

Technical project overview

3 Hamilton Road

Building project	3 Hamilton Road
Date	17.04.2023
In-house project no.	PA_230417_508104
Editor	Renusol Europe GmbH
Link to configurator	Open link
Number of modules	21
Rated output	9.66 kWp

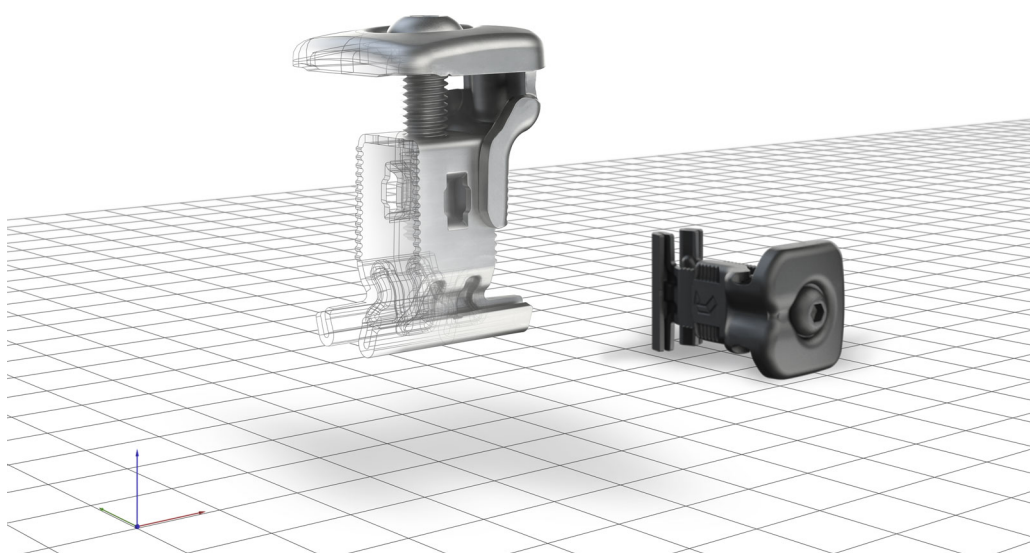


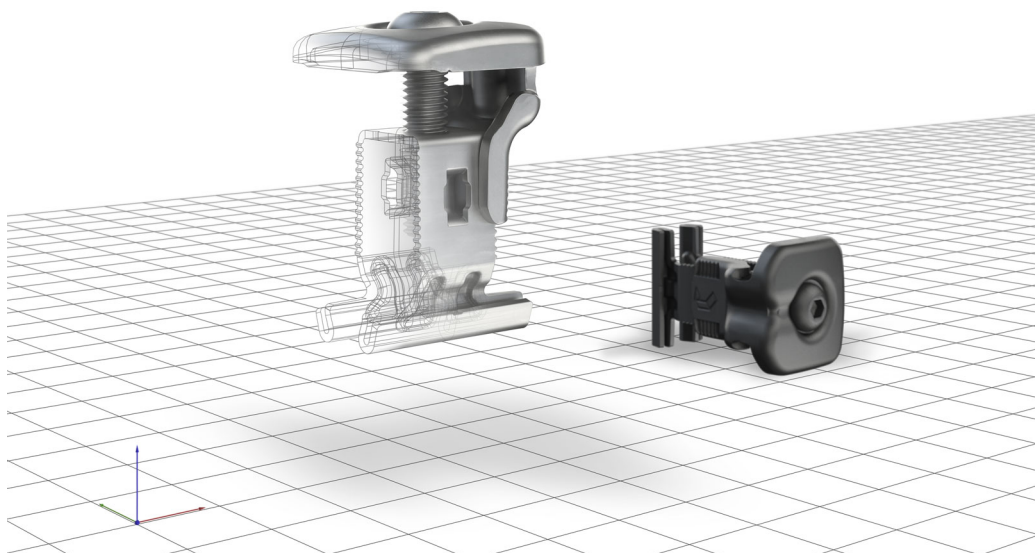
TABLE OF CONTENTS

Planned construction Roof 1	3
Specifications	4
Location	4
Surroundings	4
Load calculation result	4
Topography	4
Roof properties	5
Module parameters	5
System	6
Clamps	6
Static validation	6
Project documentation	7
Drawings	7
Module fields	8
Module overview with ballast values	9
Module field 1	10
Modules with positions counter for statics tables	11
Bill of material	12
Roof statics	13
Module field statics	14
Module statics	15
Important notes	17

Technical project overview

3 Hamilton Road

Building project	3 Hamilton Road
Address	Hamilton Road 3, M25 9GG Prestwich
Country	United Kingdom
Module Type	JinkoSolar Holding Co. Ltd. - JKM-460M-60HL4 Tiger Pro 60HC
Number of modules	21
Rated output	9.66 kWp
Mounting system	FS10S
Editor	Renusol Europe GmbH



LOCATION

Street	Hamilton Road 3
City	M25 9GG Prestwich
Country	United Kingdom

SURROUNDINGS

Code	Eurocode NA GB
Terrain height above sealevel	89,00 m
Snow load zone	Zone 3
Terrain category	Country
Distance to coast	40,00 km
Surroundings	normal
Service life of PV system	25 years
Failure consequence class	2
Partial safety factor dead load (ballast)	1

LOAD CALCULATION RESULT

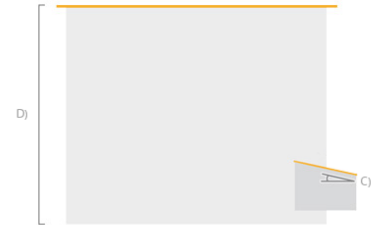
Peak velocity pressure	0,67 kN/m ²
Snow load	0,46 kN/m ²
Snow load on roof	0,37 kN/m ²
Base wind speed ($V_{b,0}$)	22,50 m/s

TOPOGRAPHY

Topography	Not exposed
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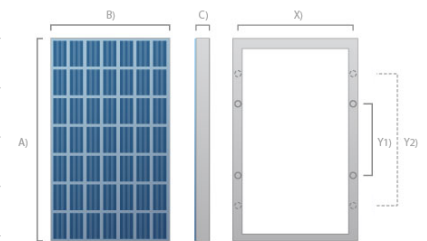
ROOF PROPERTIES

Roof type	Free-form Flat roof
Coverage type	Foil
C) Roof pitch	5,00 °
D) Building height	5,00 m
Parapet height	150,00 mm
Parapet width	400,00 mm



MODULE PARAMETERS

Manufacturer	JinkoSolar Holding Co. Ltd.
Name	JKM-460M-60HL4 Tiger Pro 60HC
Length	1903 mm
Width	1134 mm
Height	30 mm
Weight	24.2 kg
Rated output	460 W _{peak}
Datasheet	Open datasheet



Please check the compatibility of clamping positions with module manufacturer advice.

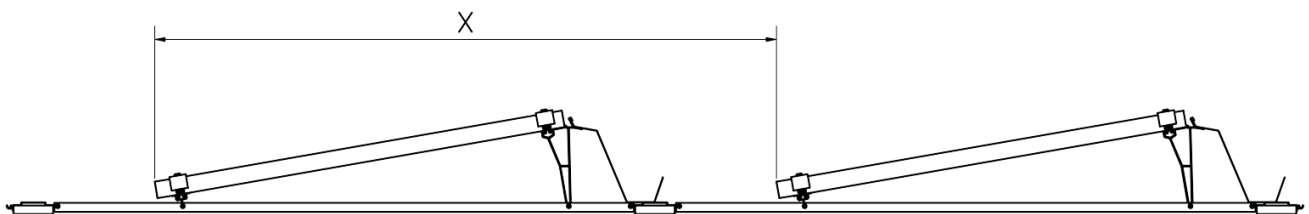
The module data was taken from a database. Please check whether this data corresponds to your actual module order. If necessary, please correct the data using the editing function.

SYSTEM

System type	Ballasted
System	FS10S
Friction coefficient	0,50
Ballast block mass (optional)	10,00 kg
X) Row distance	1740mm
Streamliner	Optimized (recommended)
Add third rail under the module	Automatic



Please check the entered row distance for an ideal yield calculation with a correct calculation including consideration of the shading.



CLAMPS

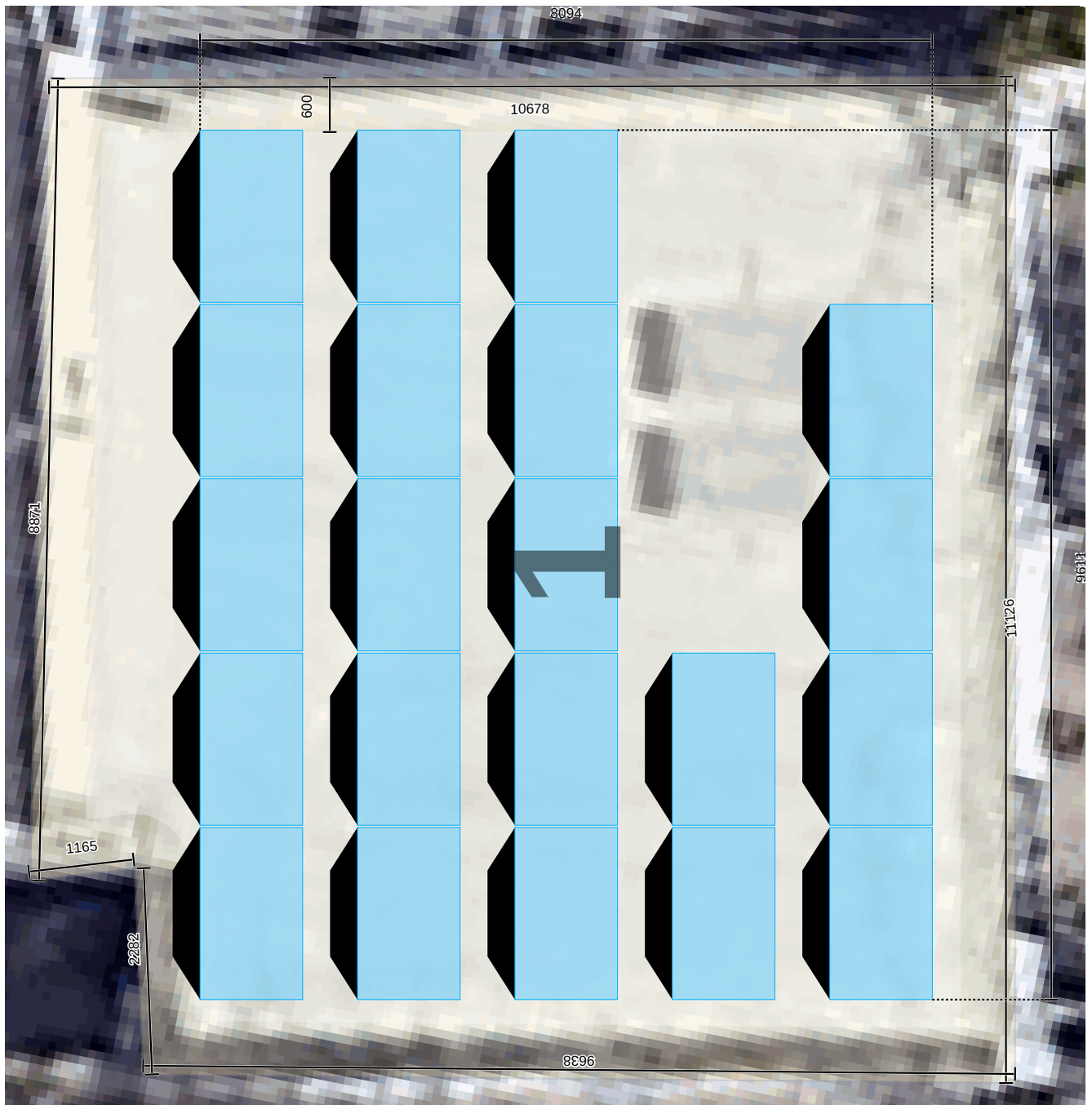
Clamp type	Mid clamps+ / End clamps+
Clamp colour	silver

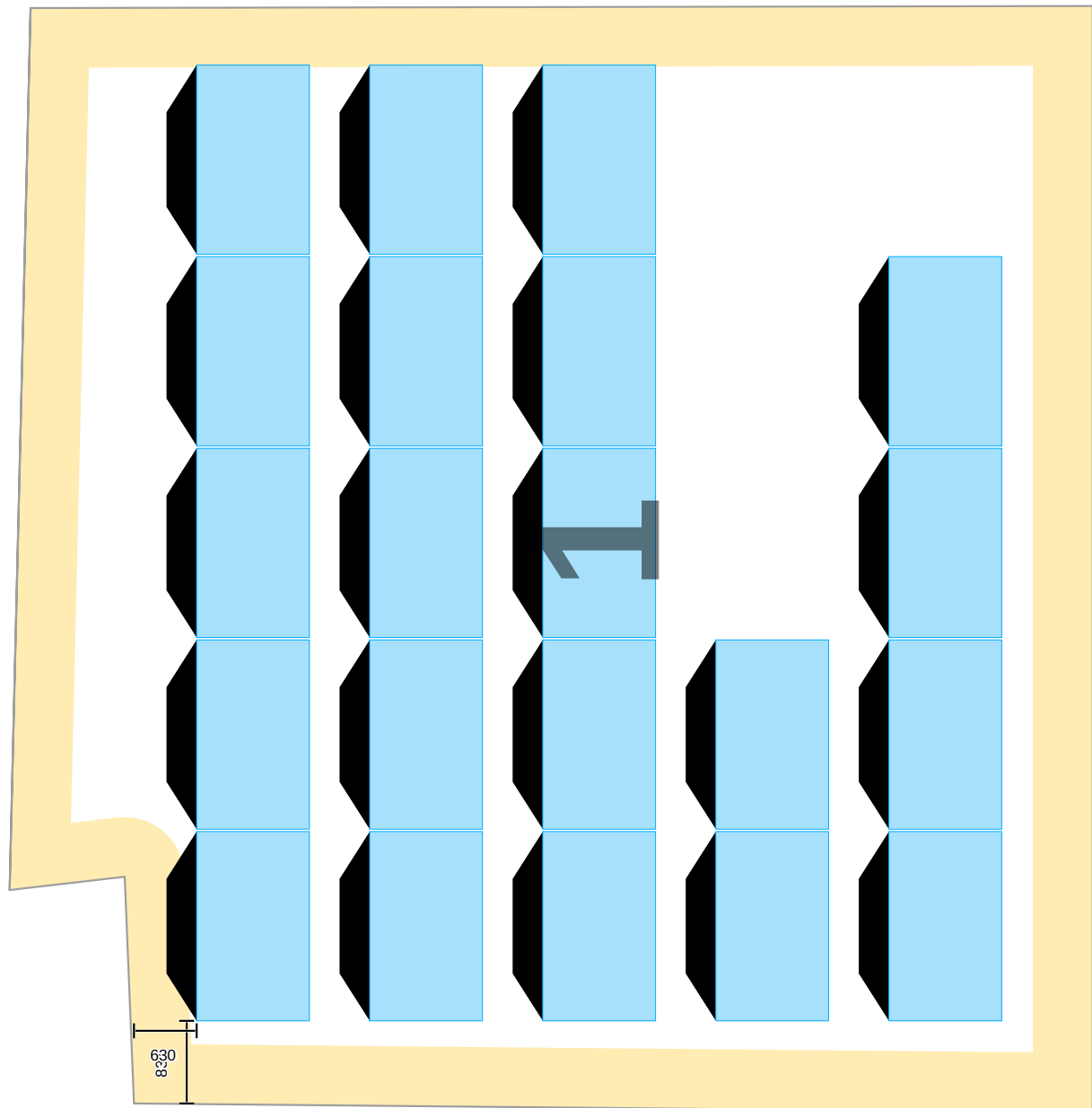
STATIC VALIDATION

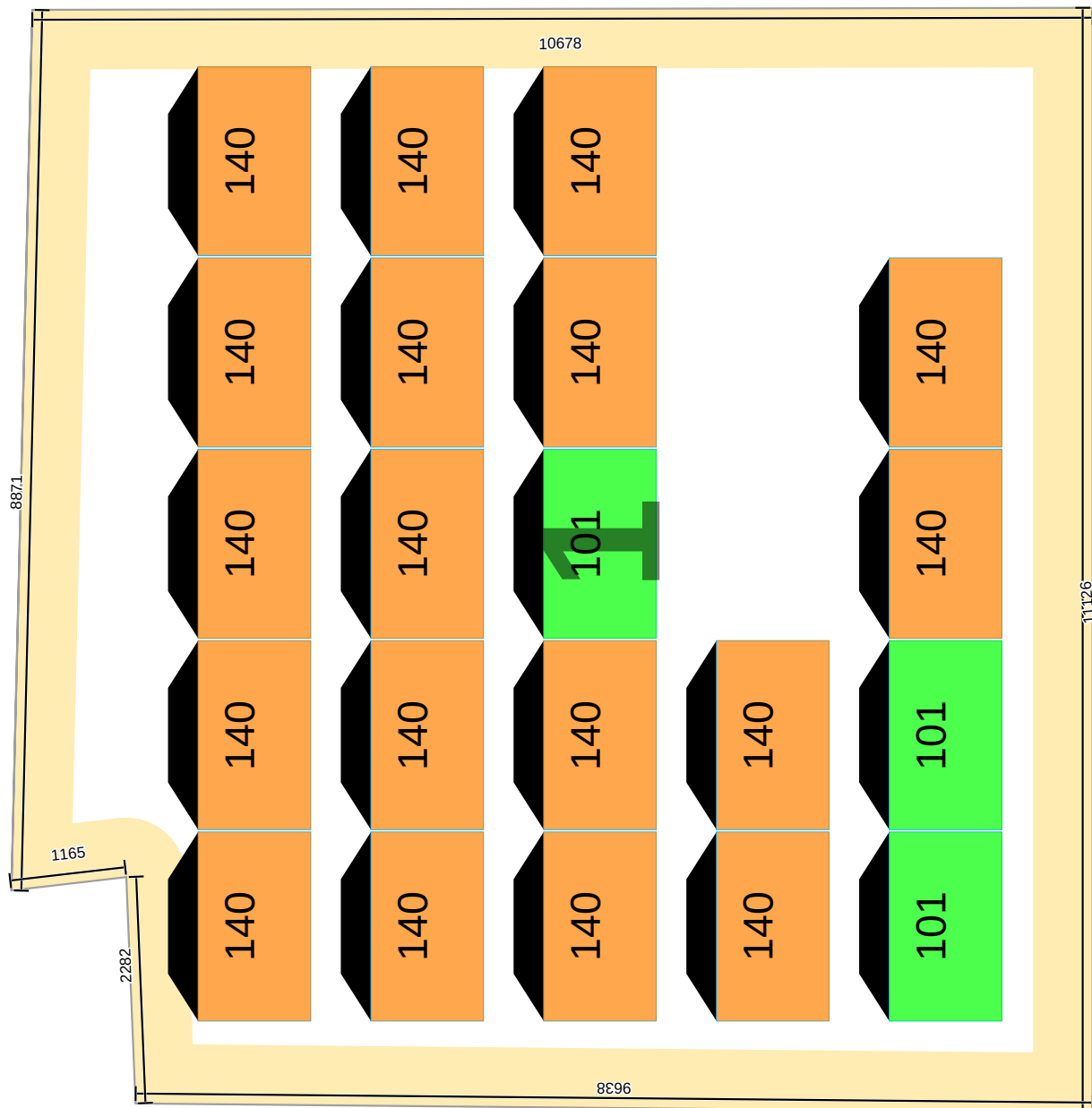
Your project was validated by our statics check successfully.

Maximum ballast value: 140 kg

Ballast: 2815 kg
Modules: 508 kg
Partlist: 175 kg

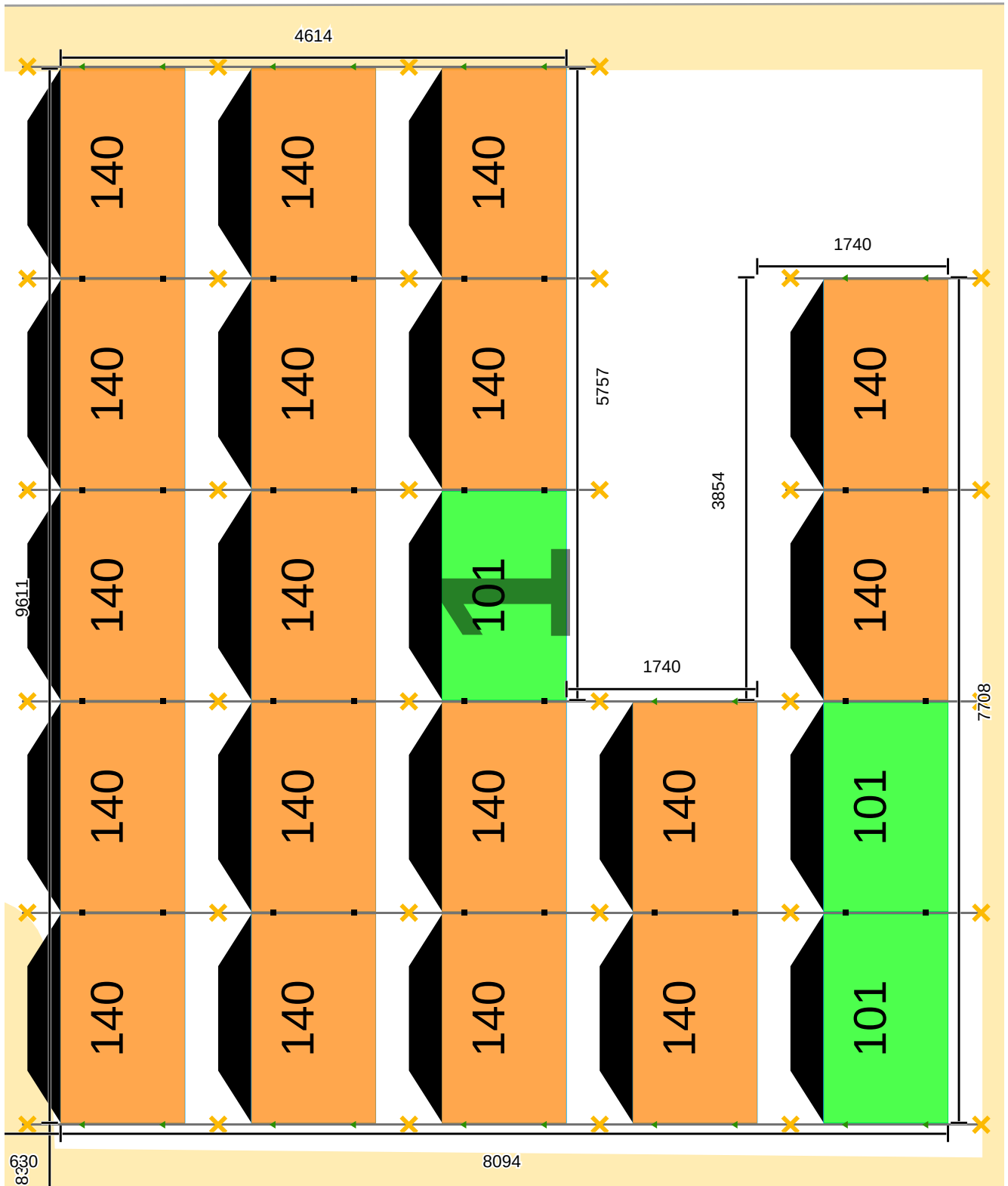


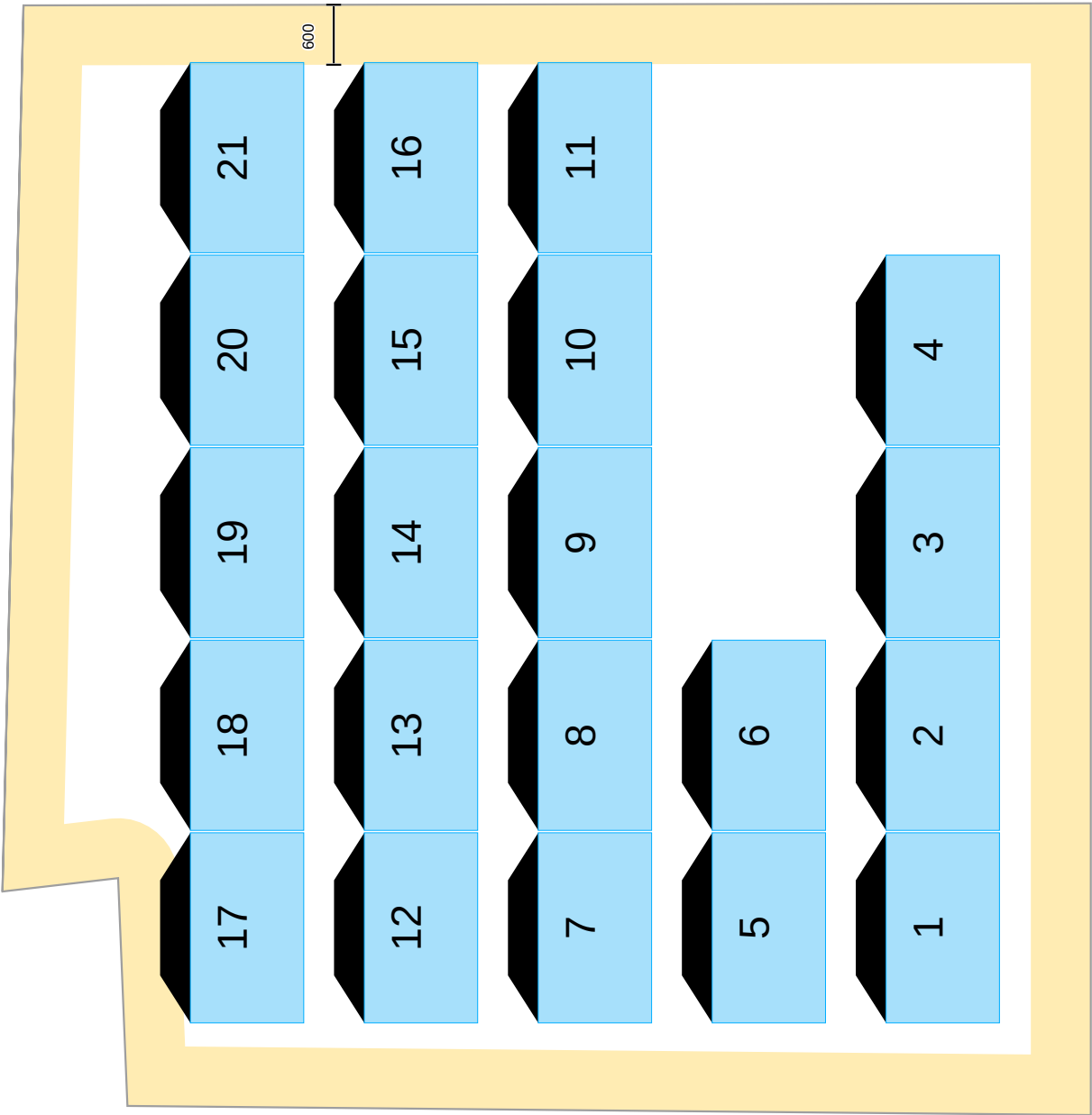




Ballast value[kg] (Blocks with 10 kg) / Sum of ballast stones: 285

101	140
(11)	(14)
(3 x 11)	(18 x 14)





BILL OF MATERIAL

Article No.	Article	Quantity	Ordering Unit	Weight/Piece	Weight
R420081	End clamp+	20	1	0,064 kg	1,280 kg
R420082	Middle clamp+	32	1	0,063 kg	2,016 kg
R500404	Base rail connector	34	1	0,079 kg	2,686 kg
R500409	Base rail FS10-S XL 1639 mm	26	1	1,203 kg	31,278 kg
R500411	Roof protection pad 110x95x20mm alu coated	55	1	0,133 kg	7,315 kg
R500419	Eave support XL	26	1	0,049 kg	1,274 kg
R500423	Ridge support 10° XL	26	1	0,443 kg	11,518 kg
R500457	Streamliner FS10-S XL 2150 mm	21	1	3,375 kg	70,875 kg
R520502	ECO Ballast set FS 2100 mm	18	1	2,500 kg	45,000 kg
R900229	Self Drilling Screw 4,8x19 A2	1	100	0,005 kg	0,500 kg
R900314	Socket bolt 6 x 110 mm	104	1	0,009 kg	0,936 kg
				Total Weight: 174,678 kg	

ROOF STATICS**ROOF STATICS**

Total weight	3498 kg
Module weight	508 kg
Ballast	2815 kg
Max ballast	140 kg
Roof size	116,87 m ²
Weight per total roof area	29,93 kg/m ²
Mounting system weight	174,68 kg
Max rail pressure	14 kN/m ²

MODULE FIELD STATICS**FIELD1**

Total weight	3498 kg
Module weight	508 kg
Ballast	2815 kg
Max ballast	140 kg
Field area	64,46 m ²
Weight per field area	54,26 kg/m ²
Mounting system weight	174,68 kg
Max rail pressure	14 kN/m ²

MODULE STATICS

MODULE STATICS

Sliding B_W	$B_W = [q_p * A * \gamma_Q * (C_W - \mu * C_{AW})] / [\gamma_G * (\mu \cos \alpha - \sin \alpha)] - G$
Uplift B_A	$B_A = [-q_p * A * \gamma_Q * C_{AA}] / [\gamma_G * \cos \alpha] - G$
C_{AA} & C_{AW}	Cp value for uplift
C_W	Cp value for sliding
γ_G	Partial safety factor self-weight
γ_Q	Partial safety factor wind
$G = 0,33 \text{ kN}$	Self weight
Loads F_z	$F_z = q_p * A * \gamma_Q * C_A$
Loads F_x	$F_x = q_p * A * \gamma_Q * C_W$
$A = 2,16 \text{ m}^2$	Module area
$\mu = 0,50$	Friction coefficient
$q_p = 0,67$	Peak velocity pressure
$\alpha = 5,00^\circ$	Roof pitch

Modul	B _W [kN]	B _A [kN]	C _W	C _{AA}	C _{AW}	Y _G	Y _Q
1	0,94	0,27	0,200	-0,306	-0,135	1,00	1,35
2	0,94	0,27	0,200	-0,306	-0,135	1,00	1,35
3	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
4	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
5	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
6	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
7	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
8	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
9	0,94	0,27	0,200	-0,306	-0,135	1,00	1,35
10	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
11	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
12	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
13	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
14	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
15	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
16	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
17	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
18	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
19	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
20	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35
21	1,32	0,86	0,210	-0,607	-0,276	1,00	1,35

IMPORTANT NOTES

The Project Report is a result of information provided by the Customer ("Customer" means customer of Renusol ordering this Project Report from the technical service of Renusol or user of the PV Configurator creating this Project Report himself). Renusol has neither verified the accurateness nor the completeness of the information and data provided by the Customer, which form the basis of this Project Report. It is the responsibility of the Customer to check and verify all input variables (including but not limited to those input variables which had been pre-set with proposed values) and assumptions used in the Project for their accuracy and correctness.

These verifications shall include but not be limited to the following aspects: (a) Wind and snow loads are proposed by the PV Configurator using respective wind and snow load maps. It should be verified that the local conditions do not deviate from the values used in the Configuration (e.g. location on mountain with higher snow load). (b) The Customer shall check and verify the Failure Consequence Class ("CC"). Typical residential and commercial buildings require CC 2. The Customer shall use higher CC in sensitive local environment (e.g. public building, high frequency of visitors, vicinity with potential for severe damages). (c) The service lifetime of the PV installation shall be verified by the Customer depending on the expectation of the ultimate user of the PV installation as well as the lifetime of the other components used in the installation. If the lifetime is expected beyond the service lifetime used for this Project Report, all relevant structural properties as well as input variables and assumptions shall be re-checked using the then expected service lifetime. (d) For flat roof systems: The Customer shall in any case measure and document the friction coefficient of the PV system on the location-specific roof cover it is placed on. The measurement shall be performed in various, at least three roof areas. (e) For flat roof systems: The PV Configurator proposes a ballast calculation. The ballast forms, together with the weight of the PV mounting system itself and the weight of the module, the total weight of the system. The actual ballast applied may in no case be lower than the values proposed by the PV Configurator. The ballast applied shall furthermore be documented. If the ballast applied cannot be precisely determined, a safety factor increasing the ballast is to be applied.

To the extent values of input variables measured or observed by the Customer differ from values used in this Project Report, the configuration of the PV installation shall be re-iterated using the respective correct values.

To the extent this Project Report includes a data concerning structural properties, it is the responsibility of the Customer to professionally verify (have verified) the structural data with regards to its compliance with the applicable local laws and properties of the location for which the Project Report has been prepared.

Furthermore the Terms of Use of the Renusol PV Configurator (<https://www.pv-configurator.com/pages/terms>) and the General Terms and Conditions (https://www.renusol.com/files/content/Downloads/Rechtliche%20Dokumente/Renusol_AGB_EN_110406.pdf) apply. The General Installation Guidelines of Renusol as well as the Installation Manuals and Data Sheets of the respective Renusol products, have likewise to be complied to.



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