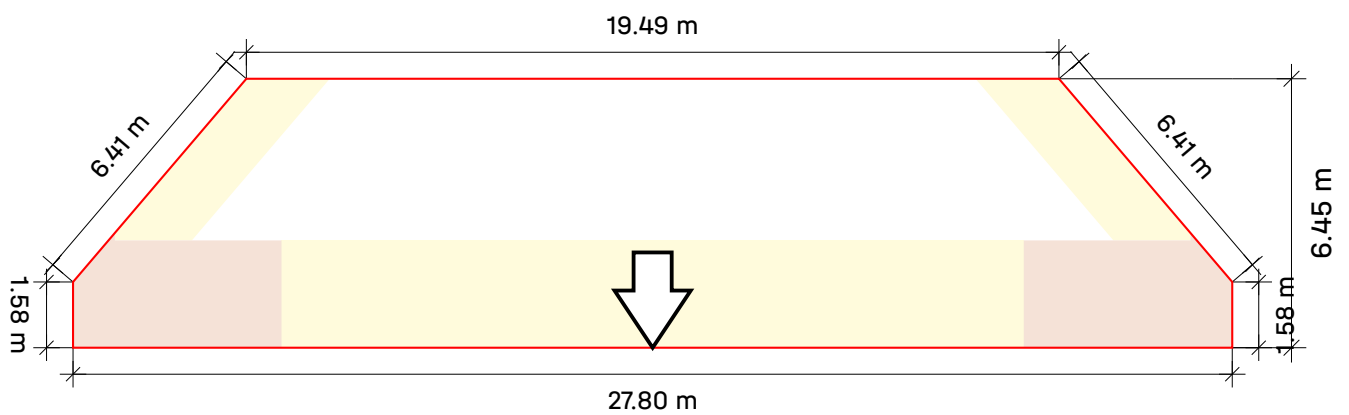


Project information

Address	Glenside Manor, Warminster Rd, South Newton, Salisbury SP2 0QD, UK
Planned installation date	18/05/2026
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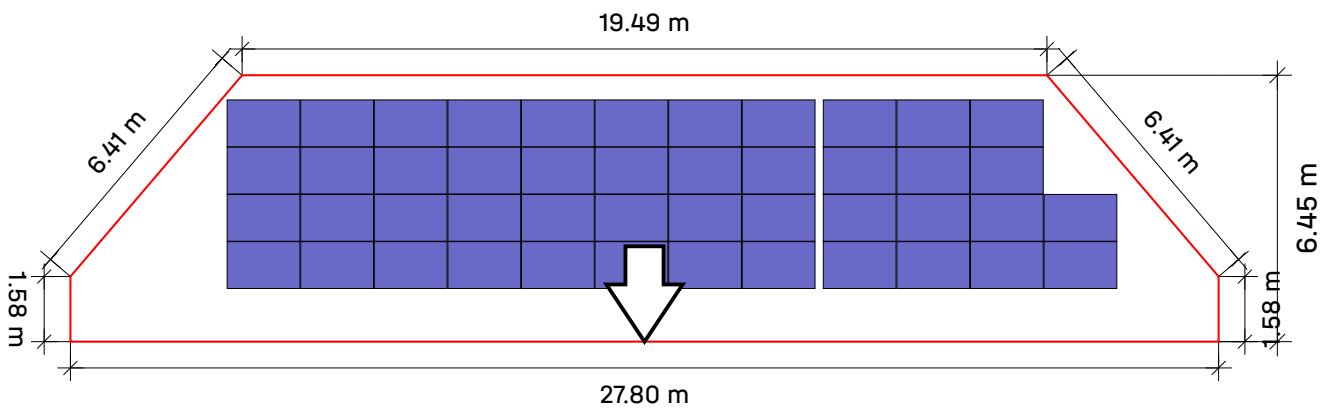


Front Roof





Front Roof



Roof	System	Module	Height	Quantity	Total power
Front Roof	SingleRail	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	10.00 m	46	20.47 kWp
 Tile					

Front Roof | Assembly plan

Base Rails

Type	Whole Rails		Rail cutting		
	Total Rail Length	Quantity 3.65 m	Part of Rail / Rest	Length	Rest
4*A	7.208 m	1*3.65 m	3.650	3.558 from 3.650	0.082
8*B	14.336 m	3*3.65 m	3.650	3.386 from 3.650	0.254
2*C	5.426 m	1*3.65 m	3.650	1.776 from 3.650	1.864
2*D	5.426 m	1*3.65 m	1.864	1.776 from 1.864	0.078

1 cm is viewed as lost for each cutting

Red numbers are leftover rails which will not be used any longer

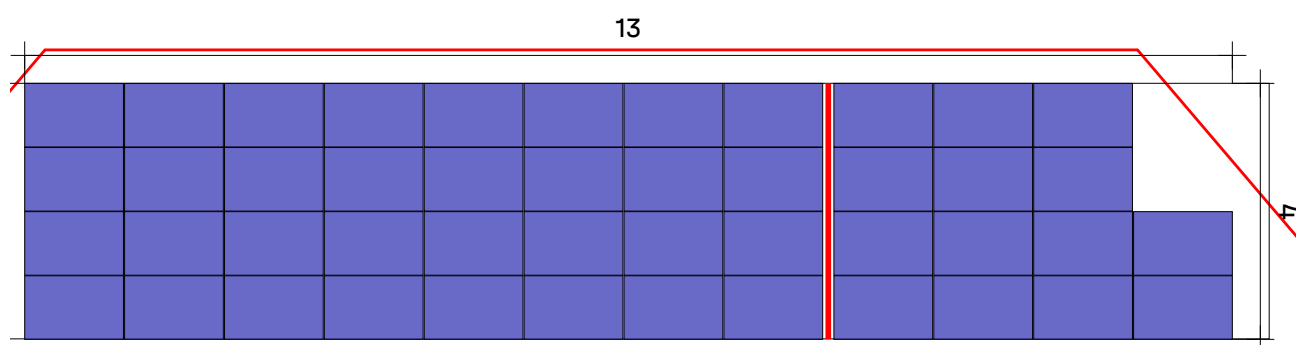
Fastener Spacing

Module	Array	Distance	maximum cantilever length [m]	maximum fastener spacing [m]
1	Inner Area	1.80 m	0.583	2.083
1	gableboard	1.20 m	0.598	1.650
1	eaves	1.80 m	0.588	2.095
1	corner region (eave)	1.20 m	0.592	1.594

Module arrays

Module array	Width[m]	Length[m]	Width in modules	Length in modules
1	23.33	4.57	12	4

Front Roof | Module array 1



Roof ① Module array ①

Mounting System

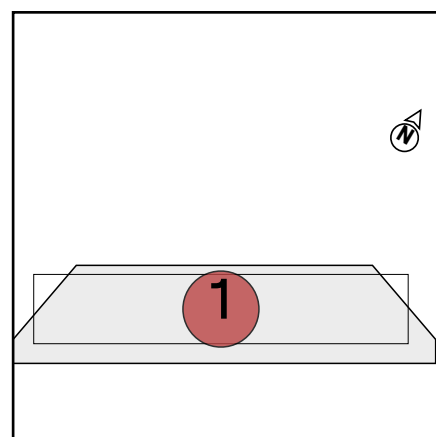
[SingleRail](#)

Module

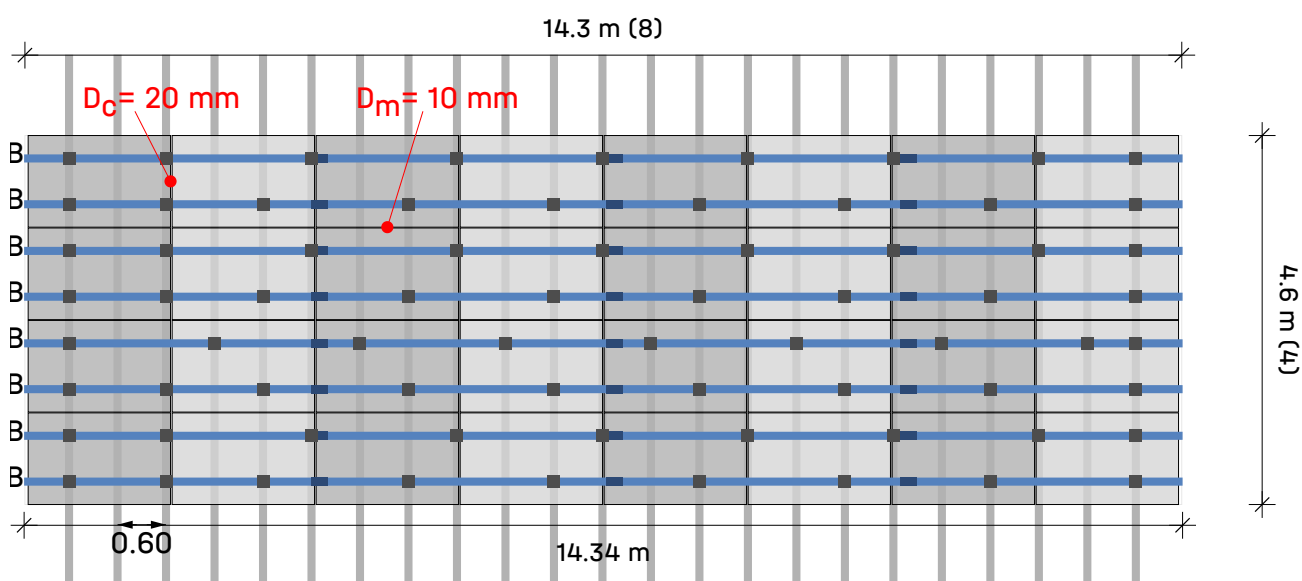
46(20.47 kWp) x
TSM-445NEG9R.28 (Vertex
S+)

Row spacing

1.14 m



Front Roof | Module array 1 | Module block 1

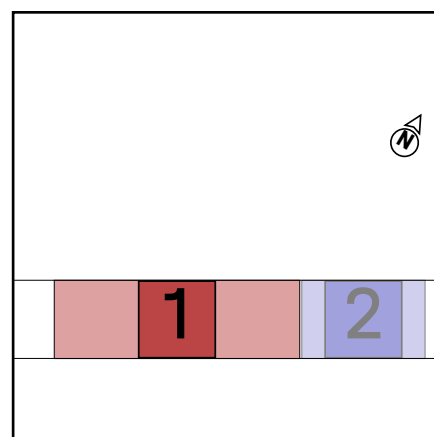


Roof **1** Module array **1** Module block **1**

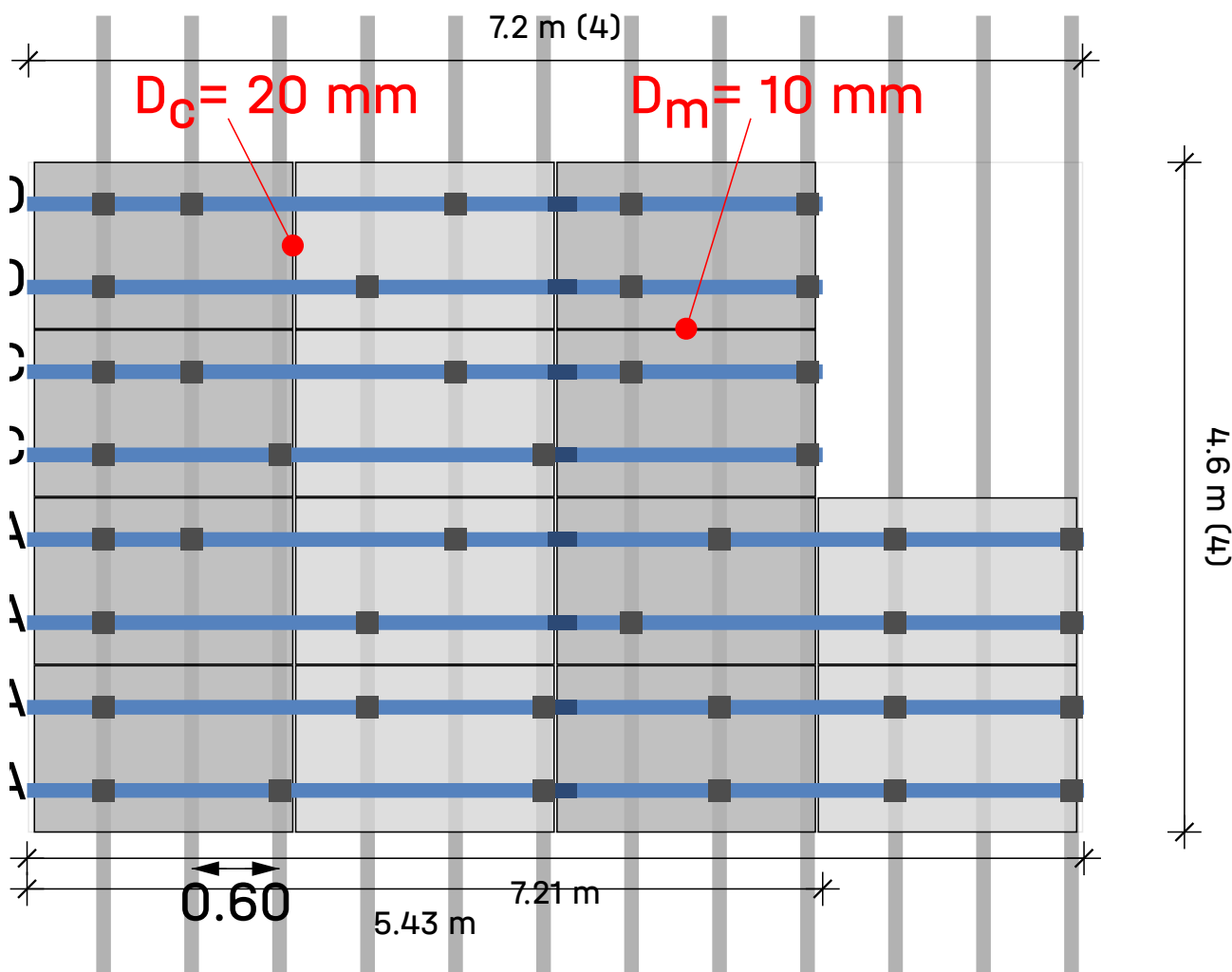
Modules $8 \times 4 = 32$

Legend

- Fastener
- Mounting rail: K2 SingleRail 36
- ➔ Dist. to neighbour module block/array [m]
- D_c Distance for clamping between modules
- D_m Distance between modules



Front Roof | Module array 1 | Module block 2

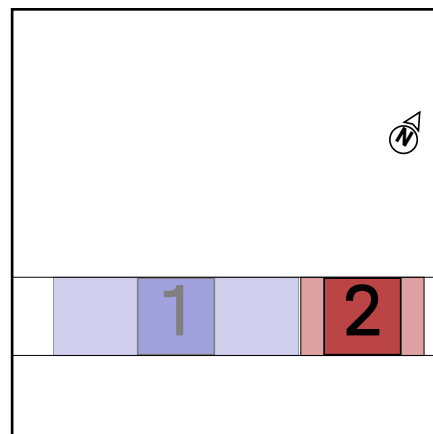


Roof ① Module array ① Module block 2

Modules (4 × 4) - 2 = 14

Legend

- Fastener
- Mounting rail: K2 SingleRail 36
- Dist. to neighbour module block/array [m]
- D_c Distance for clamping between modules
- D_m Distance between modules





Results | Front Roof

Roof	System	Module	Height	Quantity	Total power
Front Roof	SingleRail	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	10.00 m	46	20.47 kWp
 Tile					

Module

Name	TSM-445NEG9R.28 (Vertex S+)
Manufacturer	Trina Solar Energy
Output power	445 Wp
Dimensions	1,762×1,134×30 mm
Weight	21.0 kg

Components

Fastener	SingleHook 2 Set
Base rails	K2 SingleRail 36

Loads on modules (module dimensioning)

No. Module Array	Array	A-TrA [m ²]	ultimate state [Pa]				Serviceability [Pa]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift 	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	2.00	840.0	273.9	-535.3	75.7	569.3	190.2	-325.7	75.7
1	gableboard	2.00	840.0	273.9	-1,122.1	75.7	569.3	190.2	-716.9	75.7
1	eaves	2.00	819.0	273.9	-535.3	75.7	555.4	190.2	-325.7	75.7
1	corner region (eave)	2.00	1,070.5	273.9	-1,164.0	75.7	723.0	190.2	-744.9	75.7

Utilisation result

No. Module Array	roof areas	ultimate limit state			Usab.	Distances		maximum values	
		Pr σ[%]	CL σ[%]	Fst F[%]	Pr f[%]	Fst [m]	BR [m]	CL L _{max} [m]	Fst D _{max} [m]
1	Inner Area	48.6	25.1	55.1	55.8	1.800	---	0.583	2.083
1	gableboard	24.6	26.5	72.7	17.0	1.200	---	0.598	1.650
1	eaves	47.6	24.6	55.1	54.5	1.800	---	0.588	2.095
1	corner region (eave)	26.4	28.4	75.3	17.7	1.200	---	0.592	1.594
Pr	Profile				Fst D _{max}	maximum fastener spacing [m]			
Fst	Fastener				BR	Base Rail			



Results | Front Roof

σ **Stress**

f **Deflection**

F **Force**

CL/L_{max} **maximum cantilever length [m]**

Usab. **serviceability limit state**

CL **Cantilever**



Results | Front Roof

Important Information

- The dimensioning of the timber construction screws is not part of this structural analysis. This must be done on site. If the rafters are made of solid wood, glued laminated timber, cross laminated timber and laminated veneer lumber, assembly with 2 timber construction screws is usually sufficient. The edge distances must be upheld in accordance with the manufacturer's specifications.
- The structure was statically verified in accordance with Eurocode 9: Design of aluminium structures (DIN EN 1999-1-1:2021) and offers sufficient load-bearing capacity and stability for the loads specified in the chapter 'Maximum actions on the components'.
- Adjustment factor for wind load regarding service life period, f_W , is according to DIN EN 1991-1-4/NA, NDP for 4.2 (2P) note 5, table 3
- Adjustment factor for snow load regarding service life period, f_S , is according to DIN EN 1991-1-3/annex D, table 4
- The structural design complies with BS EN 1990 - Basis of Structural Design.
- Snow loads are determined in accordance with National Annex BS NA EN 1991-1-3 (2018) - UK National Annex to EC1 - Action on structures - general actions - snow loads.
- Wind loads are determined in accordance with National Annex BS NA EN 1991-1-4 - UK National Annex to EC1 - Action on structures, general actions - wind actions.
- Service life is recognised according to 'Eurocode EN 1991 - Action on structures, Snow loads' and 'Eurocode EN 1991 - Actions on structures, Wind actions'. Subject to the Building Regulations and for security-relevant reasons the installation has to be dismantled at the end of its service life.
- Failure consequence class is considered according to 'Eurocode EN 1990 - Basis of structural design'.
- The person responsible for the execution of the work must check the load assumptions made with the conditions on site. If deviations are found, the person who prepared the static calculation must be consulted immediately.
- Please note our General Terms and Conditions of Use (TCU-E) in their currently valid version, available at: <https://k2-systems.com/en/digital-services/general-terms-and-conditions-of-use-for-entrepreneurs-tcu-e/>
Please note in particular § 1, Special provisions for K2 Base, clause 3 ("Technical and specialist requirements on the Customer's premises."), § 6 ("Limitation of warranty") and § 7 ("Limitation of liability").
- All instructions and requirements of the static calculations must be observed.
- Compliance with the regulations and requirements of the building permit and the building trade associations must be ensured during the execution of all work.
- All connections and anchoring measures must be carried out using approved and standardized connecting elements or parts only.
- Subordinate components that have not been verified must be implemented structurally.
- The "General Rules" for corrosion protection design of the structure are strongly recommended for application during implementation.
- The structure may only be climbed by trained and authorized personnel wearing appropriate safety equipment. Unauthorized use of the structure poses a risk of falling.

Warnings

- The clamping range of the module may not comply with for this installation variant, as the rail spacing depends on the laying of the tiles and thus the batten length. Please ensure that the clamping range specified by the module manufacturer is observed.



Structural analysis report | Front Roof

General information

Name	SDH - South Newton Main Block
Mounting System	SingleRail
Author	Ed McGloin

Location information

Address	Glenside Manor, Warminster Rd, South Newton, Salisbury SP2 0QD, UK
Ground elevation	60.97 m

Roof information

Building height	10.00 m
Roof type	Half Hip roof
Roof pitch	39°
Roof covering	Tile
Min. roof edge distance	0.00 m
Rafter Spacing	0.600 m
Rafter width	45.0 mm
set edge rafter left	No
Rafter spacing left	100.0 mm
set edge rafter right	No
Rafter spacing right	100.0 mm
Batten spacing	340.0 mm

Loads

Design method	BS EN
Failure consequence class (CC)	CC2
Design working life	25 years
Terrain category	Country Terrain
Distance to shoreline	25.00 km

Wind load

Velocity pressure, 50 years	$q_{p,50} = 0.807 \text{ kN/m}^2$
Adjustment factor for service life	$f_w = 0.921$
Velocity pressure, 25 years	$q_{p,25} = 0.743 \text{ kN/m}^2$

Structural analysis report | Front Roof

Roof areas

No. Module Array	Array	load impact area [m ²]	maxCpe	minCpe	wind pressure [kN/m ²]	wind suction [kN/m ²]
1	Inner Area	10.00	0.580	-0.600	0.405	-0.419
1	gableboard	10.00	0.580	-1.160	0.405	-0.810
1	eaves	10.00	0.560	-0.600	0.391	-0.419
1	corner region (eave)	10.00	0.800	-1.200	0.559	-0.838

Snow load

Snow load zone	1
Snow guard	No
Snow load on ground level	$s_k = 0.300 \text{ kN/m}^2$
Shape Coefficient for Snow	$\mu_i = 0.840$
Factor for roof pitch	$d_i = 0.777$
Snow load on roof, 50 year	$s_{i,50} = 0.196 \text{ kN/m}^2$
Adjustment factor for service life	$f_s = 0.929$
Snow load on roof, 25 years	$s_{i,25} = 0.182 \text{ kN/m}^2$

Dead Load

Weight of module	$G_M = 21.0 \text{ kg}$
Weight of mounting system per module	$= 3.50 \text{ kg}$
Module area	$A_M = 2.00 \text{ m}^2$
Dead weight of module per m ²	$= 10.51 \text{ kg/m}^2$
Dead weight of mounting system per m ²	$= 1.75 \text{ kg/m}^2$
Total Dead Load (excl. ballast) per m ²	$= 0.12 \text{ kN/m}^2$



Structural analysis report | Front Roof

Load Combinations

Ultimate limit state

Partial safety factor unfavourable permanent load	$\gamma_{G,sup} = 1.35$
Partial safety factor favourable permanent load	$\gamma_{G,inf} = 1.00$
Partial safety factor destabilising permanent load	$\gamma_{G,dst} = 1.10$
Partial safety factor stabilising permanent load	$\gamma_{G,stab} = 0.90$
Partial safety factor variable loads	$\gamma_Q = 1.50$
Combination coefficient with regards to wind	$\psi_{0,W} = 0.60$
Combination coefficient with regards to Snow	$\psi_{0,S} = 0.50$
Importance factor permanent	$k_{Fl,G} = 1.00$
Importance factor variable	$k_{Fl,Q} = 1.00$
Characteristic dead weight	G_k
Characteristic snow load on the roof	$S_{i,n}$
Characteristic wind load	W_k
Load case combination 01	$LCC\ 01_{uls} = \gamma_{G,sup} * k_{Fl,G} * G_k + \gamma_Q * k_{Fl,Q} * S_{i,n}$
Load case combination 02	$LCC\ 02_{uls} = \gamma_{G,sup} * k_{Fl,G} * G_k + \gamma_Q * k_{Fl,Q} * W_{k,Pressure}$
Load case combination 03	$LCC\ 03_{uls} = \gamma_{G,sup} * k_{Fl,G} * G_k + \gamma_Q * k_{Fl,Q} * (W_{k,Pressure} + \psi_{0,S} * S_{i,n})$
Load case combination 04	$LCC\ 04_{uls} = \gamma_{G,sup} * k_{Fl,G} * G_k + \gamma_Q * k_{Fl,Q} * (S_{i,n} + \psi_{0,W} * W_{k,Pressure})$
Load case combination 06	$LCC\ 06_{uls} = \gamma_{G,inf} * G_k + \gamma_Q * k_{Fl,Q} * W_{k,Suction}$

Serviceability limit state

Combination coefficient with regards to wind	$\psi_{0,W} = 0.60$
Combination coefficient with regards to Snow	$\psi_{0,S} = 0.50$
Load case combination 01	$LCC\ 01_{sls} = G_k + S_{i,n}$
Load case combination 02	$LCC\ 02_{sls} = G_k + W_{k,Pressure}$
Load case combination 03	$LCC\ 03_{sls} = G_k + W_{k,Pressure} + \psi_{0,S} * S_{i,n}$
Load case combination 04	$LCC\ 04_{sls} = G_k + S_{i,n} + \psi_{0,W} * W_{k,Pressure}$
Load case combination 06	$LCC\ 06_{sls} = G_k + W_{k,Suction}$

Maximum load on modules (Mounting system dimensioning)

No. Module Array	Array	A-TrA [m ²]	ultimate state [kN/m ²]				Serviceability [kN/m ²]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift 	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	10.00	0.840	0.274	-0.535	0.076	0.569	0.190	-0.326	0.076
1	gableboard	10.00	0.840	0.274	-1.122	0.076	0.569	0.190	-0.717	0.076
1	eaves	10.00	0.819	0.274	-0.535	0.076	0.555	0.190	-0.326	0.076
1	corner region (eave)	10.00	1.071	0.274	-1.164	0.076	0.723	0.190	-0.745	0.076

Structural analysis report | Front Roof

Max. load on fastener

No. Module Array	Array	A-TrA [m ²]	ultimate state [kN]				Serviceability [kN]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	10.00	0.943	0.307	-0.601	0.085	0.639	0.213	-0.366	0.085
1	gableboard	10.00	0.629	0.205	-0.840	0.057	0.426	0.142	-0.537	0.057
1	eaves	10.00	0.919	0.307	-0.601	0.085	0.623	0.213	-0.366	0.085
1	corner region (eave)	10.00	0.801	0.205	-0.871	0.057	0.541	0.142	-0.557	0.057

Resistance Values of Components

Base Rails

Base Rails	A [cm ²]	I _y [cm ⁴]	I _z [cm ⁴]	W _y [cm ³]	W _z [cm ³]
K2 SingleRail 36	2.850	4.02	6.37	2.14	3.09

Fastener

Fastener	R _{D,Uplift,Perpendicular} [kN]	R _{D,Pressure,Perpendicular} [kN]	R _{D,Pressure,Parallel} [kN]
SingleHook 2 Set	1.22	4.22	1.46

Utilisation result

No. Module Array	roof areas	ultimate limit state			Usab. Pr f[%]	Distances		maximum values	
		Pr σ[%]	CL σ[%]	Fst F[%]		Fst [m]	BR [m]	CL L _{max} [m]	Fst D _{max} [m]
1	Inner Area	48.6	25.1	55.1	55.8	1.800	---	0.583	2.083
1	gableboard	24.6	26.5	72.7	17.0	1.200	---	0.598	1.650
1	eaves	47.6	24.6	55.1	54.5	1.800	---	0.588	2.095
1	corner region (eave)	26.4	28.4	75.3	17.7	1.200	---	0.592	1.594

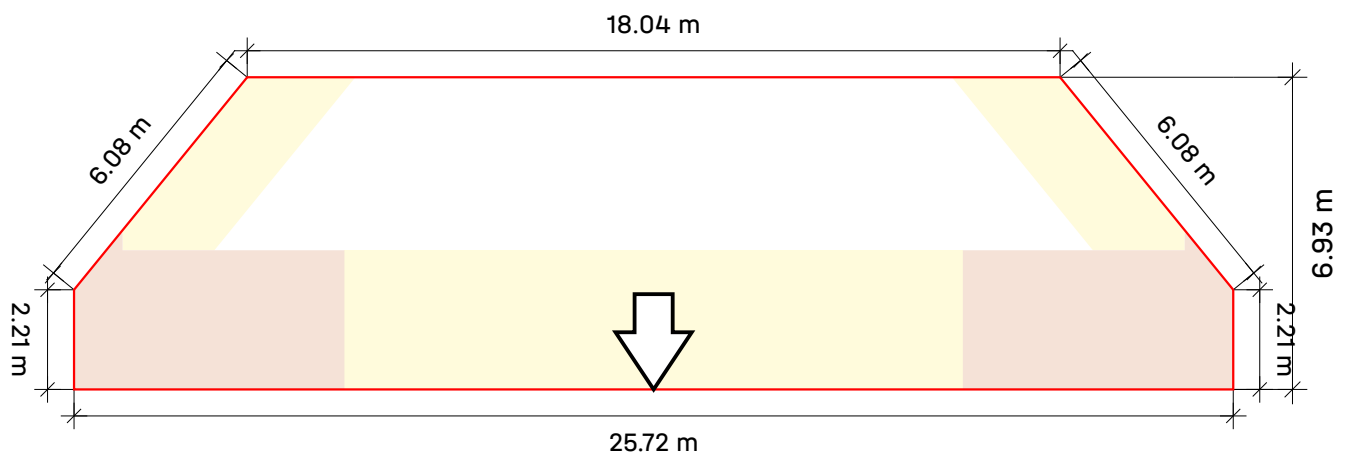
Pr	Profile	Fst D _{max}	maximum fastener spacing [m]
Fst	Fastener	BR	Base Rail
σ	Stress	Usab.	serviceability limit state
f	Deflection	CL	Cantilever
F	Force		
CL/L _{max}	maximum cantilever length [m]		



Front Roof | Bill of material

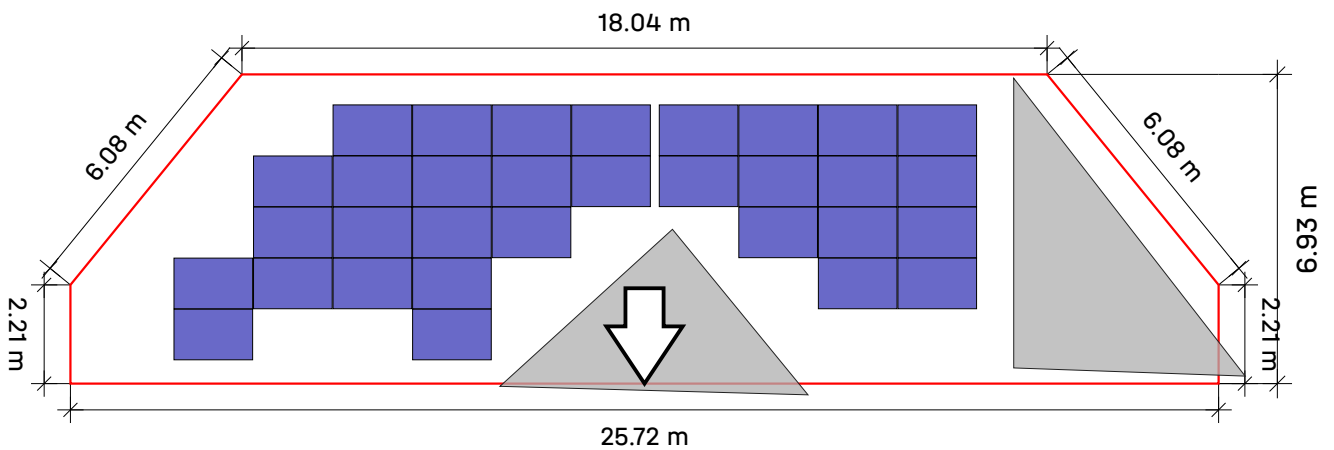
Position	Item no.	Item description	Quantity	Weight
1	2004112	Wood screw 8×100	226	6.1 kg
2	2004545	K2 Clamp EC 25-40 Black	32	2.3 kg
3	2003175	SingleHook 2 Set	113	111.9 kg
4	2003072	OneMid Black Set 30-42	76	6.0 kg
5	1004767	SingleRail 36 End Cap	32	0.2 kg
6	2002870	K2 Solar Cable Manager	46	0.1 kg
7	2004258	SingleRail 36; 3.65 m	46	129.3 kg
8	2001976	SingleRail 36 RailConnector Set	32	12.0 kg
Total				267.9 kg

Middle Roof





Middle Roof



Roof	System	Module	Height	Quantity	Total power
<u>Middle Roof</u>	<u>SolidRail</u>	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	12.00 m	32	14.24 kWp
 Tile					



Middle Roof | Assembly plan

Base Rails

Type	Whole Rails		Rail cutting		
	Total Rail Length	Quantity 3.65 m	Part of Rail / Rest	Length	Rest
2*A	3.644 m		3.650	3.644 from 3.650	0.000
10*B	7.208 m	1*3.65 m	3.650	3.558 from 3.650	0.082
4*C	1.862 m		3.650	1.862 from 3.650	1.778
2*D	5.426 m	1*3.65 m	1.778	1.776 from 1.778	0.000
2*E	8.990 m	2*3.65 m	1.778	1.690 from 1.778	0.078

1 cm is viewed as lost for each cutting

Red numbers are leftover rails which will not be used any longer

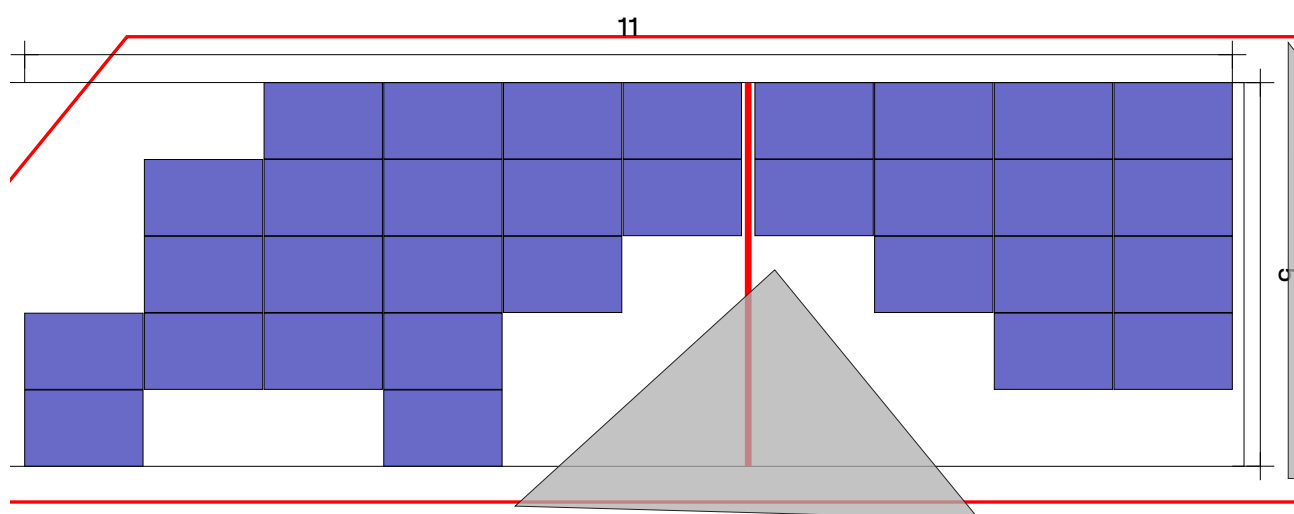
Fastener Spacing

Module	Array	Distance	maximum cantilever length [m]	maximum fastener spacing [m]
1	Inner Area	1.80 m	0.504	1.836
1	gableboard	0.60 m	0.577	1.155
1	eaves	1.80 m	0.508	1.847
1	corner region (eave)	0.60 m	0.571	1.115

Module arrays

Module array	Width[m]	Length[m]	Width in modules	Length in modules
1	19.76	5.71	10	5

Middle Roof | Module array 1



Roof ② Module array ①

Mounting System

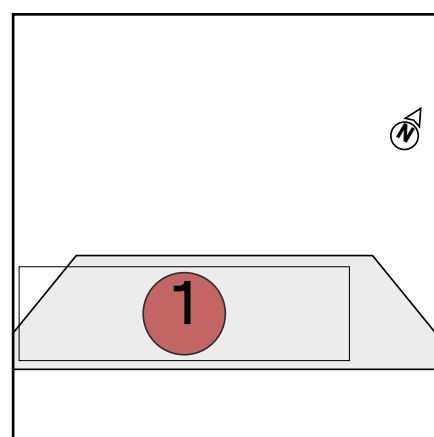
Module

Row spacing

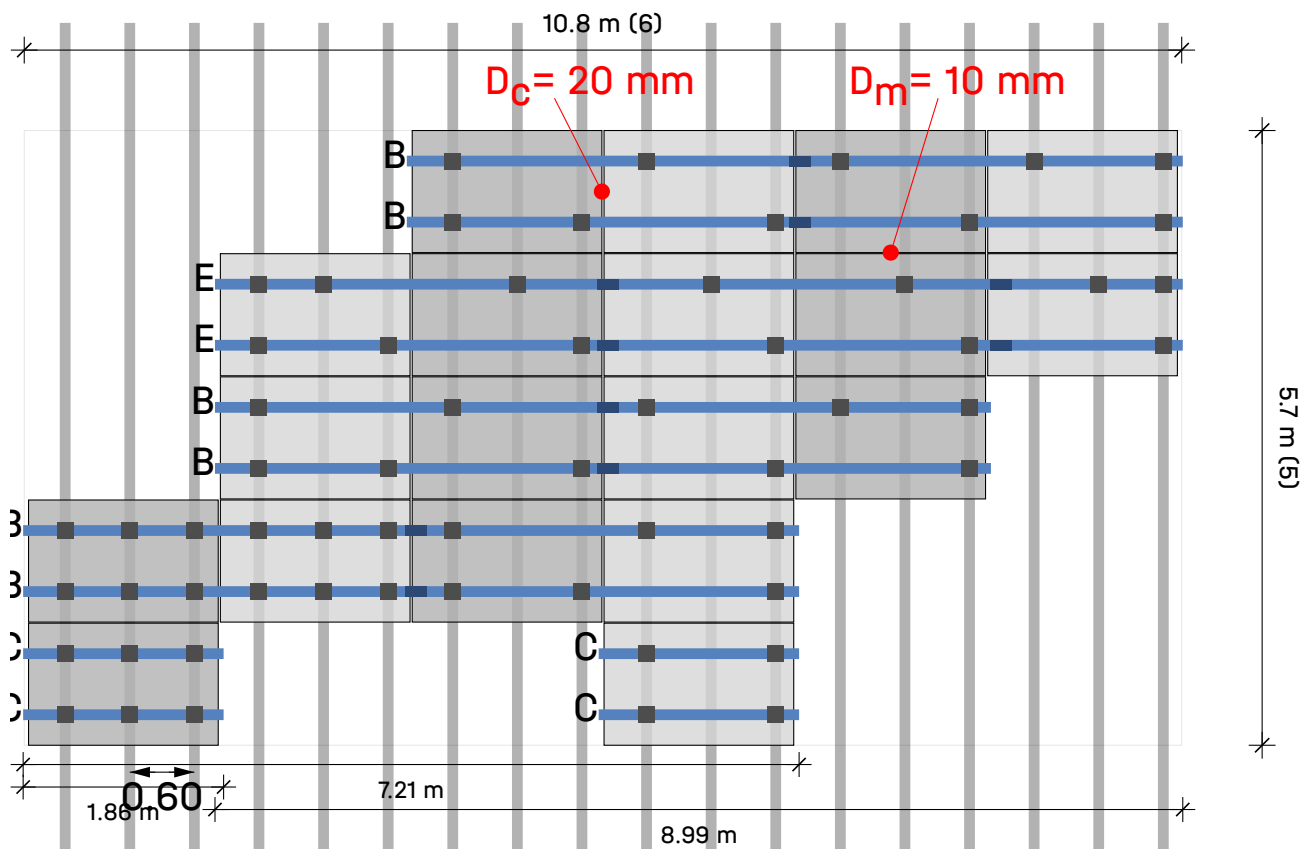
[SolidRail](#)

32(14.24 kWp) x
TSM-445NEG9R.28 (Vertex
S+)

1.14 m



Middle Roof | Module array 1 | Module block 1

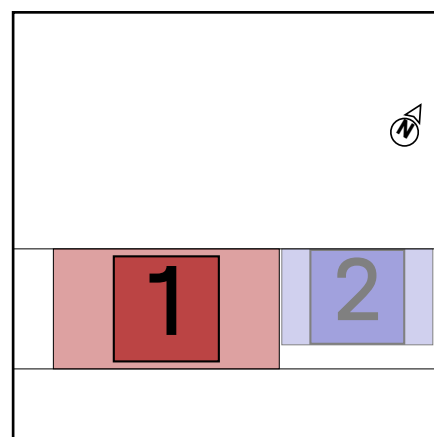


Roof ② Module array ① Module block 1

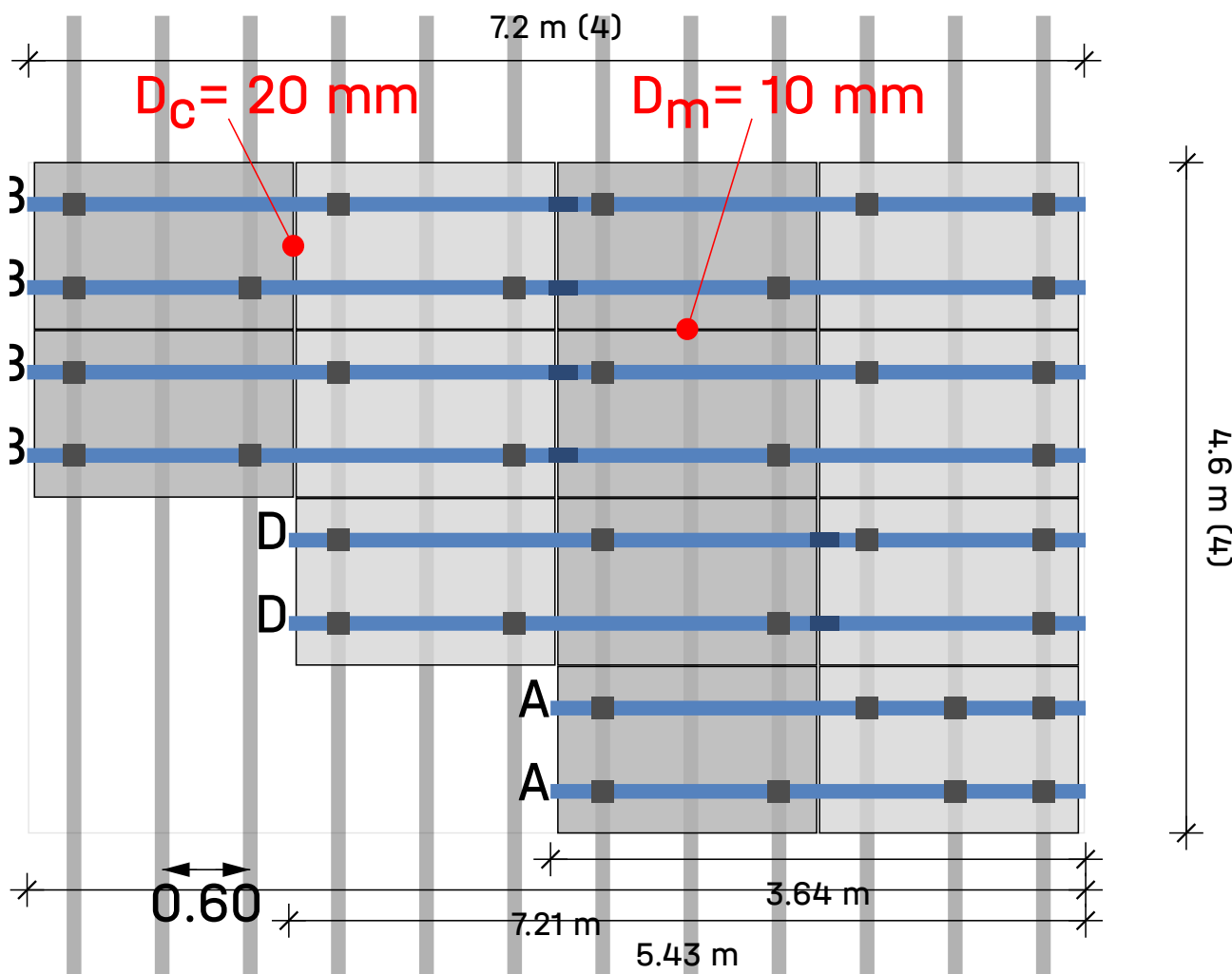
Modules (6 × 5) - 11 = 19

Legend

- Fastener
- Mounting rail: K2 SolidRail UltraLight 32
- ➔ Dist. to neighbour module block/array [m]
- D_c Distance for clamping between modules
- D_m Distance between modules



Middle Roof | Module array 1 | Module block 2

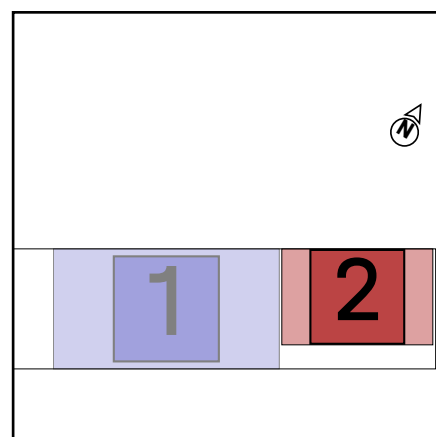


Roof ② Module array ① Module block 2

Modules (4 × 4) - 3 = 13

Legend

- Fastener
- Mounting rail: K2 SolidRail UltraLight 32
- ➔ Dist. to neighbour module block/array [m]
- D_c Distance for clamping between modules
- D_m Distance between modules





Results | Middle Roof

Roof	System	Module	Height	Quantity	Total power
Middle Roof	SolidRail	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	12.00 m	32	14.24 kWp
 Tile					

Module

Name	TSM-445NEG9R.28 (Vertex S+)
Manufacturer	Trina Solar Energy
Output power	445 Wp
Dimensions	1,762×1,134×30 mm
Weight	21.0 kg

Components

Fastener	SolidHook Slate H0/72 40×6
Base rails	K2 SolidRail UltraLight 32

Loads on modules (module dimensioning)

No. Module Array	Array	A-TrA [m ²]	ultimate state [Pa]				Serviceability [Pa]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift 	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	2.00	908.4	273.9	-606.1	75.7	615.0	190.2	-372.9	75.7
1	gableboard	2.00	908.4	273.9	-1,259.0	75.7	615.0	190.2	-808.2	75.7
1	eaves	2.00	885.1	273.9	-606.1	75.7	599.4	190.2	-372.9	75.7
1	corner region (eave)	2.00	1,165.0	273.9	-1,305.7	75.7	786.0	190.2	-839.3	75.7

Utilisation result

No. Module Array	roof areas	ultimate limit state			Usab.	Distances		maximum values	
		Pr σ[%]	CL σ[%]	Fst F[%]	Pr f[%]	Fst [m]	BR [m]	CL L _{max} [m]	Fst Fst D _{max} [m]
1	Inner Area	68.2	19.2	76.8	92.5	1.800	---	0.504	1.836
1	gableboard	9.3	21.6	51.9	3.7	0.600	---	0.577	1.155
1	eaves	66.7	20.4	76.8	90.2	1.800	---	0.508	1.847
1	corner region (eave)	9.6	20.4	53.8	3.9	0.600	---	0.571	1.115

Pr	Profile	Fst D _{max}	maximum fastener spacing [m]
Fst	Fastener	BR	Base Rail
σ	Stress	Usab.	serviceability limit state



Results | Middle Roof

f	Deflection	CL	Cantilever
F	Force		
CL/L _{max}	maximum cantilever length [m]		



Results | Middle Roof

Important Information

- The dimensioning of the timber construction screws is not part of this structural analysis. This must be done on site. If the rafters are made of solid wood, glued laminated timber, cross laminated timber and laminated veneer lumber, assembly with 2 timber construction screws is usually sufficient. The edge distances must be upheld in accordance with the manufacturer's specifications.
- The structure was statically verified in accordance with Eurocode 9: Design of aluminium structures (DIN EN 1999-1-1:2021) and offers sufficient load-bearing capacity and stability for the loads specified in the chapter 'Maximum actions on the components'.
- Adjustment factor for wind load regarding service life period, f_W , is according to DIN EN 1991-1-4/ NA, NDP for 4.2 (2P) note 5, table 3
- Adjustment factor for snow load regarding service life period, f_S , is according to DIN EN 1991-1-3/ annex D, table 4
- The structural design complies with BS EN 1990 - Basis of Structural Design.
- Snow loads are determined in accordance with National Annex BS NA EN 1991-1-3 (2018) - UK National Annex to EC1 - Action on structures - general actions - snow loads.
- Wind loads are determined in accordance with National Annex BS NA EN 1991-1-4 - UK National Annex to EC1 - Action on structures, general actions - wind actions.
- Service life is recognised according to 'Eurocode EN 1991 - Action on structures, Snow loads' and 'Eurocode EN 1991 - Actions on structures, Wind actions'. Subject to the Building Regulations and for security-relevant reasons the installation has to be dismantled at the end of its service life.
- Failure consequence class is considered according to 'Eurocode EN 1990 - Basis of structural design'.
- The person responsible for the execution of the work must check the load assumptions made with the conditions on site. If deviations are found, the person who prepared the static calculation must be consulted immediately.
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- Compliance with the regulations and requirements of the building permit and the building trade associations must be ensured during the execution of all work.
- All connections and anchoring measures must be carried out using approved and standardized connecting elements or parts only.
- Subordinate components that have not been verified must be implemented structurally.
- The "General Rules" for corrosion protection design of the structure are strongly recommended for application during implementation.
- The structure may only be climbed by trained and authorized personnel wearing appropriate safety equipment. Unauthorized use of the structure poses a risk of falling.

Warnings

- The clamping range of the module may not comply with for this installation variant, as the rail spacing depends on the laying of the tiles and thus the batten length. Please ensure that the clamping range specified by the module manufacturer is observed.



Structural analysis report | Middle Roof

General information

Name	SDH - South Newton Main Block
Mounting System	SolidRail
Author	Ed McGloin

Location information

Address	Glenside Manor, Warminster Rd, South Newton, Salisbury SP2 0QD, UK
Ground elevation	60.97 m

Roof information

Building height	12.00 m
Roof type	Half Hip roof
Roof pitch	39°
Roof covering	Tile
Min. roof edge distance	0.00 m
Rafter Spacing	0.600 m
Rafter width	45.0 mm
set edge rafter left	No
Rafter spacing left	260.0 mm
set edge rafter right	No
Rafter spacing right	260.0 mm
Batten spacing	340.0 mm

Loads

Design method	BS EN
Failure consequence class (CC)	CC2
Design working life	25 years
Terrain category	Country Terrain
Distance to shoreline	25.00 km

Wind load

Velocity pressure, 50 years	$q_{p,50} = 0.844 \text{ kN/m}^2$
Adjustment factor for service life	$f_w = 0.921$
Velocity pressure, 25 years	$q_{p,25} = 0.777 \text{ kN/m}^2$

Structural analysis report | Middle Roof

Roof areas

No. Module Array	Array	load impact area [m ²]	maxCpe	minCpe	wind pressure [kN/m ²]	wind suction [kN/m ²]
1	Inner Area	10.00	0.580	-0.600	0.451	-0.466
1	gableboard	10.00	0.580	-1.160	0.451	-0.902
1	eaves	10.00	0.560	-0.600	0.435	-0.466
1	corner region (eave)	10.00	0.800	-1.200	0.622	-0.933

Snow load

Snow load zone	1
Snow guard	No
Snow load on ground level	$s_k = 0.300 \text{ kN/m}^2$
Shape Coefficient for Snow	$\mu_i = 0.840$
Factor for roof pitch	$d_i = 0.777$
Snow load on roof, 50 year	$s_{i,50} = 0.196 \text{ kN/m}^2$
Adjustment factor for service life	$f_s = 0.929$
Snow load on roof, 25 years	$s_{i,25} = 0.182 \text{ kN/m}^2$

Dead Load

Weight of module	$G_M = 21.0 \text{ kg}$
Weight of mounting system per module	$= 3.50 \text{ kg}$
Module area	$A_M = 2.00 \text{ m}^2$
Dead weight of module per m ²	$= 10.51 \text{ kg/m}^2$
Dead weight of mounting system per m ²	$= 1.75 \text{ kg/m}^2$
Total Dead Load (excl. ballast) per m ²	$= 0.12 \text{ kN/m}^2$



Structural analysis report | Middle Roof

Load Combinations

Ultimate limit state

Partial safety factor unfavourable permanent load	$\gamma_{G,sup} = 1.35$
Partial safety factor favourable permanent load	$\gamma_{G,inf} = 1.00$
Partial safety factor destabilising permanent load	$\gamma_{G,dst} = 1.10$
Partial safety factor stabilising permanent load	$\gamma_{G,stab} = 0.90$
Partial safety factor variable loads	$\gamma_Q = 1.50$
Combination coefficient with regards to wind	$\psi_{0,W} = 0.60$
Combination coefficient with regards to Snow	$\psi_{0,S} = 0.50$
Importance factor permanent	$\kappa_{Fl,G} = 1.00$
Importance factor variable	$\kappa_{Fl,Q} = 1.00$
Characteristic dead weight	G_k
Characteristic snow load on the roof	$S_{i,n}$
Characteristic wind load	W_k
Load case combination 01	$LCC\ 01_{uls} = \gamma_{G,sup} * \kappa_{Fl,G} * G_k + \gamma_Q * \kappa_{Fl,Q} * S_{i,n}$
Load case combination 02	$LCC\ 02_{uls} = \gamma_{G,sup} * \kappa_{Fl,G} * G_k + \gamma_Q * \kappa_{Fl,Q} * W_{k,Pressure}$
Load case combination 03	$LCC\ 03_{uls} = \gamma_{G,sup} * \kappa_{Fl,G} * G_k + \gamma_Q * \kappa_{Fl,Q} * (W_{k,Pressure} + \psi_{0,S} * S_{i,n})$
Load case combination 04	$LCC\ 04_{uls} = \gamma_{G,sup} * \kappa_{Fl,G} * G_k + \gamma_Q * \kappa_{Fl,Q} * (S_{i,n} + \psi_{0,W} * W_{k,Pressure})$
Load case combination 06	$LCC\ 06_{uls} = \gamma_{G,inf} * G_k + \gamma_Q * \kappa_{Fl,Q} * W_{k,Suction}$

Serviceability limit state

Combination coefficient with regards to wind	$\psi_{0,W} = 0.60$
Combination coefficient with regards to Snow	$\psi_{0,S} = 0.50$
Load case combination 01	$LCC\ 01_{sls} = G_k + S_{i,n}$
Load case combination 02	$LCC\ 02_{sls} = G_k + W_{k,Pressure}$
Load case combination 03	$LCC\ 03_{sls} = G_k + W_{k,Pressure} + \psi_{0,S} * S_{i,n}$
Load case combination 04	$LCC\ 04_{sls} = G_k + S_{i,n} + \psi_{0,W} * W_{k,Pressure}$
Load case combination 06	$LCC\ 06_{sls} = G_k + W_{k,Suction}$

Maximum load on modules (Mounting system dimensioning)

No. Module Array	Array	A-TrA [m ²]	ultimate state [kN/m ²]				Serviceability [kN/m ²]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift 	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	10.00	0.908	0.274	-0.606	0.076	0.615	0.190	-0.373	0.076
1	gableboard	10.00	0.908	0.274	-1.259	0.076	0.615	0.190	-0.808	0.076
1	eaves	10.00	0.885	0.274	-0.606	0.076	0.599	0.190	-0.373	0.076
1	corner region (eave)	10.00	1.165	0.274	-1.306	0.076	0.786	0.190	-0.839	0.076



Structural analysis report | Middle Roof

Max. load on fastener

No. Module Array	Array	A-TrA [m ²]	ultimate state [kN]				Serviceability [kN]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	10.00	1.020	0.307	-0.680	0.085	0.690	0.213	-0.419	0.085
1	gableboard	10.00	0.340	0.102	-0.471	0.028	0.230	0.071	-0.302	0.028
1	eaves	10.00	0.994	0.307	-0.680	0.085	0.673	0.213	-0.419	0.085
1	corner region (eave)	10.00	0.436	0.102	-0.489	0.028	0.294	0.071	-0.314	0.028

Resistance Values of Components

Base Rails

Base Rails	A [cm ²]	I _y [cm ⁴]	I _z [cm ⁴]	W _y [cm ³]	W _z [cm ³]
K2 SolidRail UltraLight 32	2.610	2.59	5.54	1.57	2.84

Fastener

Fastener	R _{D,Uplift,Perpendicular} [kN]	R _{D,Pressure,Perpendicular} [kN]	R _{D,Pressure,Parallel} [kN]
SolidHook Slate H0/72 40×6	0.93	1.64	2.52

Utilisation result

No. Module Array	roof areas	ultimate limit state			Usab.	Distances		maximum values	
		Pr σ[%]	CL σ[%]	Fst F[%]	Pr f[%]	Fst [m]	BR [m]	CL L _{max} [m]	Fst D _{max} [m]
1	Inner Area	68.2	19.2	76.8	92.5	1.800	---	0.504	1.836
1	gableboard	9.3	21.6	51.9	3.7	0.600	---	0.577	1.155
1	eaves	66.7	20.4	76.8	90.2	1.800	---	0.508	1.847
1	corner region (eave)	9.6	20.4	53.8	3.9	0.600	---	0.571	1.115

Pr	Profile	Fst D _{max}	maximum fastener spacing [m]
Fst	Fastener	BR	Base Rail
σ	Stress	Usab.	serviceability limit state
f	Deflection	CL	Cantilever
F	Force		
CL/L _{max}	maximum cantilever length [m]		

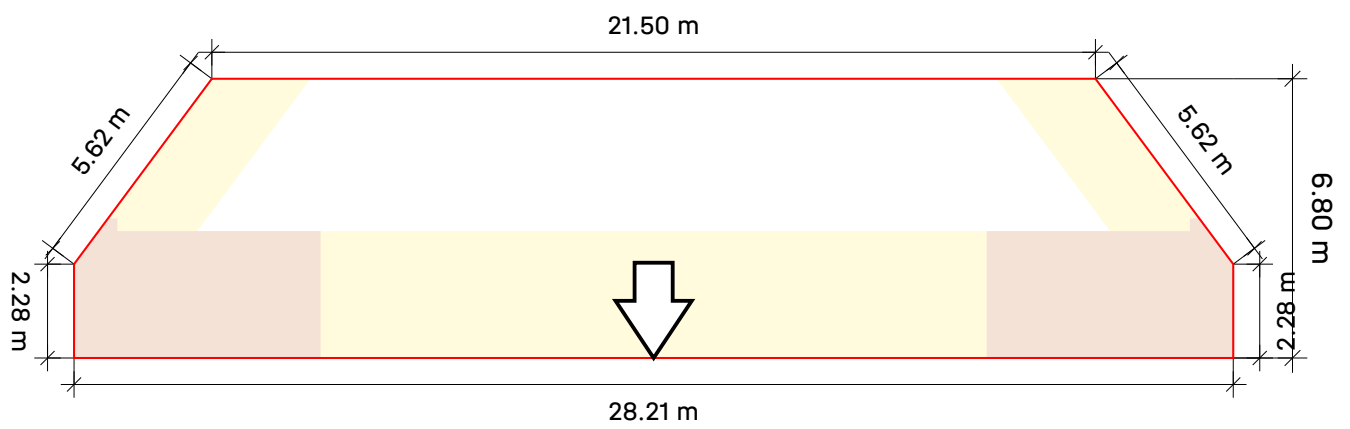


Middle Roof | Bill of material

Position	Item no.	Item description	Quantity	Weight
1	2004106	Wood screw 6×80	194	2.5 kg
2	2004545	K2 Clamp EC 25-40 Black	40	2.9 kg
3	1000373	SolidHook Slate H0/72 40×6	97	63.1 kg
4	1000041	T-Bolt 28/15 M10×30	97	2.3 kg
5	1000042	Hexagon flange nut M10	97	1.1 kg
6	2003072	OneMid Black Set 30-42	44	3.5 kg
7	2002870	K2 Solar Cable Manager	32	0.1 kg
8	2004264	SolidRail UltraLight; 3.65 m	32	82.2 kg
9	1004107	SolidRail UltraLight+Light RailConnector Set	16	3.6 kg
Total				161.1 kg

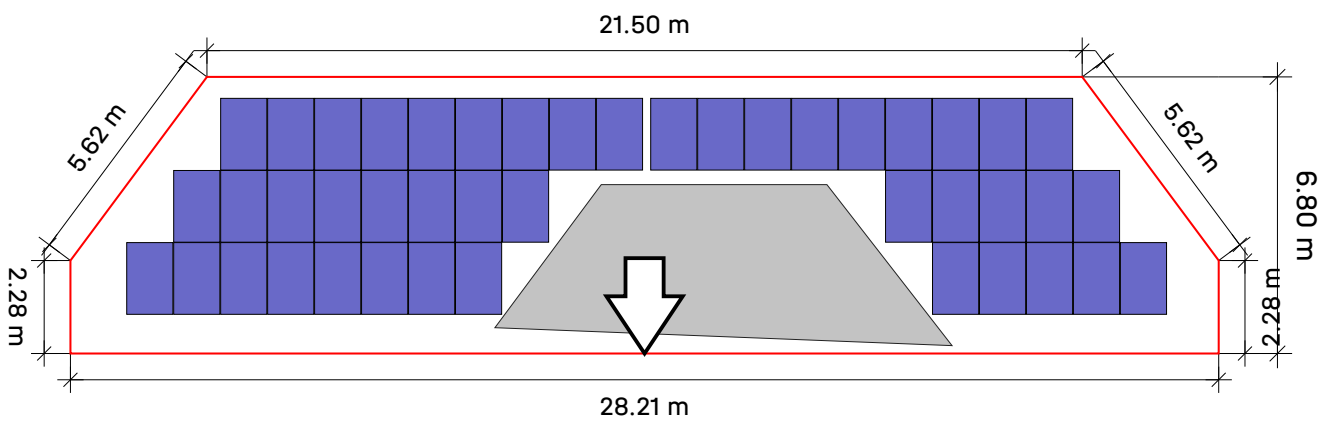


Rear Roof





Rear Roof



Roof	System	Module	Height	Quantity	Total power
Rear Roof	SolidRail	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	12.00 m	44	19.58 kWp
 Tile					

Rear Roof | Assembly plan

Base Rails

Type	Whole Rails		Rail cutting			
	Total Rail Length	Quantity 3.65 m	Part of Rail / Rest	Length	Rest	
4*A	10.466 m	2*3.65 m	3.650	3.166 from 3.650	0.474	
4*B	5.850 m	1*3.65 m	3.650	2.200 from 3.650	1.440	
4*C	9.312 m	2*3.65 m	3.650	2.012 from 3.650	1.628	

1 cm is viewed as lost for each cutting

Red numbers are leftover rails which will not be used any longer

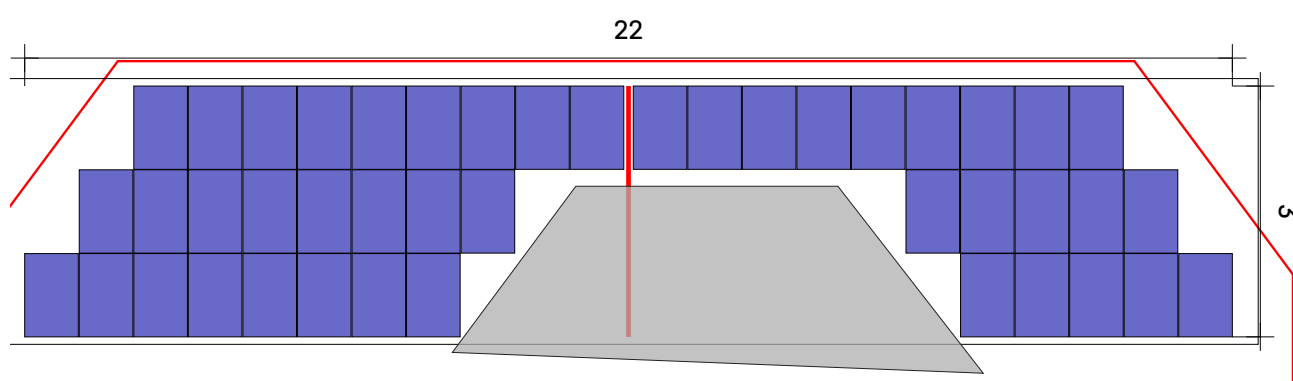
Fastener Spacing

Module	Array	Distance	maximum cantilever length [m]	maximum fastener spacing [m]
1	Inner Area	1.20 m	0.487	1.507
1	gableboard	0.60 m	0.512	0.743
1	eaves	1.20 m	0.490	1.507
1	corner region (eave)	0.60 m	0.507	0.717

Module arrays

Module array	Width[m]	Length[m]	Width in modules	Length in modules
1	25.55	5.31	22	3

Rear Roof | Module array 1



Roof ③ Module array ①

Mounting System

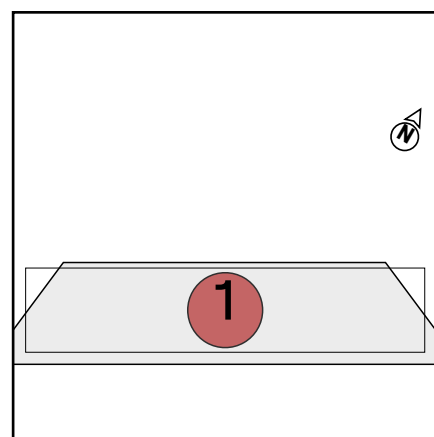
Module

Row spacing

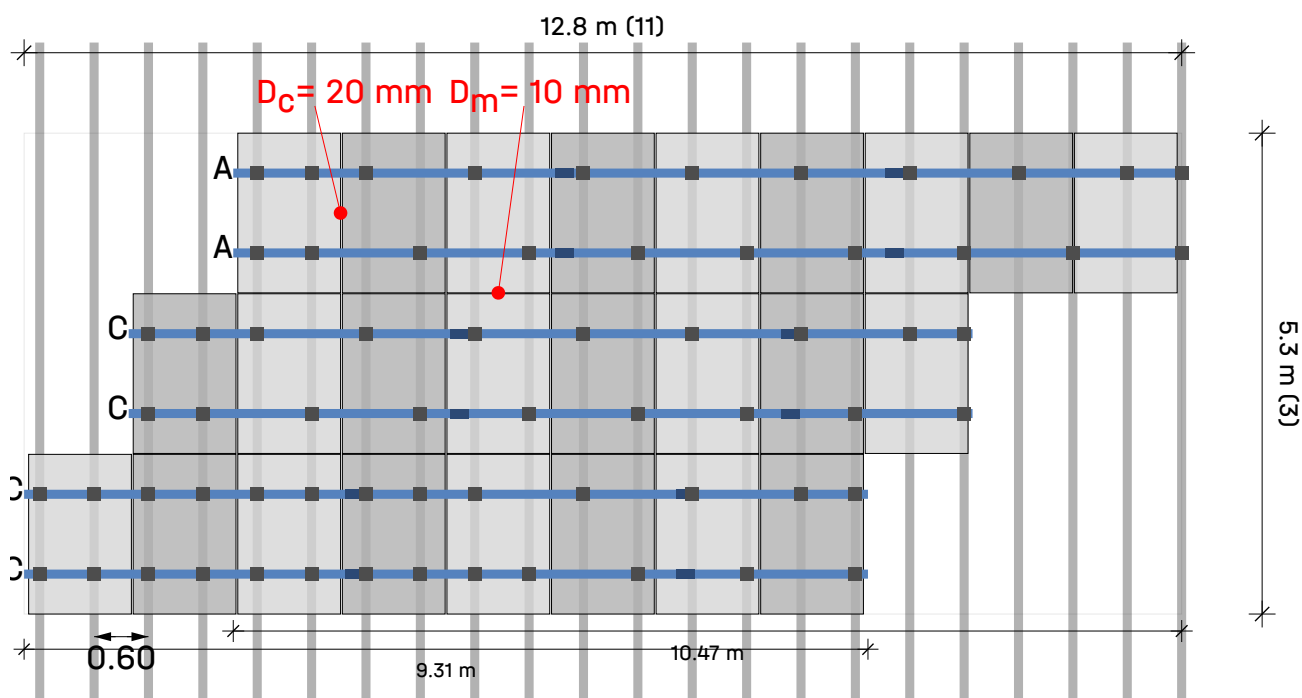
[SolidRail](#)

44(19.58 kWp) x
TSM-445NEG9R.28 (Vertex
S+)

1.77 m



Rear Roof | Module array 1 | Module block 1

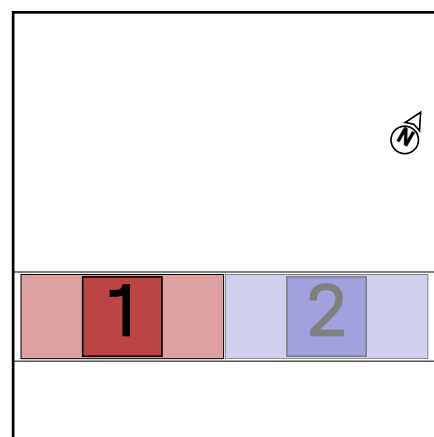


Roof ③ Module array ① Module block 1

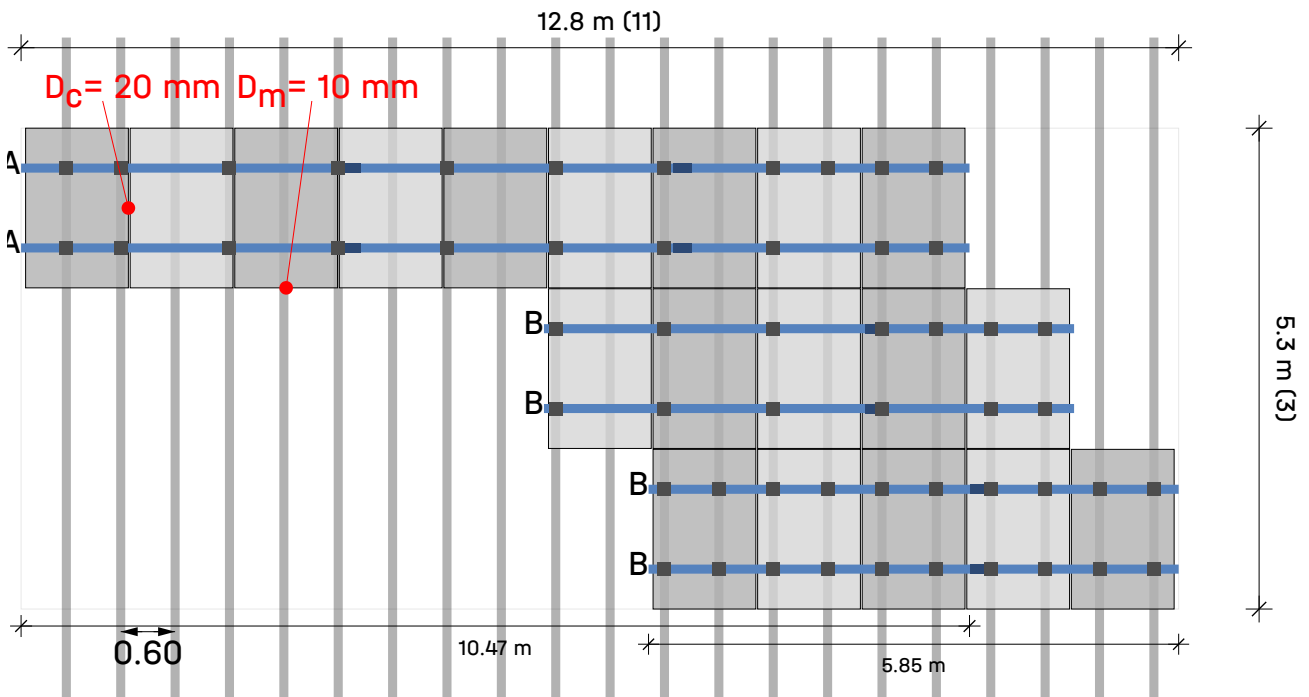
Modules (11 × 3) - 8 = 25

Legend

- Fastener
- Mounting rail: K2 SolidRail UltraLight 32
- ➔ Dist. to neighbour module block/array [m]
- D_c Distance for clamping between modules
- D_m Distance between modules



Rear Roof | Module array 1 | Module block 2

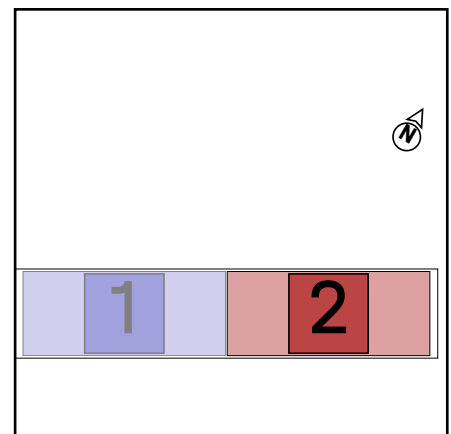


Roof ③ Module array ① Module block 2

Modules (11 × 3) - 14 = 19

Legend

- Fastener
- Mounting rail: K2 SolidRail UltraLight 32
- ➔ Dist. to neighbour module block/array [m]
- D_c Distance for clamping between modules
- D_m Distance between modules





Results | Rear Roof

Roof	System	Module	Height	Quantity	Total power
Rear Roof Tile	SolidRail	TSM-445NEG9R.28 (Vertex S+) 1,762×1,134×30 mm 445 Wp	12.00 m	44	19.58 kWp

Module

Name	TSM-445NEG9R.28 (Vertex S+)
Manufacturer	Trina Solar Energy
Output power	445 Wp
Dimensions	1,762×1,134×30 mm
Weight	21.0 kg

Components

Fastener	SolidHook Slate H0/72 40×6
Base rails	K2 SolidRail UltraLight 32

Loads on modules (module dimensioning)

No. Module Array	Array	A-TrA [m ²]	ultimate state [Pa]				Serviceability [Pa]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift 	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	2.00	906.9	272.7	-607.3	74.7	613.8	189.2	-374.1	74.7
1	gableboard	2.00	906.9	272.7	-1,260.2	74.7	613.8	189.2	-809.4	74.7
1	eaves	2.00	883.6	272.7	-607.3	74.7	598.3	189.2	-374.1	74.7
1	corner region (eave)	2.00	1,163.4	272.7	-1,306.8	74.7	784.8	189.2	-840.5	74.7

Utilisation result

No. Module Array	roof areas	ultimate limit state			Usab.	Distances		maximum values	
		Pr σ[%]	CL σ[%]	Fst F[%]	Pr f[%]	Fst [m]	BR [m]	CL L _{max} [m]	Fst Fst D _{max} [m]
1	Inner Area	47.0	40.7	79.6	35.4	1.200	---	0.487	1.507
1	gableboard	14.5	26.9	80.7	5.8	0.600	---	0.512	0.743
1	eaves	46.0	4.9	79.6	34.5	1.200	---	0.490	1.507
1	corner region (eave)	15.0	15.6	83.7	6.0	0.600	---	0.507	0.717

Pr	Profile	Fst D _{max}	maximum fastener spacing [m]
Fst	Fastener	BR	Base Rail
σ	Stress	Usab.	serviceability limit state



Results | Rear Roof

f	Deflection	CL	Cantilever
F	Force		
CL/L _{max}	maximum cantilever length [m]		



Results | Rear Roof

Important Information

- The dimensioning of the timber construction screws is not part of this structural analysis. This must be done on site. If the rafters are made of solid wood, glued laminated timber, cross laminated timber and laminated veneer lumber, assembly with 2 timber construction screws is usually sufficient. The edge distances must be upheld in accordance with the manufacturer's specifications.
- The structure was statically verified in accordance with Eurocode 9: Design of aluminium structures (DIN EN 1999-1-1:2021) and offers sufficient load-bearing capacity and stability for the loads specified in the chapter 'Maximum actions on the components'.
- Adjustment factor for wind load regarding service life period, f_W , is according to DIN EN 1991-1-4/NA, NDP for 4.2 (2P) note 5, table 3
- Adjustment factor for snow load regarding service life period, f_S , is according to DIN EN 1991-1-3/annex D, table 4
- The structural design complies with BS EN 1990 - Basis of Structural Design.
- Snow loads are determined in accordance with National Annex BS NA EN 1991-1-3 (2018) - UK National Annex to EC1 - Action on structures - general actions - snow loads.
- Wind loads are determined in accordance with National Annex BS NA EN 1991-1-4 - UK National Annex to EC1 - Action on structures, general actions - wind actions.
- Service life is recognised according to 'Eurocode EN 1991 - Action on structures, Snow loads' and 'Eurocode EN 1991 - Actions on structures, Wind actions'. Subject to the Building Regulations and for security-relevant reasons the installation has to be dismantled at the end of its service life.
- Failure consequence class is considered according to 'Eurocode EN 1990 - Basis of structural design'.
- The person responsible for the execution of the work must check the load assumptions made with the conditions on site. If deviations are found, the person who prepared the static calculation must be consulted immediately.
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- All connections and anchoring measures must be carried out using approved and standardized connecting elements or parts only.
- Subordinate components that have not been verified must be implemented structurally.
- The "General Rules" for corrosion protection design of the structure are strongly recommended for application during implementation.
- The structure may only be climbed by trained and authorized personnel wearing appropriate safety equipment. Unauthorized use of the structure poses a risk of falling.



Structural analysis report | Rear Roof

General information

Name	SDH - South Newton Main Block
Mounting System	SolidRail
Author	Ed McGloin

Location information

Address	Glenside Manor, Warminster Rd, South Newton, Salisbury SP2 0QD, UK
Ground elevation	60.97 m

Roof information

Building height	12.00 m
Roof type	Half Hip roof
Roof pitch	39°
Roof covering	Tile
Min. roof edge distance	0.00 m
Rafter Spacing	0.600 m
Rafter width	45.0 mm
set edge rafter left	No
Rafter spacing left	305.0 mm
set edge rafter right	No
Rafter spacing right	305.0 mm
Batten spacing	340.0 mm

Loads

Design method	BS EN
Failure consequence class (CC)	CC2
Design working life	25 years
Terrain category	Country Terrain
Distance to shoreline	25.00 km

Wind load

Velocity pressure, 50 years	$q_{p,50} = 0.844 \text{ kN/m}^2$
Adjustment factor for service life	$f_w = 0.921$
Velocity pressure, 25 years	$q_{p,25} = 0.777 \text{ kN/m}^2$

Structural analysis report | Rear Roof

Roof areas

No. Module Array	Array	load impact area [m ²]	maxCpe	minCpe	wind pressure [kN/m ²]	wind suction [kN/m ²]
1	Inner Area	10.00	0.580	-0.600	0.451	-0.466
1	gableboard	10.00	0.580	-1.160	0.451	-0.902
1	eaves	10.00	0.560	-0.600	0.435	-0.466
1	corner region (eave)	10.00	0.800	-1.200	0.622	-0.933

Snow load

Snow load zone	1
Snow guard	No
Snow load on ground level	$s_k = 0.300 \text{ kN/m}^2$
Shape Coefficient for Snow	$\mu_i = 0.840$
Factor for roof pitch	$d_i = 0.777$
Snow load on roof, 50 year	$s_{i,50} = 0.196 \text{ kN/m}^2$
Adjustment factor for service life	$f_s = 0.929$
Snow load on roof, 25 years	$s_{i,25} = 0.182 \text{ kN/m}^2$

Dead Load

Weight of module	$G_M = 21.0 \text{ kg}$
Weight of mounting system per module	$= 3.2 \text{ kg}$
Module area	$A_M = 2.00 \text{ m}^2$
Dead weight of module per m ²	$= 10.51 \text{ kg/m}^2$
Dead weight of mounting system per m ²	$= 1.60 \text{ kg/m}^2$
Total Dead Load (excl. ballast) per m ²	$= 0.12 \text{ kN/m}^2$



Structural analysis report | Rear Roof

Load Combinations

Ultimate limit state

Partial safety factor unfavourable permanent load	$\gamma_{G,sup} = 1.35$
Partial safety factor favourable permanent load	$\gamma_{G,inf} = 1.00$
Partial safety factor destabilising permanent load	$\gamma_{G,dst} = 1.10$
Partial safety factor stabilising permanent load	$\gamma_{G,stab} = 0.90$
Partial safety factor variable loads	$\gamma_Q = 1.50$
Combination coefficient with regards to wind	$\psi_{0,W} = 0.60$
Combination coefficient with regards to Snow	$\psi_{0,S} = 0.50$
Importance factor permanent	$k_{Fl,G} = 1.00$
Importance factor variable	$k_{Fl,Q} = 1.00$
Characteristic dead weight	G_k
Characteristic snow load on the roof	$S_{i,n}$
Characteristic wind load	W_k
Load case combination 01	$LCC\ 01_{uls} = \gamma_{G,sup} * k_{Fl,G} * G_k + \gamma_Q * k_{Fl,Q} * S_{i,n}$
Load case combination 02	$LCC\ 02_{uls} = \gamma_{G,sup} * k_{Fl,G} * G_k + \gamma_Q * k_{Fl,Q} * W_{k,Pressure}$
Load case combination 03	$LCC\ 03_{uls} = \gamma_{G,sup} * k_{Fl,G} * G_k + \gamma_Q * k_{Fl,Q} * (W_{k,Pressure} + \psi_{0,S} * S_{i,n})$
Load case combination 04	$LCC\ 04_{uls} = \gamma_{G,sup} * k_{Fl,G} * G_k + \gamma_Q * k_{Fl,Q} * (S_{i,n} + \psi_{0,W} * W_{k,Pressure})$
Load case combination 06	$LCC\ 06_{uls} = \gamma_{G,inf} * G_k + \gamma_Q * k_{Fl,Q} * W_{k,Suction}$

Serviceability limit state

Combination coefficient with regards to wind	$\psi_{0,W} = 0.60$
Combination coefficient with regards to Snow	$\psi_{0,S} = 0.50$
Load case combination 01	$LCC\ 01_{sls} = G_k + S_{i,n}$
Load case combination 02	$LCC\ 02_{sls} = G_k + W_{k,Pressure}$
Load case combination 03	$LCC\ 03_{sls} = G_k + W_{k,Pressure} + \psi_{0,S} * S_{i,n}$
Load case combination 04	$LCC\ 04_{sls} = G_k + S_{i,n} + \psi_{0,W} * W_{k,Pressure}$
Load case combination 06	$LCC\ 06_{sls} = G_k + W_{k,Suction}$

Maximum load on modules (Mounting system dimensioning)

No. Module Array	Array	A-TrA [m ²]	ultimate state [kN/m ²]				Serviceability [kN/m ²]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift 	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	10.00	0.907	0.273	-0.607	0.075	0.614	0.189	-0.374	0.075
1	gableboard	10.00	0.907	0.273	-1.260	0.075	0.614	0.189	-0.809	0.075
1	eaves	10.00	0.884	0.273	-0.607	0.075	0.598	0.189	-0.374	0.075
1	corner region (eave)	10.00	1.163	0.273	-1.307	0.075	0.785	0.189	-0.840	0.075



Structural analysis report | Rear Roof

Max. load on fastener

No. Module Array	Array	A-TrA [m ²]	ultimate state [kN]				Serviceability [kN]			
			Pressure ⊥	Pressure 	Uplift ⊥	Uplift	Pressure ⊥	Pressure 	Uplift ⊥	Uplift
1	Inner Area	10.00	1.055	0.317	-0.706	0.087	0.714	0.220	-0.435	0.087
1	gableboard	10.00	0.527	0.159	-0.733	0.043	0.357	0.110	-0.471	0.043
1	eaves	10.00	1.028	0.317	-0.706	0.087	0.696	0.220	-0.435	0.087
1	corner region (eave)	10.00	0.676	0.159	-0.760	0.043	0.456	0.110	-0.489	0.043

Resistance Values of Components

Base Rails

Base Rails	A [cm ²]	I _y [cm ⁴]	I _z [cm ⁴]	W _y [cm ³]	W _z [cm ³]
K2 SolidRail UltraLight 32	2.610	2.59	5.54	1.57	2.84

Fastener

Fastener	R _{D,Uplift,Perpendicular} [kN]	R _{D,Pressure,Perpendicular} [kN]	R _{D,Pressure,Parallel} [kN]
SolidHook Slate H0/72 40×6	0.93	1.64	2.52

Utilisation result

No. Module Array	roof areas	ultimate limit state			Usab.	Distances		maximum values	
		Pr σ[%]	CL σ[%]	Fst F[%]	Pr f[%]	Fst [m]	BR [m]	CL L _{max} [m]	Fst Fst D _{max} [m]
1	Inner Area	47.0	40.7	79.6	35.4	1.200	---	0.487	1.507
1	gableboard	14.5	26.9	80.7	5.8	0.600	---	0.512	0.743
1	eaves	46.0	4.9	79.6	34.5	1.200	---	0.490	1.507
1	corner region (eave)	15.0	15.6	83.7	6.0	0.600	---	0.507	0.717

Pr	Profile	Fst D _{max}	maximum fastener spacing [m]
Fst	Fastener	BR	Base Rail
σ	Stress	Usab.	serviceability limit state
f	Deflection	CL	Cantilever
F	Force		
CL/L _{max}	maximum cantilever length [m]		



Rear Roof | Bill of material

Position	Item no.	Item description	Quantity	Weight
1	1006398	Wood screw countersunk head 6×70/42	240	2.4 kg
2	2004545	K2 Clamp EC 25-40 Black	24	1.7 kg
3	1000373	SolidHook Slate H0/72 40×6	120	78.0 kg
4	1000041	T-Bolt 28/15 M10×30	120	2.8 kg
5	1000042	Hexagon flange nut M10	120	1.3 kg
6	2003072	OneMid Black Set 30-42	76	6.0 kg
7	2002870	K2 Solar Cable Manager	44	0.1 kg
8	2004264	SolidRail UltraLight; 3.65 m	32	82.2 kg
9	1004107	SolidRail UltraLight+Light RailConnector Set	20	4.5 kg
Total				179.1 kg



Bill of material

Position	Item no.	Item description	Quantity	Weight
1	2004112	Wood screw 8×100	226	6.1 kg
2	2004545	K2 Clamp EC 25-40 Black	96	6.9 kg
3	2003175	SingleHook 2 Set	113	111.9 kg
4	2003072	OneMid Black Set 30-42	196	15.5 kg
5	1004767	SingleRail 36 End Cap	32	0.2 kg
6	2002870	K2 Solar Cable Manager	122	0.3 kg
7	2004258	SingleRail 36; 3.65 m	46	129.3 kg
8	2001976	SingleRail 36 RailConnector Set	32	12.0 kg
9	2004106	Wood screw 6×80	194	2.5 kg
10	1000373	SolidHook Slate H0/72 40×6	217	141.1 kg
11	1000041	T-Bolt 28/15 M10×30	217	5.1 kg
12	1000042	Hexagon flange nut M10	217	2.4 kg
13	2004264	SolidRail UltraLight; 3.65 m	64	164.4 kg
14	1004107	SolidRail UltraLight+Light RailConnector Set	36	8.1 kg
15	1006398	Wood screw countersunk head 6×70/42	240	2.4 kg
Total				608.1 kg



Thank you for choosing a K2 mounting system.

Systems from K2 Systems are quick and easy to install.

We hope these instructions have helped.

Please contact us with any questions or suggestions for improvement.

Our contact data:

k2-systems.com/en/contact

Our General Terms of Business apply. Please refer to k2-systems.com

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