PV Configurator
Powered by Renusol

Project report

8/23/2018

5 & 6 Cliff Villas London NW1 9AL

Cliff Villas 10
NW1 9AL London
United Kingdom

Responsible

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Mehr Informationen funden sie unter: www.pv-konfigurator.de

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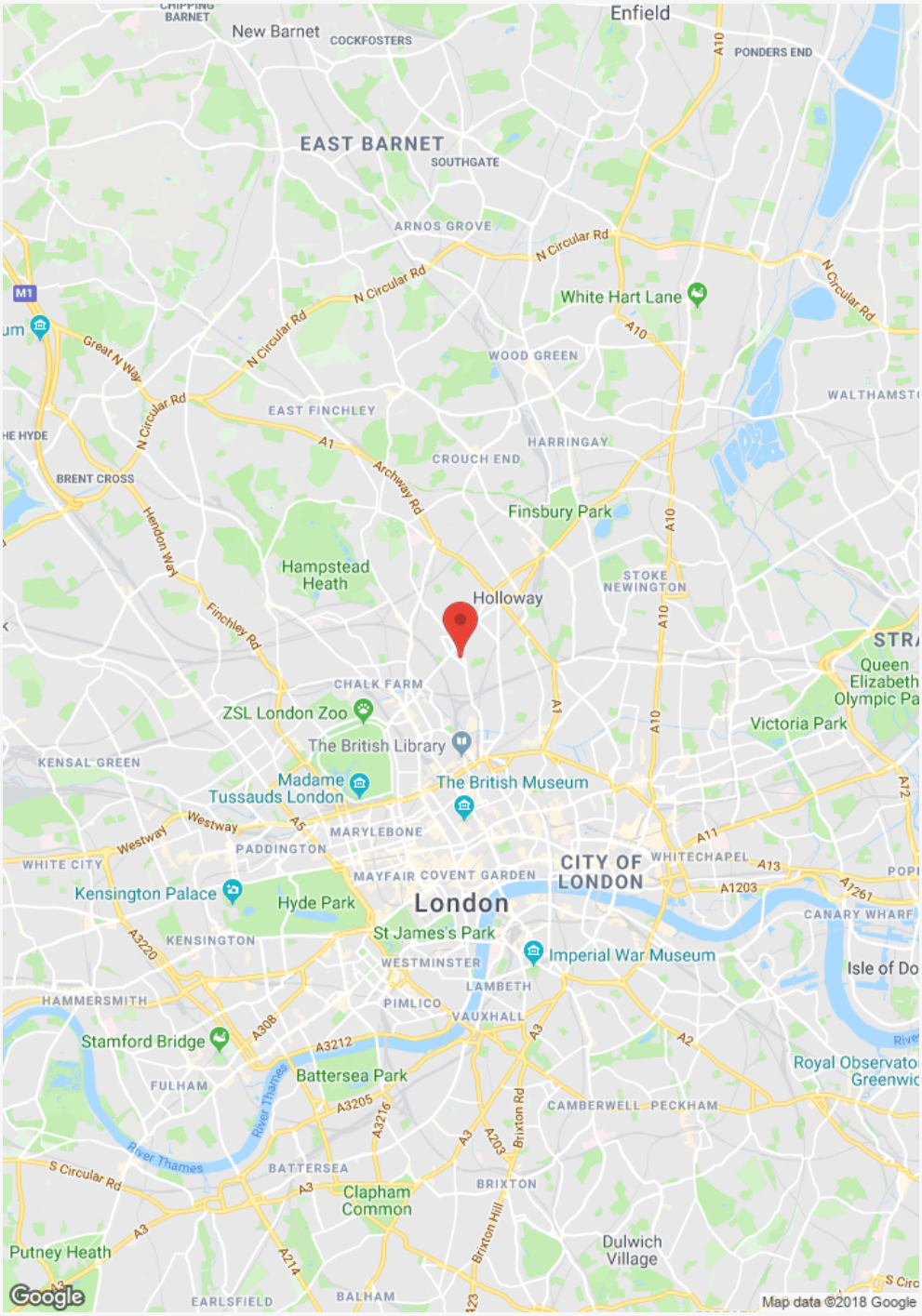
Master data

Project Name	**5 & 6 Cliff Villas London NW1 9AL**
Comment	**FS10-S**
Planning Responsible	**Darren Painter**
Amount Modules	**24**
System Size	**8.64 kWp**
Orientation [°]	**179.96**
Roofpitch [°]	**0**
Module Surface [m²]	**41**

Project Address

Name	
Street Address	**Cliff Villas 10**
Postal code	**NW1 9AL**
City	**London**
Phone	
Email	
Notes	
Country	**United Kingdom**
Latitude °	**51.54724**
Longitude °	**-0.12783**
Altitude [mm]	**49**

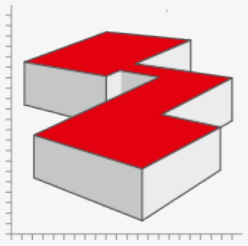
Project Location



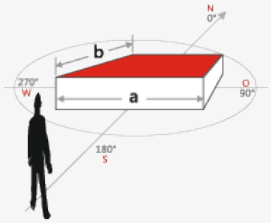
Roof [Roof_1]

Building height h [m]	**21**
Slope of roof [°]	**0**
Roofing	**Foil Roof**
Product Type:	**ConSole+**
System alignment [°]	**179.96**
Parapet height [mm]:	**300**
Parapet width [mm]:	**250**

Custom(Elev.)



System alignment [°]*



Snow load NA BS EN 1991-1-3:2003

Snow load [kN/m²]* (si=μi*sk)	**0.32**
Elevation altitude [m]:	**49**
Slope of roof [°]:	**0**
Snow load zone	**Area 3**

Wind load NA BS EN 1991-1-4:2005

Wind load [kN/m²]	**0.82**
Wind speed [m/s]	**22**
Building height h [m]*	**21**
Exposure Category	**4**
z-hdis	**21**
Distance to edge of City [km]	**4.19**
Distance to Ocean [km]	**42.92**

PV-Module [Roof_1]

Manufacturer:	**LG Electronics Inc.**
Name	**copied_LG360Q1C-A5**
Width [mm]:	**1016**
Height [mm]:	**1700**
Thickness [mm]:	**40**
Framing:	**Aluminum**
Weight (kg)	**18.5**
Nominal Power [Watt]:	**360**
Module Type:	**Monocrystalline**
Installation:	**On Both Sides**
Frame color	**Aluminium**
Temperature coefficient [%/°C]:	**-0.3**
Efficiency STC:	**0.208**
Output current MPP - STC [A]:	**9.81**
Output voltage MPP - STC [V]:	**36.7**
Short circuit current [A]:	**10.61**
Open circuit voltage [V]:	**43.6**
Temperature coefficient Power [%/K]:	**0.04**
Temperature coefficient Voltage [%/K]:	**-0.24**
Max. System voltage EU:	**1000**
Galvanic seperation required:	**No**

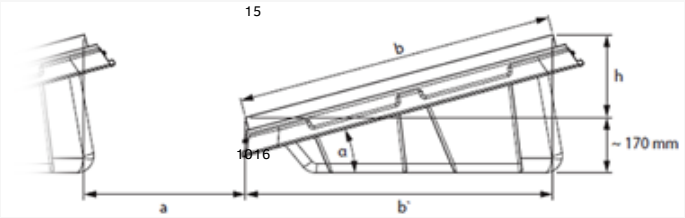
Racking Parameter [Roof_1]

Bracket tilt α [°]:	**15**
Inter-row spacing a [mm]:	**500**
Elevation rack depth on the roof b [mm]:	**1016**
Maximum height of rack incl. Module [mm]:	**263**
Friction Constant µ	**0.6**

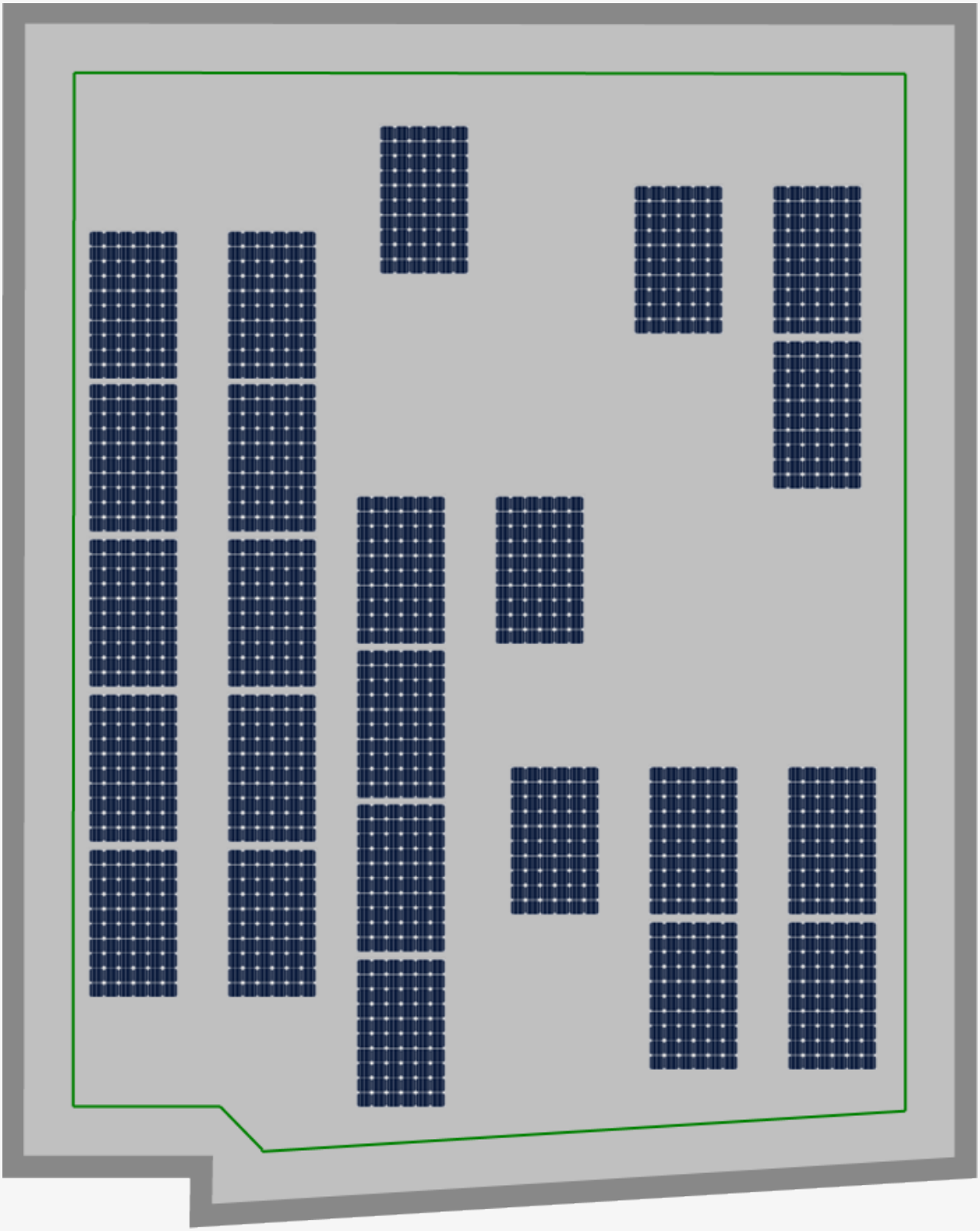
The default set-friction coefficient is 0.5 and checked by the installer / buyer (wet and dry test). If a lower friction coefficient is determined, it is mandatory to enter the value here, for the surcharge calculation! A higher value can be set to the maximum limit of 0.7 if it has been determined.

Roof load allowable [kg/m²]

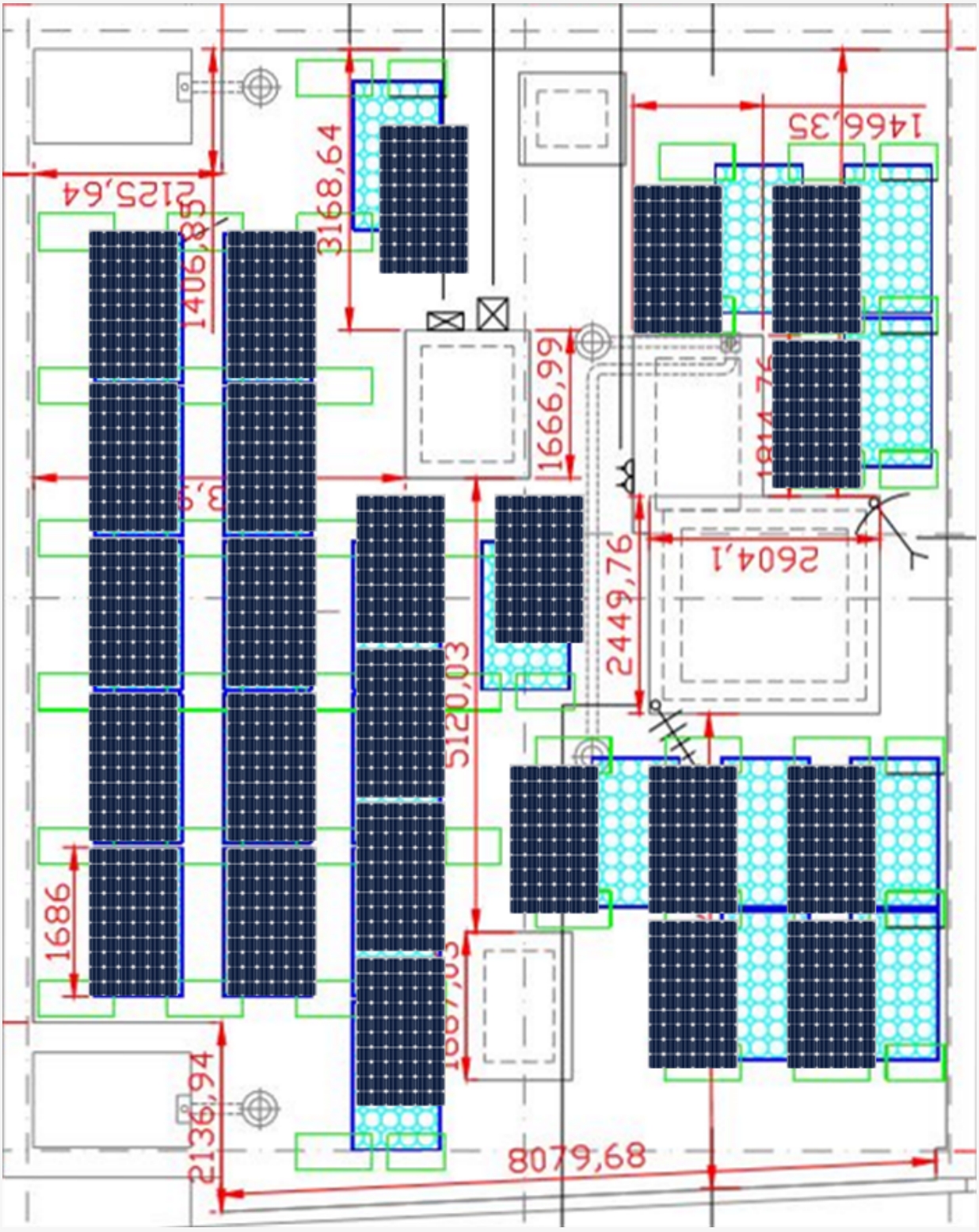
The examination of the load reserve serves as an aid in the planning phase. In case of the realization, a building structural engineer has to examine whether the additional load of the PV system can be applied to the object.



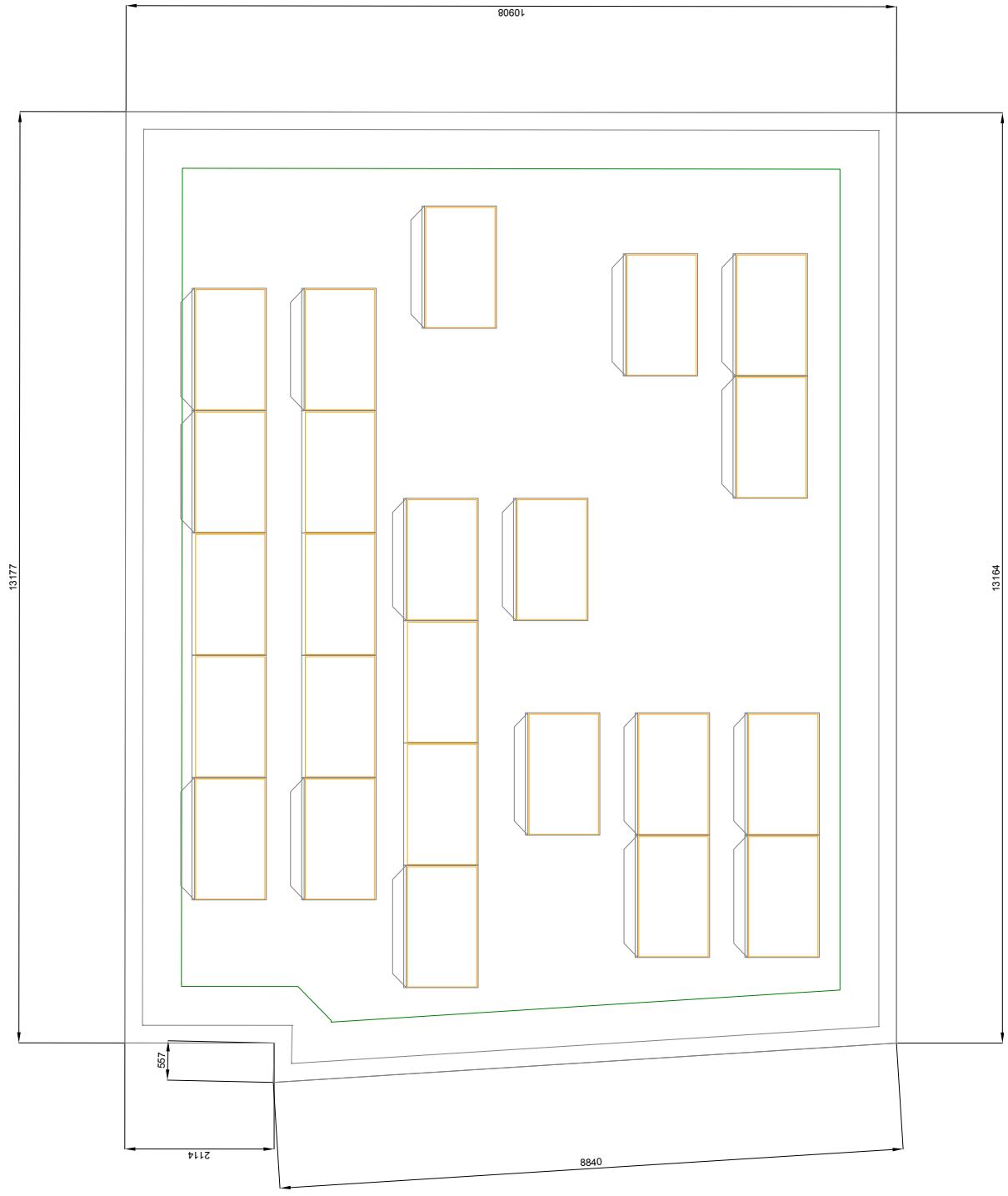
Position [Roof_1]



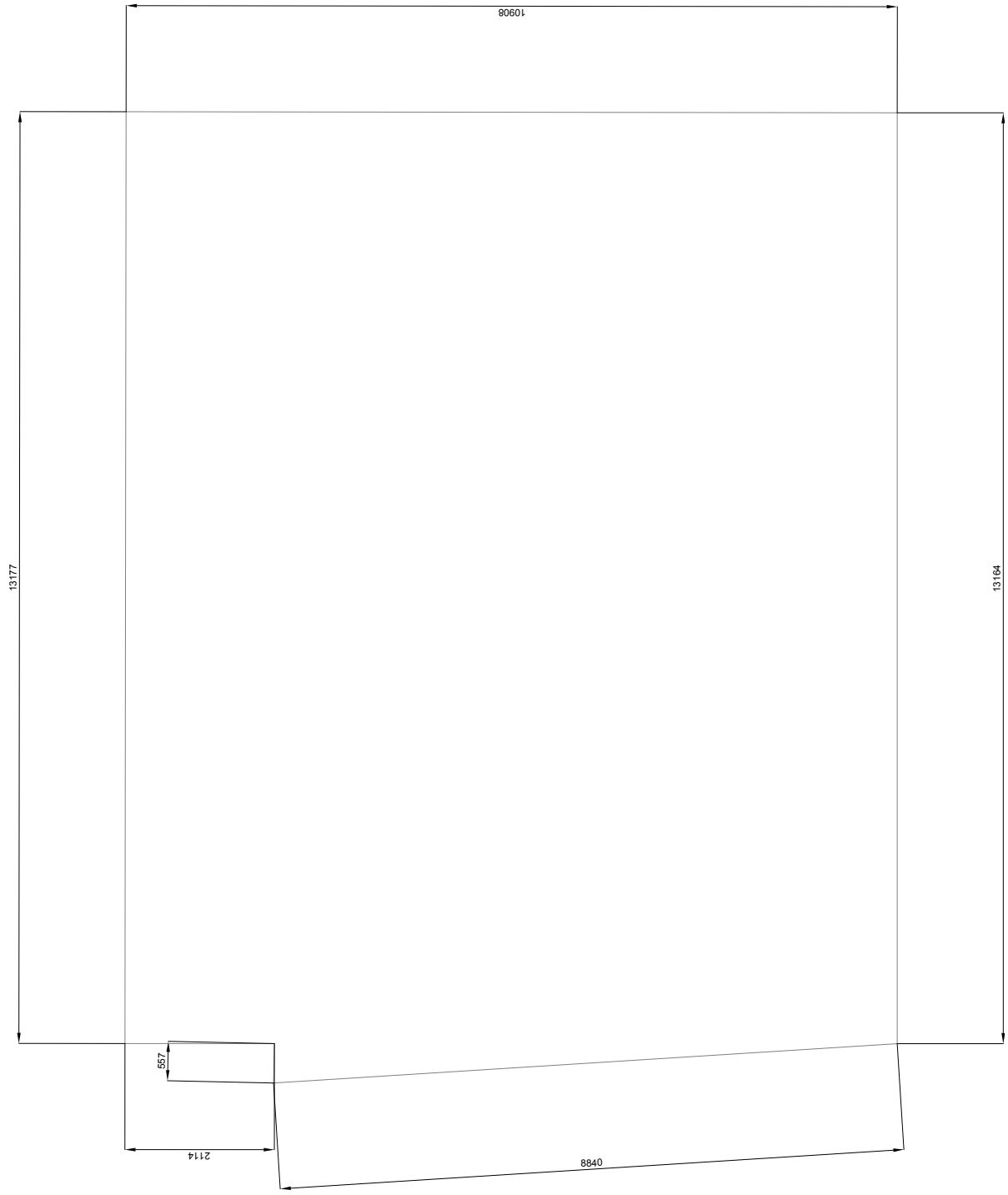
Disposition - Google Maps [Roof_1]



Installation-Plan [Roof_1]



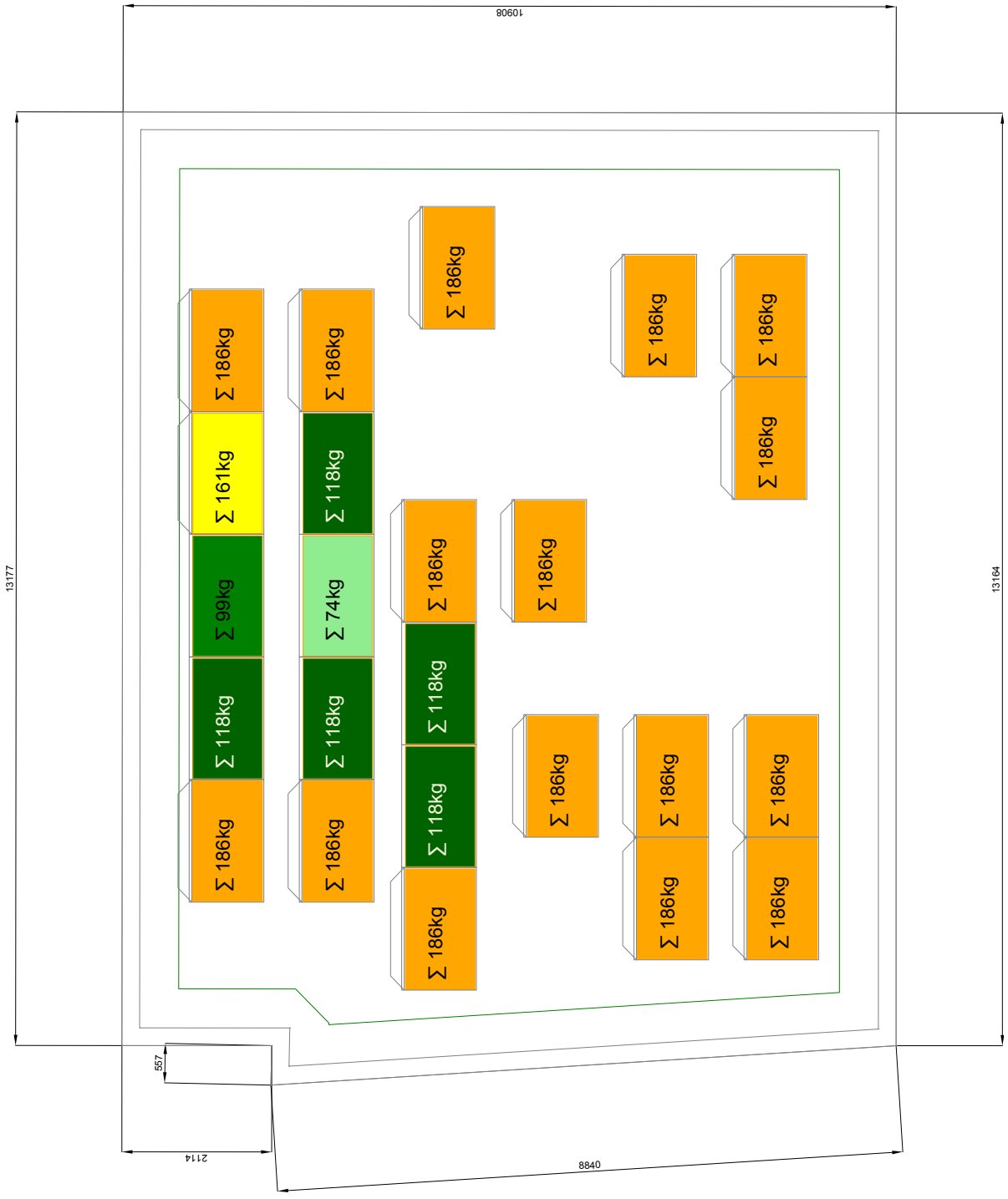
Roof coordinates [Roof_1]



Roof coordinates [Roof_1]

Coordinate 0	X:	0.557	Y:	8.81	Z:	10
Coordinate 1	X:	0	Y:	8.822	Z:	10
Coordinate 2	X:	0.556	Y:	0	Z:	10
Coordinate 3	X:	13.72	Y:	0	Z:	10
Coordinate 4	X:	13.735	Y:	10.908	Z:	10
Coordinate 5	X:	0.558	Y:	10.924	Z:	10

Static information: Ballasting [Roof_1]



Static - Important parameters and output values [Roof_1]

Factor of Safety for Uplift	**1.35**
Factor of Safety for Sliding	**1.35**
Load factor applied to Dead Load	**1**
System surface area [m²]	**62.58**
Roof area [m²]	**146.226**
Total ballast weight [kg]	**3902.90**
Weight Module/Rack [kg]	**679.00**
Total System weight [kg]	**4581.90**
Surface load on system area [kg/m²]	**73.22**
Surface load on roof [kg/m²]	**31.33**

Resulting surface stresses Basics

Roofpitch α [°]	α	= 0 °
Snow load	Q_s	= 0.32 kN/m²
Wind load	Q_w	= 0.82 kN/m²
Self-weight	G_m	= 0.15 kN/m²
Safeness factor stat., max.	γ_{G+}	= 1.35
Safeness factor stat., min.	γ_{G-}	= 0.9
Safeness factor dyn., max.	γ_{Q+}	= 1.5
Safeness factor dyn., min.	γ_{Q-}	= 0.9
Combined coefficient Wind	ψ_w	= 0.6
Combined coefficient Snow	ψ_s	= 0.5
$G_{upright}$	$= G_m \cdot \cos(\alpha)$	= 0.15
$G_{parallel}$	$= G_m \cdot \sin(\alpha)$	= 0
$Q_{s,upright}$	$= Q_s \cdot \cos^2(\alpha)$	= 0.32
$Q_{s,parallel}$	$= Q_s \cdot \sin(\alpha) \cdot \cos(\alpha)$	= 0
LC 1 (Sd,1)	$Q_1 = \gamma_{G+} \cdot G_m + \gamma_{Q+} \cdot (Q_s + \psi_w \cdot Q_{w,d})$	
LC 2 (Sd,2)	$Q_2 = \gamma_{G+} \cdot G_m + \gamma_{Q+} \cdot (\psi_s \cdot Q_s + Q_{w,d})$	
LC 3 (Sd,3)	$Q_3 = \gamma_{G-} \cdot G_m + \gamma_{Q+} \cdot Q_{w,sog}$	
LC 5 (Sd,5)	$Q_5 = G_m + 2.3 \cdot Q_s$	

Resulting surface stresses [Roof_1]

Area F

Affected area:	**1 sqf**
Cpe Suction:	**-2**
Max. Suction [kN/m²]:	**2.325**
Cpe Pressure:	**0**
Max. Pressure [kN/m²]:	**0.683**

	LC 1 (Sd,1)	LC 2 (Sd,2)	LC 3 (Sd,3)
upright [kN/m²]:	**0.683**	**0.443**	**-2.325**
parallel [kN/m²]:	**0**	**0**	**0**
Combined [kN/m²]:	**0.683**	**0.443**	**2.325**
Resulting angle°:	**0**	**0**	**180**

Area G

Affected area:	**1 sqf**
Cpe Suction:	**-0.9**
Max. Suction [kN/m²]:	**0.972**
Cpe Pressure:	**0**
Max. Pressure [kN/m²]:	**0.683**

	LC 1 (Sd,1)	LC 2 (Sd,2)	LC 3 (Sd,3)
upright [kN/m²]:	**0.683**	**0.443**	**-0.972**
parallel [kN/m²]:	**0**	**0**	**0**
Combined [kN/m²]:	**0.683**	**0.443**	**0.972**
Resulting angle°:	**0**	**0**	**180**

Area H

Affected area:	**10 sqf**
Cpe Suction:	**-0.7**
Max. Suction [kN/m²]:	**0.726**
Cpe Pressure:	**0**
Max. Pressure [kN/m²]:	**0.683**

	LC 1 (Sd,1)	LC 2 (Sd,2)	LC 3 (Sd,3)
upright [kN/m²]:	**0.683**	**0.443**	**-0.726**
parallel [kN/m²]:	**0**	**0**	**0**
Combined [kN/m²]:	**0.683**	**0.443**	**0.726**
Resulting angle°:	**0**	**0**	**180**

Module load determination, basics

Module wind load, example by Nr.24

Roofpitch α [°]	α
Pitch range regarded, lower limit	α_{start}
Pitch range regarded, upper limit	α_{end}
Coefficient at pitch lower limit	$C_{pe,0}$
Coefficient at pitch upper limit	$C_{pe,1}$
Coefficient interpolation formula	$c_{pe} = C_{pe,0} + (\alpha - \alpha_{start}) \cdot (C_{pe,1} - C_{pe,0}) / (\alpha_{end} - \alpha_{start})$
Load case 1	$Q_1 = \gamma_{G+} \cdot G_m + \gamma_{Q+} \cdot (Q_s + \psi_w \cdot Q_{w,d})$
Load case 2	$Q_2 = \gamma_{G+} \cdot G_m + \gamma_{Q+} \cdot (\psi_s \cdot Q_s + Q_{w,d})$
Load case 3	$Q_3 = \gamma_{G-} \cdot G_m + \gamma_{Q+} \cdot Q_{w,sog}$
Load case 4	$Q_4 = G_m + Q_s + \psi_w \cdot Q_{w,d}$
Load case 5	$Q_5 = G_m + 2.3 \cdot Q_s$
Permanent loads factor, upper	$\gamma_{G+} = 1.35$
Permanent loads factor, lower	$\gamma_{G-} = 0.9$
Varying loads factor, upper	$\gamma_{Q+} = 1.5$
Varying loads factor, lower	$\gamma_{Q-} = 0$
Wind coefficient	$\psi_w = 0.6$
Snow coefficient	$\psi_s = 0.5$

Area F

Wind load	$Q_w = 0.82$
Wind pressure	$Q_{w,d} = 0.82 \cdot 0 = 0$
LC 1 (Sd,1)	$Q_1 = 1.35 \cdot 0.15 + 1.5 \cdot (0.32 + 0.6 \cdot 0) = 0.682$
LC 1 (Sd,1), force	0.019 kN

LC 3 (Sd,3)	$Q_3 = 0.9 \cdot 0.15 + 1.5 \cdot -1.64 = -2.325$ kN/m²
LC 3 (Sd,3), force	-0.066 kN

Area G

Wind load	$Q_w = 0.82$
Wind pressure	$Q_{w,d} = 0.82 \cdot 0 = 0$
LC 1 (Sd,1)	$Q_1 = 1.35 \cdot 0.15 + 1.5 \cdot (0.32 + 0.6 \cdot 0) = 0.682$
LC 1 (Sd,1), force	0.07 kN
LC 3 (Sd,3)	$Q_3 = 0.9 \cdot 0.15 + 1.5 \cdot -0.738 = -0.972$ kN/m²
LC 3 (Sd,3), force	-0.1 kN

Area H

Wind load	$Q_w = 0.82$
Wind pressure	$Q_{w,d} = 0.82 \cdot 0 = 0$
LC 1 (Sd,1)	$Q_1 = 1.35 \cdot 0.15 + 1.5 \cdot (0.32 + 0.6 \cdot 0) = 0.682$
LC 1 (Sd,1), force	1.174 kN
LC 3 (Sd,3)	$Q_3 = 0.9 \cdot 0.15 + 1.5 \cdot -0.574 = -0.726$ kN/m²
LC 3 (Sd,3), force	-1.249 kN

Material list [Roof_1]

Part number	Description	Matchcode	Pck	Total Nr.	Total weight (kg)	Length (mm)	Total length (mm)
520075-K	ConSole+ (incl. Mounting material and U-Profile)	R520075-K	1	**24**	201.6	--	--
520076	Streamliner+	R520076	1	**17**	33.5	--	--
					235.04		--

PV Configurator

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