

CORAB WSC

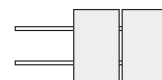


INSTALLATION INSTRUCTIONS

INSTALLATION MANUAL

free-standing system, two supports
 attached to the foundation
 modules vertical 10_{about}
 example for 15 and 30 modules

ground mounted system
attached to foundation
 vertical modules layout 10_{about}
 example for 15 and 30 modules



For modules with dimensions length 1670-1855 mm / width 1090-1135 mm *System dedicated*
 for the following module dimensions: 1670-1855 mm / width 1090-1135 mm



Tools needed for installation



Bezpieczeństwo
 Produkcja
 kontrolowana




www.tuv.com
 ID 000044726





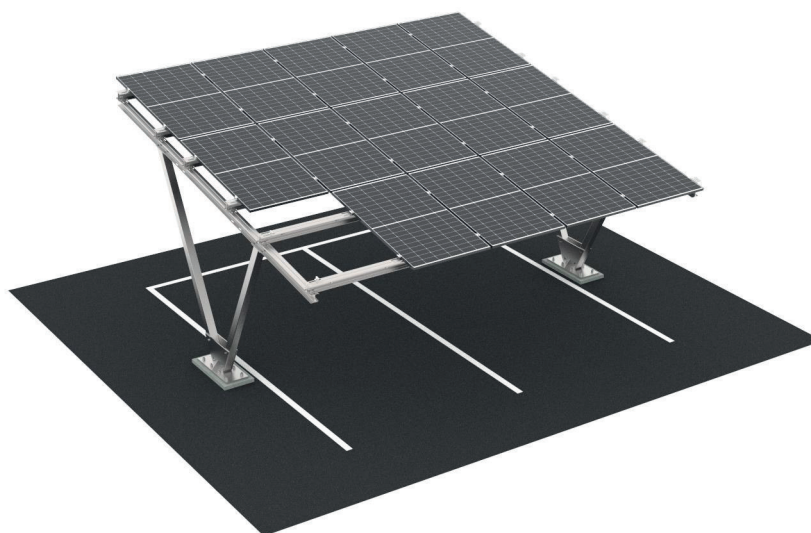
System
 zarządzania
 ISO 9001:2015

www.tuv.com
 ID 9105046721
















	size 6
	bits - Allen bits/ screwdriver bits
	screwdriver/screwdriver

	size 2 x 19 mm
	size 2 x 24 mm



Elements

LP		Index Index	Name Name	Tightening torque Tightening torque	Number of PV modules	
					15	30
22		XPF_M1067	M12 expansion washer Washer expanded	-	264 (240**)	432 (396**)
21		XPF_CP000N.1.0004	Reinforcing flat bar Reinforcing flat bar	-	- (8**)	- (12**)
20		M1070	Flexible washer M8 Safety washer M8	-	36	72
19		M485	M8x20 screw Screw M8x20	according to the photovoltaic module manufacturer's instructions according to the instructions of the PV module producer	12	24
18		M682	M8x55 screw Screw M8x55	according to the photovoltaic module manufacturer's instructions according to the instructions of the PV module producer	24	48
17		M635	M12 nut Nut M12	-	140	252
16		M882	Spring washer M12 Spring washer M12	-	140	252
15		M826	M12x30 screw Screw M12x30	57 Nm	140	252
14		X_M631*	M12 washer Washer M12	-	16 (40**)	72 (108**)
13		X_NAK00Z*	Hammer lock nut Hammer nut	-	36	72
12		Depends on the photovoltaic module. Depends on the PV module.	End clamp End clamp	-	12	24
11		XPF_KLX*	Middle clamp Middle clamp	-	24	48
10		M875	M16 nut Nut M16	-	8	12
9		M892	Spring washer M16 Spring washer M16	-	8	12
8		M1074	M16 washer Washer M16	-	16	24
7		M891	Screw M16x160 Screw M16x160	140 Nm	8	12
6		XPF_CP000N.5.0001	Horizontal beam connector	-	-	12
5		XPF_CP000N.2.XXXX*	Longitudinal rail Horizontal beam	-	12	24
4		XPF_CP000N.1.XXXX*	Diagonal rail Slanted beam	-	4	6
3		XPF_CP001.2.XXXX*	Rear support Rear support	-	2	3
2		XPF_CP001.3.XXXX*	Front support Front support	-	2	3
1		XPF_CP001.XXXX*	Support base Support base	-	2	3

* X and Z variable parts in the index.

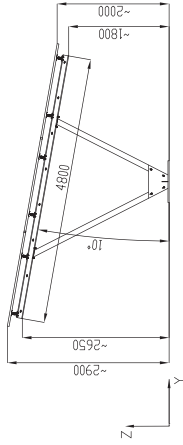
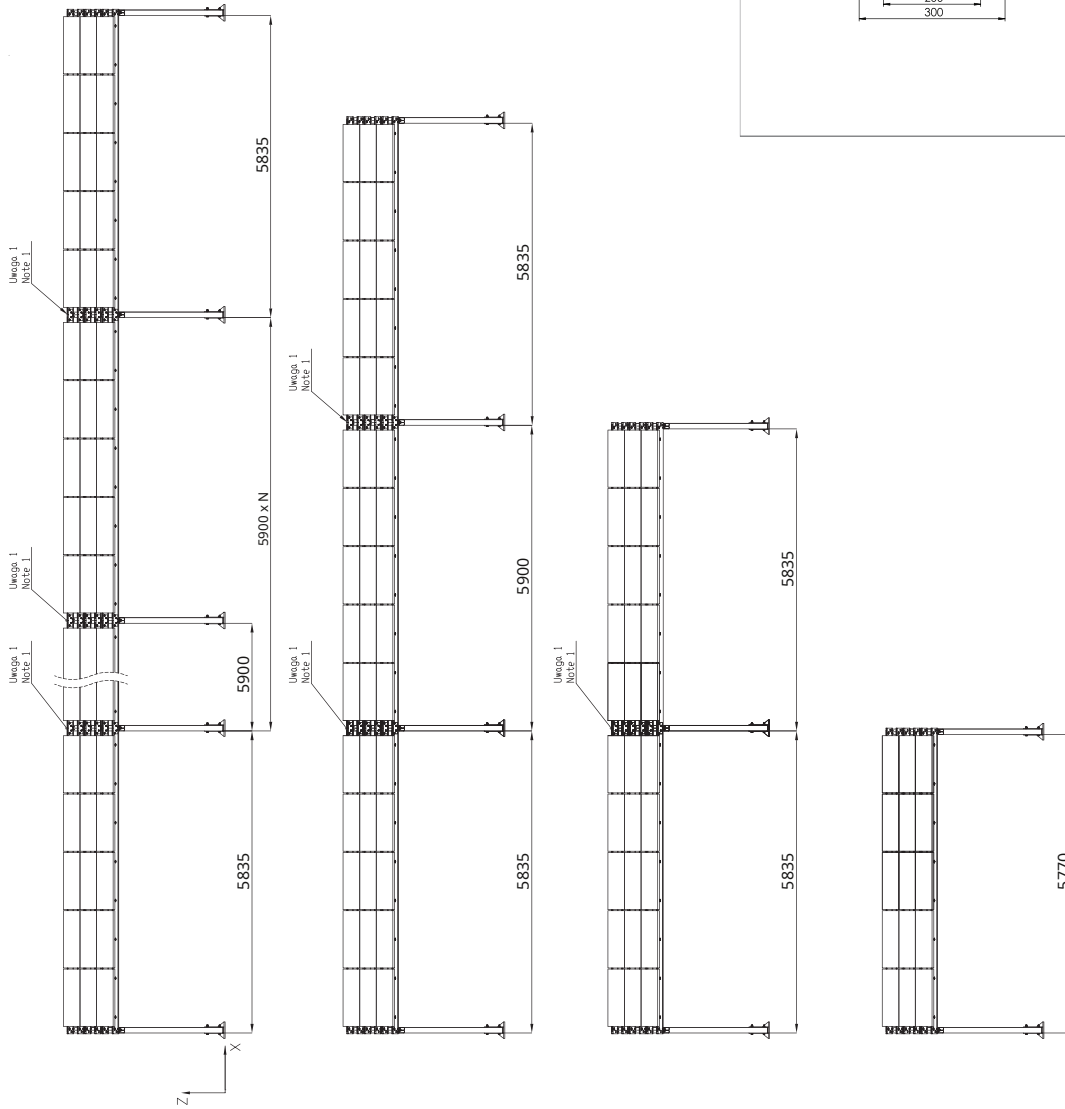
** Number of elements when the investment location is in the IV snow zone.

* X and Z parts of the variables in the index.

** Number of elements when the investment location is in snow zone IV.

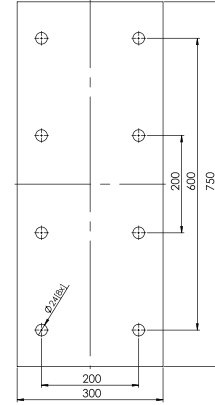
1

1 CARPORT for 2 cars / 1 CARPORT for 2 cars

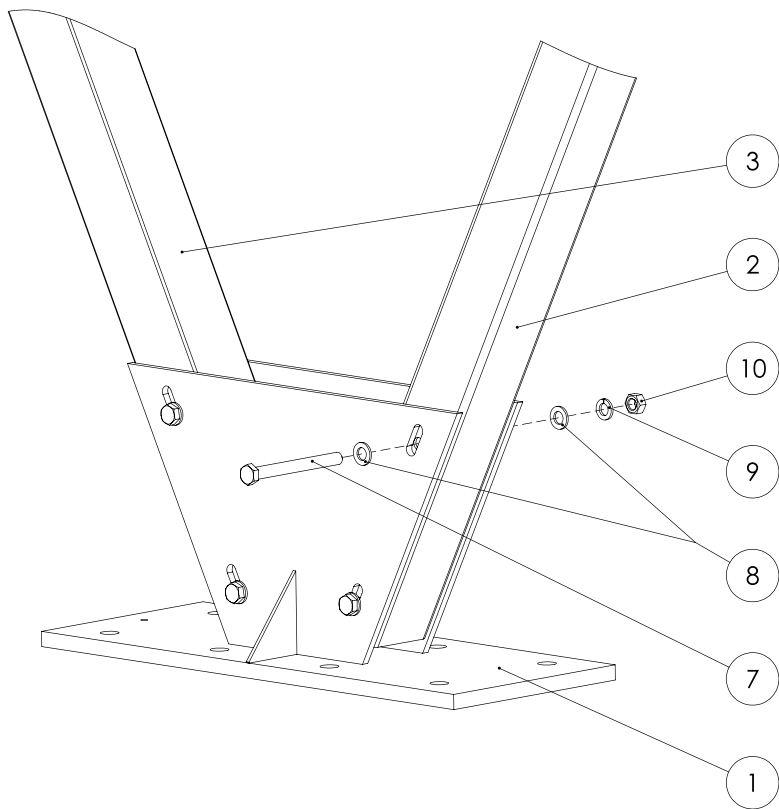


Support reactions Support reactions					
No.	N [kN]	T _g [kN]	M _{aj} [kNm]	T _L [kN]	M _i [kNm]
1	60.23	0.32	0.72	0.93	7.16
2	44.02	0.23	0.52	1.83	7.92
3	-24.72	0.13	0.31	5.6	15.04

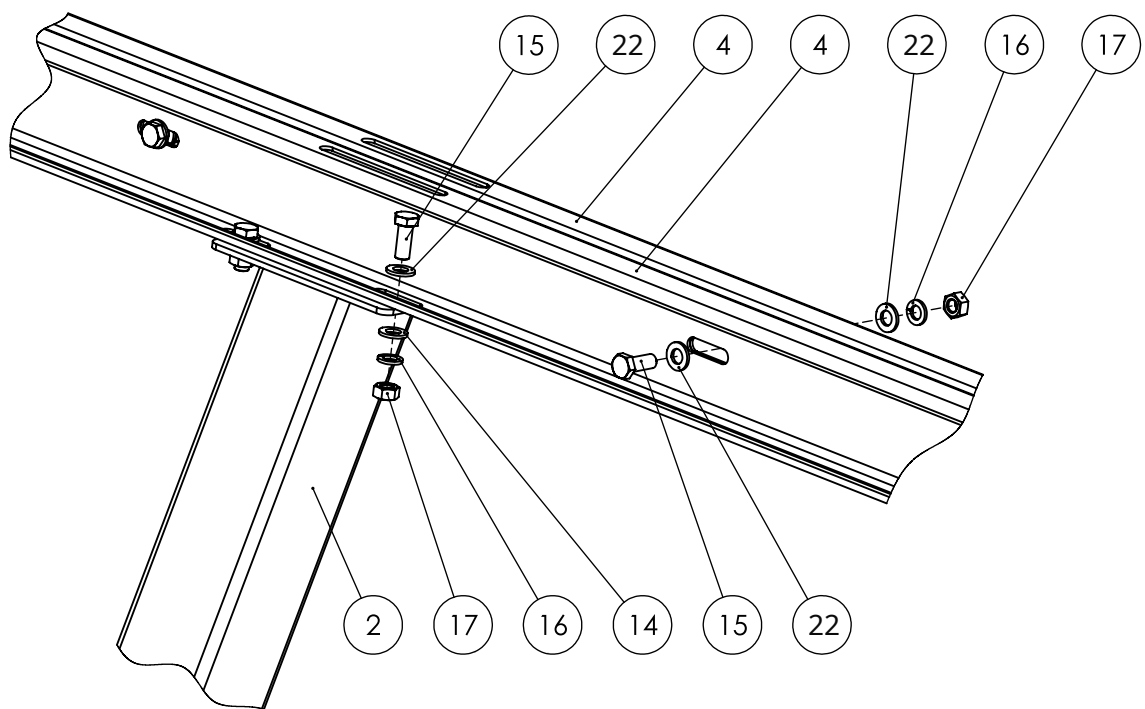
FOUNDATION SLAB DIMENSIONS



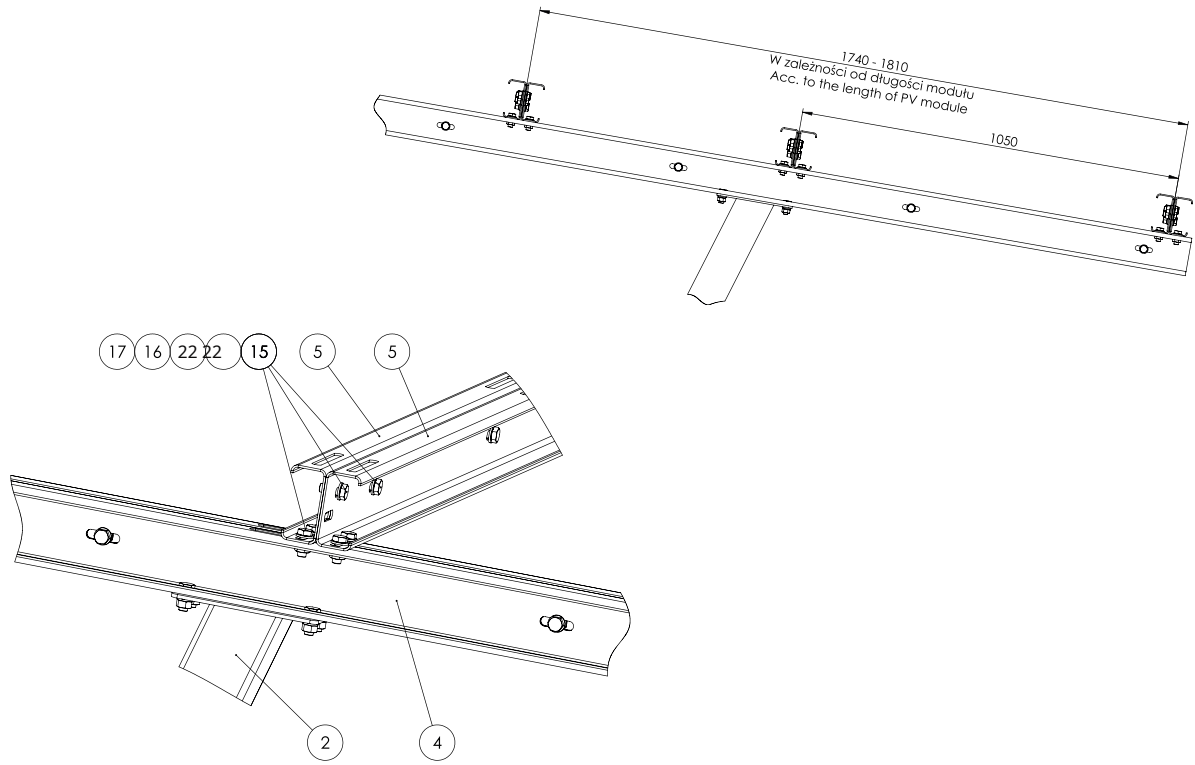
2



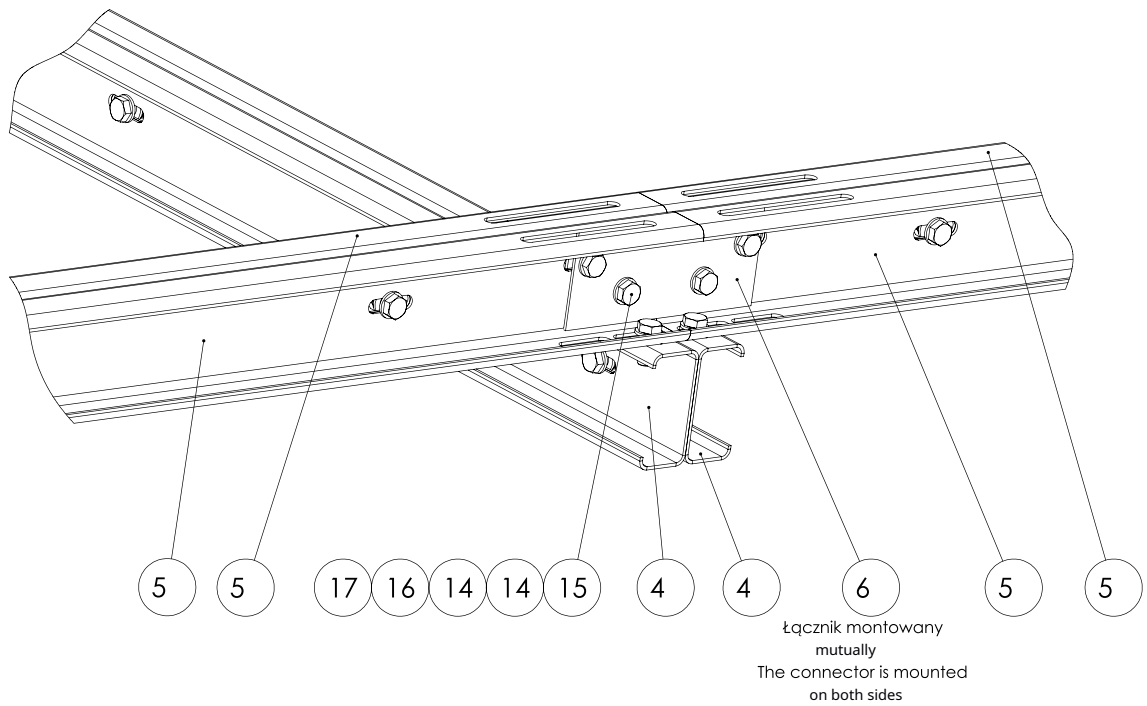
3



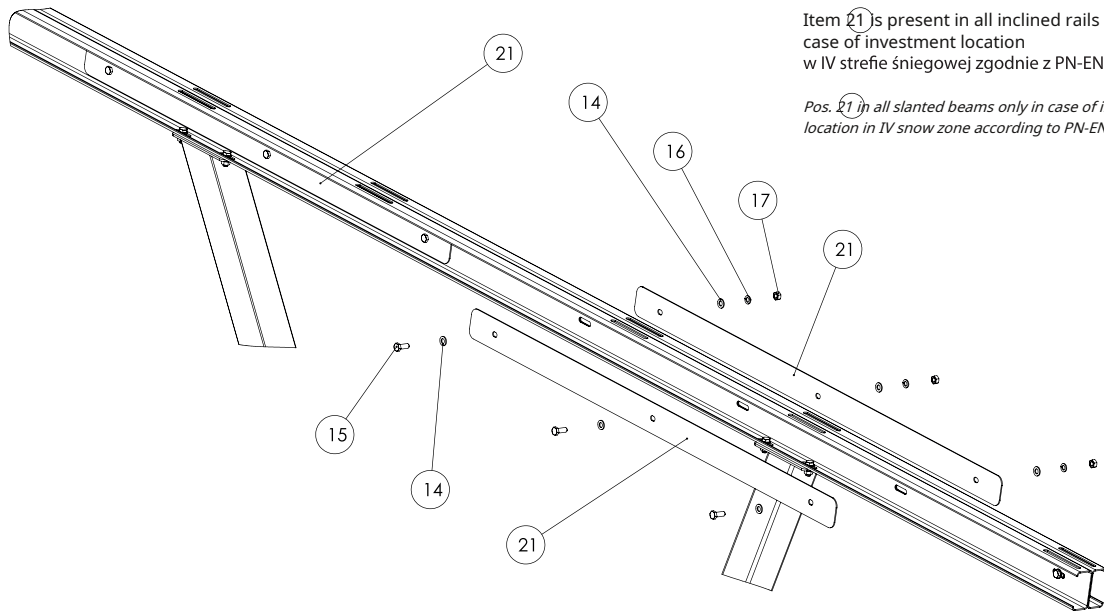
4



5



6

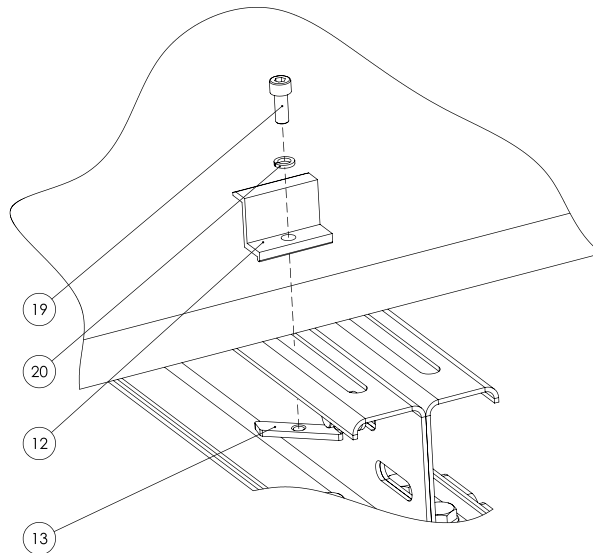


Attention /note 1:

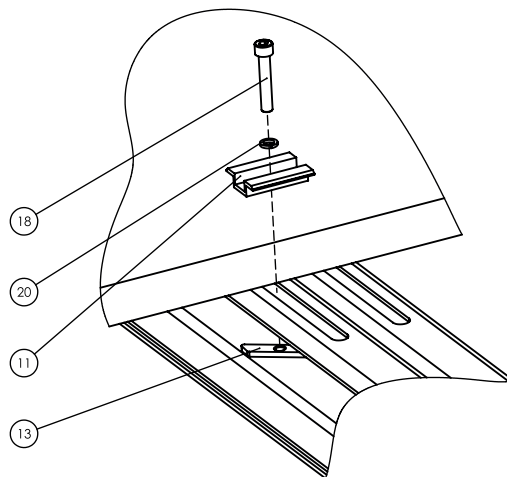
Item 21 is present in all inclined rails only in the case of investment location w IV strefie śniegowej zgodnie z PN-EN 1991-1-3

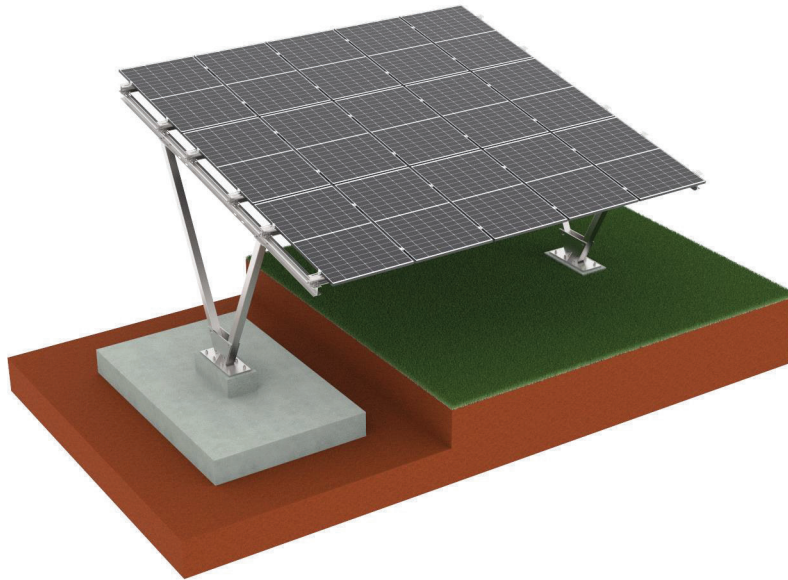
Pos. 21 in all slanted beams only in case of investment location in IV snow zone according to PN-EN 1991-1-3

7

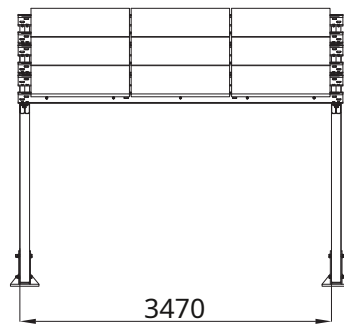


8

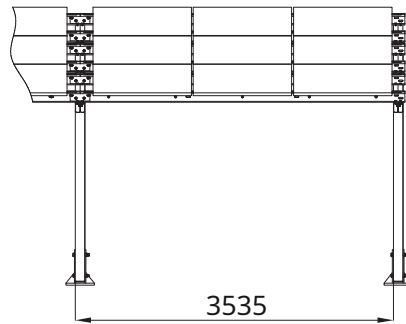




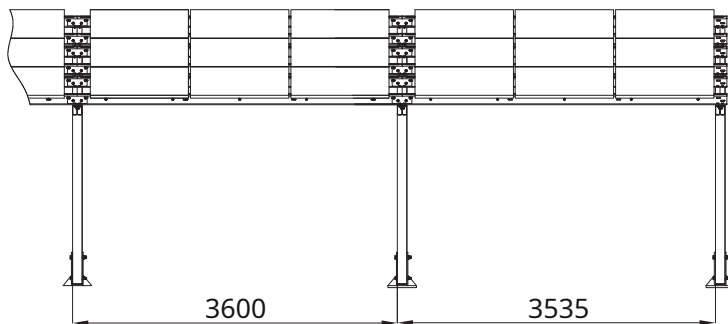
EXPANSION / EXTENSION



1 CARPORT for 1 car /1
CARPORT for 1 car



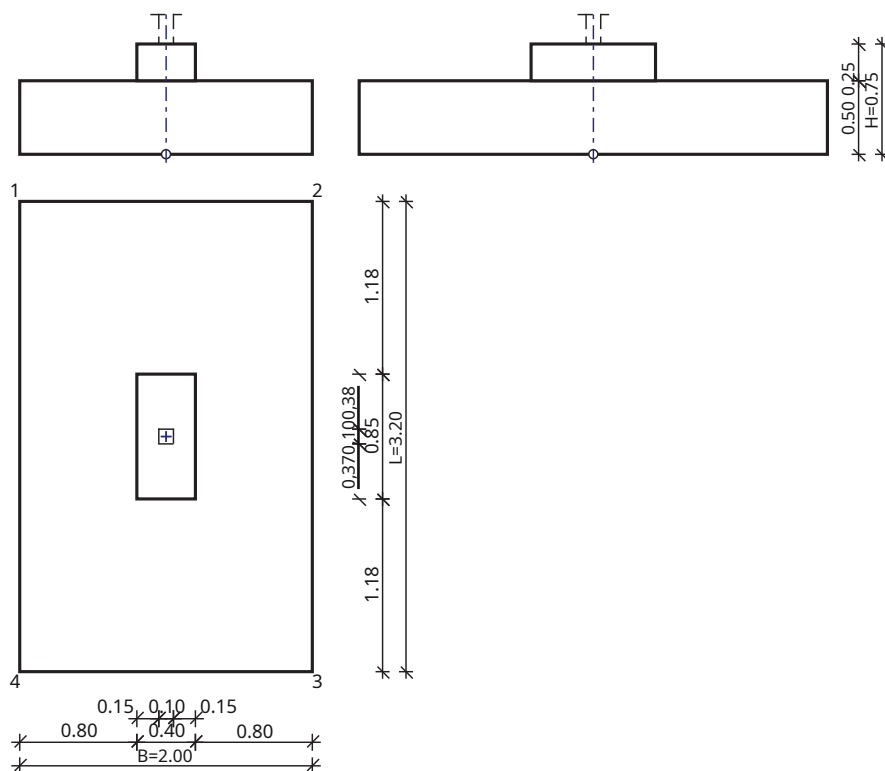
CARPORT expansion for 1 car /
Expansion with CARPORT for 1 car



Expansion with 2 CARPORTS for 1 car /
Expansion with 2 CARPORTS for 1 car

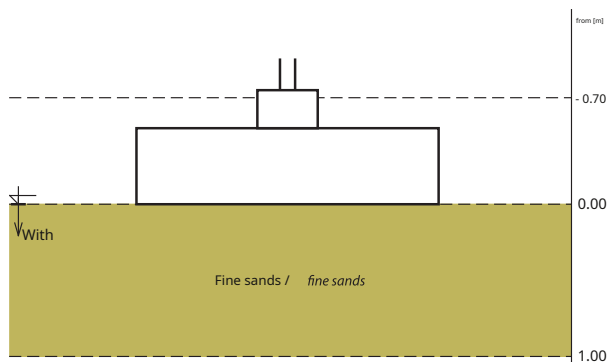
Carpot - typical foundation / Carport - standard foundation

FOUNDATION SKETCH / FOUNDATION SKETCH



DESCRIPTION OF THE SUBSTRATE / DESCRIPTION OF THE GROUND

Outline of ground layers:



Summary of substrate layers / list of ground layers:

No.	Name of land Ground name	h [m]	Hydrated Irrigated	$\rho_{\text{sat}}^{(n)}$ [t/m ³]	$\gamma_{\text{f,Minuses}}$	$\gamma_{\text{f,max}}$	$\phi_{\text{at}}^{(r)[\text{about}]}$	$C_{\text{at}}^{(r)}$ [kPa]	M_0 [kPa]	M [kPa]
1	Fine sands / <i>fine sands</i> Id=0.50	1.00	NO / <i>yeah</i>	1.65	0.90	1.10	27.37	0.00	61908	77386

FOUNDATION LOADS / FOUNDATION LOAD

Support reactions <i>Support reactions</i>					
No.	N [kN]	T _B [kN]	M _B [kNm]	T _L [kN]	M _L [kNm]
1	60.23	0.32	0.72	0.93	7.16
2	44.02	0.23	0.52	1.83	7.92
3	-24.72	0.13	0.31	5,6	15,04

MATERIAL DATA / MATERIAL DATE

Concrete parameters / Parameters of concrete:

Concrete class / Concrete grade: Volumetric

B25(C20/25) → $f_{cont} = 13.33$ MPa, $f_{ctd} = 1.00$ MPa, $E_{cm} = 30.0$ GPa

weight / Unit weight:

$\rho = 24.0$ kN/m³

Maximum aggregate size / Maximum size of aggregate:

$d_g = 16$ mm

Load factor / Loading factors:

$\gamma_{f,min} = 0.90$; $\gamma_{f,max} = 1.10$

Reinforcement / Reinforcement:

Steel class / Steel grade:

A-IIIN (RB500W) → $f_{yk} = 500$ MPa, $f_{yd} = 420$ MPa, $f_{tk} = 550$ MPa

Diameter of bars along side B / Reinforcement bars along side B:

$\phi B = 12$ mm

Diameter of bars along the side L / Reinforcement bars along side L:

$\phi L = 12$ mm

Maximum bar spacing / Maximum spacing of rods:

$\phi L = 20.0$ cm

Wrap up / Covering:

Nominal cover thickness at foundation base / Nominal thickness of covering on the basis of the foundation:

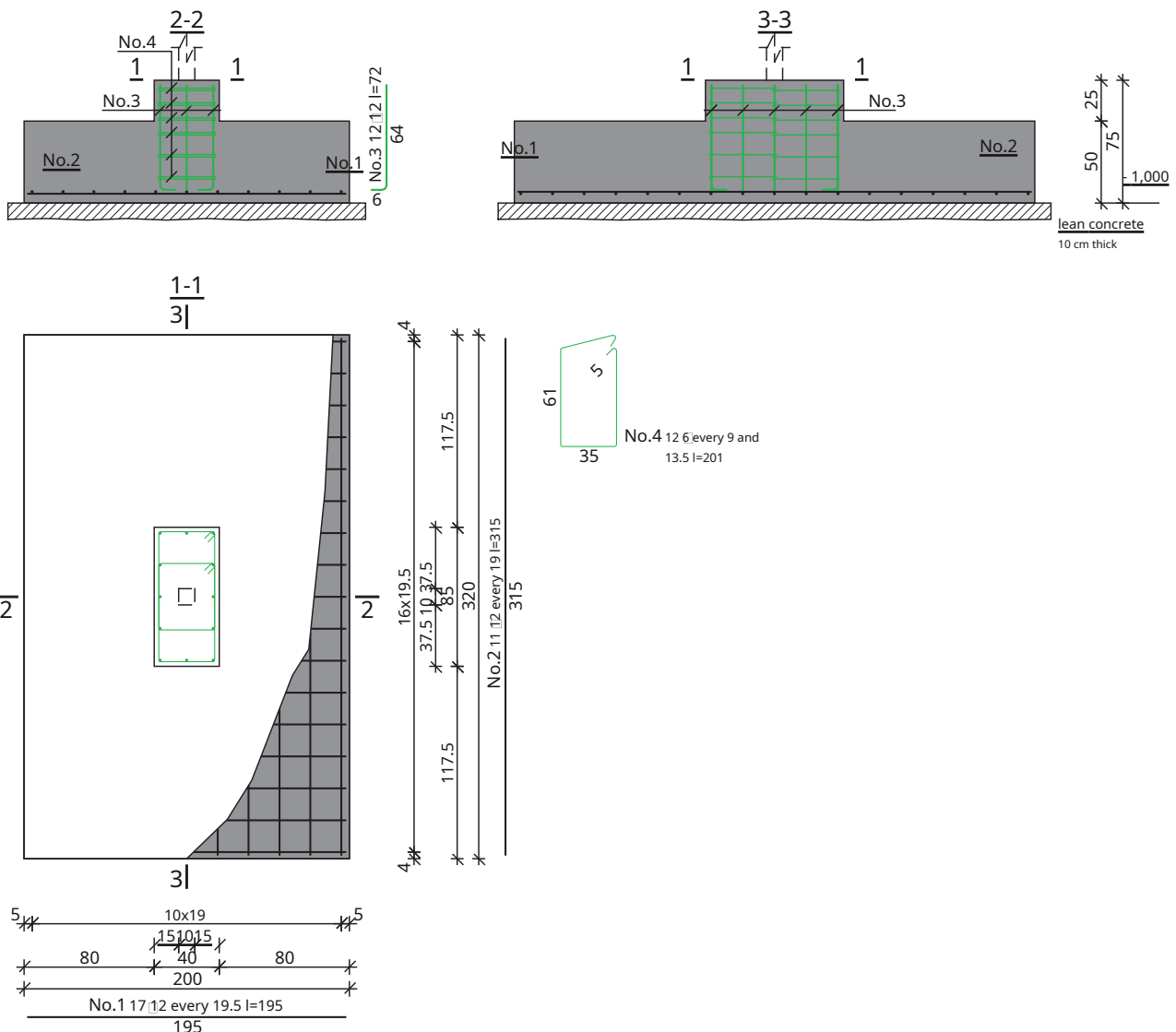
$c_{nom} = 50$ mm

Nominal thickness of the cover on the side surfaces / Nominal thickness of covering on side surfaces:

$c_{nom,b} = 25$ mm

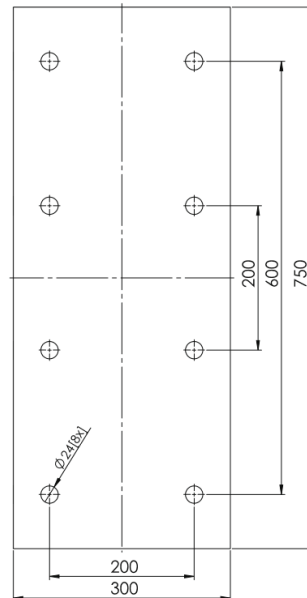
RESULTS - DESIGN / RESULTS-DESIGN

Reinforcement sketch / Sketch of the reinforcement



In order to enable the installation of the substructure supporting the photovoltaic panels to the foundation, 8 M20 socket screws of min. class 5.6 should be anchored in the foundation footing to a depth of at least 50 cm. The spacing of the foundation anchors is shown in the diagram below (screws placed centrally in the foundation).

In order to allow the assembly of the supporting sub-structure for photovoltaic panels, eight M20 J-bolts with minimum grade of 5.6 must be anchored in the base of foundation at depth of at least 50cm. The spacing of foundation anchors has been presented in the diagram below (bolts placed centrally in the foundation).



The structure should be adapted each time to local soil and water conditions and load conditions (structure load zones, type of soil subgrade, conventional ground frost depth). All non-bearing and native soils should be removed from under the foundation to the frost depth and a construction embankment should be made to the designed foundation level from aggregate compacted in layers to $I_s \geq 0.96$.

Each time, the construction must be adapted to the local ground and water conditions as well as the load conditions (load zones of the construction, type of ground, approximate ground freezing depth). All non-bearing and native soils must be removed from under the foundation up to the freezing depth and a construction embankment of all-in aggregate condensed with layers up to $I_s \geq 0.96$ must be prepared for the designed level of foundation.

LEGAL CLAUSE

This manual specifies only the minimum safety standards for the installation and use of the photovoltaic panel mounting system. We would like to draw your attention to the fact that the manual does not constitute a photovoltaic installation project and cannot replace such a project. The proper selection of the photovoltaic panel mounting system and its components is the responsibility of the persons who directly perform the installation of such a system.

Corab SA is a manufacturer of mounting systems for photovoltaic installations. Our products include a wide range of solutions and materials. These products are of very high quality and are adapted for specialist use in various conditions. However, as a manufacturer of mounting systems, we are not responsible for their correct use and correct installation. Corab SA does not analyze the needs of end customers and the expected conditions for the location of photovoltaic installations.

As a manufacturer, Corab SA does not design photovoltaic installations or supervise their installation. These are activities that are the responsibility of contractors, who should take into account local weather conditions, among other things. Contractors who have direct contact with end customers are left to select the systems used, all the elements they contain, as well as the methods of connecting them to buildings or the ground. Corab SA is not responsible for the actions of these people, because it does not analyze the needs of end customers and the correctness of the solutions used by the installation contractors.

As a manufacturer of photovoltaic panel mounting systems, we draw attention to the fact that their safety of use requires systematic inspections of the installations carried out by persons with appropriate qualifications. Such inspections should take place no less than once every twelve months, and in any case after the occurrence of winds exceeding 79 km/h, because our products are designed for the so-called first wind zone. The systems cannot be subject to excessive deterioration of their performance properties and loss of their technical efficiency. Any changes to the design of the mounting systems, including their connection or connection with elements not originating from Corab SA, modification of the systems, including their welding, shortening, reducing the number of elements specified in the assembly instructions or the submitted proposal, and intended for the construction of a specific system, their extension, etc., failure to comply with the minimum safety rules resulting from the assembly instructions or the submitted proposal, increasing the load of the systems or using the systems in a manner inconsistent with their intended use result in the loss of warranty rights and may have a direct impact on the life of the systems and their safe use.

During installation, it must be ensured that the photovoltaic panel system is used only for its original purpose. Both installation and assembly should be carried out by professional installers. During installation, particular attention should be paid to compliance with applicable national and European standards (PN and EN) regarding electrical installations, building regulations and health and safety regulations. Failure to follow the instructions given in this document may result in electric shock, fire and serious injury to the installer or third parties, as well as damage or destruction of property.



Attention! Before using the photovoltaic panels, read the instructions carefully! The instructions must be kept for the entire period of use.

LEGAL CLAUSE

This manual specifies only the minimum assembly and use safety standards for the mounting system of photovoltaic panels. We would like to draw attention to the fact that the manual does not serve as a design of a photovoltaic installation and must not be used to replace dry and design. The proper choice of the mounting system for photovoltaic panels and other relevant elements must be made by people who are directly involved in the assembly of such a system. Corab SA manufactures mounting systems for photovoltaic installations. Our product range includes a broad selection of solutions and materials. The products are of very high quality and dedicated to specialist applications under various conditions. However, as a manufacturer of mounting systems, we shall not assume any liability for their correct use and proper assembly. Corab SA does not analyze the needs of national customers or the expected placement conditions of photovoltaic installations.

As a manufacturer, Corab SA also does not prepare designs of photovoltaic installations and does not supervise their assembly. Such activities must be performed by contractors that, as part of the said activities, must acknowledge the local weather.

The decision regarding the used systems, all their elements, as well as the method of connecting them with buildings or the ground must be made by contractors who have a direct contact with the national customers. Corab SA shall not bear any responsibility for actions of such persons, since it does not analyze the needs of national customers or the appropriateness of solutions used by contractors working on the installations.

As a manufacturer of mounting systems for photovoltaic panels, we would like to draw attention to the fact that in order to maintain the safe use of such systems, qualified personnel must inspect the installations on a regular basis. Such inspections should take place at least once every twelve months and after every event in which the speed of wind exceeded 79 km/h since our products are dedicated for the so-called "1st wind-load zone". Systems must not be exposed to excessive deterioration of their properties or loss of technical efficiency. Any in the construction of mounting systems, including connection with third-party elements, modifications of the systems, such as welding, length adjustments, reduction of the number of elements specified in the installation manual or the provided proposal, where such elements are intended for the construction of a specific system, length adjustments of such elements, etc., non-compliance with the minimum safety rules described in the installation manual or the sent proposal, higher system load or use of the systems against their intended purpose shall result in loss of guarantee rights and may have a direct impact on durability and safety of the systems.

During the installation, it must be ensured that the system of photovoltaic panels will be used only according to its original intended purpose. Both the installation and the assembly should be performed by professional installers. During the assembly, please pay attention to compliance with the applicable domestic and European standards (PN and EN) on electrical installations, building regulations and OH&S rules. Non-compliance with instructions provided in this document may lead to electrocution, severe injuries to the installer or third-persons, and damage or destruction of property.



Caution! Before using the photovoltaic panels, they must carefully read the manual! The manual must be kept throughout the whole period of use.

PROPERTY OR HEALTH RISKS



Attention! The installation connection must be carried out only by qualified personnel with the appropriate installation qualifications. Mounting systems

Corab® may only be used for its original purpose, as described in this manual, which also contains information on maintenance. The manufacturer is not liable for any damage caused by failure to follow the recommendations of this assembly manual. The assembly must be carried out in compliance with the rules of occupational health and safety and work at height.

To ensure long-term operation of the photovoltaic system, the systems cannot be installed and used in areas with high dust levels (dust, sand) or environmental pollution causing the formation of so-called "acid" rain.



Attention! The system has been adapted to an environment with a corrosivity class of up to C3. In the event of the system being installed in an environment with a corrosivity class above C3, the installer should contact CORAB SA



Attention! All calculations of the system strength were made according to the current wind load standards for the so-called first wind zone,

wind speed does not exceed 79 km/h. Nevertheless, after the occurrence of extreme, surge wind gusts exceeding 79 km/h, the installation position should be checked again, as the manufacturer cannot with certainty rule out system shifts as a result of their occurrence.

The content of this assembly instruction is consistent with the current state at the time of delivery of the instruction. The manufacturer reserves the right to introduce changes that do not deteriorate the technical condition of the offered systems.

MAINTENANCE

When repairing, use only original spare parts!

The use of other spare parts may lead to serious damage to property or a health hazard to people in the vicinity of the PV system! The Corab® system is a homogeneous and coherent set of elements.

HAZARDS TO PROPERTY AND HEALTH



Caution! Connection of the installation must be conducted only by qualified personnel with a proper third-license. Corab® mounting systems can be used only in accordance with their original intended purpose described in the manual that also contains information regarding maintenance. The manufacturer shall not be liable for any damage resulting from non-compliance with instructions of this installation manual. The assembly must be performed in line with OH&S and rules concerning work at heights.

In order to ensure many years of operation of the photovoltaic system, it must not be mounted and used in areas with a high level of dustiness (dust, sand) or environmental pollution leading to so-called acid rain.



Caution! The system is designed for environment with corrosivity class up to C3. In case of installation of the system in environment with corrosivity class above C3, installer should contact CORAB SA



Caution! All calculations concerning system resistance should be made in accordance with the current standards regarding wind load for the so-called 1st wind-load zone, in the case of which speed of wind must not exceed 79 km/h. What is more, whenever there have been extreme, percussive wind blows exceeding 79 km/h, the position of the installation must be re-inspected since the manufacturer is unable to exclude the possibility of system shifts caused by such winds.

The contents of this installation manual are up-to-date as of the delivery of the manual. The manufacturer shall reserve the right to make changes that will not be detrimental to the technical condition of the offered systems.

MAINTENANCE

For repairs, use only original spare parts!

The use of other spare parts may lead to serious damage to property or hazards to health of people in the vicinity of the PV system! The Corab® system forms a uniform and consistent set of elements.