

ELENCO FOGLI
--------------

[illegible]

R E G I O N E   L O M B A R D I A  
C O M U N E   D I   A R C O N A T E  
P R O V I N C I A   D I   M I L A N O

PROCEDURA ABILITATIVA SEMPLIFICATA (P.A.S.)  
art. 6 D.Lgs. 28/2011

Elaborato:  
A.05 - Elaborati generali impianto

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Committente:

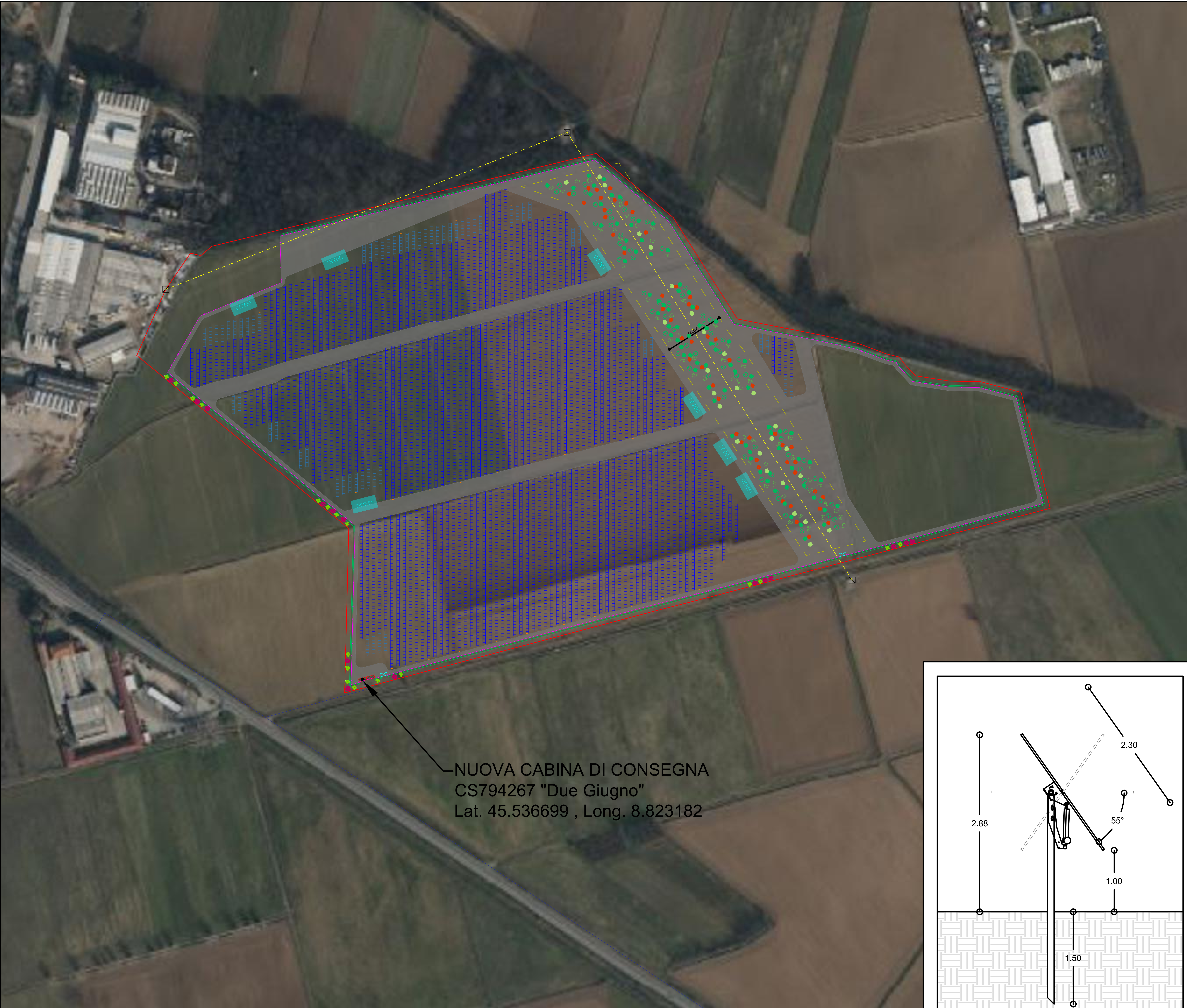
**NEOEN** **Neoen Renewables Italia Srl**  
Via G. Rovani, 7  
20123 Milano  
neoenrenewablesitalia@pecplus.it

  
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**HC Human Capital Srl**  
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ORDINE DEGLI ARCHITETTI, PAESAGGISTI E CONSERVATORI DELLA PROVINCIA DI MILANO  
PAPARO LAURA  
architetto  
11725





GENERAL INFORMATION					
Total power, kWp_DC					9403,42
Total power, kWp_AC					8400
Nominal power (CEI 0-16, see 2E100 for details - sum of minor between AC and DC on each inverter)					
Module power, Wp_DC					590
Module quantity					15938
Azimut					0
Modules manufacturer/ model					TWSolar // TWMND -72HD560-590W
Inverter manufacturer/ model					Huawei // SUN2000-330KTL-H1
Inverters nominal AC power, kW_AC					300
Inverters n.					28
Capacity, kW_AC					8400
Cadastral data					Arconate (MI) - fg.6 mapp. 3
Road lenght, m					da definire
Road Width, m					da definire
Fence length, m					1833
Mitigation length, m					1661
Mitigations, m2					1495

DATI IMPIANTO					
NOME IMPIANTO	POTENZA DI PICCO [Kw]	POTENZA DI MODULO FV [W]	QUANTITA' MODULI	QUANTITA' TRACKER	DISTANZA INTERFILA [m]
IMP-01	2193,62	590	3718	143	5
IMP-02	3620,24	590	6136	236	5
IMP-03	3589,56	590	6084	234	5
TOTALE	9403,42	590	15938	613	5

- LEGENDA
- VIABILITA' PRINCIPALE
  - FASCE DI MITIGAZIONE DA PIANTUMARE
  - RECINZIONE
  - CONFINO MAPPALE
  - TRACKER (26 MODULI)
  - 1/2 TRACKER (13 MODULI)
  - CABINE DI TRASFORMAZIONE
  - CABINE DI CONSEGNA E UTENTE/MT
  - LINEA ELETTRICA ESISTENTE
  - INVERTER

IMPIANTO FOTOVOLTAICO "ARCONATE"

REGIONE LOMBARDIA  
COMUNE DI ARCONATE  
PROVINCIA DI MILANO

PROCEDURA ABILITATIVA SEMPLIFICATA (P.A.S.)  
art. 6 D.Lgs. 28/2011

SETTEMBRE 2024

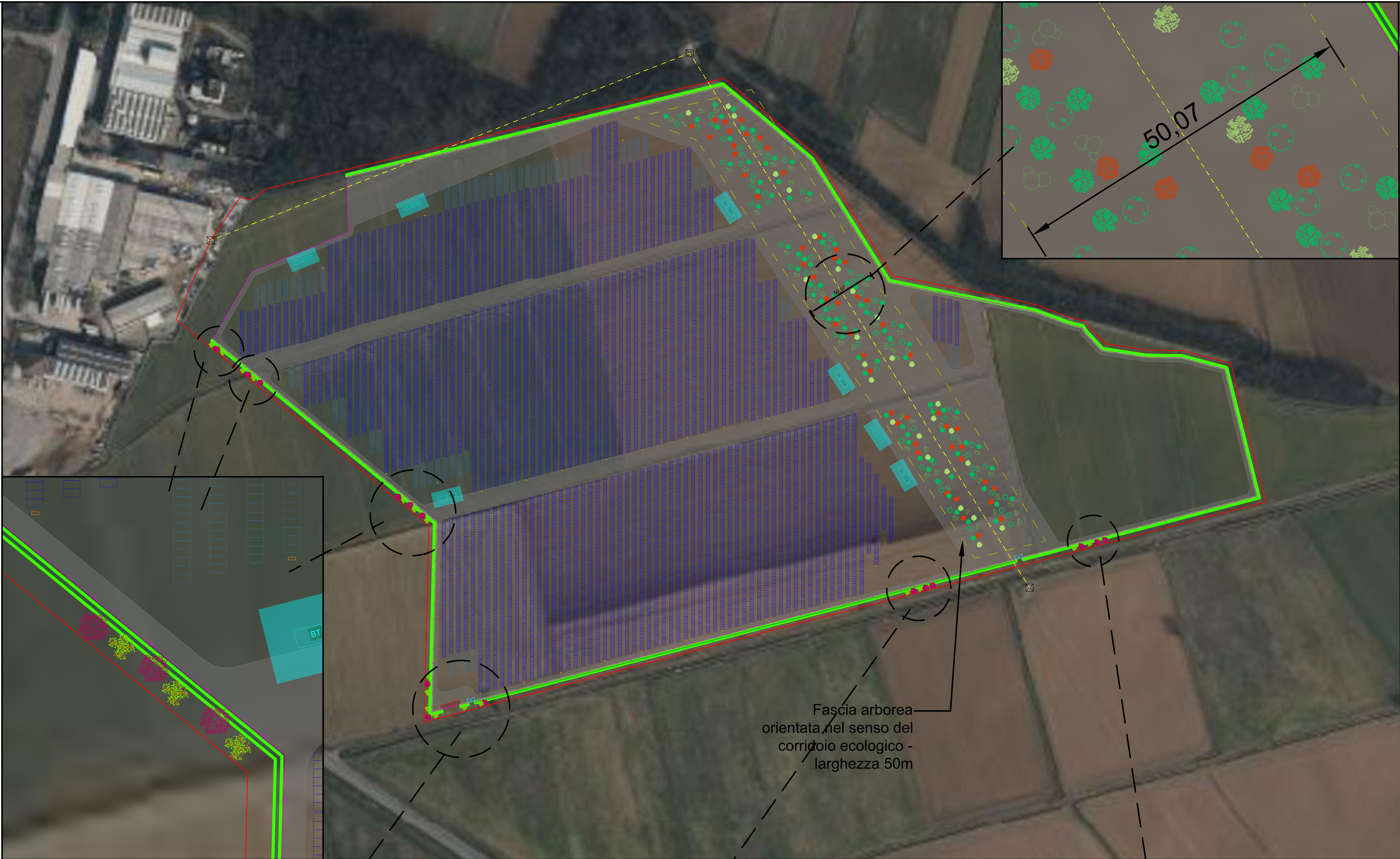
Elaborato:  
A.05.a - Planimetria generale impianto

Committente:  
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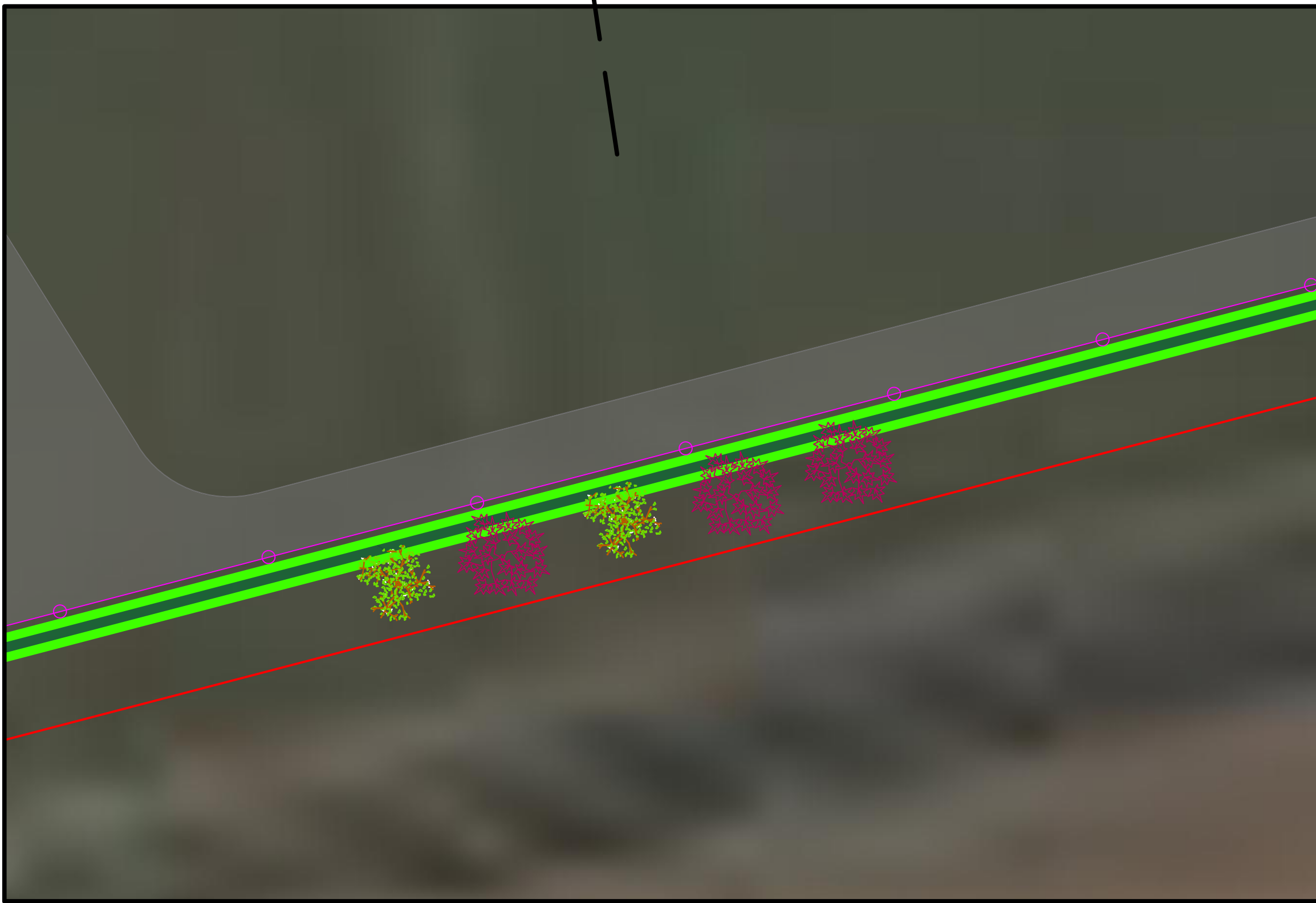
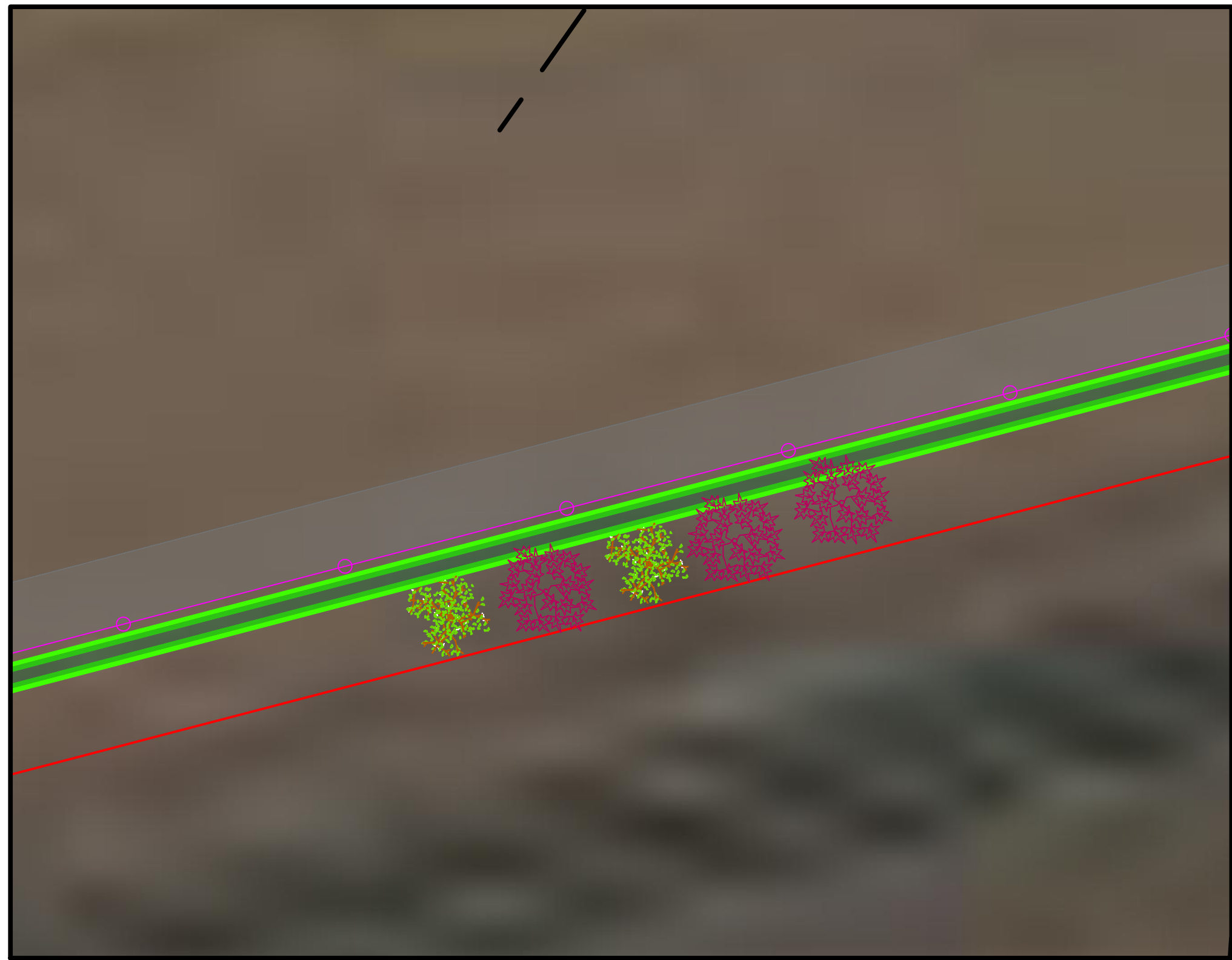
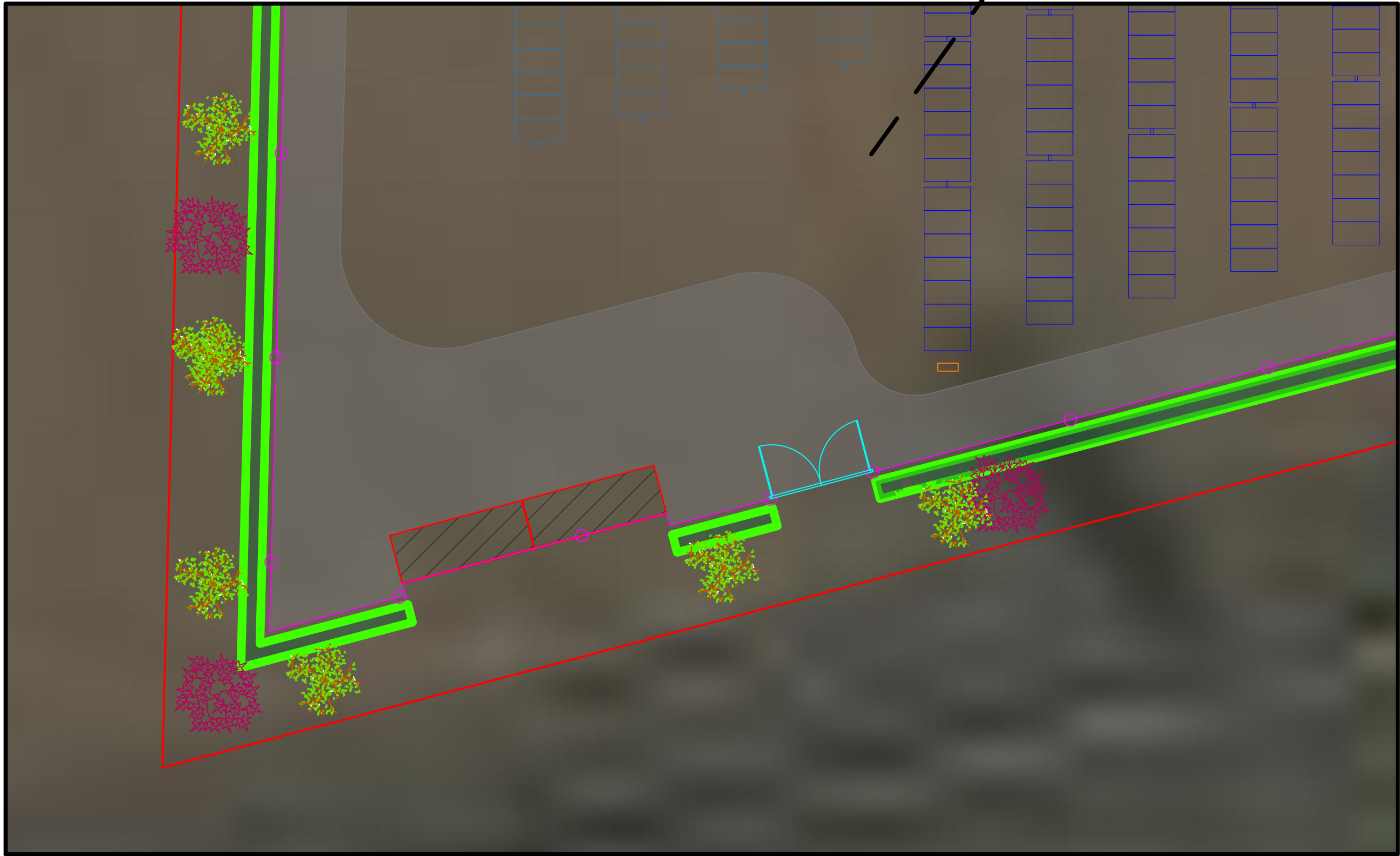
Progettisti:  
**human capital** HC Human Capital Srl  
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**(studio next.)** Studio Next Srls  
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Fascia arborea  
orientata nel senso del  
corridoio ecologico -  
larghezza 50m



LEGENDA OPERE DI MITIGAZIONE

- ROSA CANINA
- GINESTRA
- CRESPINO
- SAMBUCO
- BIANCOSPINO
- ACERO
- FRASSINO

LEGENDA

- VIABILITA' PRINCIPALE
- FASCE DI MITIGAZIONE DA PIANTUMARE
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PROCEDURA ABILITATIVA SEMPLIFICATA (P.A.S.)  
art. 6 D.Lgs. 28/2011

SETTEMBRE 2024

Elaborato:  
A.05.b - Elaborati generali impianto - dettaglio mitigazione

Committente:  
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Distribuzione della vegetazione arbustiva nel perimetro



Biancospino



Crespino



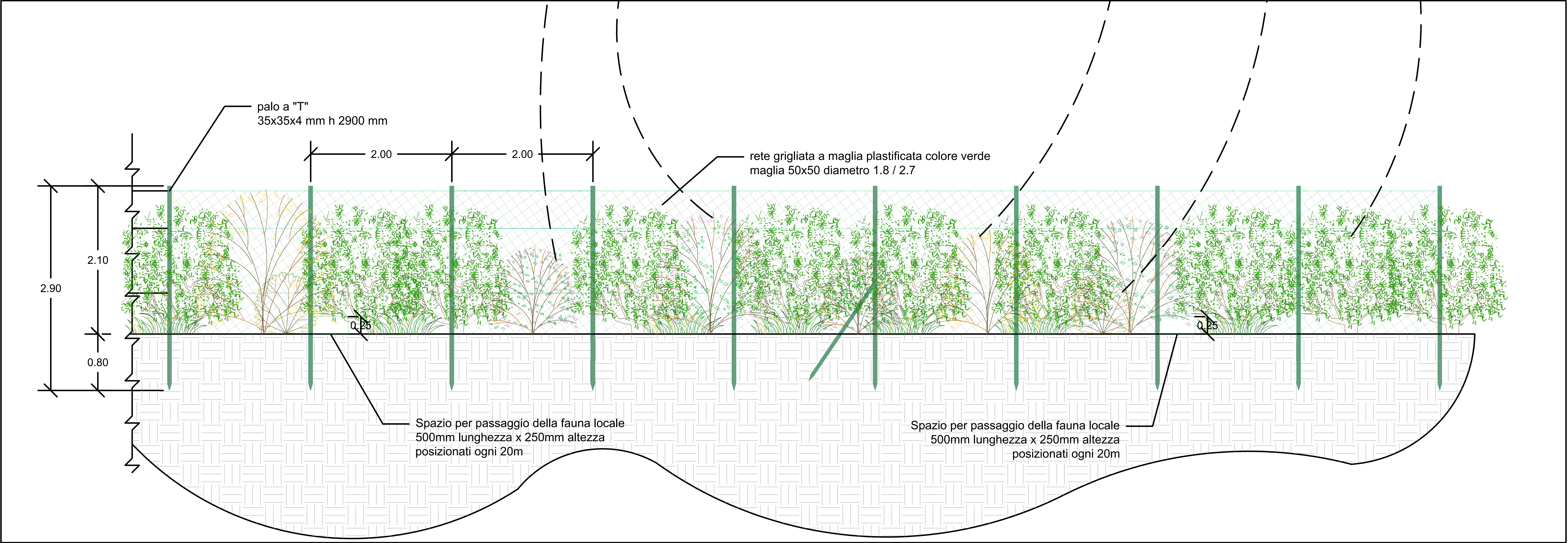
Rosa canina



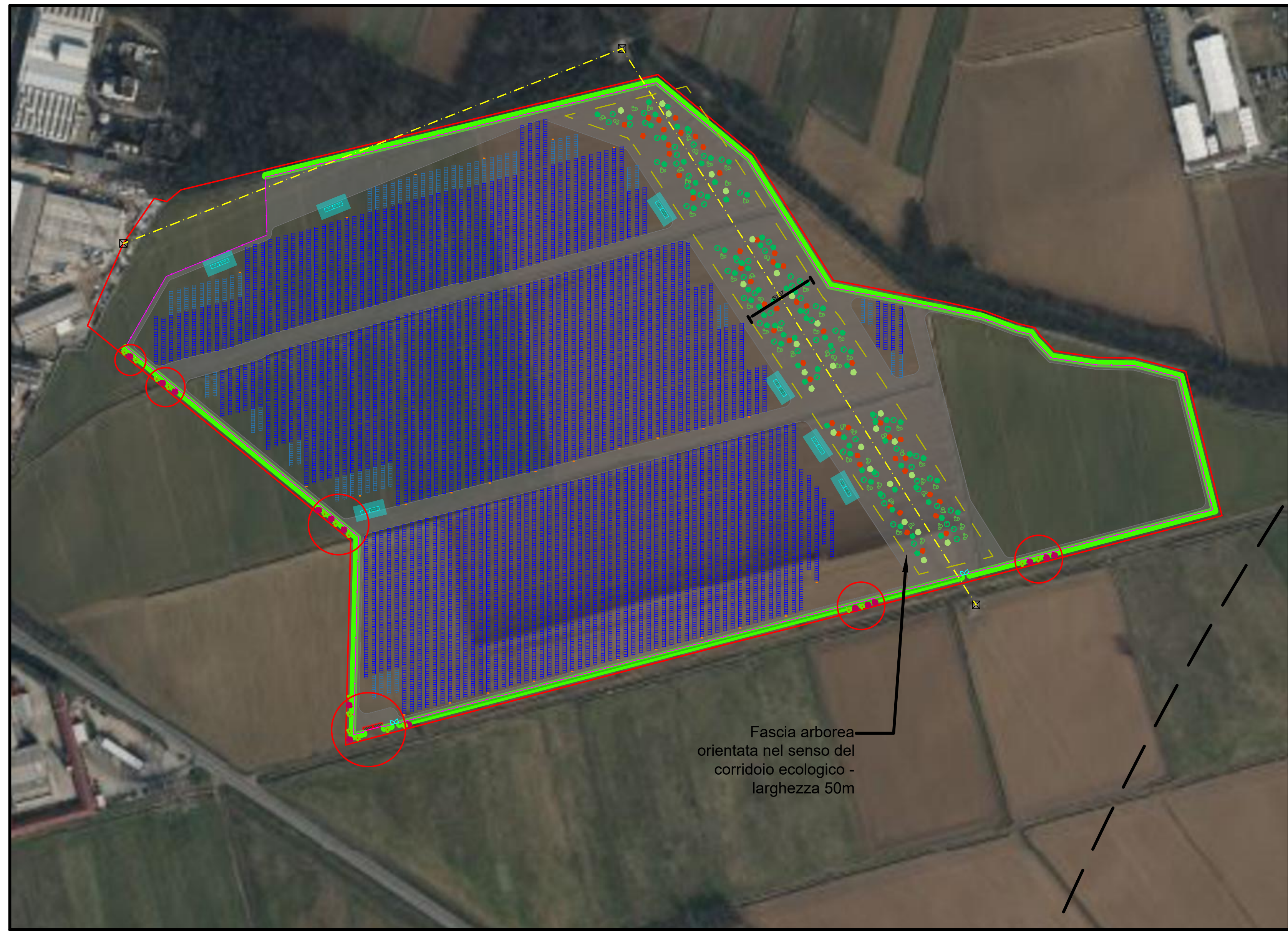
Ginestra



Lauroceraso







Aree con presenza di vegetazione arborea



Biancospino



Crespino



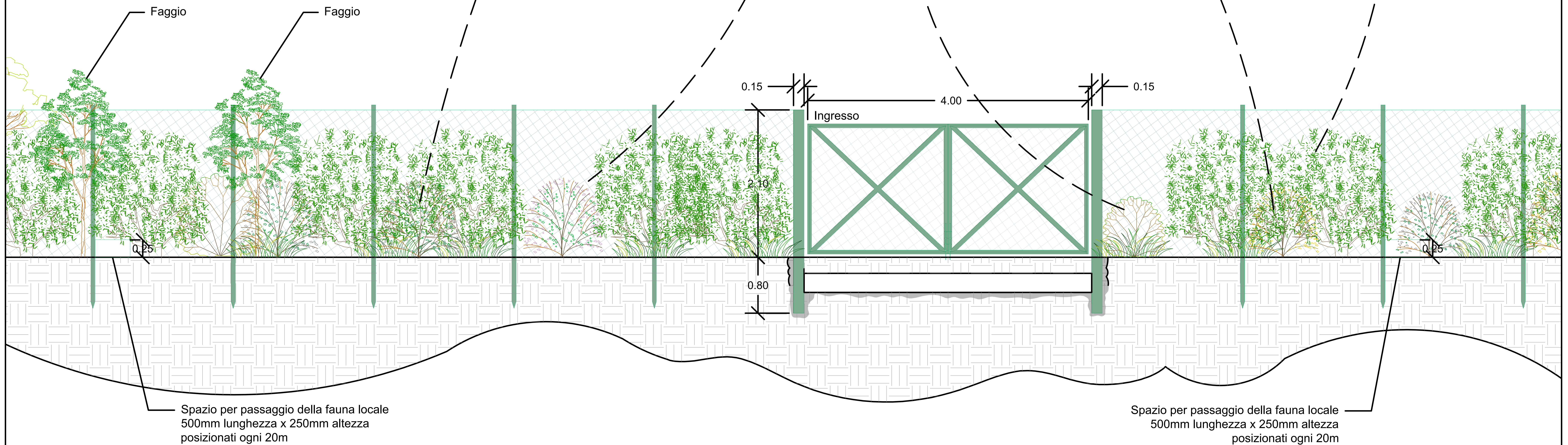
Rosa canina



Ginestra

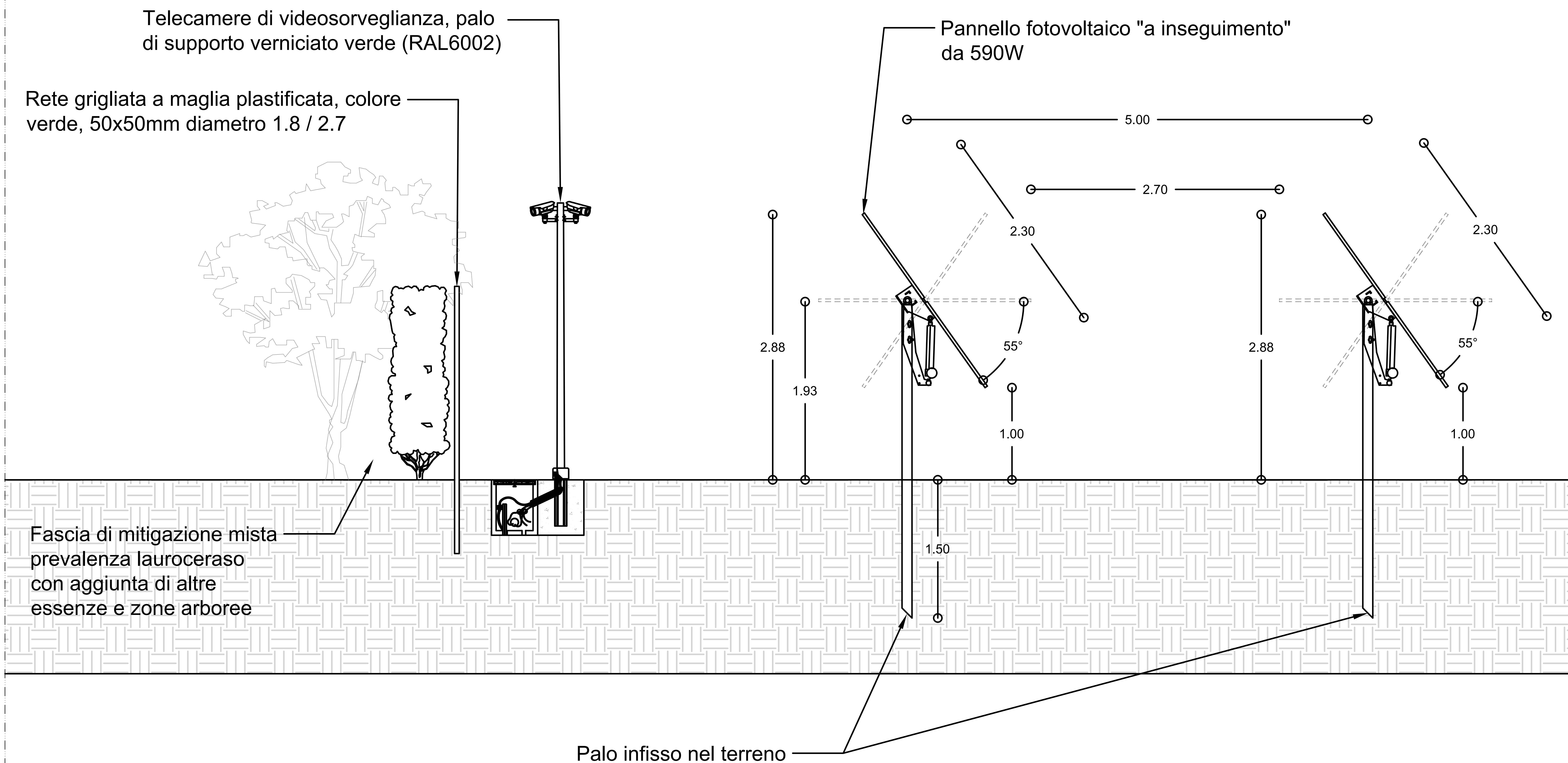


Lauroceraso



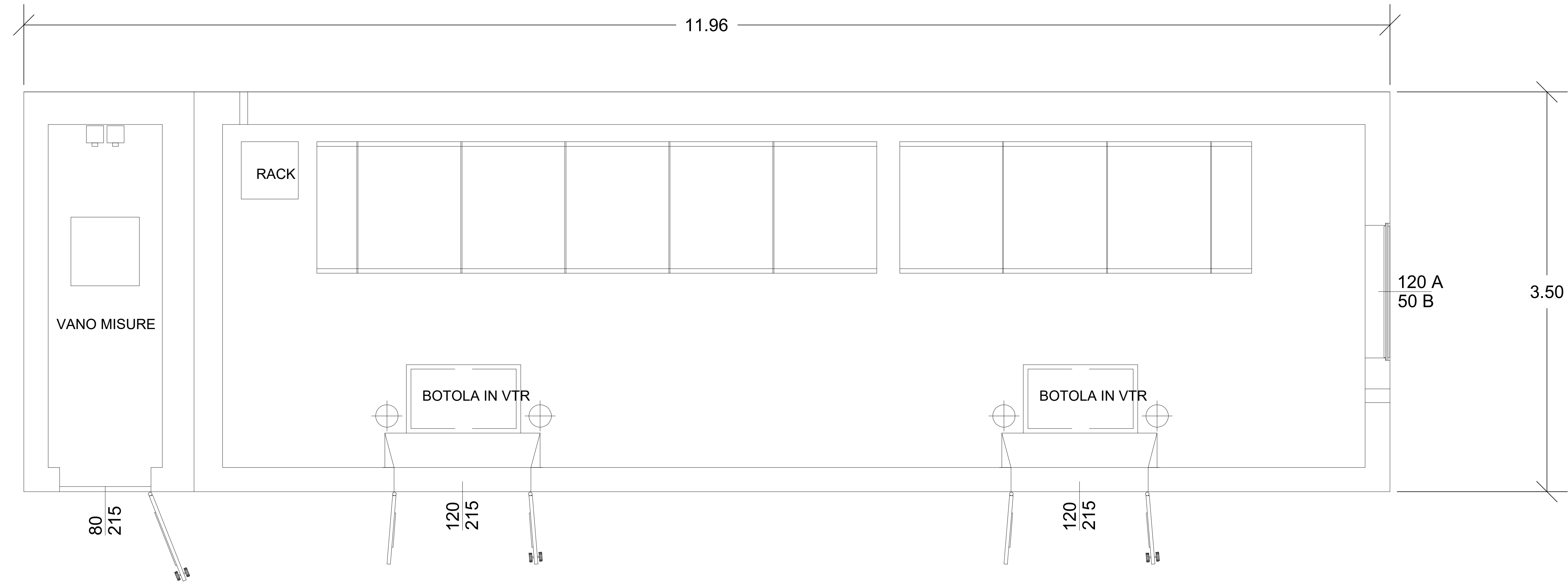


# SEZIONE





Lato D

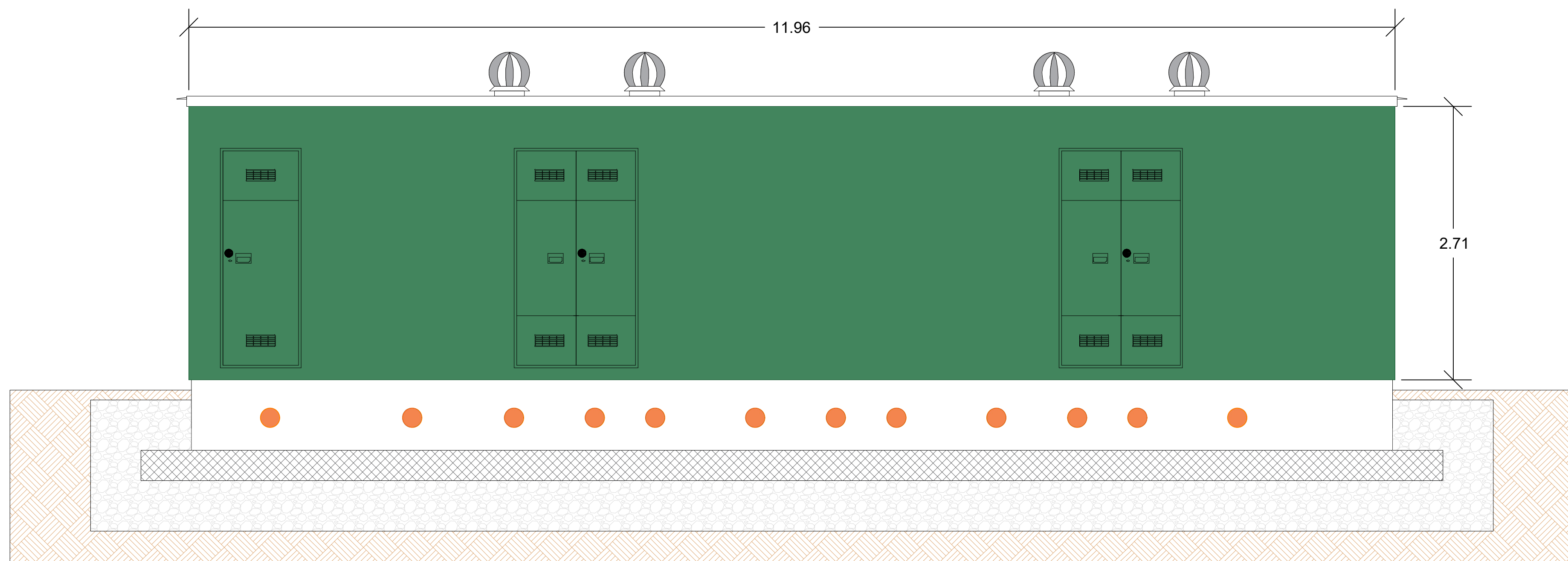


Lato B

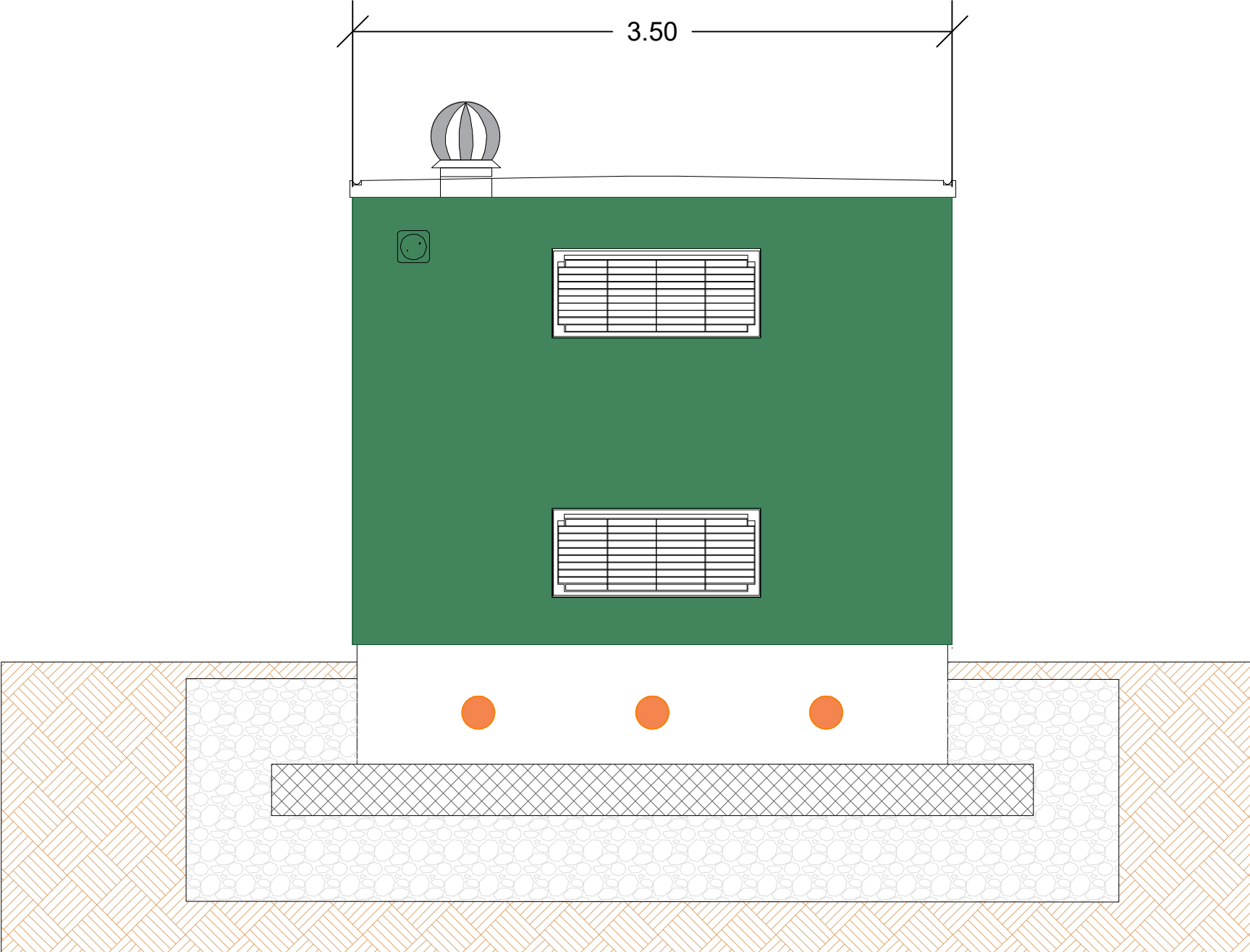
Lato A



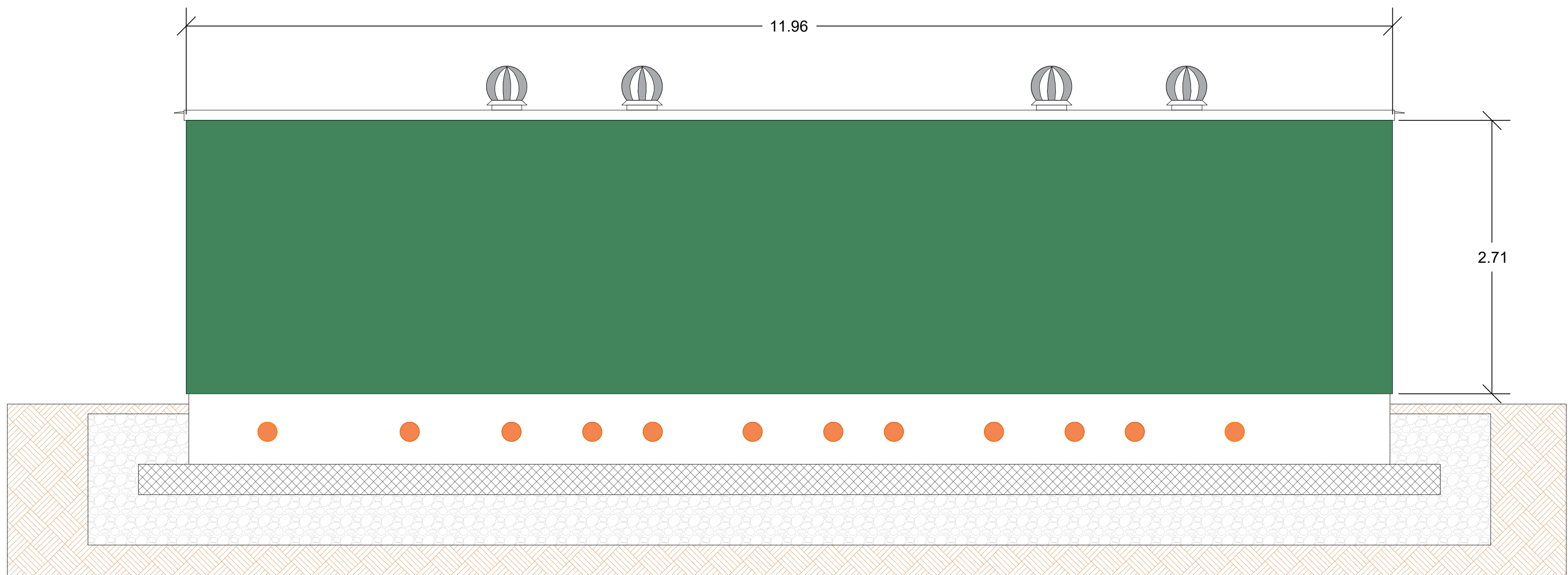
Prospetto lato A



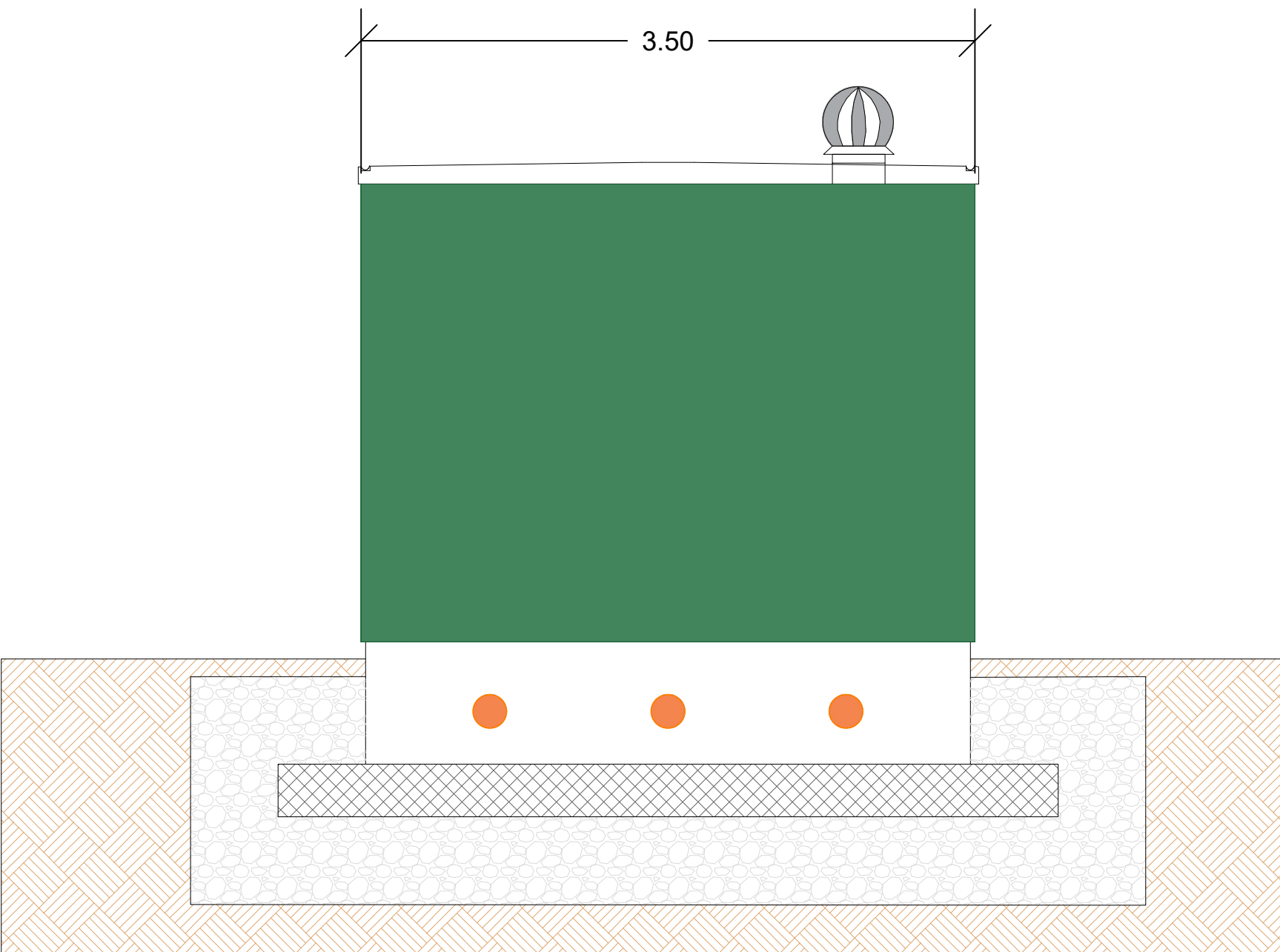
Prospetto lato B



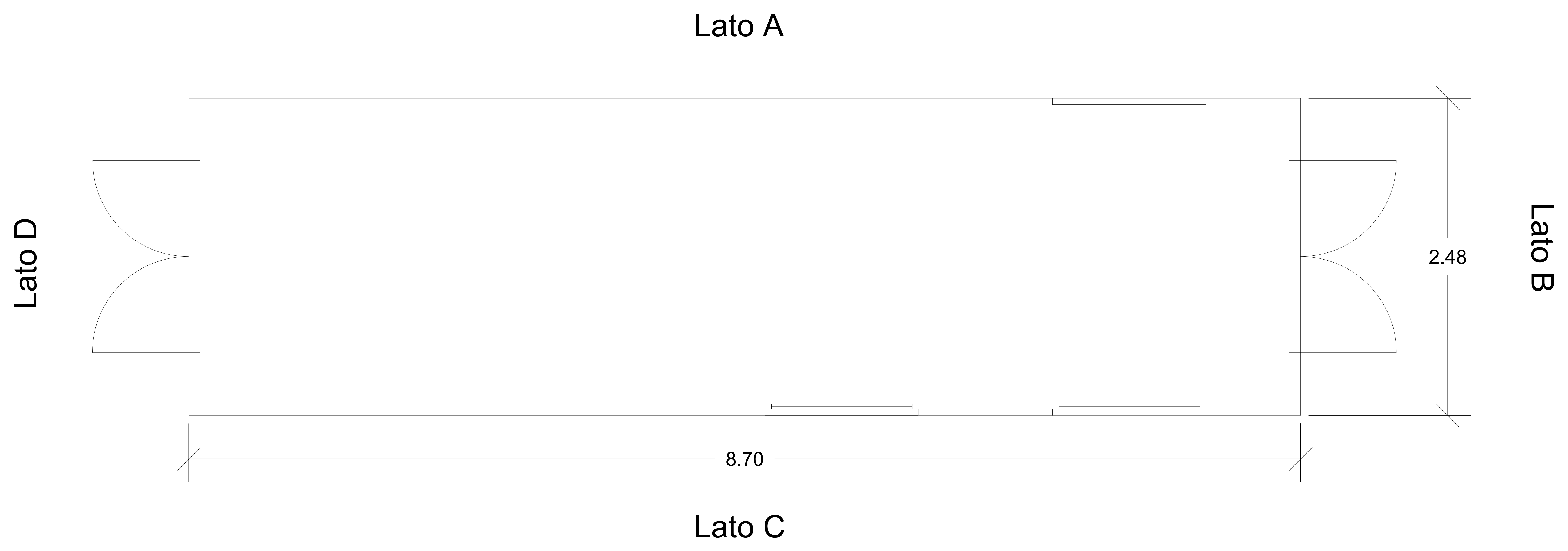
Prospetto lato C



Prospetto lato D

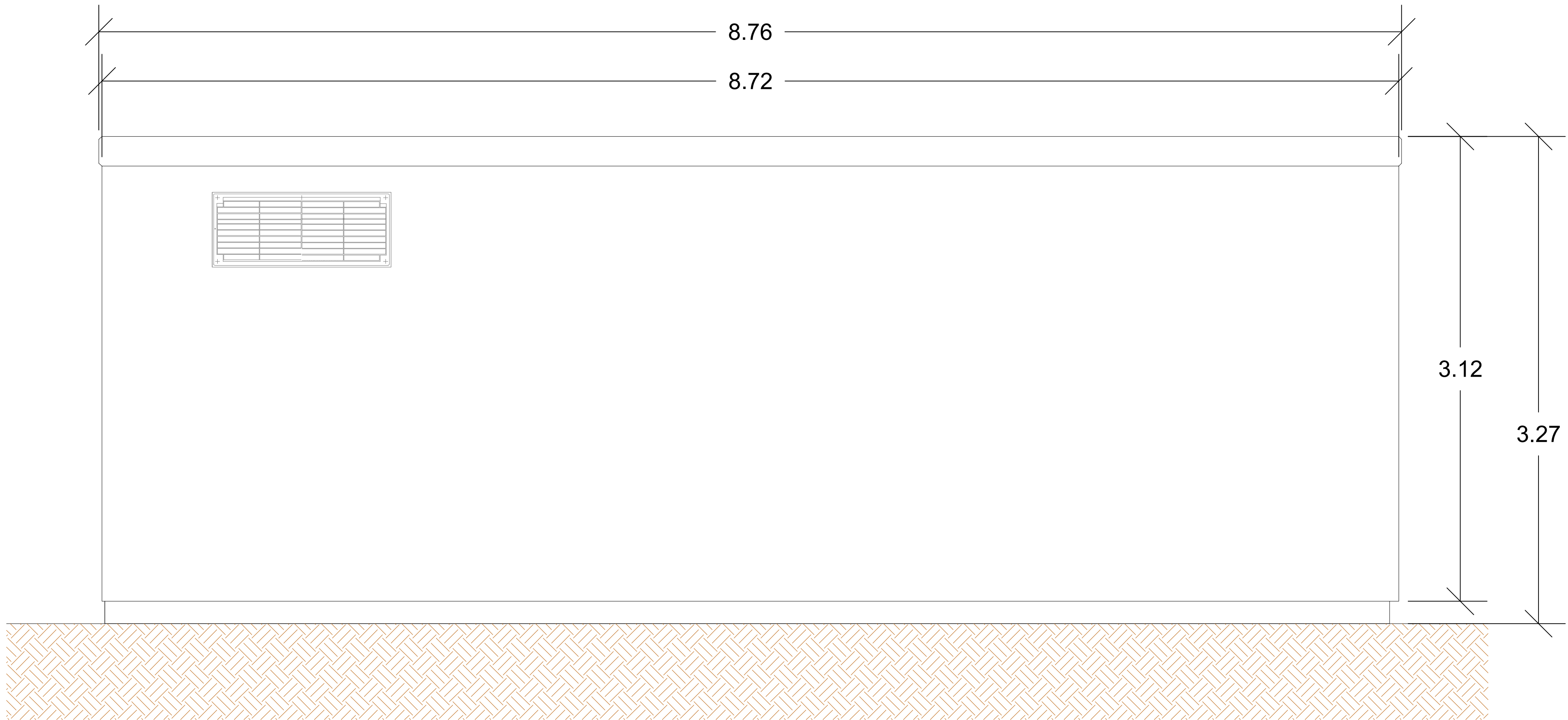




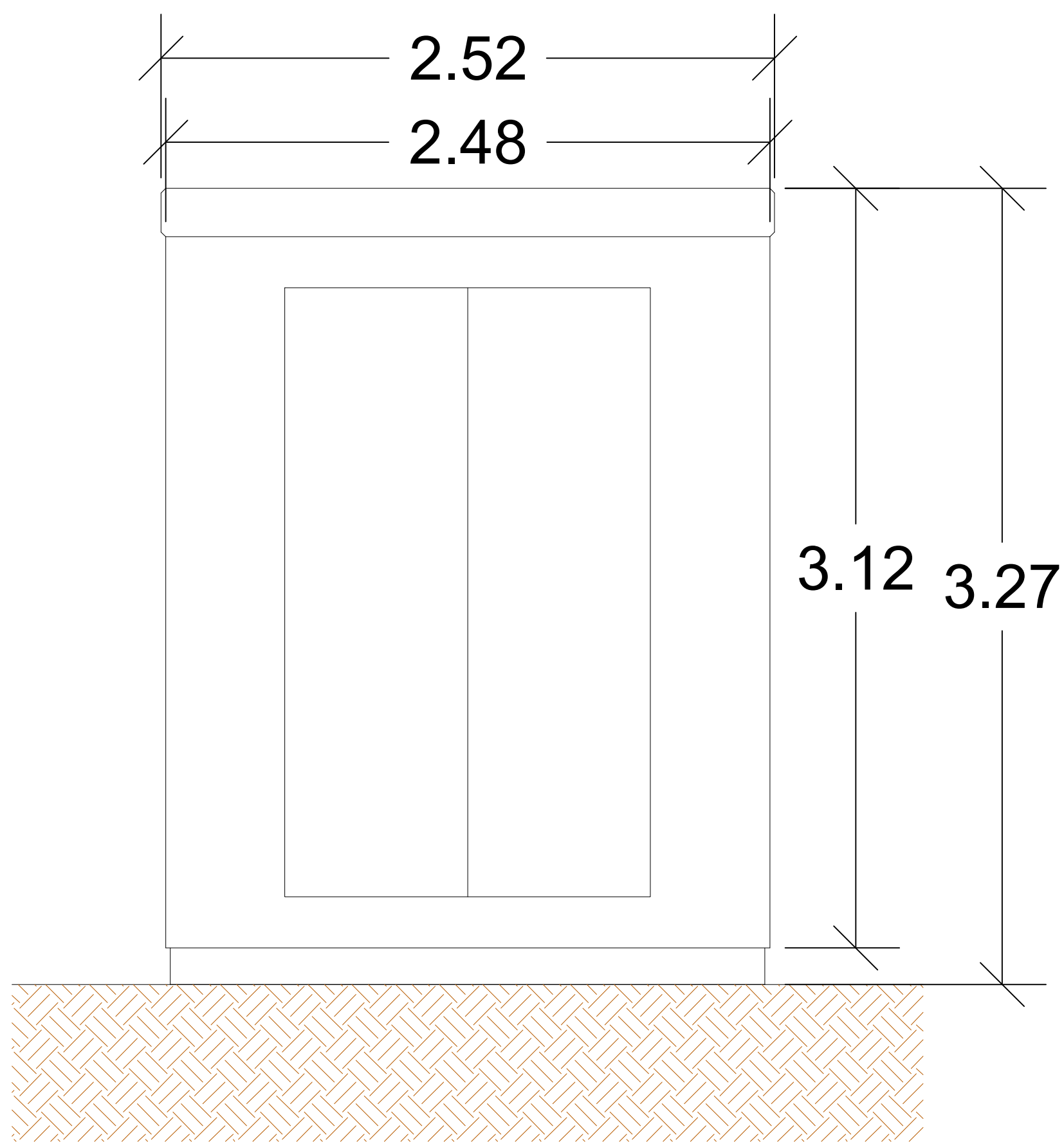




Prospetto lato A



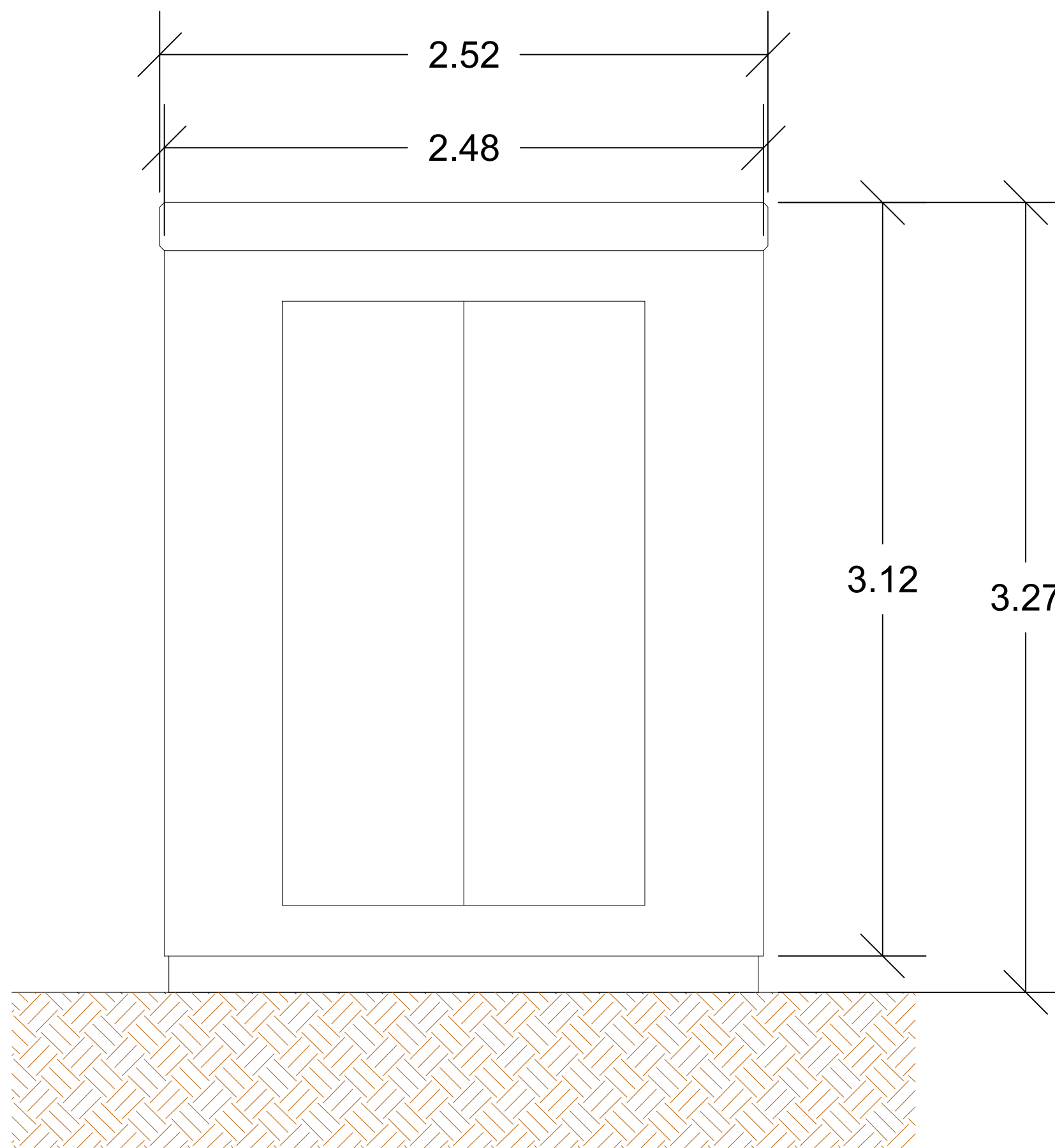
Prospetto lato B



Prospetto lato C



Prospetto lato D





# SUN2000-330KTL-H1

## Output Characteristics Curve



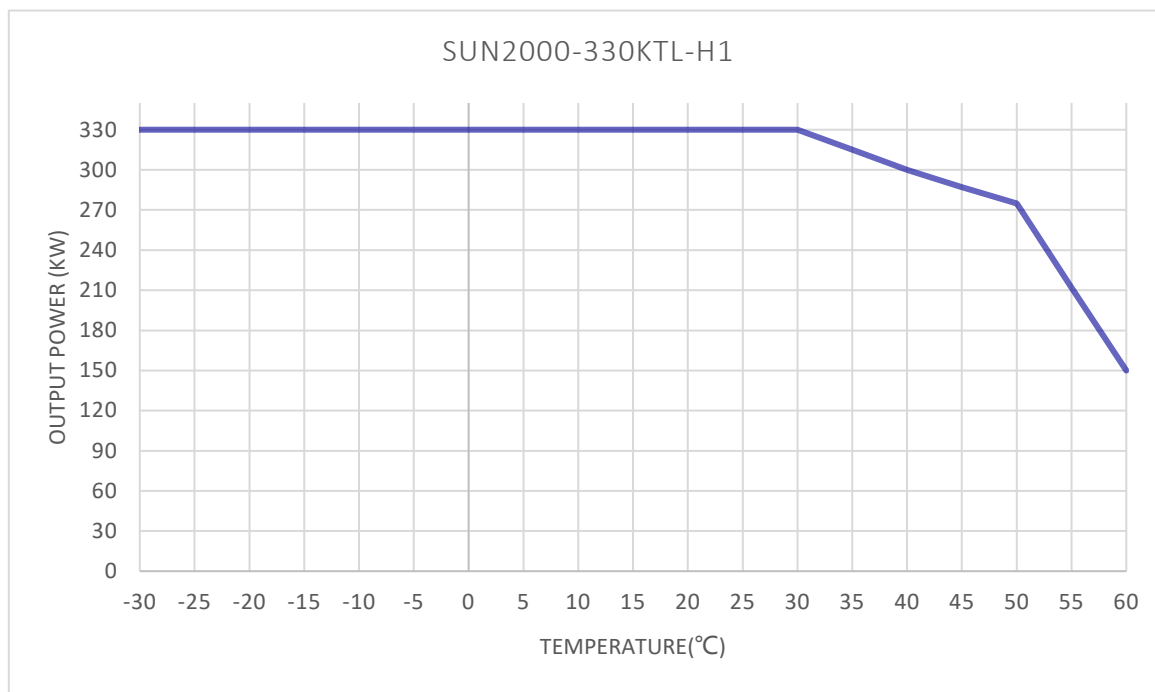
**Huawei Technologies Co., Ltd.**

Version	Created by	Date	Remarks
01	HUAWEI	22/08/2022	Preliminary
02	HUAWEI	30/09/2022	Add DC voltage Derating Curve



## Power De-rating Curve VS. Ambient Temperature

Power De-rating Curve VS. Ambient Temperature of SUN2000-330KTL-H1:



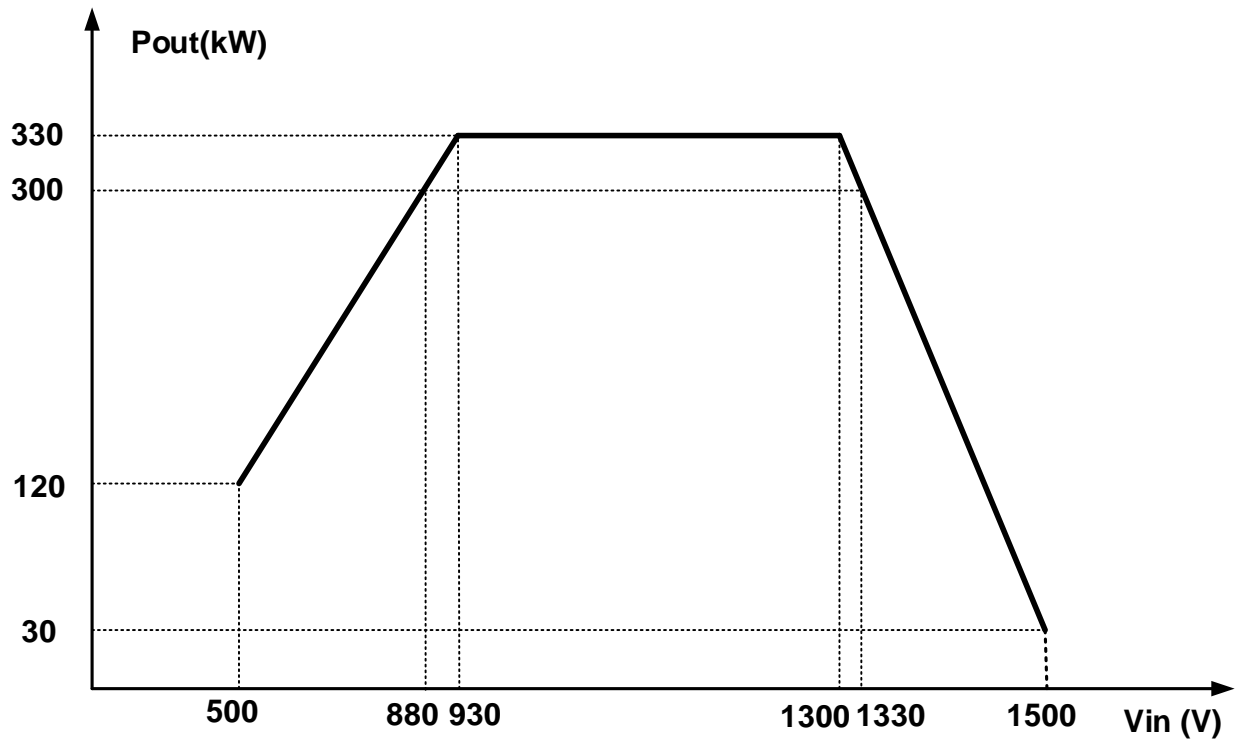
Grid Voltage: 800Vac, PF=1, output power under specific DC working voltage

Model	-30° C	-25° C	-20° C	-15° C	-10° C	-5° C	0° C	5° C	10° C	15° C
SUN2000-330KTL-H1	330 kW	330 kW	330 kW	330 kW	330 kW	330 kW	330 kW	330 kW	330 kW	330 kW
	20° C	25° C	30° C	35° C	40° C	45° C	50° C	55° C	60° C	
	330 kW	330 kW	330 kW	315 kW	300 kW	287 kW	275 kW	212 kW	150 kW	



## Power- DC Input Voltage Curve

Power-DC Input Voltage Curve of SUN2000-330KTL-H1



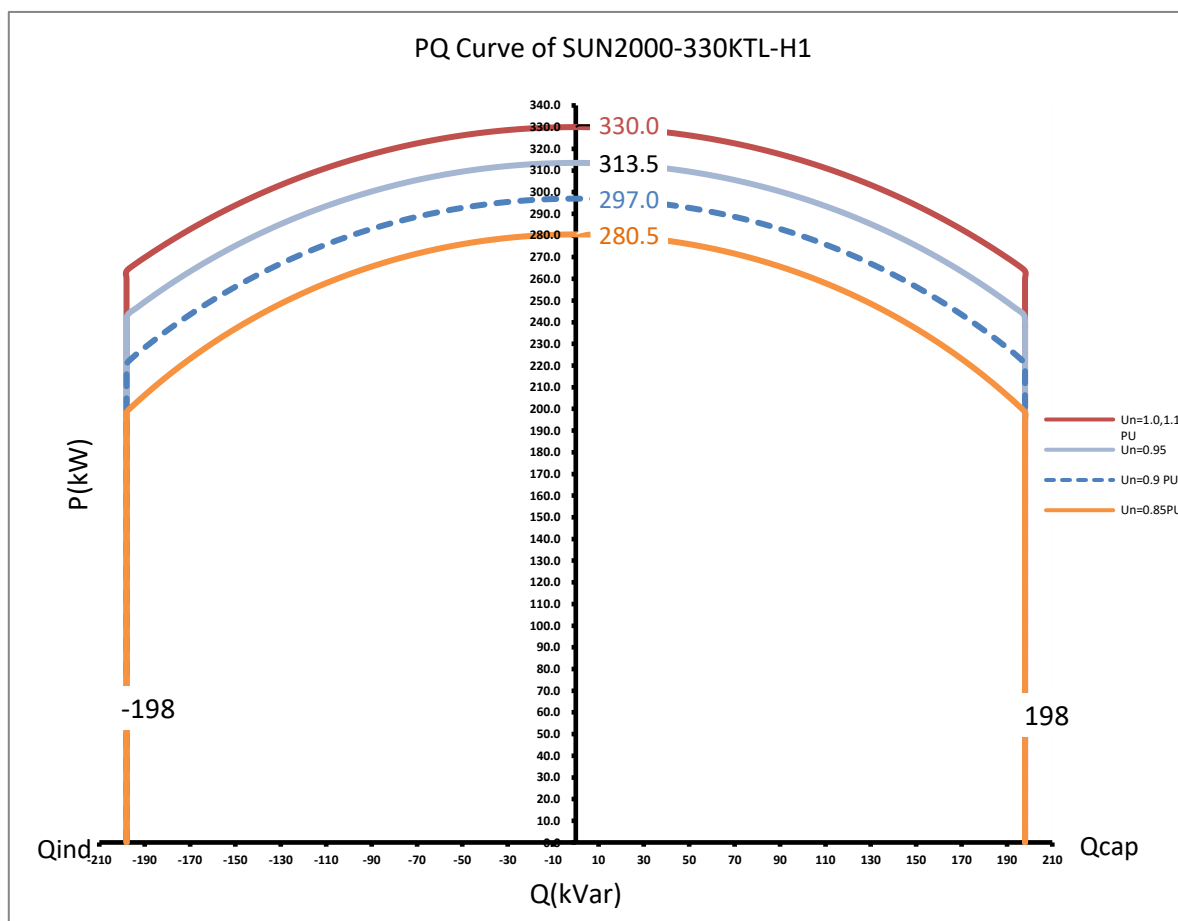
**Note:**

The power-DC input voltage curve is shaped when PF equals 1.0.



## P-Q Curve

P-Q Curve of SUN2000-330KTL-H1



### Note:

When SUN2000-330KTL-H1 operates at grid voltage 1.1 p.u./1.0 p.u., the output power can reach 330 kW (when PF=1) or 330 kVA.

When SUN2000-330KTL-H1 operates at grid voltage 0.95 p.u., the output power can reach 313.5 kW (when PF=1) or 313.5 kVA.

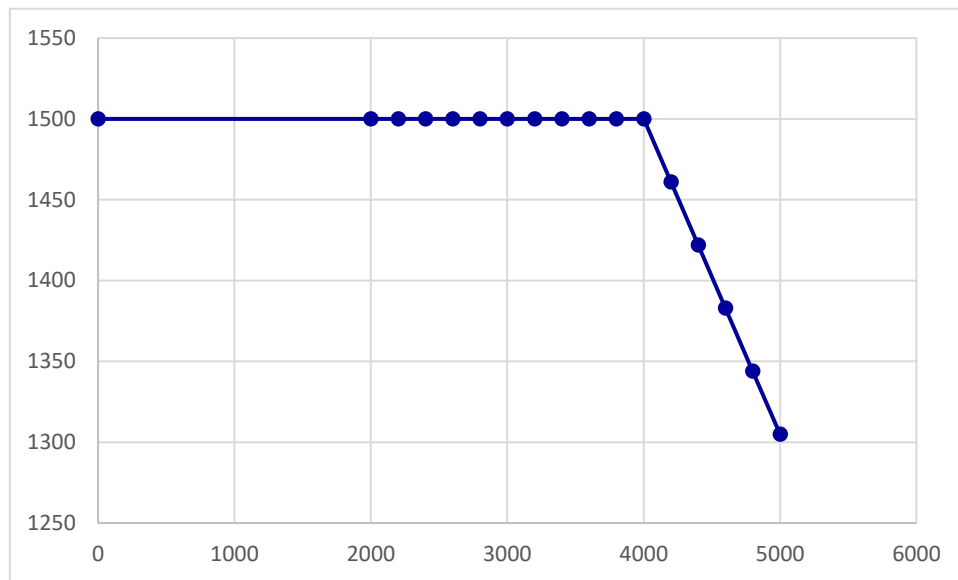
When SUN2000-330KTL-H1 operates at grid voltage 0.9 p.u., the output power can reach 297 kW (when PF=1) or 297 kVA.

When SUN2000-330KTL-H1 operates at grid voltage 0.85 p.u., the output power can reach 280.5 kW (when PF=1) or 280.5 kVA.



## DC Voltage Curve VS. Altitude

DC Voltage Curve of SUN2000-330KTL-H1:



### Note:

The power of SUN2000-330KTL-H1 inverter doesn't derate when altitude  $\leq 4000$  m.

When altitude  $> 4000$  m, DC voltage derating should be taken into consideration and DC voltage derates in accordance with 20 V/100 m.

The rated AC voltage (800 V) of the SUN2000 inverter doesn't derate when altitude  $\leq 5000$  m.





# TWMND-72HD560-590W

N-type Half-cell Bifacial Module (72)

## PRODUCT FEATURES



High Power Output  
Low LCOE



Maximum Power  
590W+



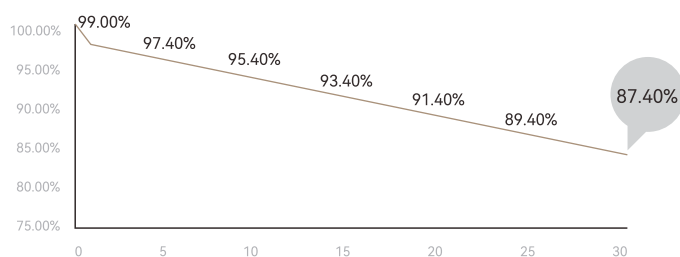
High  
Reliability



Low  
LID

## POWER WARRANTY

1st year <1%, 0.4% power degradation per year from 2 to 30 years



12-year Warranty for Materials



30-year Warranty for Linear Power Output

## MANAGEMENT SYSTEM AND PRODUCT CERTIFICATION

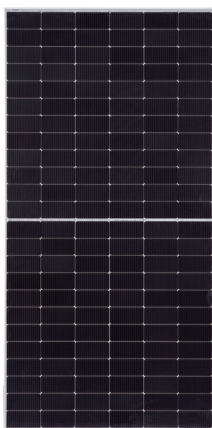
ISO9001: 2015/Quality Management System

ISO14001: 2015/Environment Management System

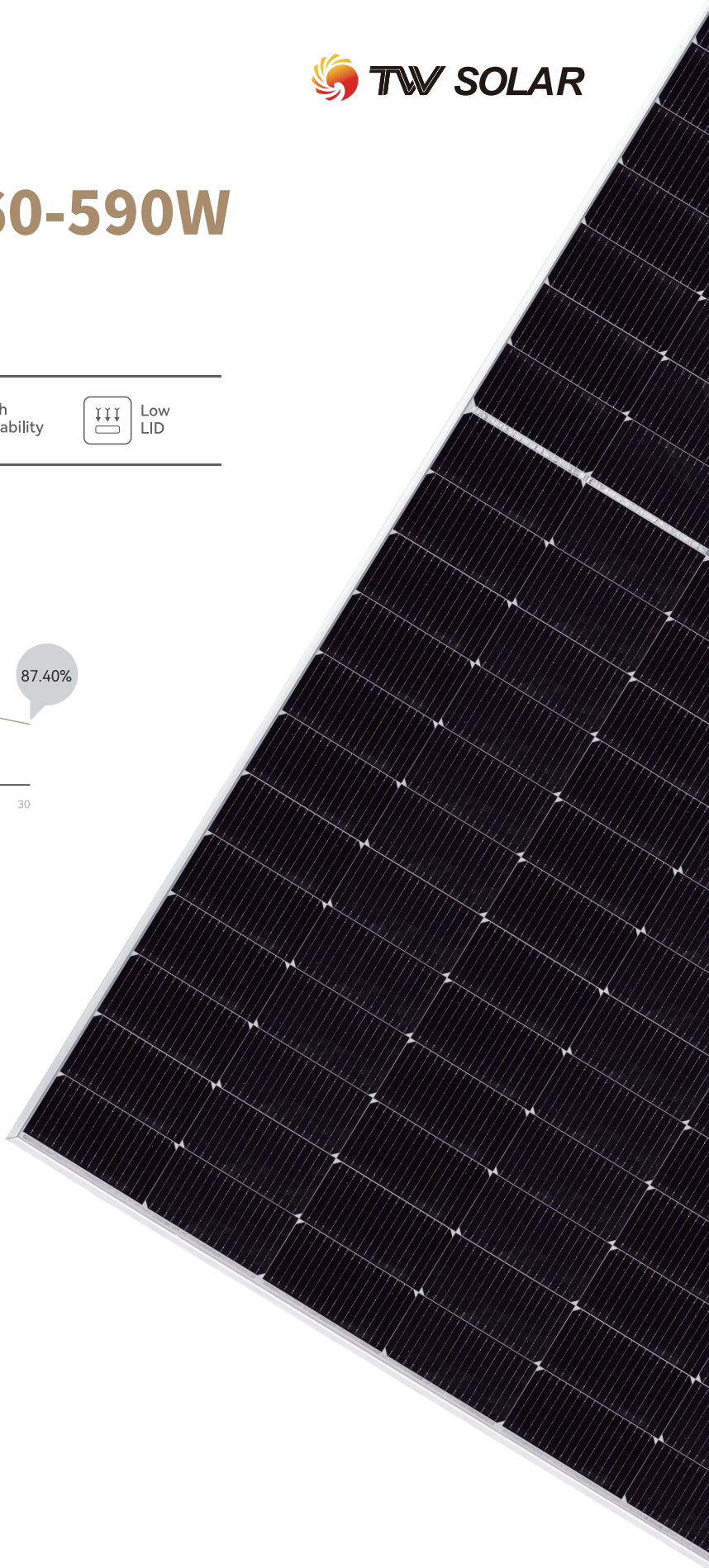
ISO45001: 2018/Occupational Health and Safety Management System



Front



Side





## Electrical Characteristics (STC)

Module Type: TWMND-72HDXXX							
Maximum Power: P <sub>max</sub> [W]	560	565	570	575	580	585	590
Open Circuit Voltage: V <sub>oc</sub> [V]	50.84	51.04	51.24	51.44	51.64	51.84	52.04
Short Circuit Current: I <sub>sc</sub> [A]	14.13	14.17	14.21	14.25	14.29	14.33	14.37
Voltage at Maximum Power: V <sub>mp</sub> [V]	42.48	42.68	42.88	43.08	43.28	43.48	43.68
Current at Maximum Power: I <sub>mp</sub> [A]	13.18	13.24	13.29	13.35	13.40	13.46	13.51
Module Efficiency: η [%]	21.7	21.9	22.1	22.3	22.5	22.6	22.8
STC: Irradiance 1000W/m <sup>2</sup> , Cell Temperature 25°C, Air Mass1.5, Measuring Tolerance: ±3%							

## Electrical Characteristics (NMOT)

Maximum Power: P <sub>max</sub> [W]	421.1	424.8	428.6	432.4	436.1	439.9	443.7
Open Circuit Voltage: V <sub>oc</sub> [V]	48.29	48.48	48.67	48.86	49.05	49.24	49.43
Short Circuit Current: I <sub>sc</sub> [A]	11.42	11.47	11.52	11.56	11.60	11.63	11.66
Voltage at Maximum Power: V <sub>mp</sub> [V]	39.84	39.89	39.95	40.00	40.19	40.37	40.56
Current at Maximum Power: I <sub>mp</sub> [A]	10.56	10.63	10.70	10.78	10.85	10.90	10.94
NMOT: Irradiance 800W/m <sup>2</sup> , Ambient Temperature 20°C, Air Mass1.5, Wind Speed 1m/s							

## Electrical characteristics with different rear side power gain

5%	Maximum Power: P <sub>max</sub> [W]	588.0	593.3	598.5	603.8	609.0	614.3	619.5
	Module Efficiency: η [%]	22.8	23.0	23.2	23.4	23.6	23.8	24.0
15%	Maximum Power: P <sub>max</sub> [W]	644.0	649.8	655.5	661.3	667.0	672.8	678.5
	Module Efficiency: η [%]	24.9	25.2	25.4	25.6	25.8	26.0	26.3
25%	Maximum Power: P <sub>max</sub> [W]	700.0	706.3	712.5	718.8	725.0	731.3	737.5
	Module Efficiency: η [%]	27.1	27.3	27.6	27.8	28.1	28.3	28.5

## Temperature Ratings

Temperature Coefficient (P <sub>max</sub> )	-0.30%/°C
Temperature Coefficient (V <sub>oc</sub> )	-0.25%/°C
Temperature Coefficient (I <sub>sc</sub> )	0.046%/°C
NMOT	45±2°C

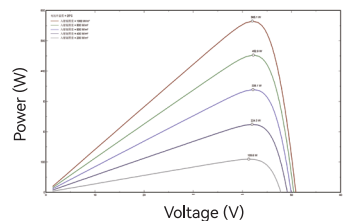
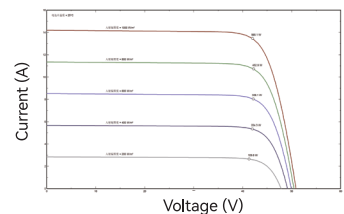
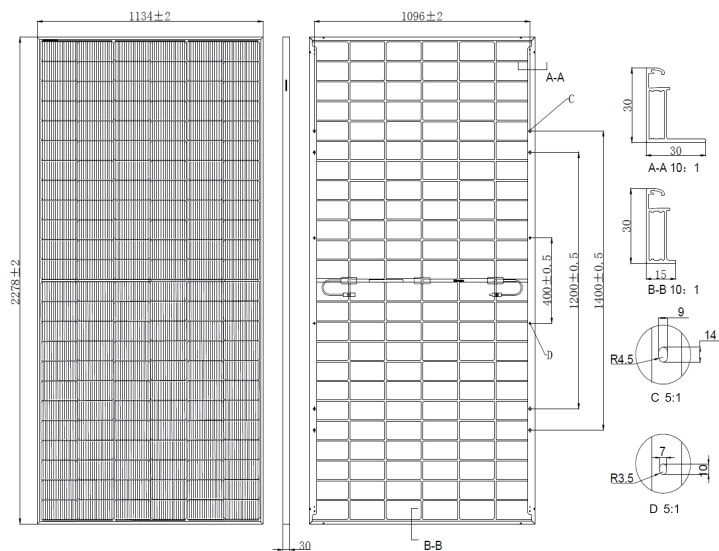
## Mechanical Parameters

Cells	TNC
Cell Orientation	144[6X24]
Dimension	2278±2 X1134±2X30mm
Weight	32.7kg
Front Glass	2.0mm high transmittance, AR coated tempered glass
Rear Glass	2.0mm high transmittance, coated tempered glass
Frame	Anodized aluminum alloy frame
Junction Box	IP68, 3 diodes
Output Cable	4.0mm <sup>2</sup>
Cable Length	+400mm, -200mm, length can be customized
Wind/Snow Load	2400Pa/5400Pa
Packaging	36pcs per pallet, 720pcs per 40'HC

## Operating Parameters

Operational Temperature	-40°C~+85°C
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	30A
Power Output Tolerance	0~+5W
Maximum Bifaciality	80±5%

## Drawings (Unit: mm)





# CONVERT-1P

## SINGLE-AXIS SOLAR TRACKER | 1-IN-PORTRAIT



### Easy to Install. Easy to Own.

The modular design and superior engineering of Valmont® Solar Convert-1P Trackers make them simple to install, easy to maintain and built for long-term performance.



**Simple, Robust Table Structure Design** | Short rows provide best-in-class terrain following and layout density while enabling a stiff structure that minimizes failures and decreases long-term costs.



**Innovative, Hybrid Controller Architecture** | The wireless controller utilizes existing DC infrastructure to enable backup capabilities instead of failure-prone batteries or the need for auxiliary modules.



**Global Supply Chain, Highest Quality** | With 85 manufacturing facilities on six continents, Valmont has the footprint and capability to ship the highest-quality product while offering unmatched price stability and availability.



**International, Bankable Product Portfolio** | The Convert-1P Single-Axis Solar Trackers have been deployed in 11 countries on four continents, generating over 3.5GW for leading customers, financiers and partners.



**THE IDEAL SOLUTION FOR:**  
Distributed Generation Projects  
Utility-Scale Projects



## STRUCTURAL/MECHANIC FEATURES

<b>Tracking Technology</b>	Horizontal, balanced single-axis tracker with independently driven rows and backtracking
<b>Maximum Tracking Error<sup>1</sup></b>	Up to $\pm 20$ mm horizontally in all directions ; up to $\pm 5^\circ$ twist ; up to $\pm 2^\circ$ out-of-plumb
<b>Rotation Angle</b>	$110^\circ (\pm 55^\circ) / 80^\circ (\pm 40^\circ)$
<b>Module Compatibility</b>	Adaptable to all available PV modules types on market: Monofacial and Bifacial (thin film, framed and frameless)
<b>Ground Cover Ratio</b>	Fully configurable; typical range from 30% to 50%
<b>Terrain Flexibility</b>	Up to 5% N-S standard, configurable up to 15% with extended pile length
<b>Configurations</b>	1 module in portrait

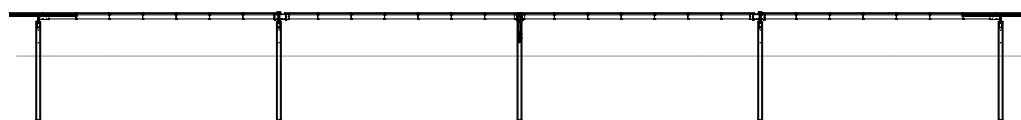
## ELECTRONIC SPECIFICATIONS

<b>Motor</b>	Linear actuator with induction AC motor (lubrication free) with integrated encoder
<b>System</b>	Electronic control boards for multiple system architectures (two solutions 10 or 100 actuators in closed loop with encoder)
<b>Power Supply</b>	<ul style="list-style-type: none"> <li>AC power supply from auxiliary service</li> <li>In-house combiner boxes with 5, 6 or 8 lines options</li> <li>Smart power integration with string inverters</li> </ul>
<b>Operating Temperature Range</b>	$-20^\circ/50^\circ \text{ C}$
<b>Solar Tracking Method</b>	Astronomical clock with GPS input; self-configuring; no irradiation or tilt sensor required
<b>Monitoring &amp; Data Stream</b>	Wireless or wired (RS485, Ethernet, Fiber Optic)
<b>Communication</b>	Real-time local or remote communication data provided via Modbus

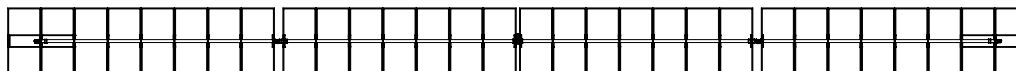
## INSTALLATION

<b>Foundation</b>	Compatible with all foundation types (driven pile, concrete)
<b>Installation Method</b>	Requires no specialized personnel or equipment; no in-field welding
<b>Module Installation Method</b>	Rivets or bolts
<b>Grounding Method</b>	Direct ramming, or pre-drilled solutions depending on geo-technical properties of the terrain
<b>Warranty</b>	10 years on structural components; 5 years on motors and electronic components (extended warranty available)

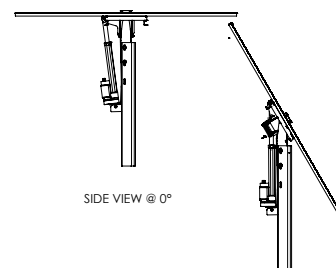
## EXAMPLE OF: TYPICAL TRACKER TABLE WITH 30 MODULES



FRONT VIEW @ 0°



TOP VIEW @ 0°



SIDE VIEW @ 0°

SIDE VIEW @ 55°

### QUALIFICATIONS & CERTIFICATES:

UL 2703  
UL 3707  
ISO 9001  
IEC 65817  
ISO 14001  
ISO 45001  
ISO 50001



1. when average terrain slope is below 5%



# SUN2000-330KTL-H1

## Smart String Inverter



Max. Efficiency  
≥99.0%



Smart Self Clean Fan



Smart DC Connector  
Temperature Detect



Smart String Level  
Disconnection



28 High Accuracy String  
Current Detect



Support IV diagnosis

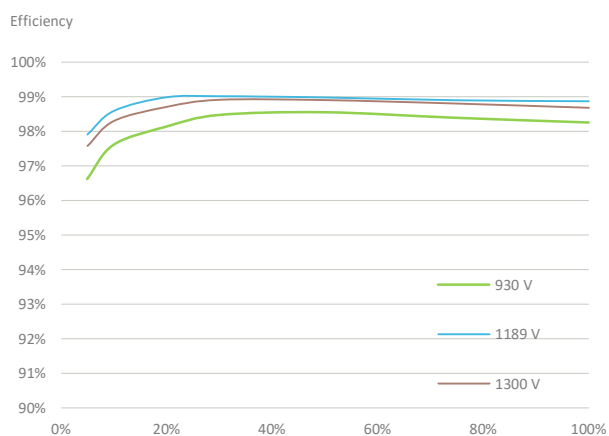


IP 66 protection

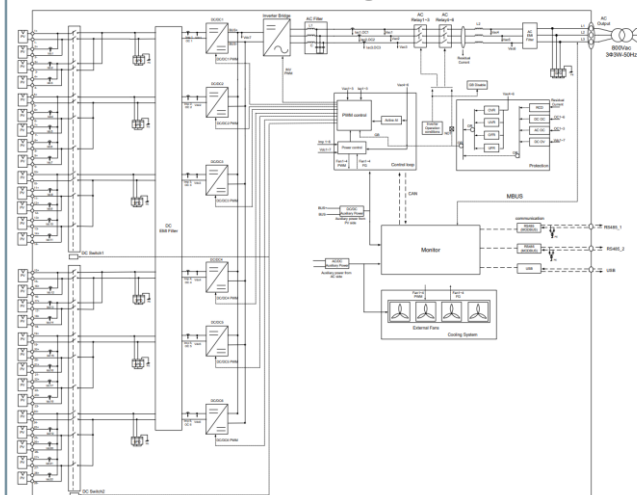


Surge Arresters for  
DC & AC

### Efficiency Curve



### Circuit Diagram





# Technical Specifications

Efficiency	
Max. Efficiency	≥99.0%
European Efficiency	≥98.8%
Input	
Max. Input Voltage	1,500 V
Number of MPP Trackers	6
Max. Current per MPPT	65 A
Max. Short Circuit Current per MPPT	115 A
Max. PV Inputs per MPPT	4/5/5/4/5/5
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
Output	
Nominal AC Active Power	300,000 W
Max. AC Apparent Power	330,000 VA
Max. AC Active Power (cosφ=1)	330,000 W
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	216.6 A
Max. Output Current	238.2 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Total Harmonic Distortion	< 1%
Protection	
Smart String-Level Disconnect(SSLD)	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
AC Grounding Fault Protection	Yes
Residual Current Monitoring Unit	Yes
Communication	
Display	LED Indicators, WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
General	
Dimensions (W x H x D)	1,048 x 732 x 395 mm
Weight (with mounting plate)	≤112 kg
Operating Temperature Range	-25 °C ~ 60 °C
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP 66
Topology	Transformerless