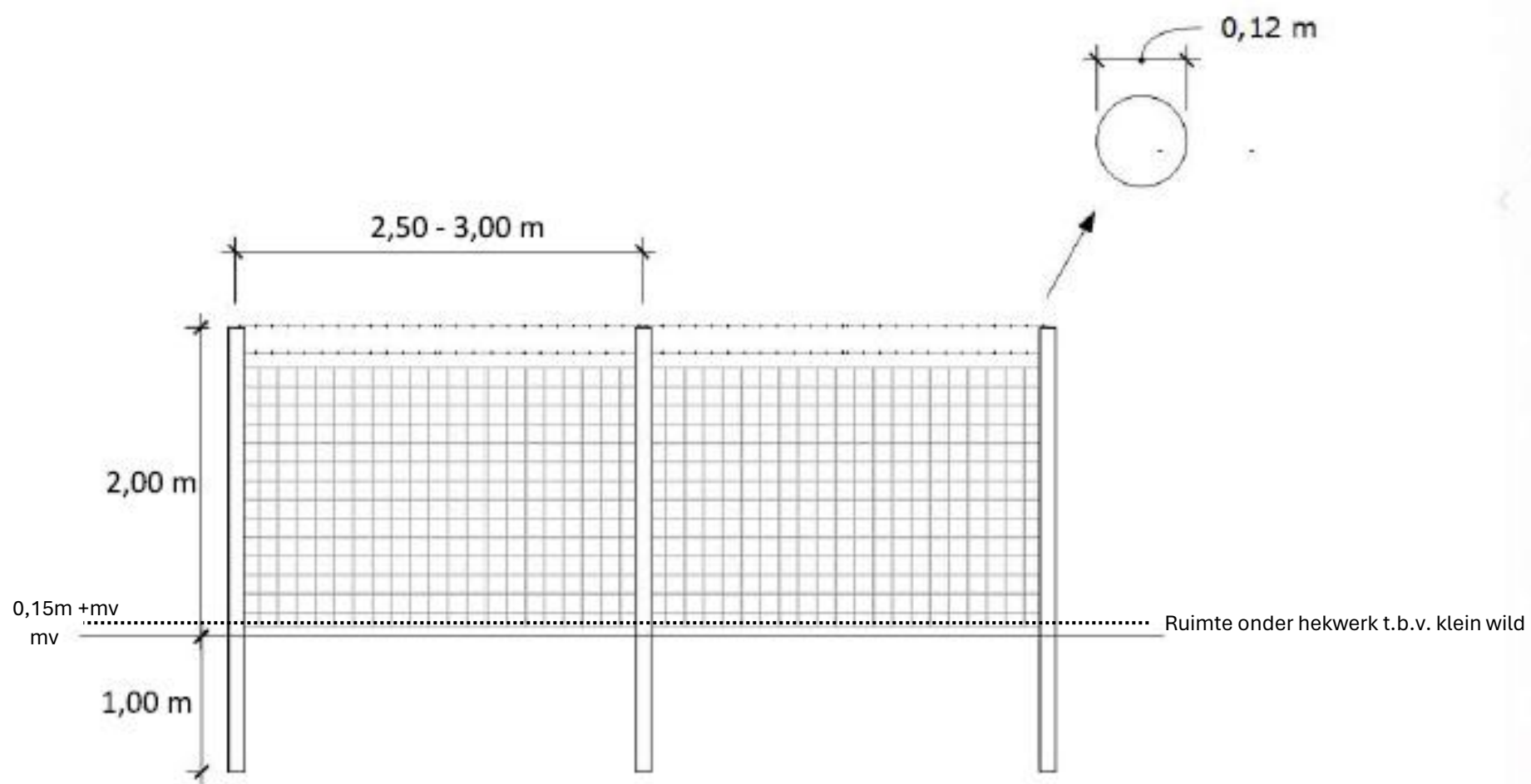
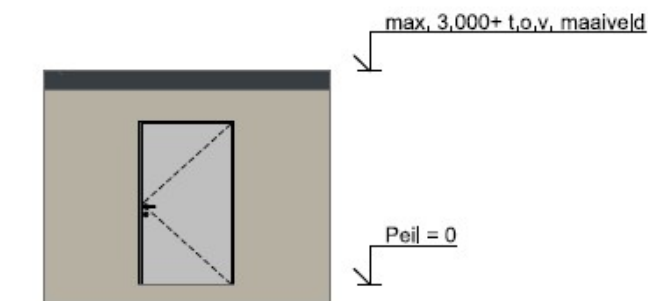






zijgevel

1:100



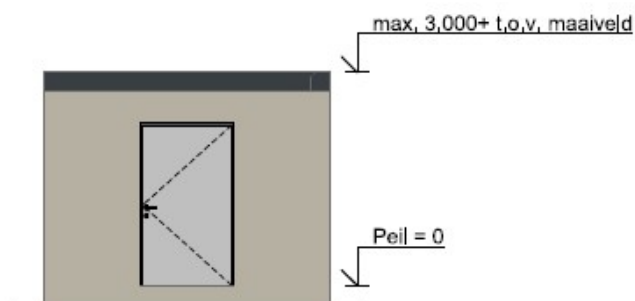
voorgevel 1

1:100



zijgevel

1:100



voorgevel 2

1:100

Standaard afwerking Inkoopstation:

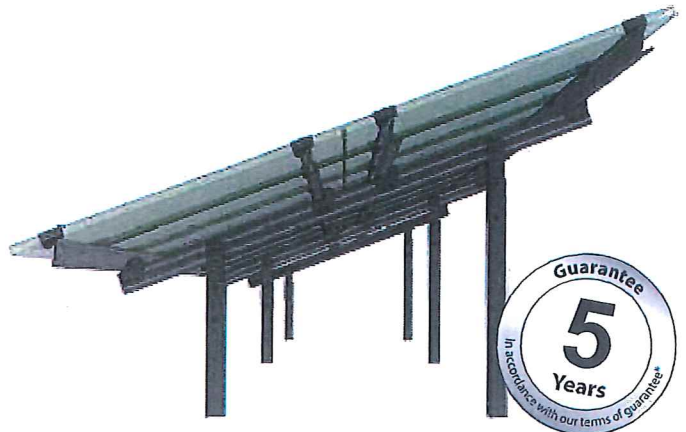
- Wanden: kunstharsemulsie met gebroken steentjes (RAL 7032)
- Dak: elastische waterdicht epoxycoating randkleur antraciet grijs (RAL 7016)
- Deuren: kleur RAL 7032

NB: bovengenoemde kleuren zijn standaard, er kunnen indien wenselijk mogelijk ook andere kleuren worden gerealiseerd.

FS Duo

The two-support system made of steel

- No soil sealing
- Extremely short assembly time
- Maximum level of pre-assembly
- Perfectly synchronized system components
- High economic efficiency



The right substructure made by Schletter safeguards structural safety, maximum economic efficiency and long durability of ground-mounted solar plants. The FS ground-mounted system has proven itself for many years in countless projects almost all over the world. Two-support systems are first choice when it comes to big multi-rowed module arrangements. If big module racks with low inclinations are to be installed on even terrain, FS Duo is the best choice.

We have successfully lowered the costs

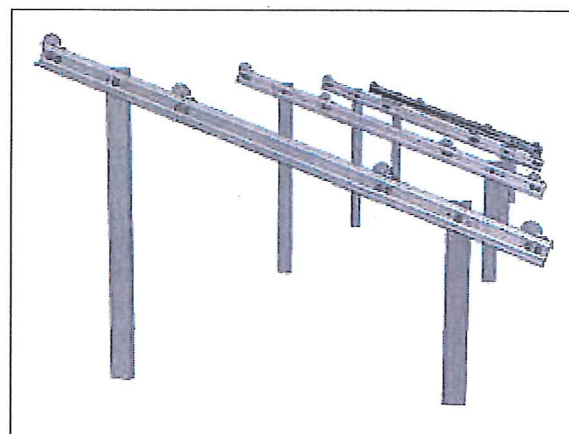
Economic efficiency is getting ever more important for ground-mounted solar plant projects because there is increasing cost pressure. In many cases we could considerably reduce the overall cost for big solar plants by using pile-driven foundations. In most cases, this type of foundation makes concrete foundations redundant. This of course saves material and labour costs.

Everything from one source

We manufacture all components ourselves in our factory. Thus, we can avoid shortages and can reliably offer you high quality products. We offer modular systems for any kind of foundation, any subsoil and any type of mounting.

Structural safety first

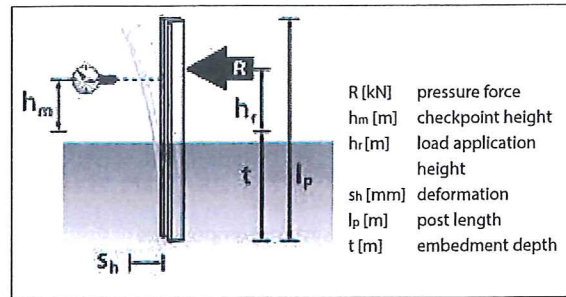
Two pile-driven foundations as one support unit combined with our load-optimized Z-purlins are a structurally safe substructure for solar module areas with wide spans. As the material is galvanized, the area of application is rather wide. FG and SRF profiles made by Schletter can be used as pile-driven foundations. Both designs allow an individual project planning with maximum economic efficiency.



Structural safety first

The detailed and individual project planning on the basis of currently valid standards safeguards the structural safety of the solar plant for many years. But of course that is not all. A geological survey of the building ground is created on location. The load-bearing capacity of the soil is determined by means of load tests.

- Inclined pull tests
- Horizontal pressure tests
- Creation of soil profiles
- Chemical analysis in a laboratory

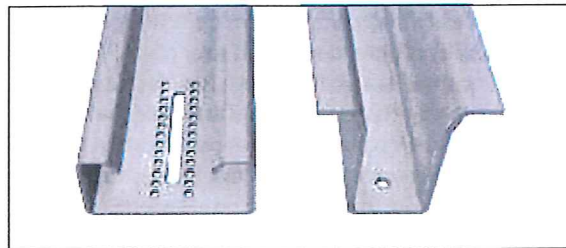


Mechanical background of inclined pull-out tests

The idea behind inclined pull-out tests is that the wind does not act in an isolated manner in vertical or horizontal direction, but impacts the inclined module area almost vertically. Thus, a surface pressure is created from the application of the bending moment in the form of a pair of forces. With inclinations bigger than 15°, the frictional resistance between the pile and the surrounding ground is generally higher than the jacket friction which results in a greater pull resistance.

Well-prepared for wind and snow loads

Hot-dip galvanized foundation posts in different size categories are used for the foundation so that the anchoring forces can be transmitted as far as the upper connection point, thus ensuring optimal structural safety of the plant against wind and snow loads. The profiles for pile-driving (FG and SRF) we developed safeguard optimum anchoring in the ground and maximum bending stiffness at the same time.



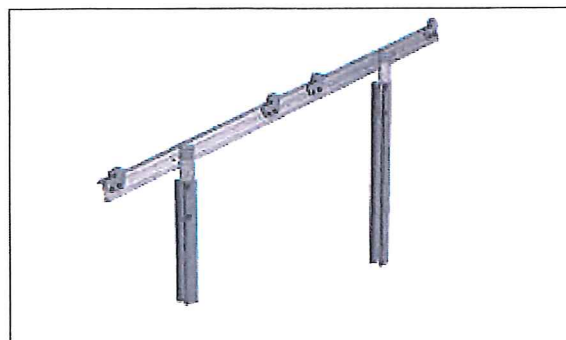
Slope, rocky subsoil? No problem!

Special terrain-friendly hydraulic pile-drivers are used for the pile-driving of the foundation posts into the soil. This pile-driving technique is very suitable for ground-mounted solar plants. Depending on the condition of the soil, one pile-driver can pile-drive up to 250 posts per day. If the subsoil is rocky, the hydraulic pile-driver can be equipped with a boring unit.



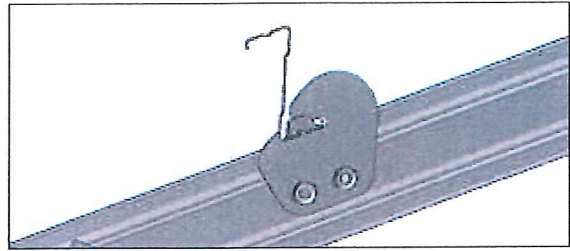
A clear plus for the two-support system

The support geometry is the skeletal structure of each FS plant. As two pile-driven foundations form one support unit, FS Duo can take bigger loads than FS Uno. This allows wider support distances and bigger module areas. The reduced number of components as well as the almost 100% prefabrication of the girder assembly groups in our factory reduce the assembly time to a minimum. As the material is galvanized, FS Duo is rather versatile.

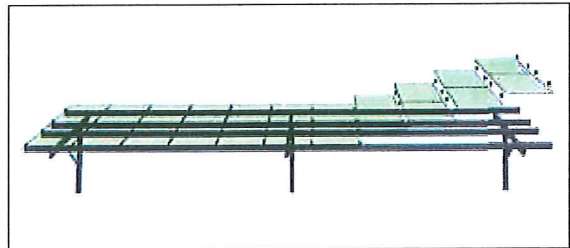


Mounting claws for a firm seat

The module-bearing rail always has a profile geometry that is aligned to the flow of forces. Thus, the required structural characteristics are achieved with minimum utilization of materials. The module-bearing rails are fastened to the support units with special mounting claws. They are connected to a firmly seated unit by means of clamping devices.



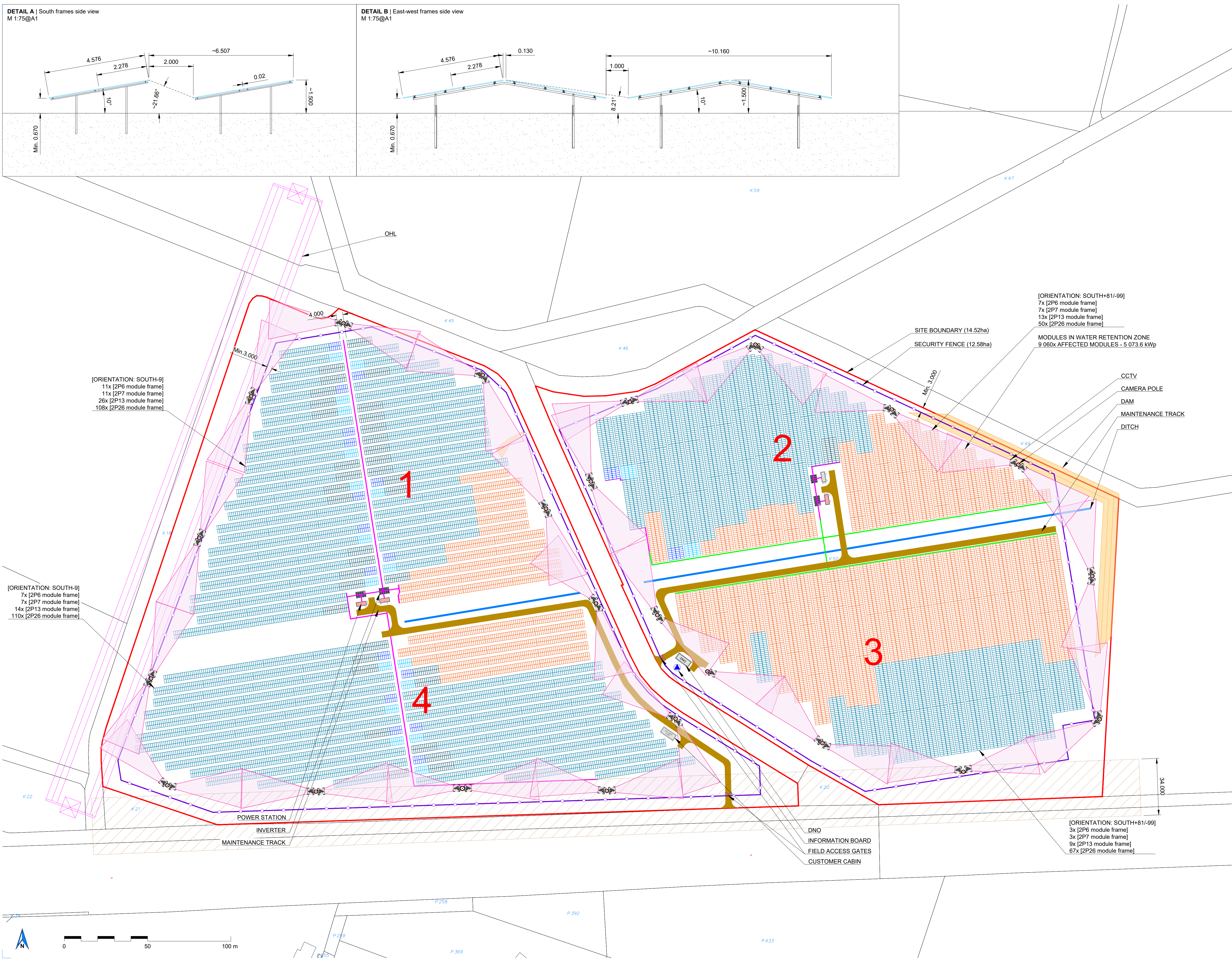
According to customer requirements, the modules are mounted quickly and cost-efficiently using suitable tools. The arrangement of the modules is project-specific. The modules are fastened vertically, horizontally or with the combined clamping system by Schletter. As a standard, steel clamps are available for this purpose. With an adapter, also Standard or Rapid clamps by Schletter can be used.



Technical data

Material	• Pile-driven foundation posts: Steel, hot-dip galvanized • Rails: Steel, hot-dip galvanized • Fastening elements, screws/bolts: Steel, hot-dip galvanized or high-grade steel
Construction	• Fine adjustment option to align the pile after pile-driving • Cost-optimized complete construction due to structural optimization • Components designed for quick and easy mounting
Module clamping¹	• Framed and unframed modules • Combined module clamping possible • With steel clamps, standard clamps or Rapid 2+ clamps
Accessories¹	• Cable channels, cable ducts, cable ties • Components for internal potential equalization
Logistics	• Highest level of pre-assembly • Quick transport to the installation site
Delivery and services	• Site-specific structural analysis based on local loading data • Delivery of the complete mounting material • Optional: Soil examination and soil statics • Optional: Pile-driving of the foundations, rack and/or module mounting
Design calculations	• Structural analysis of the respective terrain based upon a geological survey • Individual system statics based on regional load values • Load assumptions according to DIN EN 1990 (Eurocode 0), DIN EN 1991 (Eurocode 1), DIN EN 1993 (Eurocode 3), DIN EN 1999 (Eurocode 9) and further respectively corresponding country-specific technical standards • Profile geometries with highly efficient material utilization • Structural verification of all construction components based on FEM-calculation • Optional: Wind load vibration simulation • Optional: Earthquake simulation
Terrain maintenance	• A central support allows optimum terrain maintenance • Sheep grazing





Notes:

1. All dimensions to be confirmed on site prior to installation.
2. All dimensions are indicative only and in m unless otherwise specified.
3. 1.5 meter clearance from maintenance track to modules.

Reference drawings

Drawing name	Rev	Date
20210416_Zonnepark-Helden-KS.dwg	0	16/04/21
2104 Spiesberg new block.dwg	0	24/02/22
Zimmermann ZNSV-2-2p-ST4-10-72-R-OEW	0	16/03/23
Maasbracht Dodeward 380kV Mast 76-77 data	0	25/04/23
Spiesberg Delta drawing [Delta draft_2013] P15 water	0	18/09/23

Legend:

- | | |
|---|--|
|  | Site boundary |
|  | Perimeter fence (~2056 m) |
|  | Maintenance track |
|  | Customer cabin |
|  | DNO equipment |
|  | 20M. Power Station (2500 kVA) |
|  | 20M. Power Station (3000 kVA) |
|  | Inverter |
|  | Over-head line (OHL) |
|  | Ditch |
|  | Gates |
|  | Highway buffer |
|  | LV trenches |
|  | Dam |
|  | Information board |
|  | CCTV |
|  | Camera pole |
|  | LV trench/cable route through water retention zone (trench/cable tray - TBC) |
|  | Using bifacial modules |

System description:

DC Power kWp:	14938.56
AC Power kVA:	10650 (@Pmax) / 10650 (@Pno)
Max. Export Capacity:	TBC

No. of modules:	26676
Module type:	560 Wp
Dimensions:	2278x1134x35

Substructure type:	2 modules in portrait
Modules per string:	26
Number of strings:	1026
Tilt angle:	10°
Shading angle:	~21.66° (South) / ~8.21° (E/W)
Azimuth from South:	South -9°/81°/-99°

Inverter model:	String inverter
Inverter power, kVA:	150 (@Pmax) / 150 (@Pnom)
No. of inverters:	71
DC / AC ratio:	1.30 / 1.46 / 1.57 (@Pnom)

Capacity per area:

Area	Module qt.	Capacity, kWp
1	6578	3683.680
2	6240	3494.400
3	7592	4251.520
4	6266	3508.960

Proposed location:



Revisions:

Row	Date	Comments	Drawn	Approve
A	2/10/2023	First Issue	MC	MM
A	03/04/23	Modules updated, modules added	MC	MM
B	07/04/23	Modules added, OHL buffer removed	MC	MM
C	28/04/23	Modules removed under OHL	MC	MM
D	26/09/23	Layout updated according landscape design	IM	MM
E	26/09/23	Transmitters moved	IM	MM
F	26/09/23	Customer cabin moved	IM	MM
G	02/10/23	Layout updated	IM	MM
H	11/10/23	Layout updated	IM	MM
I	28/04/24	Layout updated	AD	NM
J	30/04/24	Layout updated	AD	NM

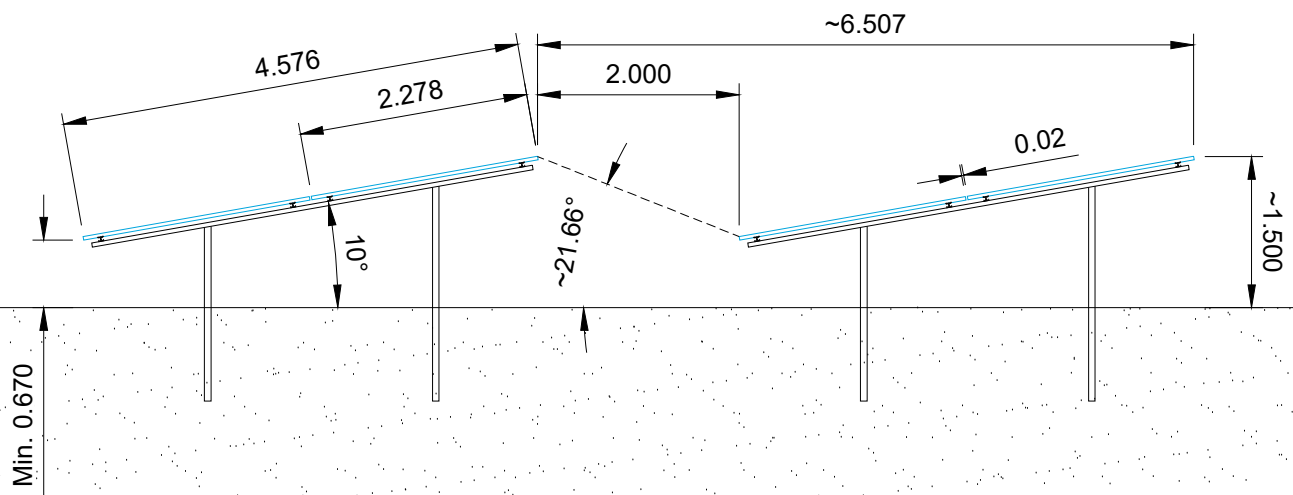
Project: Zonnepark Spiesberg

Location: Spiesberg 28,
Grashoek,
Netherlands
51°22'41.4"N, 5°56'29.9"E

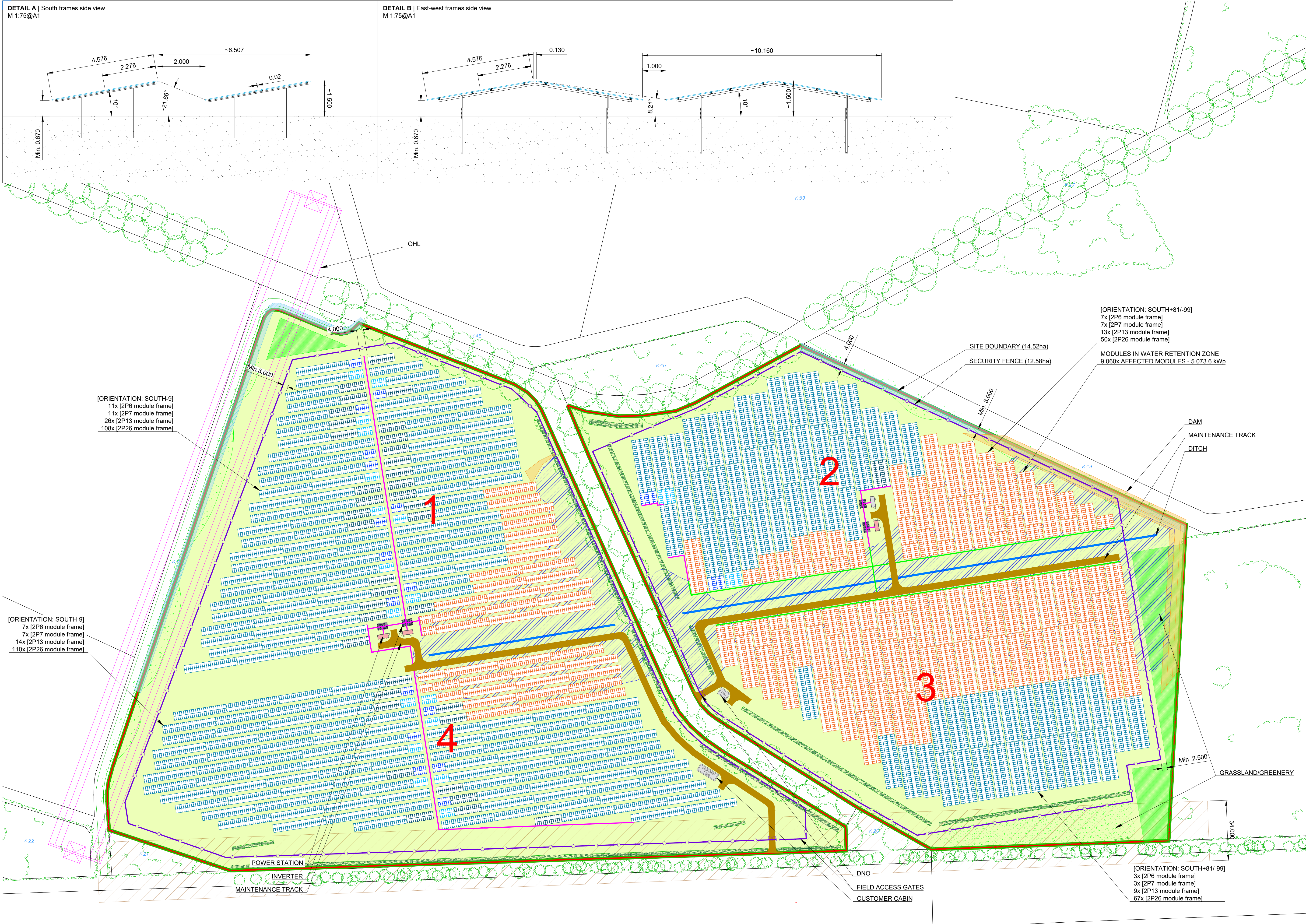
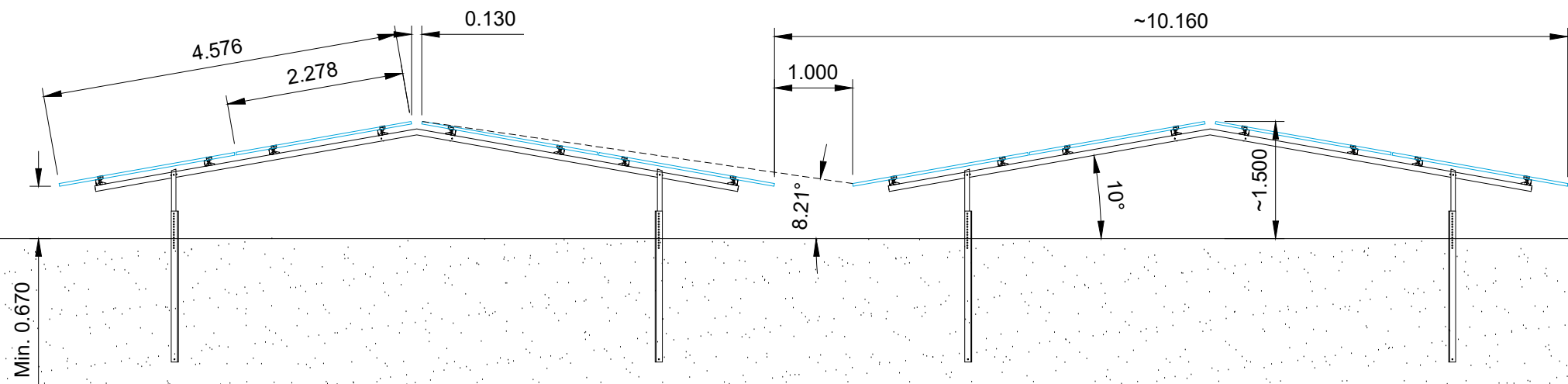
Title: PV Layout

Drawn: Detra Solar / MC Checked: JJW
Scale: 1:1000@A1 Date: 30/04/24
Drawing No: MGZ1001-102 Rev: J

DETAIL A | South frames side view
M 1:75@A1



DETAIL B | East-west frames side view
M 1:75@A1



Notes:

- All dimensions to be confirmed on site prior to installation.
- All dimensions are indicative only and in m unless otherwise specified.
- 1.5 meter clearance from maintenance track to modules.

Reference drawings

Drawing name	Rev	Date
20210416_Zonnepark-Haalen-KS.dwg	0	16/04/21
2104 Spiesberg new block.dwg	0	24/03/22
Zimmermann ZNBV-1-2p-514-10-72-R-OEW	0	16/03/22
Musshuis-Christensen 280x1 Met 75-17 side	0	25/04/22
Spiesberg Delta drawing Delta.dwg, 2013 P13 water	0	16/03/22

Legend:

- Site boundary
- Perimeter fence (~2056 m)
- Maintenance track
- Customer cabin
- DNO equipment
- 20ft. Power Station (2500 kVA)
- 20ft. Power Station (3000 kVA)
- Inverter
- Over-head line (OHL)
- Ditch
- Gates
- Water retention zone
- Grassland / greenery
- Highway buffer
- Green framework
- LV trenches
- Dam
- Shrubs / Trees
- Hedges
- LV trench/cable route through water retention zone (trench/cable tray - TBC)
- Using bifacial modules

System description:

DC Power kWp: 14938.56
AC Power kVA: 10650 (@Pmax) / 10650 (@Pnom)
Max. Export Capacity: TBC

No. of modules: 28676
Module type: 580 Wp
Dimensions: 2278x1134x35

Substructure type: 2 modules in portrait
Modules per string: 26
Number of strings: 1026
Tilt angle: 10°
Shading angle: ~21.66° (South) / ~8.21° (E/W)
Azimuth from South: South -9°/81°/-99°

Inverter model: String inverter
Inverter power, kVA: 150 (@Pmax) / 150 (@Pnom)
No. of inverters: 71
DC / AC ratio: 1.30 / 1.46 / 1.57 (@Pnom)

Capacity per area:

Area	Module qt.	Capacity, kWp
1	6578	3683.680
2	6240	3694.400
3	7592	4251.520
4	6266	3508.960

Proposed location:

Revisions:

Rev	Date	Comments	Drawn	Approve
A	11/03/22	First issue	MC	MM
B	03/04/22	Layout updated, modules added	MC	MM
C	07/04/22	Modules added, OHL buffer removed	MC	MM
D	28/04/22	Modules removed under OHL	MC	MM
E	26/06/22	Layout updated according landscape design	IM	MM
F	26/06/22	Transformer moved	IM	MM
G	26/06/22	Customer cabin moved	IM	MM
H	02/10/22	Layout updated	IM	MM
I	11/10/22	Layout updated	IM	MM

Project: Zonnepark Spiesberg
Location: Spiesberg 28, Grashoek, Netherlands
51°22'41.4"N, 5°56'29.9"E
Title: PV Layout

Drawn: Delta Solar / MC
Scale: 1:1000@A1
Drawing No: MGZ1001-102

Checked: JJW
Date: 11/10/23
Rev: H

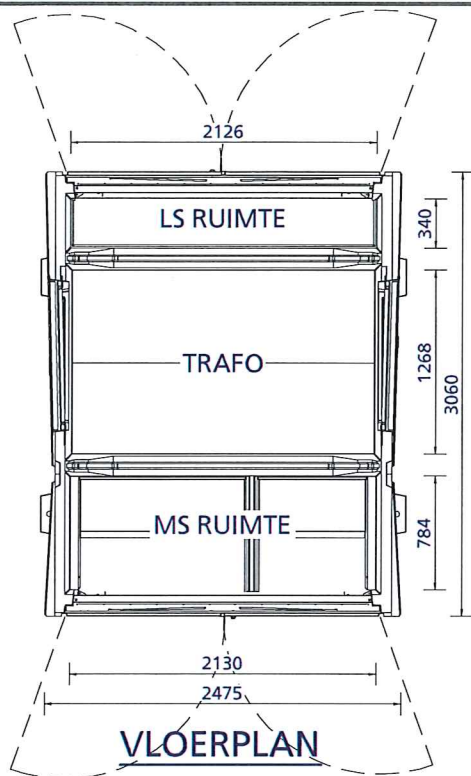
Morgenzon
Pullem 43
7202 BV, Zutphen
0642700138
www.morgenzon.nl

Delta Solar
Lvovo str. 25-104,
LT-09320 Vilnius
www.deltasolar.eu

Do not scale from this drawing. Site verify all dimensions prior to construction.
Report all discrepancies to the drawing originator immediately. This drawing is to be read in conjunction with all relevant documents and drawings.

Proposal only

G: H: I: J: K: L:
eigendom ALFEN bv almere
vermenigvuldigen of mededeling aan derden
in welke vorm dan ook, is zonder schriftelijke
toestemming eigenaars niet geoorloofd



TECHNISCHE INFORMATIE:

Gewichten (bij benadering):

Behuizing	8250 kg
Transformator (1600kVA vlg Norm '95)	4300 kg
MS	400 kg
LS verdeler	300 kg
Overige	500 kg +
Totaal	13750 kg

Gronddruk 3,42 N/cm²

Hijsvoorzieningen:

Dak	4x RD16
Station	4x RD30

Standaard kleuren en afwerking:

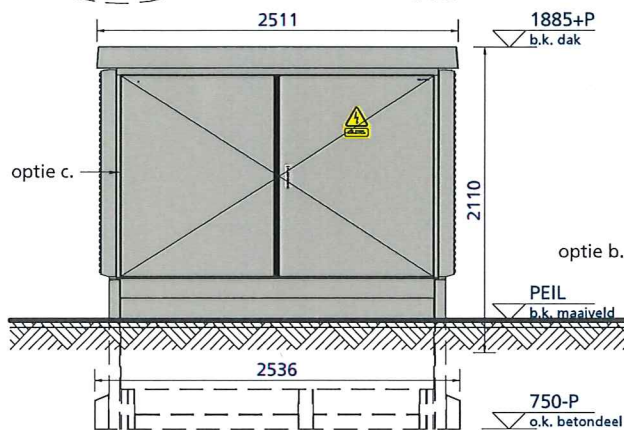
Station	Beton-grijs
Deuren / roosters / voorzetplaat	RAL 7044

Rooster(s):

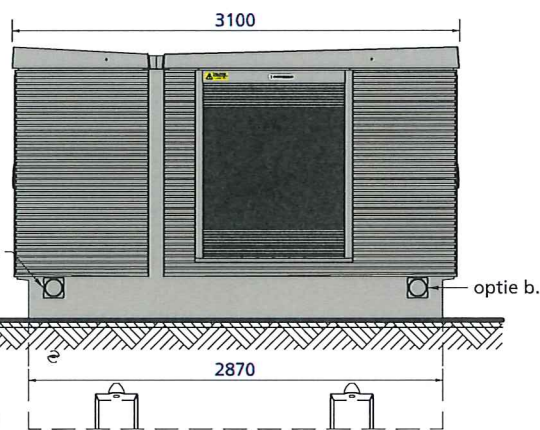
- Netto doorlaat 1 rooster: 563 cm²
- K20 bij 1 rooster en 1600kVA Norm '95 trafo
 - K20 bij 2 roosters en 2000kVA Norm '95 trafo
 - Bescherming IP 43

Opties:

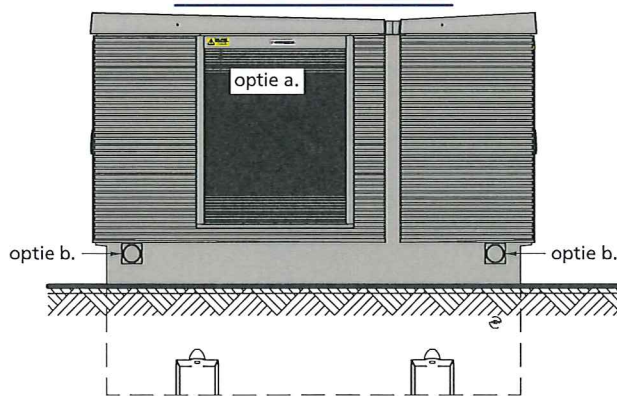
- a: extra (tweede) rooster in linkerzijde van het station
b: noodstroom doorvoering Ø 125mm links en/of rechts
c: 3 deuren aan MS en/of LS zijde
Diverse indelingen mogelijk



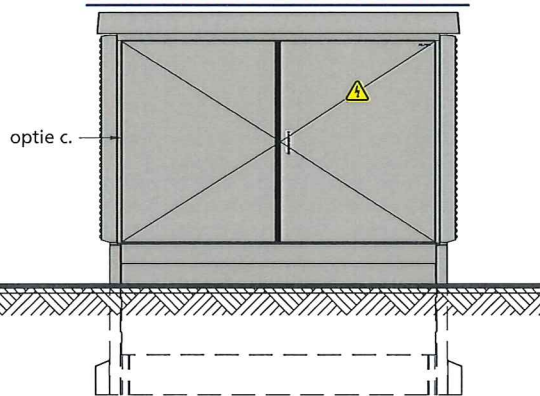
VOORAANZICHT



RECHTER ZIAANZICHT



LINKER ZIAANZICHT



ACHTERAANZICHT

samenstelling

Compactstation DIABOLO 40H

DISCLAIMER De kleuren op de tekening kunnen afwijken van de werkelijkheid, door printer- en/of beeldschermstellingen. Deze kleuren zijn indicatief, hier kunnen geen rechten aan worden ontleend.

detail

Met gescheiden LS en MS ruimten - Standaard

projectie amerikaans

maten in mm

offertenummer ALGEMEEN	getekend dgj	4-9-2013	formaat ENGINEER-A4	schaal --
	gekonstr. dgj	12-7-2011		
ordernummer	status tekening DEFINITIEF		tekeningnummer MS4408A801	rev. -

