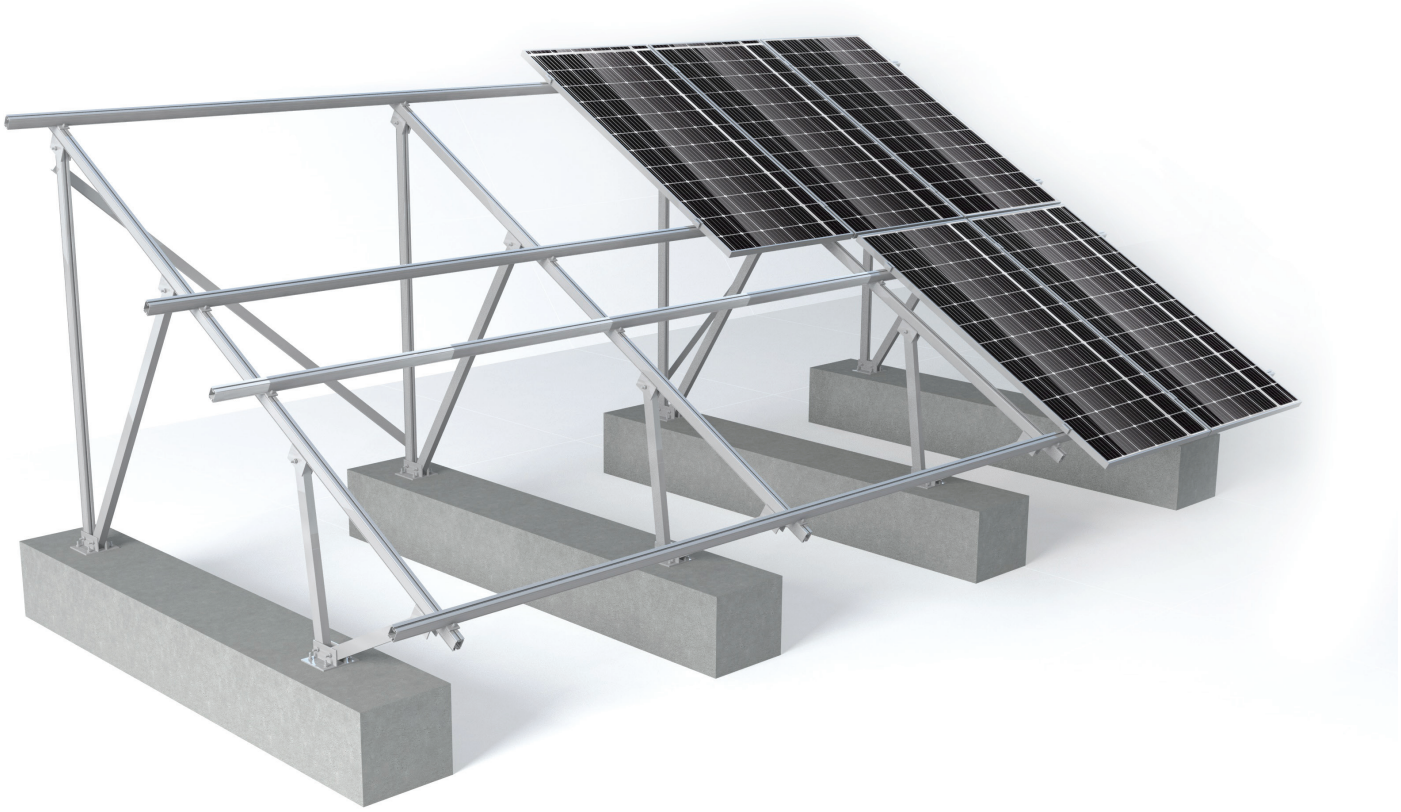
FEAL



FNE-2000

SISTEM ZA FOTONAPONSKE ELEKTRANE

SYSTEM FOR PHOTOVOLTAIC POWER PLANTS

SADRŽAJ - CONTENT

01	ZNAČAJKE SISTEMA	711.01.000-004
01	SYSTEM CHARACTERISTICS	711.01.000-004
02	ISPITIVANJA I CERTIFIKATI	711.02.000-023
02	TESTING AND CERTIFICATES	711.02.000-023
03	PROFILI	711.03.000-009
03	PROFILES	711.03.000-009
04	VEZNI ELEMENTI	711.04.000-006
04	CONNECTING ELEMENTS	711.04.000-006
05	PVC ELEMENTI	711.05.000-003
05	PVC ELEMENTS	711.05.000-003
08	DODACI	711.08.000-007
08	ACCESSORIES	711.08.000-007
10	PRESJECI	711.10.000-043
10	SECTIONS	711.07.000-043
11	OBRADA I MONTAŽA	711.11.000-047
11	PROCESSING AND INSTALLATION	711.11.000-047
12	REZNE LISTE	711.12.000-023
12	CUTTING LISTS	711.12.000-023

Značajke sistema
System characteristics

FOTONAPONSKE ELEKTRANE
PHOTOVOLTAIC POWER PLANTS

Razvojem fotonaponskih elektrana i sve veća realizacija istih zahtjeva brzu, jednostavnu i prilagodljivu izvedbu podkonstrukcijiskih sistema.

FEAL FNE rješenja omogućuju prihvat većine komercionalno dobavljivih fotonaponskih modula, a svaka konstrukcija posjeduje mogućnost prilagodbe različitim dimenzijama solarnih panela.

FNE 2000 je sistem razvijen za montažu na zemlji i različite tipove temeljne konstrukcije.
Kompletno rješenje dizajnirano je za brzu, jednostavnu i čistu montažu na licu mjesta, bez dodatnih zahtjeva za obradom na licu mjesta..

With the development of photovoltaic power plants and the increasing realization of the same requires fast, simple and flexible design of substructure systems.

FEAL FNE solutions enable the acceptance of most commercially available photovoltaic modules, and each construction has the ability to adapt to different dimensions of solar panels.

FNE 2000 is a system developed for ground mounting and various types of foundation construction.
The complete solution is designed for quick, easy and clean on-site installation, without additional ones on-site processing requests ..

Zašto solarne elektrane?

1. To je jedan od ekološki najčistijih izvora energije, ne stvara buku i ne zagađuje okolinu!

2. Sunce je vječno, besplatno te svakog dana ponovno izlazi!

3. Solarnim elektranama pomažemo u očuvanju zaštite našeg planeta sa drastičnim smanjenjem ispuštanja CO2 u atmosferu.
4.
5. Samo jedan kWh električne energije dobivene iz Sunca smanjuje emisiju CO2 za 1 kg.

6. Ulaganje u obnovljive izvore energije zadatak je svakog čovjeka koji u budućnosti teži osvještenoj potrošnji električne energije.

Why solar power plants?

1. It is one of the most environmentally friendly sources of energy, does not create noise and does not pollute the environment!
2. The sun is eternal, free and rises again every day!
3. Solar power plants help preserve the protection of our planet by drastically reducing CO2 emissions.
4. Solar power plants help preserve the protection of our planet by drastically reducing CO2 emissions into ozone.
5. Investing in renewable energy sources is the task of every person who strives for conscious electricity consumption in the future.

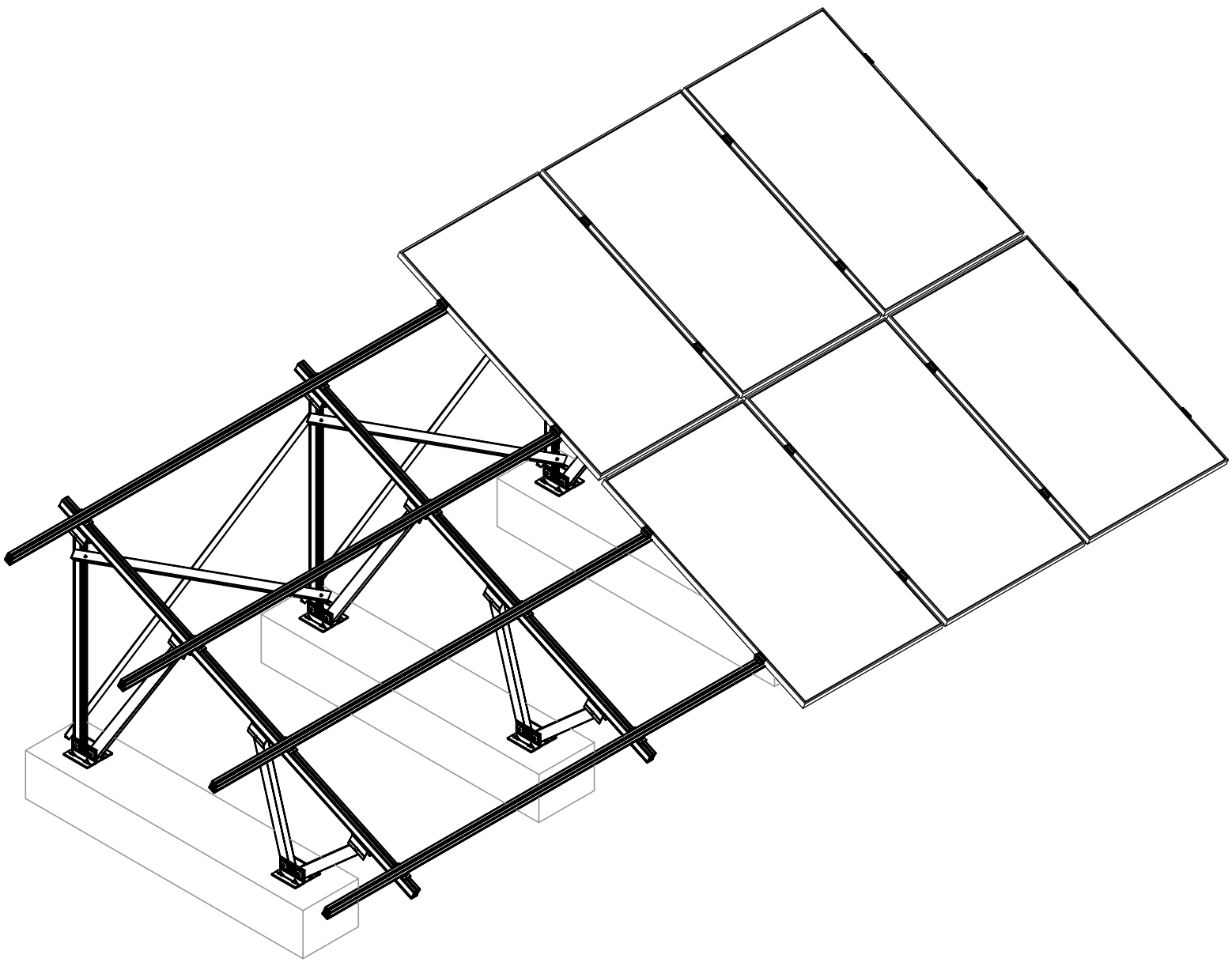
FNE 2000- Aluminijska konstrukcija za montažu za zemlji
FNE 2000- Aluminum construction for ground mounting

Ovaj sistem dizajniran je za prihvat većine standardnih dimenzija solarnih panela.
Njegova glavna karakteristika je sposobnost ugradnje na ravnim i nagnutim terenima.

Kao temeljna konstrukcija koristi se montiranje na betonski temelj
i vijak za zemlju.

This system is designed to accommodate most of the standard dimensions of solar panels. Its main feature is the ability to install on flat and sloping terrain.

Mounting on a concrete foundation and ground screw is used as the foundation structure.



Ispitivanja i certifikati
Testing and certificates

Statička analiza

Sistem FNE 2000

Analiza se provodi za dva tipa solarnih panela :
LxH= 1000 ±5mm x 1600±50mm,
LxH= 1000 ±5mm x 2000±50mm.

Predmetni paneli se mogu polagati u:
- uspravni položaj
-vodoravne položaj.

Zbog toga je podkonstrukcija provjerena za 4 moguće kombinacije koje ovise o vrsti panela i načinu slaganja.

Obuhvaćeni su nagibi solarnih panela od 20°, 25° i 30°.

Analizirane su brzine vjetra od 20m/s, 25m/s, 30m/s i 35m/s

Kompletan satički proračun proveden je za Kategoriju terena III.

U obzir se uzelo osnovno djelovanje snijega u iznosu od 0,75kN/m2.

Za sve projektne zadatke koji se ne nalaze unutar zadanih gabarita statičke analize, potrebno je provesti zasebnu staičku analizu kojom će se dokazati stabilnost ovog sistema u tim uvijetima.
Za statičku analizu svakog projekta odgovoran je glavni projektant projekta.

- TEHNIČKI OPIS

2.1.1 OPĆENITO

Statička analiza provedena je za aluminijsku podkonstrukciju solarnih panela sustava FNE 2000, dakle sustav koji prima opterećenje od solarnih ploča i prenosi ga na tlo. Analiza se provodi za dva tipa solarnih panela i to 1600mmx1000mm, te 2000mmx1000mm. Predmetni paneli se mogu polagati u uspravne i vodoravne položaje. Zbog toga je podkonstrukcija provjerena za 4 moguće kombinacije koje ovise o vrsti panela i načinu slaganja. Provjera se radila na jednom modularnom reprezentu.
Nadalje, obuhvaćeni su mogući nagibi ovih panela od 20°, 25° i 30°. Nagibi će biti definirani uvjetima predmetne lokacije i potrebnog optimalnog nagiba prema suncu.
Kako bi se dobila šira paleta proizvoda analizirane su brzine vjetra od 20m/s, 25m/s, 30m/s i 35m/s, i to sve za kategoriju terena III.
U obzir se uzelo osnovno djelovanje snijega u iznosu od 0,75kN/m2.

2.1.2 KARAKTERISTIKE MATERIJALA

Predmetne konstrukcije koje služe kao nosači solarnih panela proračunate su u skladu s važećim propisom, Eurocodom. Riječ je o laganim aluminijskim konstrukcijama načinjenim od aluminijske legure **EN AW - 6063**, stanja isporuke **T66,** granice popuštanja $f_{0,2}$= 195 MPa, vlačne čvrstoće f_u= 230MPa.

Tablica Osnovna fizikalna svojstva čistog aluminija i Al - legura

Talište	660°C
Gustoća pri 20°C	2700 kg/m^3
Toplinsko izduljenje	23·10^{-6} °C^{-1}
Specifična toplina	~ 920 J/kg°C
Toplinska provodljivost	~ 240 W/m°C
Modul elastičnosti	70 000 N/mm^2
Modul posmika	27 000 N/mm^2
Poissonov koeficijent	0.3

Oznaka legure		Oblik proizvoda	Razredba trajnosti
Brojčana	Kemijski simboli		
EN AW-6063	EN AW-Al Mg0,7Si	ET, EP, ER/B,DT	B

Legenda:
SH - lim [H.19] – [H.22]
ST - trak [H.19] – [H.22]
PL - ploča [H.19] – [H.22]
ET - istisnuta cijev [H.23] – [H.31]
EP - istisnuti profili [H.23] – [H.31]
ER/B - istisnuta šipka [H.23] – [H.31]
DT - vučena cijev [H.32] – [H.39]
FO - otkivci [H.40] – [H.42]
[1] samo jednostavni, puni (otvoreni) vučeni profili ili cijevi debelih stijenki oblikovane s pomoću trna (bešavne)

Tablica Karakteristične vrijednosti dogovorne granice popuštanja pri trajnoj deformaciji od 0.2%, f_0, vlačne čvrstoće, f_u, (za nezavarene materijale i za HAZ), minimalno izduljenje A, faktori smanjenja $\rho_{o,haz}$ i $\rho_{u,haz}$ za HAZ i razred izvijanja za kovke aluminijske legure - za istisnute profile, cijevi i šipke, i za vučene cijevi

Legura EN-AW	Oblik proizvoda	Način obrade	Debljina t mm [1)3)]	f_0 [1)]	f_u [1)]	A [5)2)]	$f_{o,haz}$ [4)]	$f_{u,haz}$ [4)]	Faktor HAZ [4)]		BC [6)]	n_p [7)]
				N/mm²		%	N/mm²		$\rho_{o,haz}$	$\rho_{u,haz}$		
6063	EP,ET,ER/B	T5	$t \le 3$	130	175	8	60	100	0.46	0.57	B	16
	EP		$3 < t \le 25$	110	160	7			0.55	0.63	B	13
	EP,ET,ER/B	T6	$t \le 25$	160	195	8	65	110	0.41	0.56	A	24
	DT		$t \le 20$	190	220	10			0.34	0.50	A	31
	EP,ET,ER/B	T66	$t \le 10$	200	245	8	75	130	0.38	0.53	A	22
	EP		$10 < t \le 25$	180	225	8			0.42	0.58	A	21
	DT		$t \le 20$	195	230	10			0.38	0.57	A	28

Vijci kvaliteta 10.9, te ankeri iz sustava proizvođača Fisher.

2.1.3 PROPISI

Proračun je proveden sukladno normama Eurocode i važećim nacionalnim aneksima. Riječ je o:

- EN 1998-1: Proračun otpornosti na potresno djelovanje
- EN 1991: Djelovanja na konstrukciju
- EN 1991-1-3: Opterećenje snijegom
- EN 1991-1-4: Opterećenje vjetrom
- EN 1999-1-1: Proračun aluminijskih konstrukcija – Opća pravila
- EN 1993-1-1: Proračun metalnih konstrukcija – Opća pravila
- EN 1993-1-8: Proračun priključaka

S obzirom kako je u ovom slučaju riječ o laganoj konstrukciji gdje inercijalne sile nisu mjerodavne, proračun na potresno djelovanje nije bio potreban.

2.1.4 DJELOVANJA

- **Stalno opterećenje:**

- opterećenje od utjecaja vlastite težine program uzima samostalno,
- opterećenje od Solarnog modula 0,12 kN/m2.

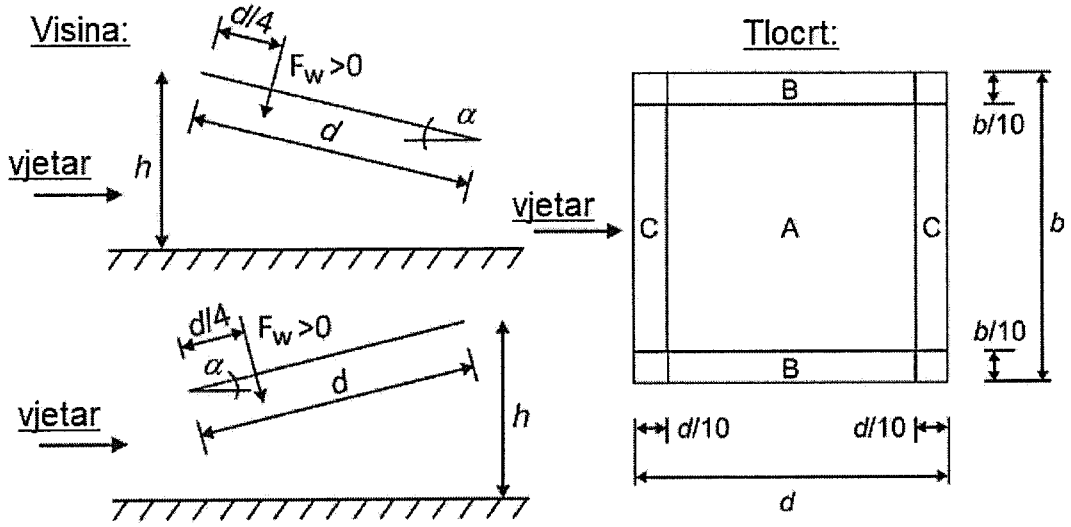
- **Opterećenje snijegom:**

Djelovanje snijega (smatra se da je riječ o glatkoj plohi na kojoj se snijeg neće nagomilavati, što se mora riješiti kroz sustav održavanja). Odabrana je regija 2, te je intenzitet djelovanja 0,60kN/m2.

Područje	20°	25°	30°
1	0,8x0,50=0,40kN/m²		
2	**0,8x0,75=0,60kN/m²**		
3	0,8x1,25=1,00 kN/m²		
4	0,8x1,50=1,20 kN/m²		

- **Opterećenje vjetrom:**

Djelovanje vjetra je proračunato za jedan segment od 6,00m po pravilu koja vrijede za jednostrešne otvorene nadstrešnice bez barijera. Koeficijenti pritiska $C_{p,net}$ je korišten za proračun nosivosti elemenata i pričvršćenja. Sile u osloncima se trebaju koristiti za proračun sustava temeljenja.



Koeficijent $c_{p,net}$ za jednostruke pokrove

Nagib	Zapriječenost	Područje A	Područje B	Područje C
20°	Najveća vrijednost φ	+1,7	+2,9	+2,1
	Najmanja vrijednost φ=0	-2,2	-2,8	-2,9
	Najmanja vrijednost φ=1	-1,6	-2,9	-3,0
25°	Najveća vrijednost φ	+2,0	+3,1	+2,3
	Najmanja vrijednost φ=0	-2,6	-3,2	-3,2
	Najmanja vrijednost φ=1	-1,5	-2,5	-2,8
30°	Najveća vrijednost φ	+2,2	+3,2	+2,4
	Najmanja vrijednost φ=0	-3,0	-3,8	-3,6
	Najmanja vrijednost φ=1	-1,5	-2,5	-2,8

Opterećenje vjetrom dobiva se sukladno izrazu:

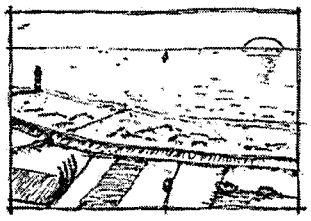
$$w_e = q_{p(ze)} \cdot c_{p,net}\ KN/m^2$$

Vršno opterećenje vjetrom dobiva se analizom opterećenja sukladno Eurocodeu, prema kome je definirano 5 mogućih kategorija terena, koje se navode u nastavku. Kategorije terena imaju najveći utjecaj na optrećenje vjetrom.

Tablica – Kategorije terena i parametri terena

Kategorija terena	
0	More ili priobalna područja izložena otvorenom moru
I	Jezera ili ravna i horizontalno položena područja sa zanemarivom vegetacijom i bez prepreka
II	Područja s niskom vegetacijom, npr. travom, i izoliranim preprekama (drveće, zgrade) s razmakom najmanje 20 visina prepreke
III	Područja sa stalnim pokrovom od vegetacije ili zgrade ili područja s izoliranim preprekama s razmakom najviše 20 visina prepreke (npr. sela, predgrađa, stalna šuma)
IV	Područja s najmanje 15 % površine pokrivene zgradama čija prosječna visina premašuje 15 m

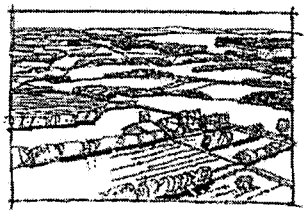
Kategorija terena 0
More, obalno područje izloženo otvorenom moru



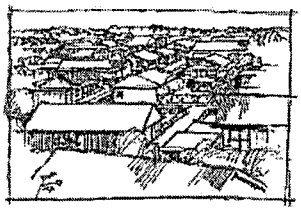
Kategorija terena I
Jezera ili područje sa zanemarivim raslinjem i bez prepreka



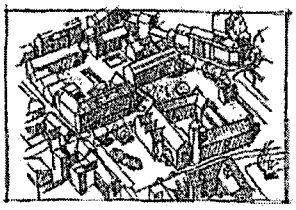
Kategorija terena II
Područje s niskim raslinjem, kao što je trava, i izoliranim preprekama (drveće, zgrade) na razmaku od najmanje 20 visina prepreke



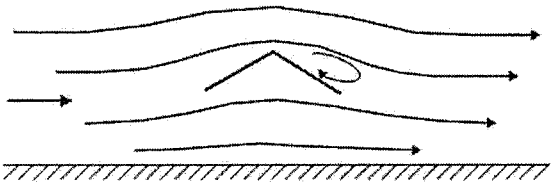
Kategorija terena III
Područje s pokrovom od raslinja ili zgradama ili s izoliranim preprekama na razmaku od najviše 20 visina prepreke
(npr. sela, predgrađe, stalna šuma)



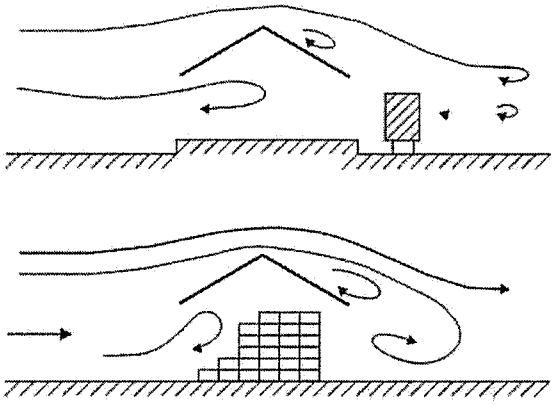
Kategorija terena IV
Područje s najmanje 15 % površine prekrivene zgradama čija prosječna visina prelazi 15 m



Za potrebe katalog proračun se bazirao za najrasprostranjenije područje terena III, te za stvarne visine ovih objekata (najniži rub panela je 30cm od tla) i životni vijek ove konstrukcije od T=25godina. U proračun se ušlo sa slobodnostojećom nadstrešnicom (ϕ=0).



Prazna, slobodnostojeća nadstrešnica ($\varphi = 0$)



Nadstrešnica zatvorena (zaprijećena) uskladištenom robom na strani niz vjetar ($\varphi = 1$)

- **Seizmičko djelovanje:**

S obzirom kako se radi o laganim konstrukcijama, inercijalne seizmičke sile su male, a sile vjetra su značajne. Stoga se seizmički utjecaj nije razmatrao.

- **Temperaturno djelovanje:**

Većinom se radi o jednostavnim statičkim sustavima. Sve veze se izvode kao vijčane, pa se konstruktivnim zahvatima osigurava nesmetan termički rad konstrukcije.

2.1.5 OPIS STATIČKOG PRORAČUNA

Statički proračun je proveden korištenjem linearno elastične analize glavnih elemenata konstrukcije. Sustav je postavljen na apsolutno krutim osloncima. Uzimanjem ovih reakcija dobivaju se utjecaji za dimenzioniranje elemenata temeljne konstrukcije (trakasti temelji, svrdla i sl.).

Predmetna konstrukcija ima životni vijek od 25 godina. Usvojeno je da se montira na kategoriji terena III, u zoni opterećenja snijegom 2 (0,75kN/m2). Pretpostavljeno je kako je riječ o slobodno stojećoj nadstrešnici (ϕ=0). Analizirano je jedno polje za četiri moguće kombinacije (paneli od 1600mm i 2000mm u vodoravnom i uspravnom položaju), u nagibima 20°, 25° i 30°. Promatrane brzine vjetra su 20m/s, 25m/s, 30m/s i 35m/s. Dobiveni podaci i usvojeni profili u katalogu se odnose na ovaj spektar djelovanja. S obzirom da svaka lokacija nosi svoje specifičnosti (kategoriju terena, opterećenje snijegom, brzinu vjetra i slično), za svaku konkretnu lokaciju potrebno je napraviti odgovarajući evaluaciju i statički proračun.

2.2 ANALIZA OPTEREĆENJA

VLASTITA TEŽINA
- opterećenje od utjecaja vlastite težine program uzima samostalno,
- opterećenje od Solarnog modula 0,12 kN/m2.

KORISNO OPTEREĆENJE

- Opterećenje snijegom:
Odabrana je regija 2, te je intenzitet djelovanja 0,60kN/m2.

- Opterećenje vjetrom:
Djelovanje vjetra je proračunato za jedan segment od 6,00m po pravilu koja vrijede za jednostrešne slobodnostojeće nadstrešnice (φ=0).
Područje terena III. Uzete stvarne visine ovih objekata (najniži rub panela je 30cm od tla) i životni vijek ove konstrukcije prema EN 1990:2011 je T=25godina.
Intenzitet djelovanja prikazan u sklopu statičkog proračuna.

Statički proračun: Sadržaj

Sadržaj svih modela je posložen po sljedećem principu:

Osnovni podaci o modelu

Ulazni podaci

Ulazni podaci - Konstrukcija

Rezultati

Statički proračun konstrukcije

Dimenzioniranje (aluminij)

Promatrani modeli su:
2PU_160x100 (2 panela uspravno)
2PU_200x100 (2 panela uspravno)
4PV_160x100 (4 panela vodoravno)
4PV_200x100 (4 panela vodoravno)

2 panela Uspravna montaža – 1600 x 1000

Datoteka: 2PU_160x100_KT3-fi_0.twp
Datum proračuna: svibanj, 2021.
Kategorija terena III (3), ϕ=0.

Način proračuna: 3D model

☒ Teorija I-og reda ☐ Modalna analiza ☐ Stabilnost

☐ Teorija II-og reda ☐ Seizmički proračun ☐ Faze građenja

☐ Nelinearni proračun

Veličina modela

Broj čvorova:	672
Broj pločastih elemenata:	0
Broj grednih elemenata:	864
Broj graničnih elemenata:	288
Broj osnovnih slučajeva opterećenja:	4
Broj kombinacija opterećenja:	16

Jedinice mjera

Dužina:	m [cm,mm]
Sila:	kN
Temperatura:	Celsius

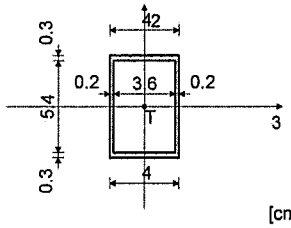
Ulazni podaci - Konstrukcija

Tabela materijala

No	Naziv materijala	E[kN/m2]	μ	γ[kN/m3]	αt[1/C]	Em[kN/m2]	μm
1	Aluminij	7.000e+7	0.34	27.00	2.350e-5	7.000e+7	0.34

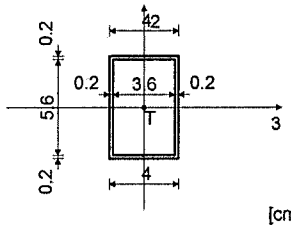
Setovi greda

Set: 1 Presjek: |=| 4/6, Fiktivna ekscentričnost

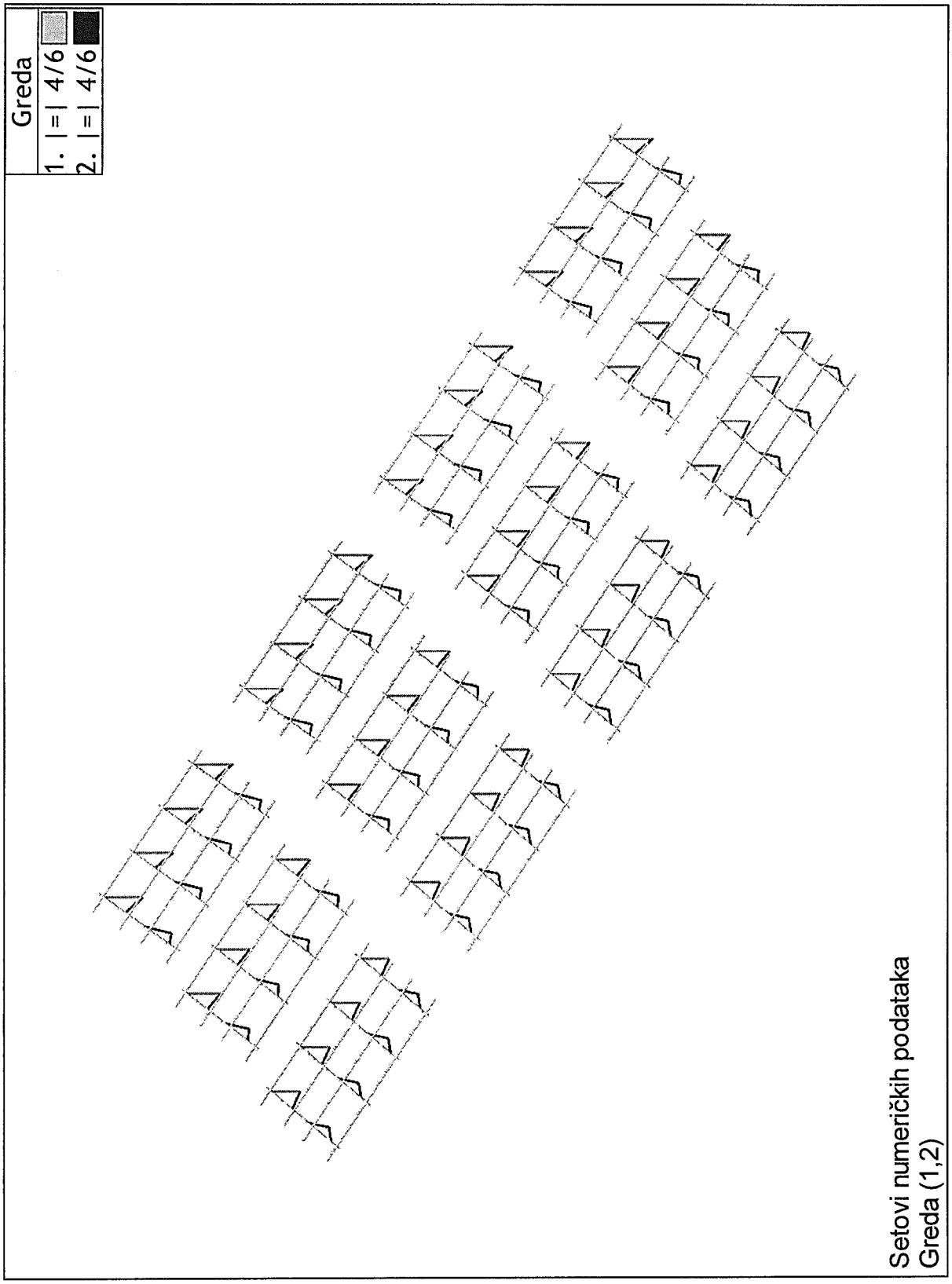


Mat	A1	A2	A3	I1	I2	I3
1 - Aluminij	4.560e-4	2.326e-4	2.326e-4	2.279e-7	9.910e-8	2.498e-7

Set: 2 Presjek: |=| 4/6, Fiktivna ekscentričnost



Mat	A1	A2	A3	I1	I2	I3
1 - Aluminij	3.840e-4	2.306e-4	1.569e-4	2.024e-7	1.023e-7	1.932e-7


Greda
1. |=| 4/6
2. |=| 4/6
Setovi numeričkih podataka
Greda (1,2)

2 Panela Uspravna montaža – 2000 x 1000

Datoteka: 2PU_200x100_KT3_fi_0.twp
Datum proračuna: svibanj, 2021.
Kategorija terena III (3), ϕ=0.

Način proračuna: 3D model

- [X] Teorija I-og reda
- [ ] Modalna analiza
- [ ] Stabilnost
- [ ] Teorija II-og reda
- [ ] Seizmički proračun
- [ ] Faze građenja
- [ ] Nelinearni proračun

Veličina modela

Broj čvorova:	592
Broj pločastih elemenata:	0
Broj grednih elemenata:	784
Broj graničnih elemenata:	288
Broj osnovnih slučajeva opterećenja:	4
Broj kombinacija opterećenja:	16

Jedinice mjera

Dužina:	m [cm,mm]
Sila:	kN
Temperatura:	Celsius

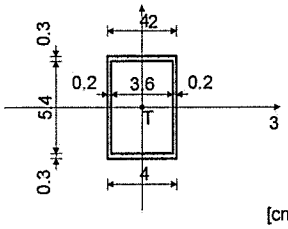
Ulazni podaci - Konstrukcija

Tabela materijala

No	Naziv materijala	E[kN/m2]	μ	γ[kN/m3]	αt[1/C]	Em[kN/m2]	μm
1	Aluminij	7.000e+7	0.34	27.00	2.350e-5	7.000e+7	0.34

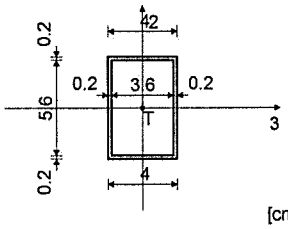
Setovi greda

Set: 1 Presjek: |=| 4/6, Fiktivna ekscentričnost



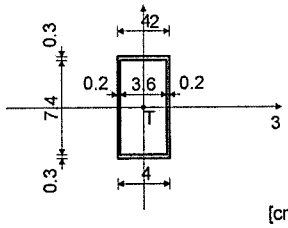
Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	4.560e-4	2.326e-4	2.326e-4	2.279e-7	9.910e-1	2.498e+0

Set: 2 Presjek: |=| 4/6, Fiktivna ekscentričnost

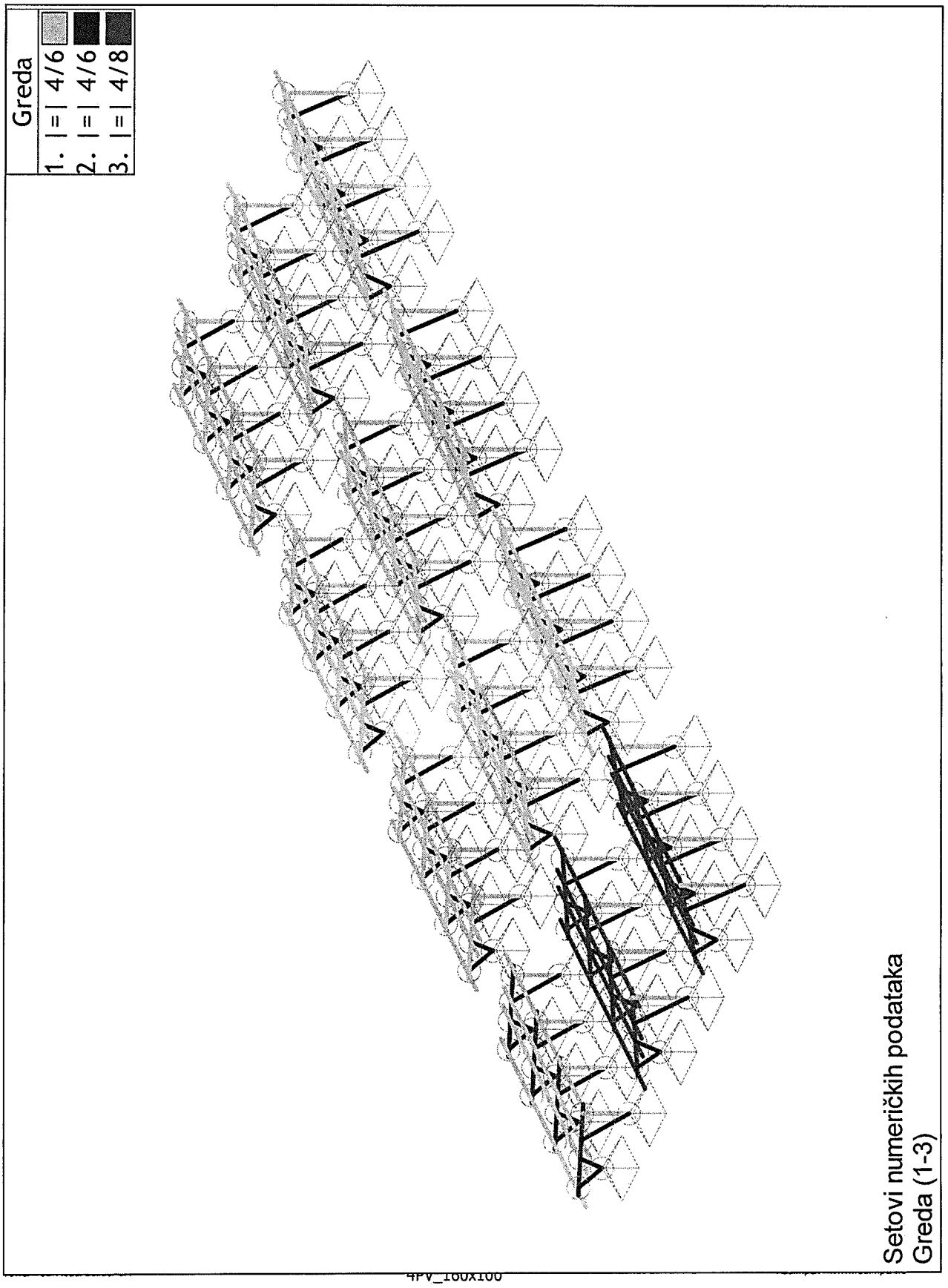


Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	3.840e-4	2.306e-4	1.569e-4	2.024e-7	1.023e-7	1.932e-7

Set: 3 Presjek: |=| 4/8, Fiktivna ekscentričnost



Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	5.360e-4	3.083e-4	2.347e-4	3.347e-7	1.214e-7	5.072e-7


Greda
1. |=| 4/6
2. |=| 4/6
3. |=| 4/8
Setovi numeričkih podataka
Greda (1-3)

4 panela vodoravno – 1600 x 1000

Datoteka: 4PV_160x100_KT3_fi=0.twp
Datum proračuna: svibanj, 2021.
Kategorija terena III (3), ϕ=0.

Način proračuna: 3D model

[X] Teorija I-og reda	[ ] Modalna analiza	[ ] Stabilnost
[ ] Teorija II-og reda	[ ] Seizmički proračun	[ ] Faze građenja
[ ] Nelinearni proračun		

Veličina modela

Broj čvorova:	680
Broj pločastih elemenata:	0
Broj grednih elemenata:	928
Broj graničnih elemenata:	288
Broj osnovnih slučajeva opterećenja:	4
Broj kombinacija opterećenja:	16

Jedinice mjera

Dužina:	m [cm,mm]
Sila:	kN
Temperatura:	Celsius

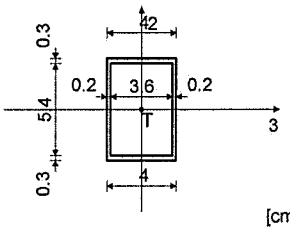
Ulazni podaci - Konstrukcija

Tabela materijala

No	Naziv materijala	E[kN/m2]	μ	γ[kN/m3]	αt[1/C]	Em[kN/m2]	μm
1	Aluminij	7.000e+7	0.34	27.00	2.350e-5	7.000e+7	0.34

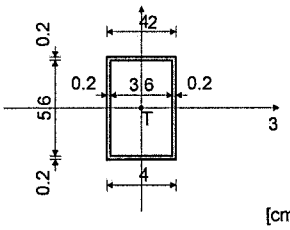
Setovi greda

Set: 1 Presjek: |=| 4/6, Fiktivna ekscentričnost



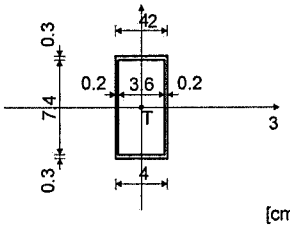
Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	4.560e-4	2.326e-4	2.326e-4	2.279e-7	1.100e-7	2.476e-7

Set: 2 Presjek: |=| 4/6, Fiktivna ekscentričnost

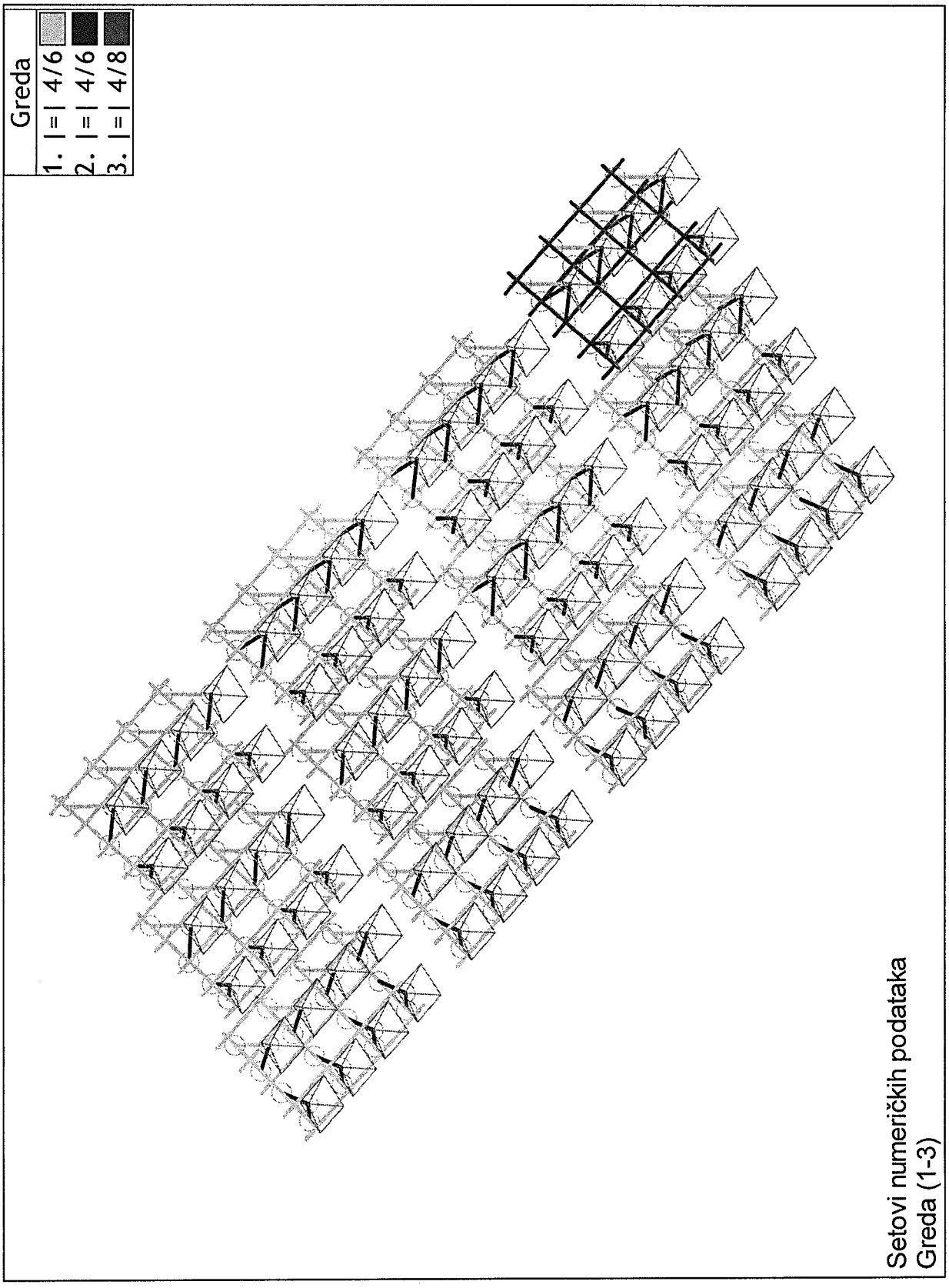


Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	3.840e-4	2.306e-4	1.569e-4	2.024e-7	1.023e-7	1.932e-7

Set: 3 Presjek: |=| 4/8, Fiktivna ekscentričnost



Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	5.360e-4	3.083e-4	2.347e-4	3.347e-7	1.214e-7	5.072e-7


Greda
1. |=| 4/6
2. |=| 4/6
3. |=| 4/8
Setovi numeričkih podataka
Greda (1-3)

4 panela vodoravno – 2000 x 1000

Datoteka: 4PV_200x100_KT3_fi=0.twp
Datum proračuna: svibanj, 2021.
Kategorija terena III (3), ϕ=0.

Način proračuna: 3D model

☒ Teorija I-og reda ☐ Modalna analiza ☐ Stabilnost

☐ Teorija II-og reda ☐ Seizmički proračun ☐ Faze građenja

☐ Nelinearni proračun

Veličina modela

Broj čvorova:	680
Broj pločastih elemenata:	0
Broj grednih elemenata:	940
Broj graničnih elemenata:	288
Broj osnovnih slučajeva opterećenja:	4
Broj kombinacija opterećenja:	16

Jedinice mjera

Dužina:	m [cm,mm]
Sila:	kN
Temperatura:	Celsius

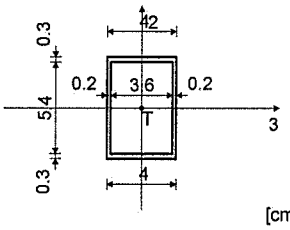
Ulazni podaci - Konstrukcija

Tabela materijala

No	Naziv materijala	E[kN/m2]	μ	γ[kN/m3]	αt[1/C]	Em[kN/m2]	μm
1	Aluminij	7.000e+7	0.34	27.00	2.350e-5	7.000e+7	0.34

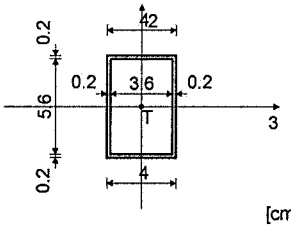
Setovi greda

Set: 1 Presjek: |= 4/6, Fiktivna ekscentričnost



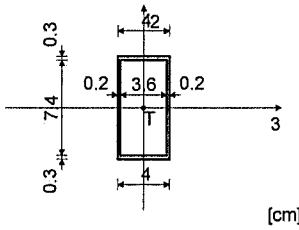
Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	4.560e-4	2.326e-4	2.326e-4	2.279e-7	9.910e-8	2.498e-7

Set: 2 Presjek: |= 4/6, Fiktivna ekscentričnost

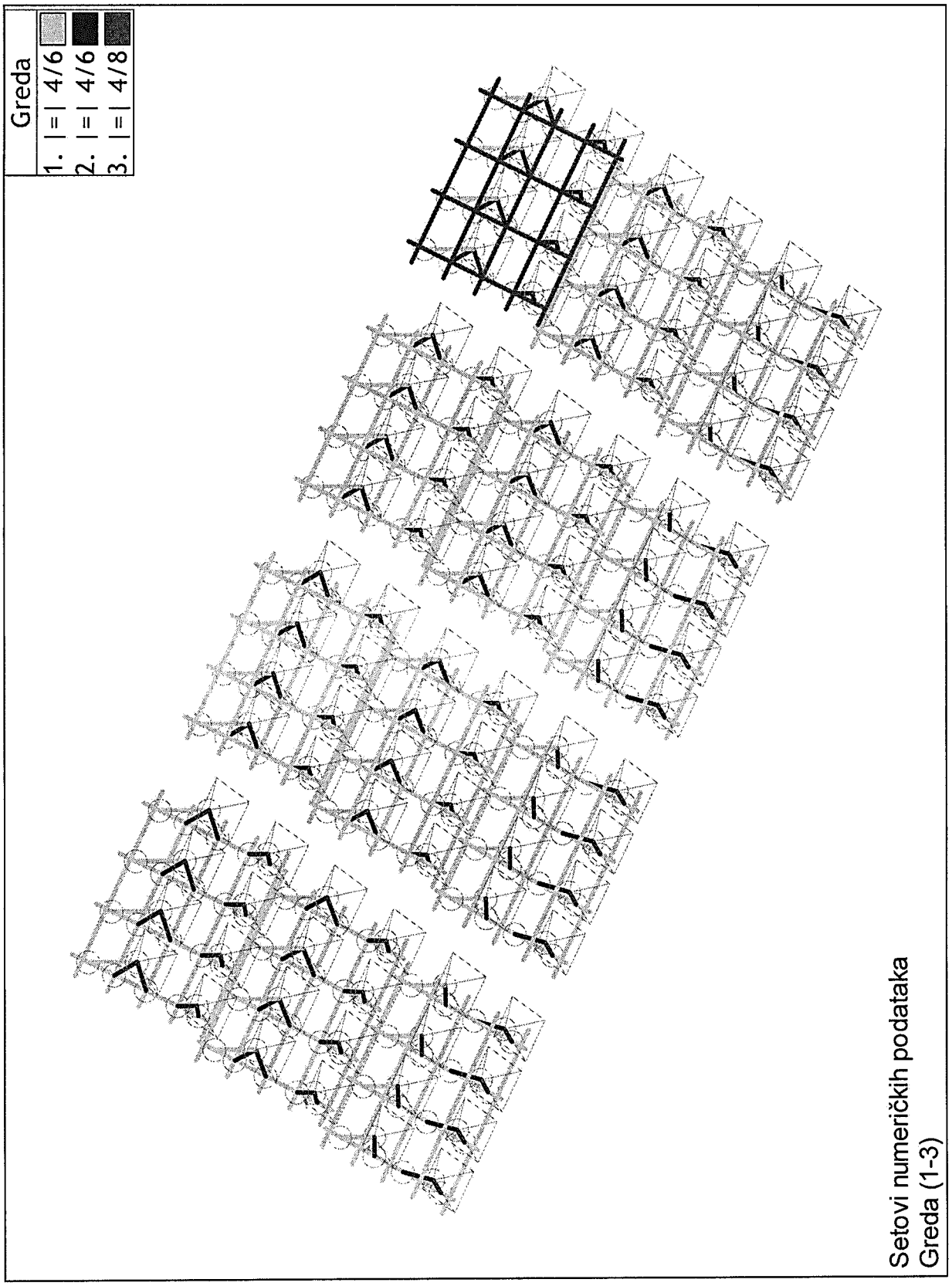


Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	3.840e-4	2.306e-4	1.569e-4	2.024e-7	1.023e-7	1.932e-7

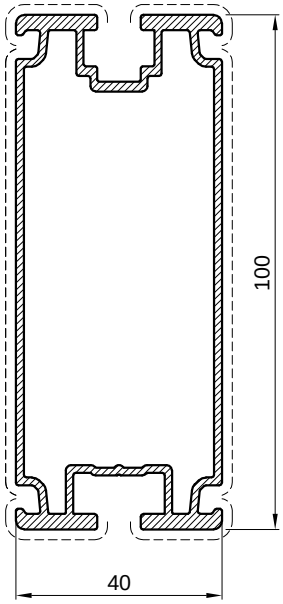
Set: 3 Presjek: |= 4/8, Fiktivna ekscentričnost



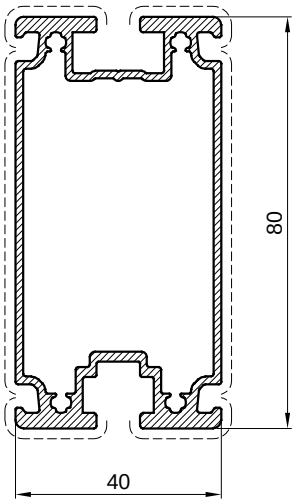
Mat.	A1	A2	A3	I1	I2	I3
1 - Aluminij	5.360e-4	3.083e-4	2.347e-4	3.347e-7	1.214e-7	5.072e-7


Greda
1. I=I 4/6
2. I=I 4/6
3. I=I 4/8
Setovi numeričkih podataka
Greda (1-3)

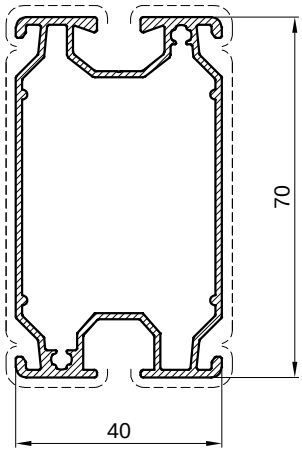
Profili
Profiles



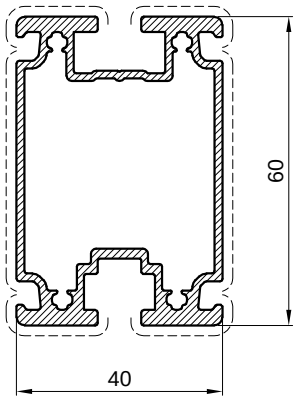
FNE-0001
kg/m 1.64



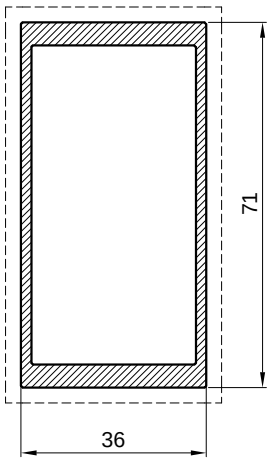
FNE-0005
kg/m 1.55



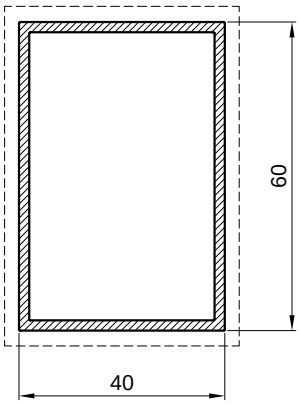
FNE-0006
kg/m 1.04



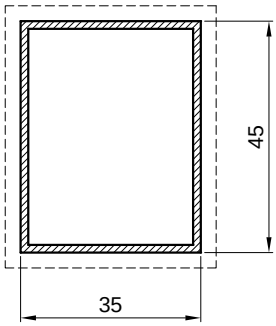
FNE-0004
kg/m 1.38



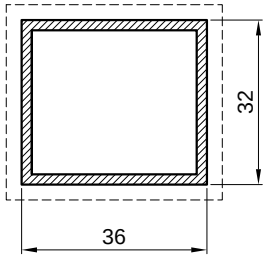
FNE-0002
kg/m 1.540



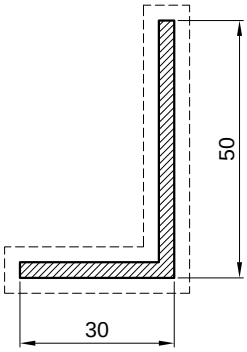
F-0180
kg/m 1.040



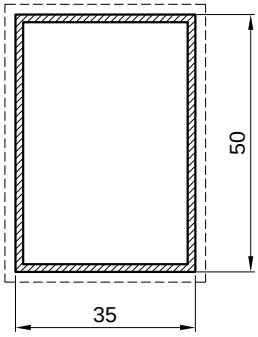
F-1767
kg/m 0.620



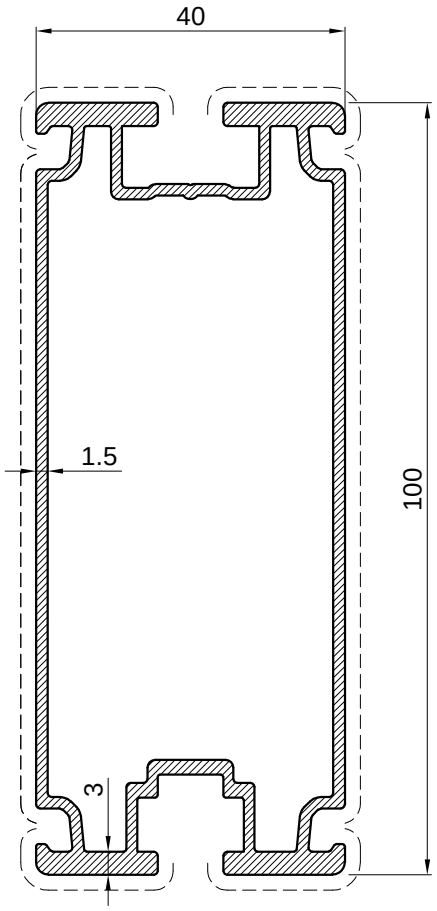
F-1766
kg/m 0.691



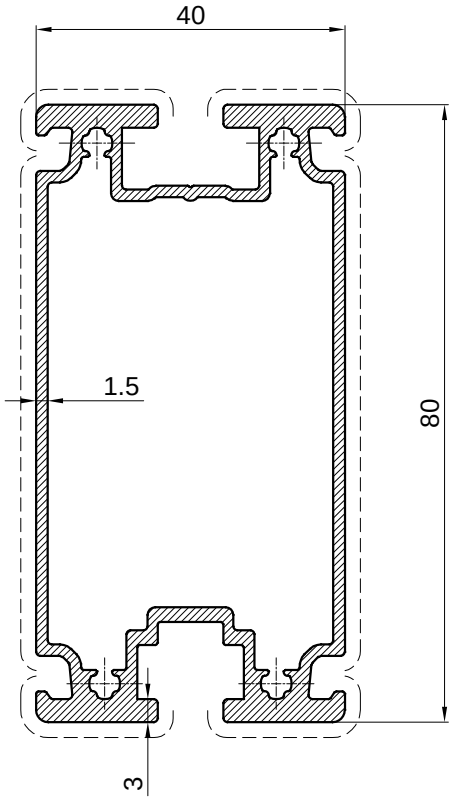
F-1045
kg/m 0.62



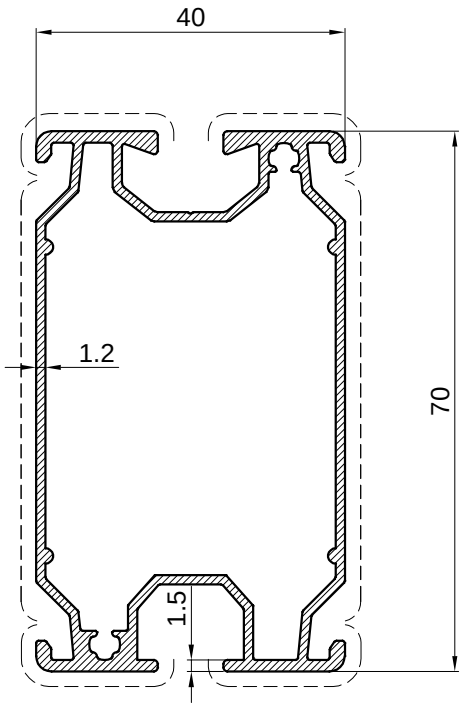
F-1777
kg/m 0.66



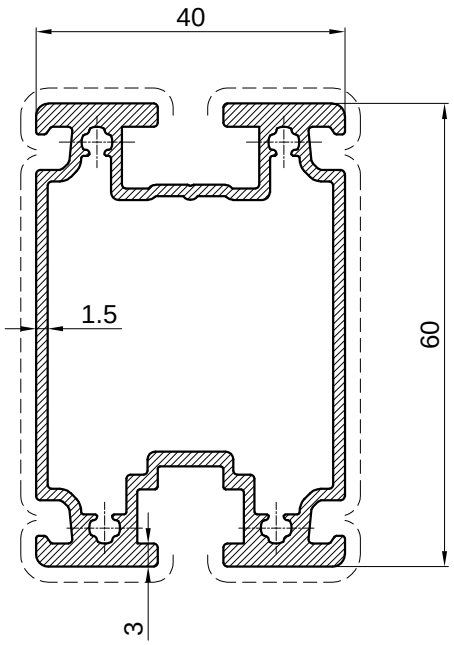
Profil Profile		
Art.Br. Art.No.	**FNE-0001**	
Težina Weight	kg/m	1.64
Opseg Perimeter	mm	389.23
Moment inercije Moment of inertia	Ix (cm4)	87.42
	Iy (cm4)	14.36
	Wx (cm3)	17.41
	Wy (cm3)	7.18
L	mm	-



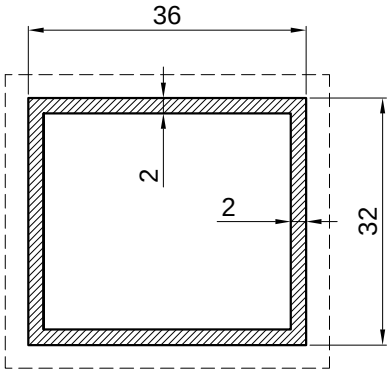
Profil Profile		
Art.Br. Art.No.	**FNE-0005**	
Težina Weight	kg/m	1.55
Opseg Perimeter	mm	349.24
Moment inercije Moment of inertia	Ix (cm4)	53.75
	Iy (cm4)	12.47
	Wx (cm3)	13.09
	Wy (cm3)	6.23
L	mm	-



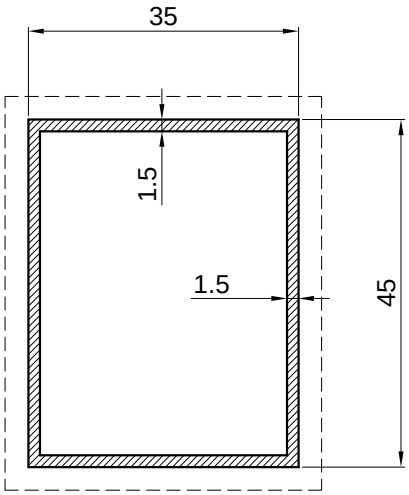
Profil Profile		
Art.Br. Art.No.	**FNE-0006**	
Težina Weight	kg/m	1.04
Opseg Perimeter	mm	325.75
Moment inercije Moment of inertia	Ix (cm4)	27.44
	Iy (cm4)	8.60
	Wx (cm3)	7.79
	Wy (cm3)	4.26
L	mm	-



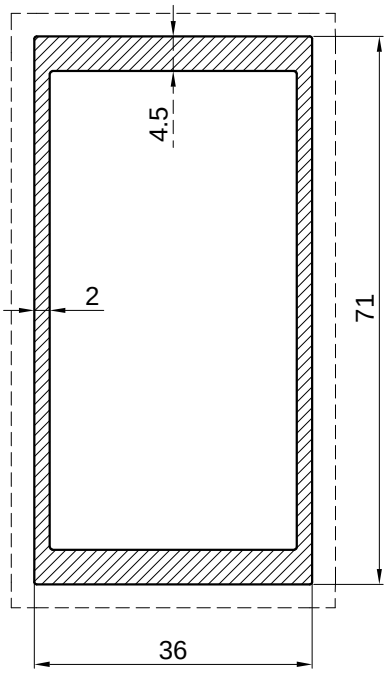
Profil Profile		
Art.Br. Art.No.	**FNE-0004**	
Težina Weight	kg/m	1.380
Opseg Perimeter	mm	309.25
Moment inercije Moment of inertia	Ix (cm4)	26.53
	Iy (cm4)	10.24
	Wx (cm3)	8.61
	Wy (cm3)	5.12
L	mm	-



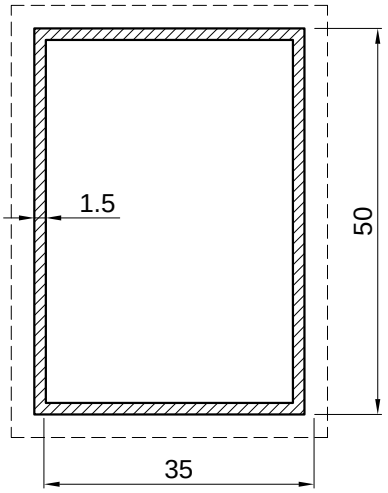
Profil Profile		
Art.Br. Art.No.	**F-1766**	
Težina Weight	kg/m	0.691
Opseg Perimeter	mm	136.00
Moment inercije Moment of inertia	Ix (cm4)	3.98
	Iy (cm4)	4.80
	Wx (cm3)	2.49
	Wy (cm3)	2.66
L	mm	-



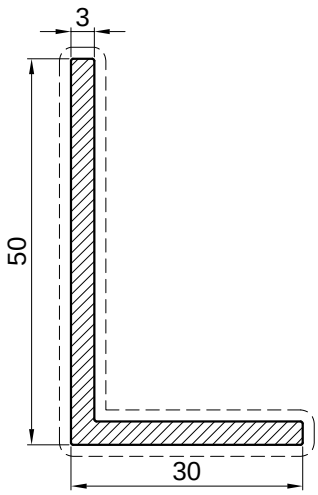
Profil Profile		
Art.Br. Art.No.	**F-1767**	
Težina Weight	kg/m	0.620
Opseg Perimeter	mm	160.00
Moment inercije Moment of inertia	Ix (cm4)	6.82
	Iy (cm4)	4.61
	Wx (cm3)	3.03
	Wy (cm3)	2.63
L	mm	-



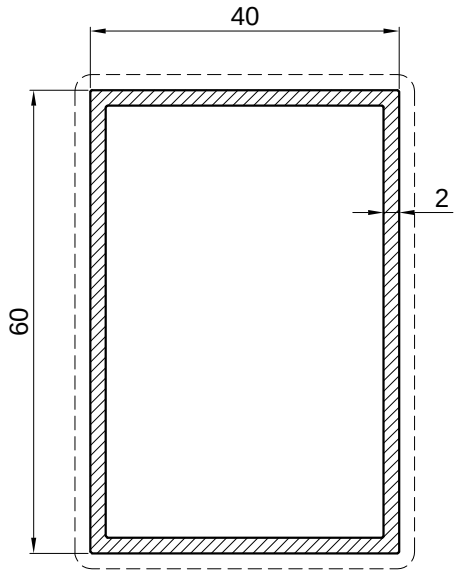
Profil Profile		
Art.Br. Art.No.	**FNE-0002**	
Težina Weight	kg/m	1.540
Opseg Perimeter	mm	213.49
Moment inercije Moment of inertia	Ix (cm4)	43.82
	Iy (cm4)	10.67
	Wx (cm3)	12.34
	Wy (cm3)	5.93
L	mm	-



Profil Profile		
Art.Br. Art.No.	**F-1777**	
Težina Weight	kg/m	0.660
Opseg Perimeter	mm	170.00
Moment inercije Moment of inertia	Ix (cm4)	8.77
	Iy (cm4)	5.03
	Wx (cm3)	3.51
	Wy (cm3)	2.87
L	mm	-

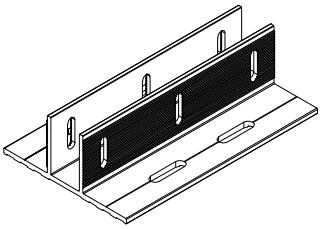
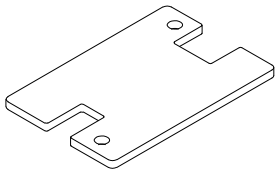
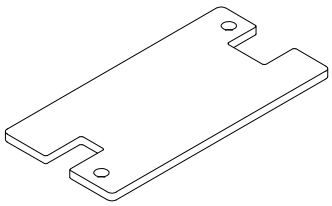
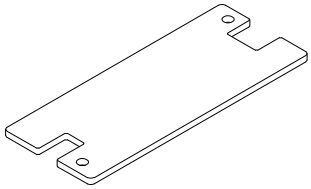
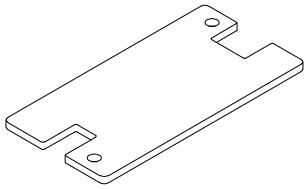
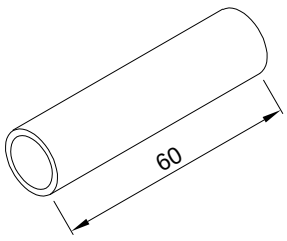


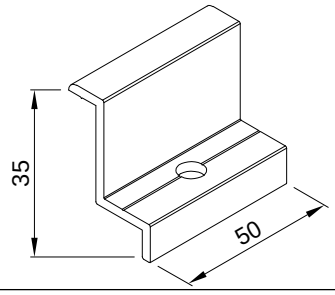
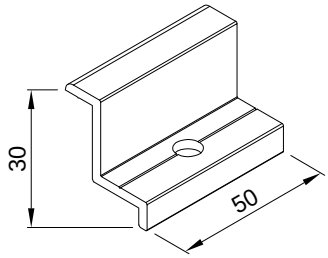
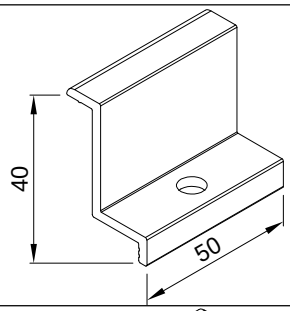
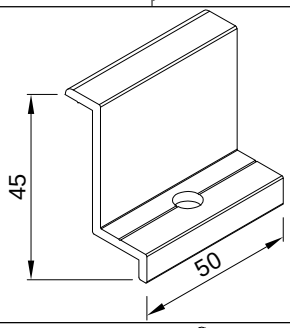
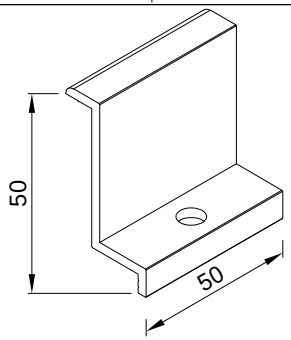
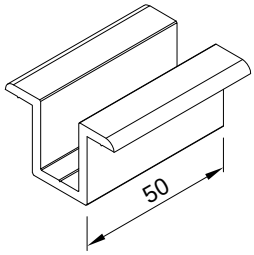
Profil Profile		
Art.Br. Art.No.	**F-1045**	
Težina Weight	kg/m	0.623
Opseg Perimeter	mm	159.36
Moment inercije Moment of inertia	Ix (cm4)	6.03
	Iy (cm4)	1.69
	Wx (cm3)	1.81
	Wy (cm3)	0.73
L	mm	-

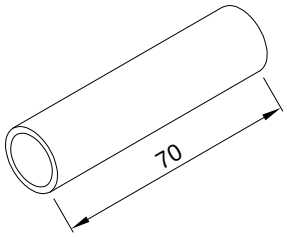
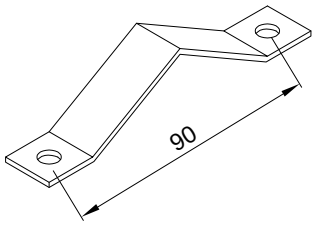
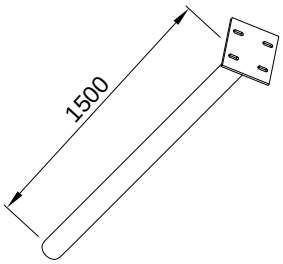
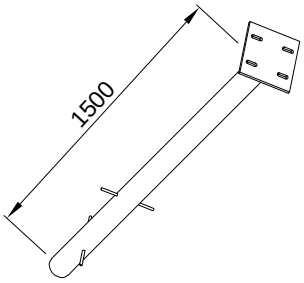
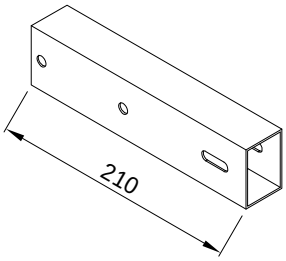
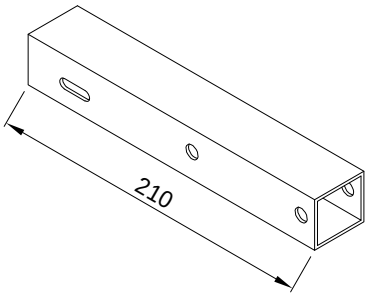


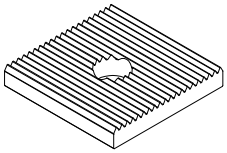
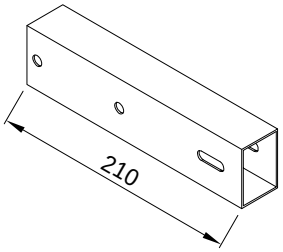
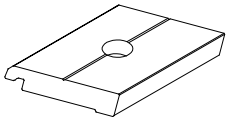
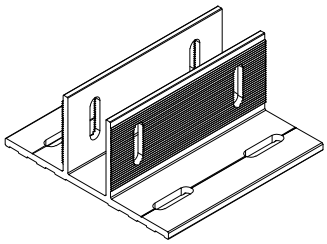
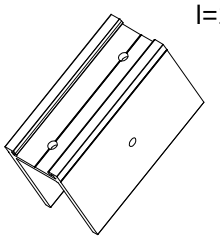
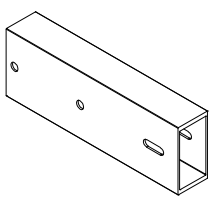
Profil Profile		
Art.Br. Art.No.	**F-0180**	
Težina Weight	kg/m	1.037
Opseg Perimeter	mm	199.70
Moment inercije Moment of inertia	Ix (cm4)	19.31
	Iy (cm4)	10.23
	Wx (cm3)	6.44
	Wy (cm3)	5.11
L	mm	-

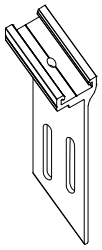
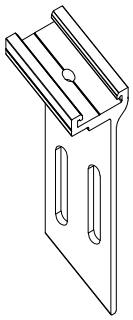
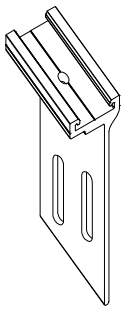
Vezni elementi
Connection elements

Oznaka Code	Izgled-presjek View-cross section	Opis Description	Materijal Material	Napomena Remark
521.389	l=280mm 	- Stopa za montažu solara na beton i vijak za zemlju -Anchor for concrete and ground screw	Al.	
521.390		- FNE bočni poklopac 60 (FNE-0004) - FNE side cover 60 (FNE-0004)	Al.	
521.391		- FNE bočni poklopac 80, (FNE-0005) - FNE side cover 80 (FNE-0005)	Al.	
521.392		- FNE bočni poklopac 100, (FNE-0001) - FNE side cover 100 (FNE-0001)	Al.	
521.418		- FNE bočni poklopac 70, (FNE-0006) - FNE side cover 70 (FNE-0006)	Al.	
521.393		-Distancer dijagonala Ø 15x1.5 -Diagonal spacer Ø 15x1.5	Inox	

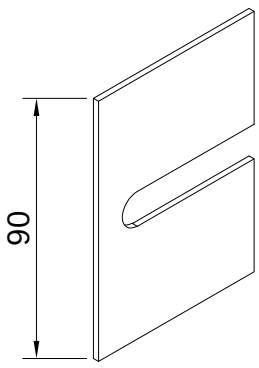
Oznaka Code	Izgled-presjek View-cross section	Opis Description	Materijal Material	Napomena Remark
521.421		-Jednostrana kopča za solare-35 mm -Solar panel holder - single sided-35 mm	Al	
521.426		-Jednostrana kopča za solare-30 mm -Solar panel holder - single sided-30 mm	Al.	
521.427		-Jednostrana kopča za solare-40 mm -Solar panel holder - single sided-40 mm	Al	
521.428		-Jednostrana kopča za solare-45 mm -Solar panel holder - single sided-45 mm	Al	
521.429		-Jednostrana kopča za solare-50 mm -Solar panel holder - single sided-50 mm	Al	
521.437		-Srednja kopča za solare -Solar panel holder - double sided	Al.	

Oznaka Code	Izgled-presjek View-cross section	Opis Description	Materijal Material	Napomena Remark
521.417		-Distancer dijagonala Ø 15x1.5 -Diagonal spacer Ø 15x1.5	Inox	
521.399		- Premosnica dilatacije 90, FNE - Dilatation bypass 90, FNE	Al	
435.009		- Vijak za zemlju, FNE - Ground screw, FNE	Čelik-Zn	
521.401		- Vijak za zemlju, FNE - Ground screw, FNE	Al	
521.408		- Spojni element sekundarnih nosača, FNE-0005 - Connecting element of secondary supports FNE 0005	Al	
521.409		- Spojni element sekundarnih nosača, FNE-0004 - Connecting element of secondary supports FNE-0004	Al	

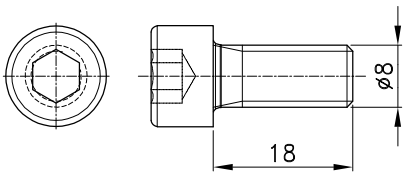
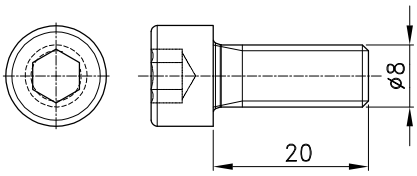
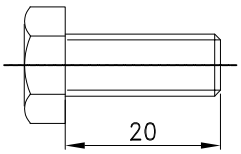
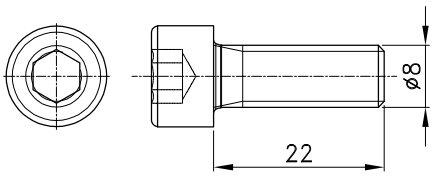
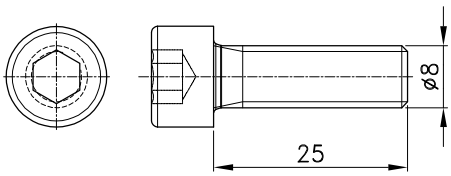
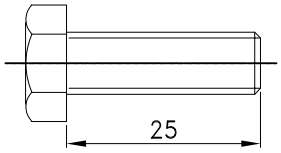
Oznaka Code	Izgled-presjek View-cross section	Opis Description	Materijal Material	Napomena Remark
521.479		-Al. podloška 40x40 mm (Ø 10.5) -Al. washer 40x40 mm (Ø 10.5)	Al.	
521.419		- Spojni element sekundarnih nosača, FNE-0006 - Connecting element of secondary supports FNE-0006	**Al.**	
521.345	l=50mm 	- Drzac primarnog i sekundarnog nosaca(profila) - Primary and secondary support holder (profile)	Al	
521.377	l=170mm 	- Stopa za montažu solara na beton i vijak za zemlju - Anchor for concrete and ground screw	Al.	
521.378	l=120mm 	- Veza dijagonala i grede u nagibu, FNE - The connection of the diagonal and the beam in the slope, FNE	Al.	
521.439		- Spojni element sekundarnih nosača FNE-0001 - Connecting element of secondary supports FNE-0001	Al.	

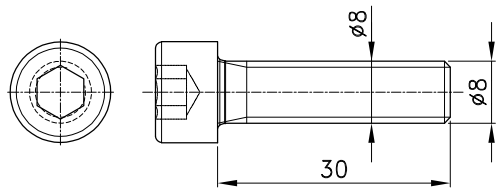
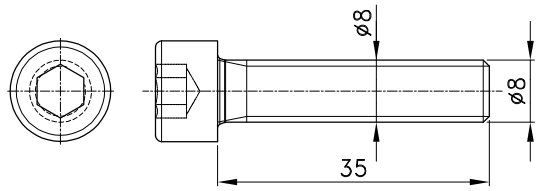
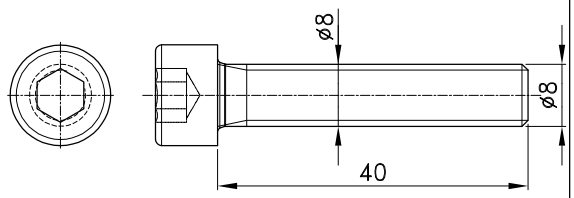
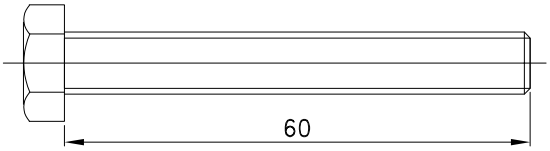
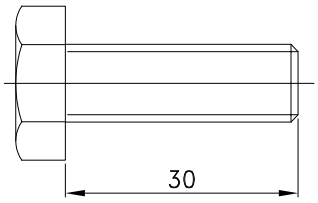
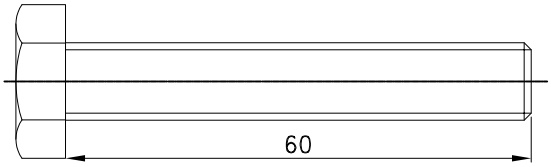
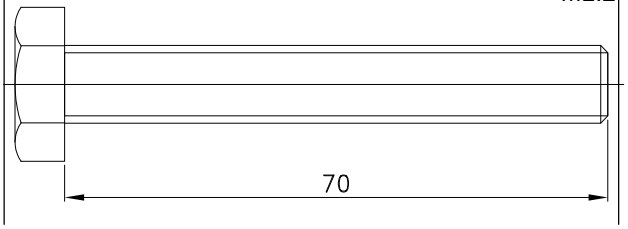
Oznaka Code	Izgled-presjek View-cross section	Opis Description	Materijal Material	Napomena Remark
521.463		-spojnica podkonstrukcije - 25° nagib - substructure connector - 25° slope	Al.	
521.464		-spojnica podkonstrukcije - 30° nagib - substructure connector - 30° slope	Al.	
521.465		-spojnica podkonstrukcije - 35° nagib - substructure connector - 35° slope	Al.	

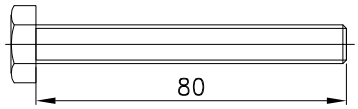
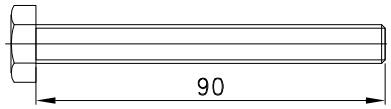
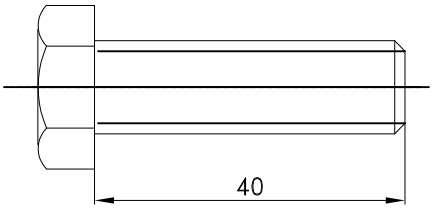
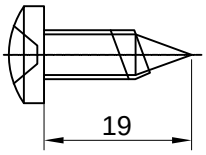
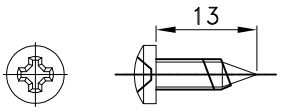
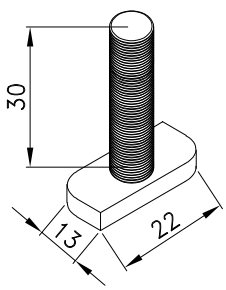
PVC elementi
PVC elements

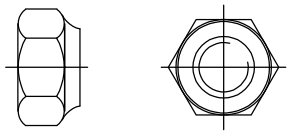
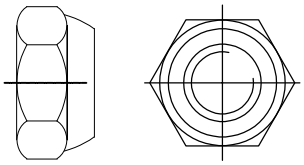
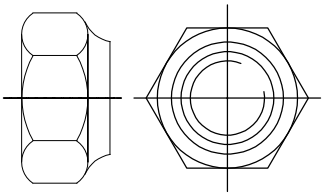
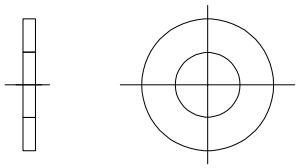
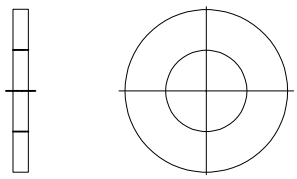
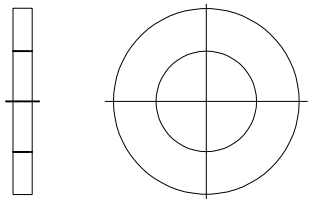
Oznaka Code	Izgled-presjek View-cross section	Opis Description	Materijal Material	Napomena Remark
374.020		- PVC podmetač al.nosača 90mm - Mullion anchor shim 90mm	PVC	

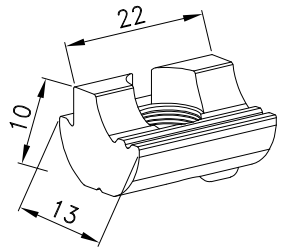
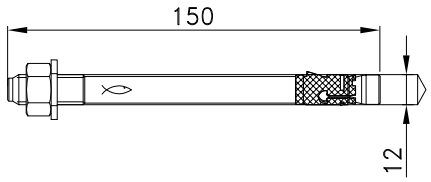
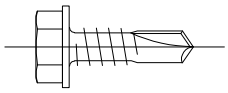
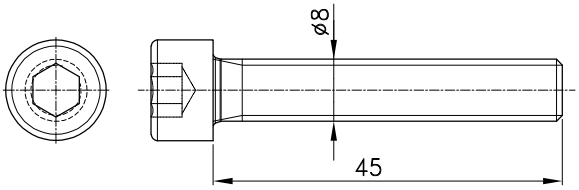
Dodaci
Accessories

Oznaka Code	Izgled-presjek View- cross section	Opis Description	Materijal Material	Napomena Remark
431.561		- Vijak M8x18 - DIN 912 - Screw M8x18 - DIN 912	Inox A2	
431.565		- Vijak M8x20 - DIN 912 - Screw M8x20 - DIN 912	Inox A2	
431.051		-Vijak M8x20 -DIN 933 -Screw M8x20 -DIN 933	Inox A2	
431.559		- Vijak M8x22 - DIN 912 - Screw M8x22 - DIN 912	Inox A2	
431.560		- Vijak M8x25 - DIN 912 - Screw M8x25 - DIN 912	Inox A2	
431.053		-Vijak M8x25 -DIN 933 -Screw M8x20 -DIN 933	Inox A2	

Oznaka Code	Izgled-presjek View- cross section	Opis Description	Materijal Material	Napomena Remark
431.567		- Vijak M8x30 - DIN 912 - Screw M8x30 - DIN 912	Inox A2	
431.568		- Vijak M8x35 - DIN 912 - Screw M8x35 - DIN 912	Inox A2	
431.566		- Vijak M8x40 - DIN 912 - Screw M8x40 - DIN 912	Inox A2	
431.060		-Vijak M8x60 -DIN 933 -Screw M8x60 -DIN 933	Inox A2	
431.079		-Vijak M10x30 -DIN 933 -Screw M10x30 -DIN 933	Inox A2	
431.085		-Vijak M10x60 -DIN 933 -Screw M10x60 -DIN 933	Inox A2	
431.087	M1:2 	-Vijak M10x70 -DIN 933 -Screw M10x70 -DIN 933	Inox A2	

Oznaka Code	Izgled-presjek View- cross section	Opis Description	Materijal Material	Napomena Remark
431.089	M1:2 	-Vijak M10x80 -DIN 933 -Screw M10x80 -DIN 933	Inox A2	
431.090	M1:2 	-Vijak M10x90 -DIN 933 -Screw M10x90 -DIN 933	Inox A2	
431.106	M1:2 	-Vijak M12x40 -DIN 933 -Screw M12x40 -DIN 933	Inox A2	
433.075		-Vijak 6.3x19 -DIN 7981 -Screw 6.3x19 -DIN 7981	Inox A2	
433.016		-Vijak 3.9x13 -DIN 7982 -Screw 3.9x19 -DIN 7981	Inox A2	
431.562		- T Vijak M8 x 30 (22 x 13 x 4) - DIN 125 - T Screw M8 x 30 (22 x 13 x 4) - DIN 125	Inox A2	

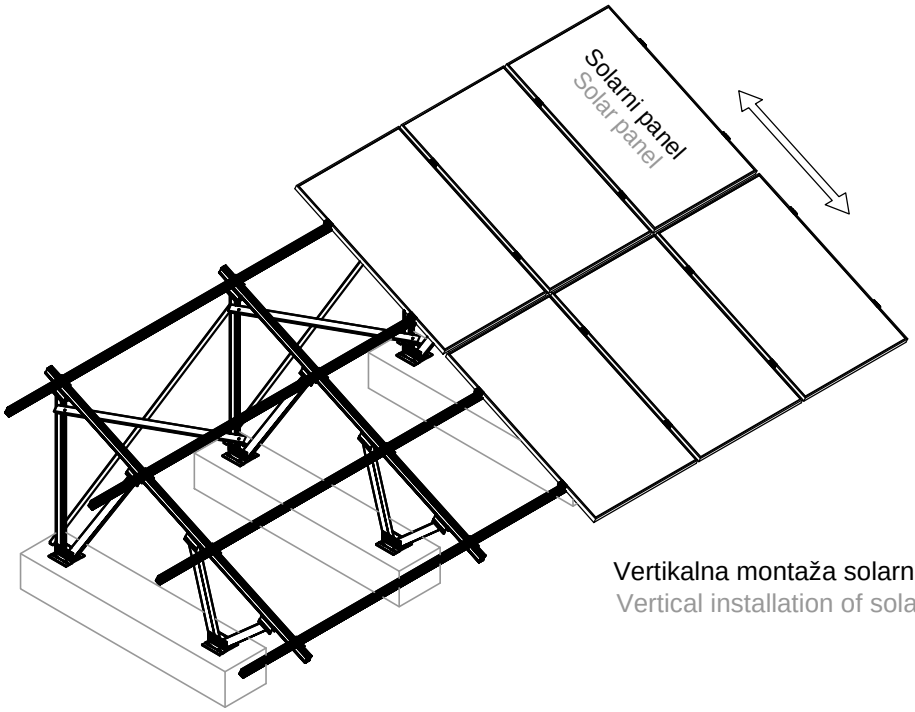
Oznaka Code	Izgled-presjek View- cross section	Opis Description	Materijal Material	Napomena Remark
432.014		- Sigurnosna Matica M8 - DIN 985 - Security Nut M8 - DIN 985	Inox A2	
432.015		- Sigurnosna Matica M10 - DIN 985 - Security Nut M8 - DIN 985	Inox A2	
432.016		- Sigurnosna Matica M12 - DIN 985 - Security Nut M8 - DIN 985	Inox A2	
432.113		- Podloška U8 - DIN 125 - Washer U8 - DIN 125	Inox A2	
432.114		- Podloška U10 - DIN 125 - Washer U10 - DIN 125	Inox A2	
432.115		- Podloška U12 - DIN 125 - Washer U12 - DIN 125	Inox A2	

Oznaka Code	Izgled-presjek View- cross section	Opis Description	Materijal Material	Napomena Remark
432.048		- Matica sa oprugom M8 (22 x 13 x 10) -Nut with spring M8 (22 x 13 x 10)	Al	
430.052		-Anker_Fischer FAZ II 12/50	Zn Čelik	
433.200		-Vijak 6.3x25 DIN 7504-K	Inox A2	
431.569		- Vijak M8x45 - DIN 912 - Screw M8x45 - DIN 912	Inox A2	

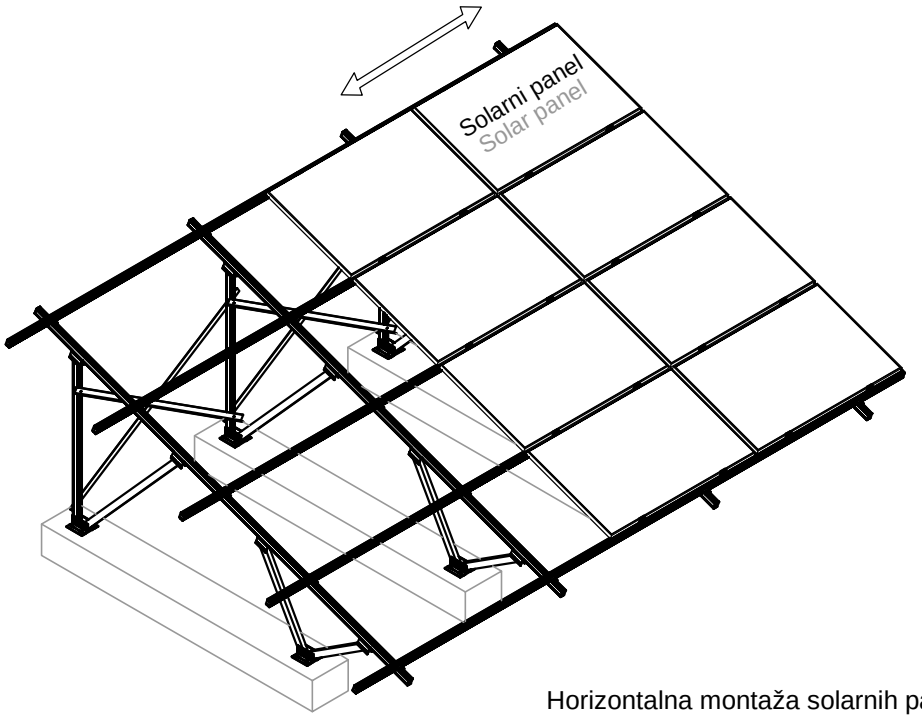
Presjeci
Cross sections

FNE 2000 sistem podjeljen je u dvije osnovne cjeline i to
Horizontalno i Vertikalno montiranje solarnih panela.

The FNE 2000 system is divided into two basic units,
namely Horizontal and Vertical mounting of solar panels.

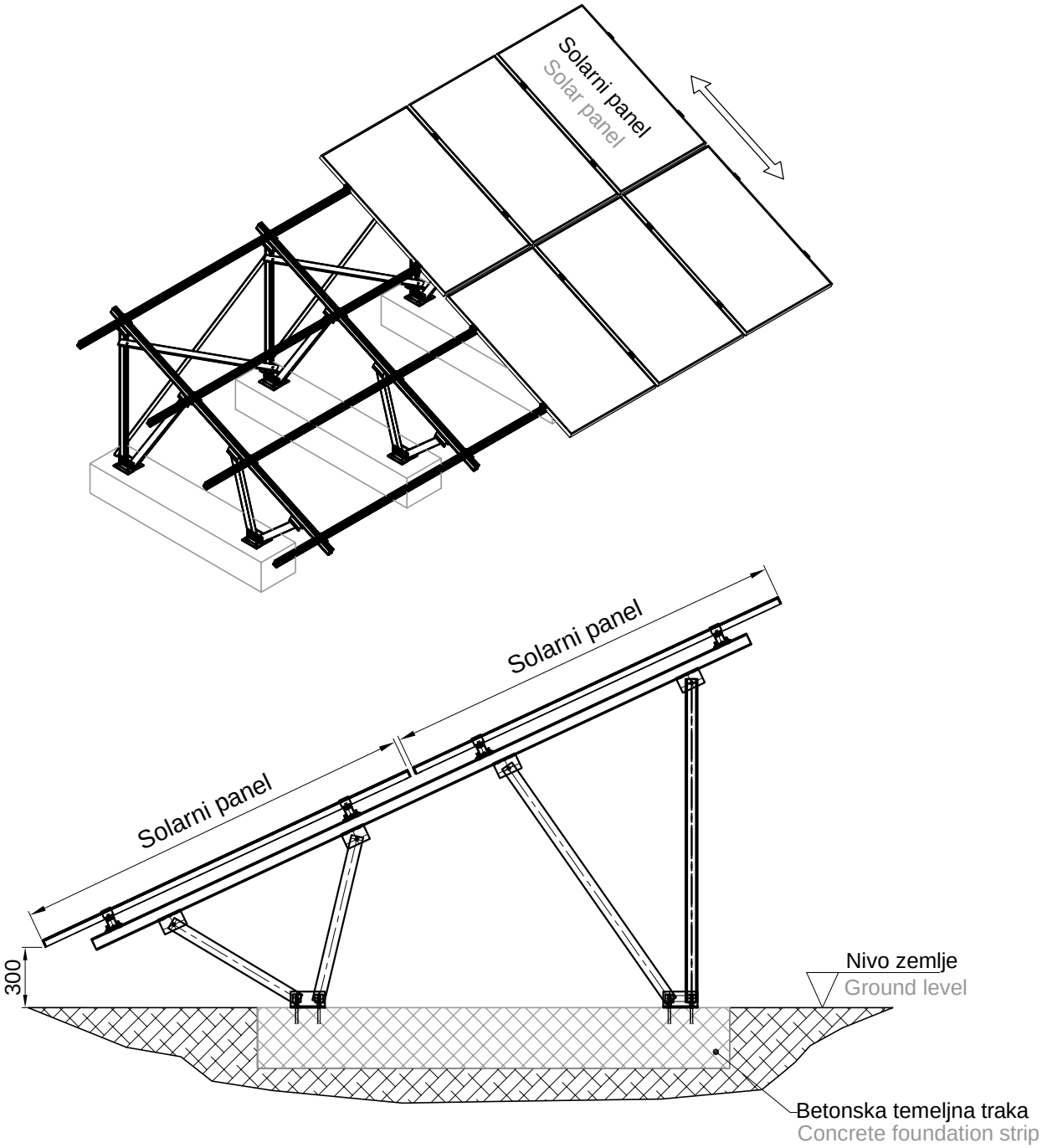


Vertikalna montaža solarnih panela
Vertical installation of solar panels



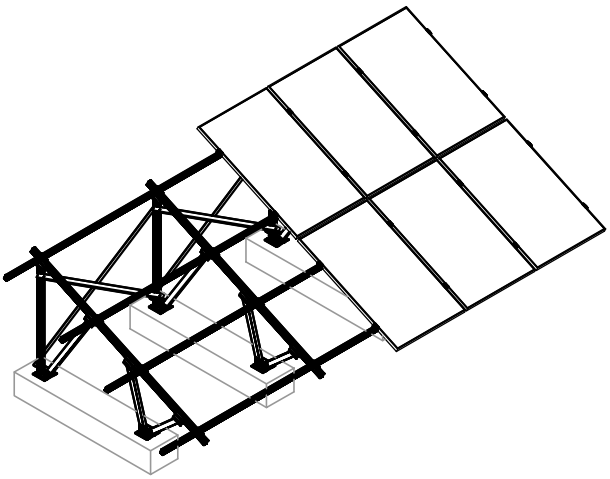
Horizontalna montaža solarnih panela
Horizontal installation of solar panels

Vertikalna montaža solarnih panela
Vertical installation of solar panels



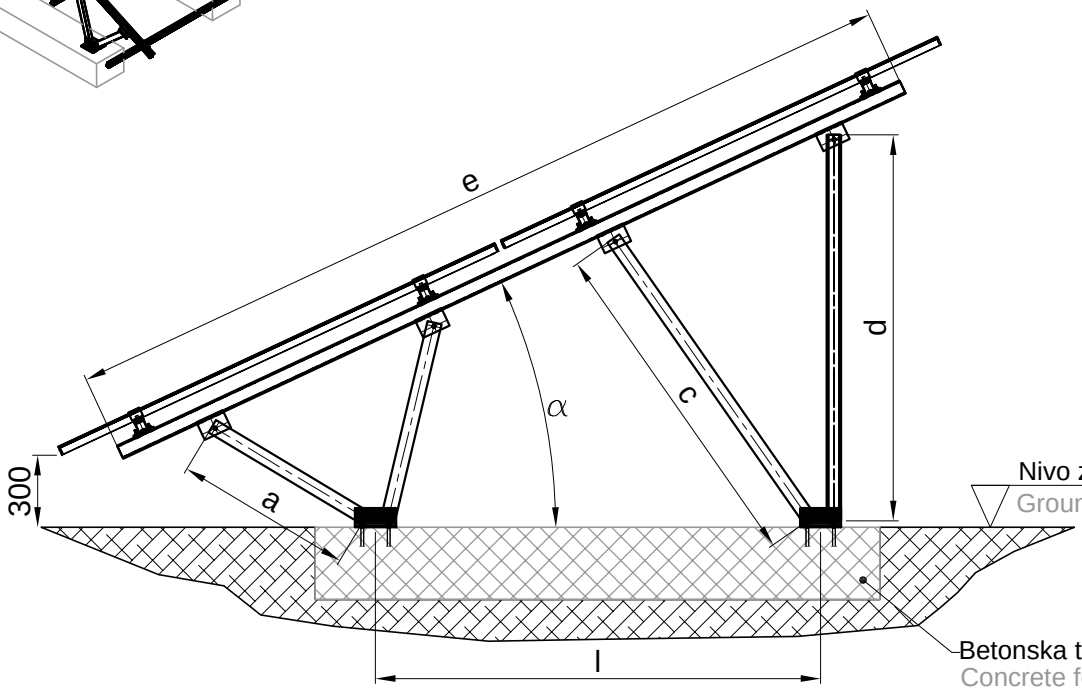
FNE-2000-V, jedna sekcija sadrži 2 solarna panela u poprečnom presjeku i 6 panela u podužnom presjeku. Ukupno 12 solarnih panela u jednoj sekciji.

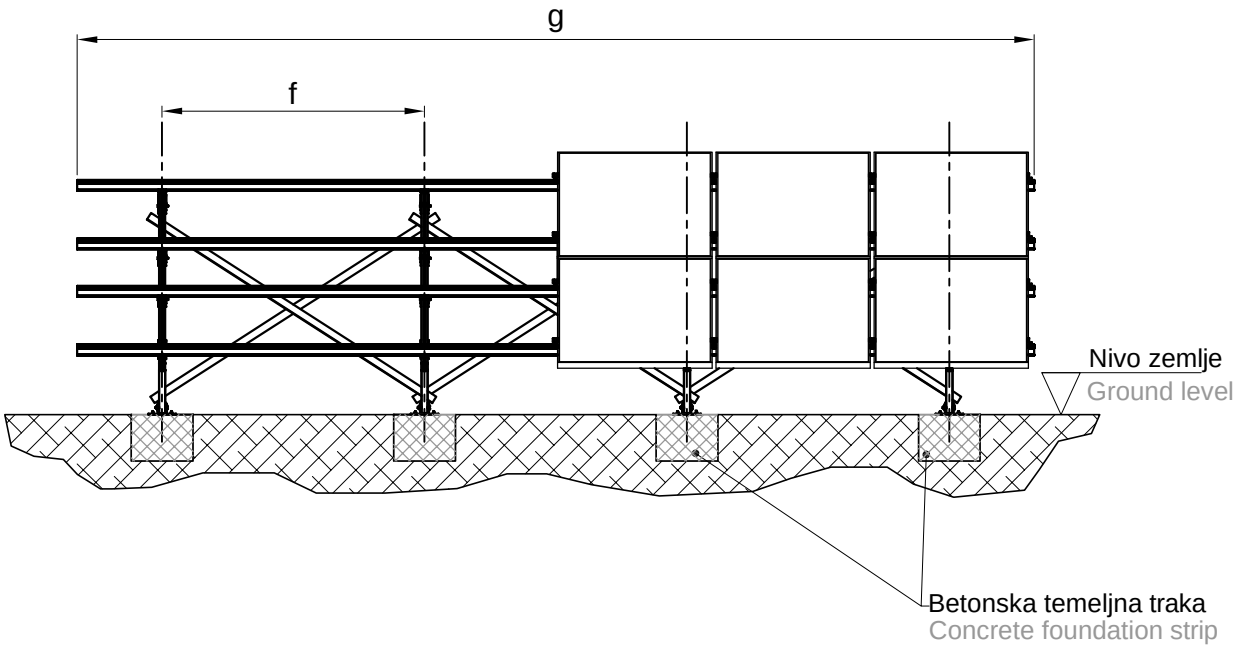
FNE-2000-V, one section contains 2 solar panels in cross section and 6 panels in longitudinal section. A total of 12 solar panels in one section.



Glavni parametri kojim su definirane različite opcije ovog sustava

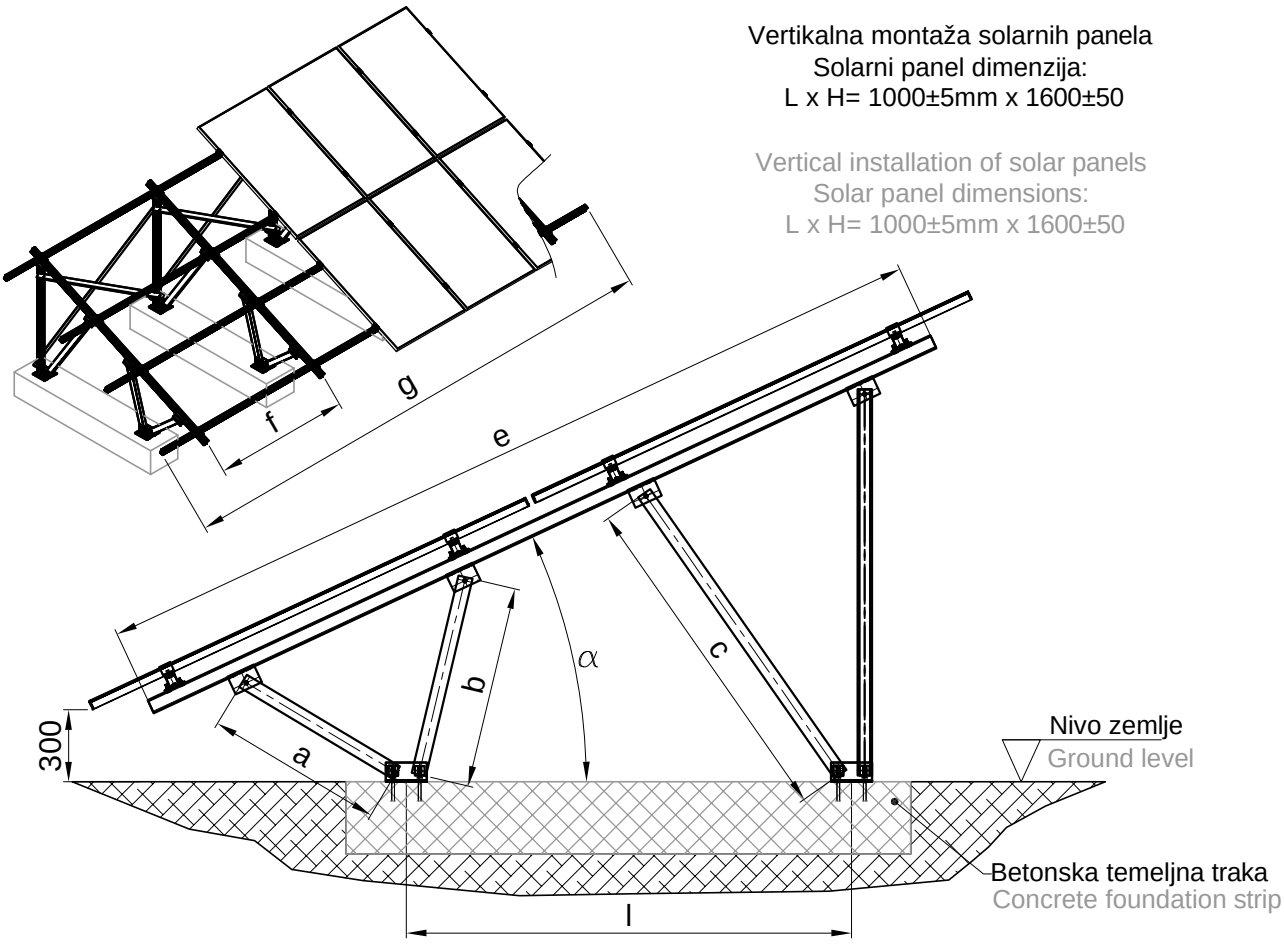
The main parameters that define the various options of this system





Vertikalna montaža solarnih panela
Solarni panel dimenzija:
L x H= 1000±5mm x 1600±50

Vertical installation of solar panels
Solar panel dimensions:
L x H= 1000±5mm x 1600±50



FNE-2000-V1			Dimenzija panela: L x H= 1000±5mm x 1600±50 Raspored: 2 panela vertikalno							
Kategorija terena	Brzina vjetra	α	l	a	b	c	d	e	f	g
III	do 35 m/s	20°	1500	605	635	1050	1110	2800	1700	6300
III	do 30 m/s	25°	1500	580	760	1180	1345	2800	1700	6300
III	do 30 m/s	30°	1500	570	885	1300	1580	2800	1700	6300
			Profili:	F-0180	F-0180	F-0180	FNE-0006	FNE-0006		FNE-0006

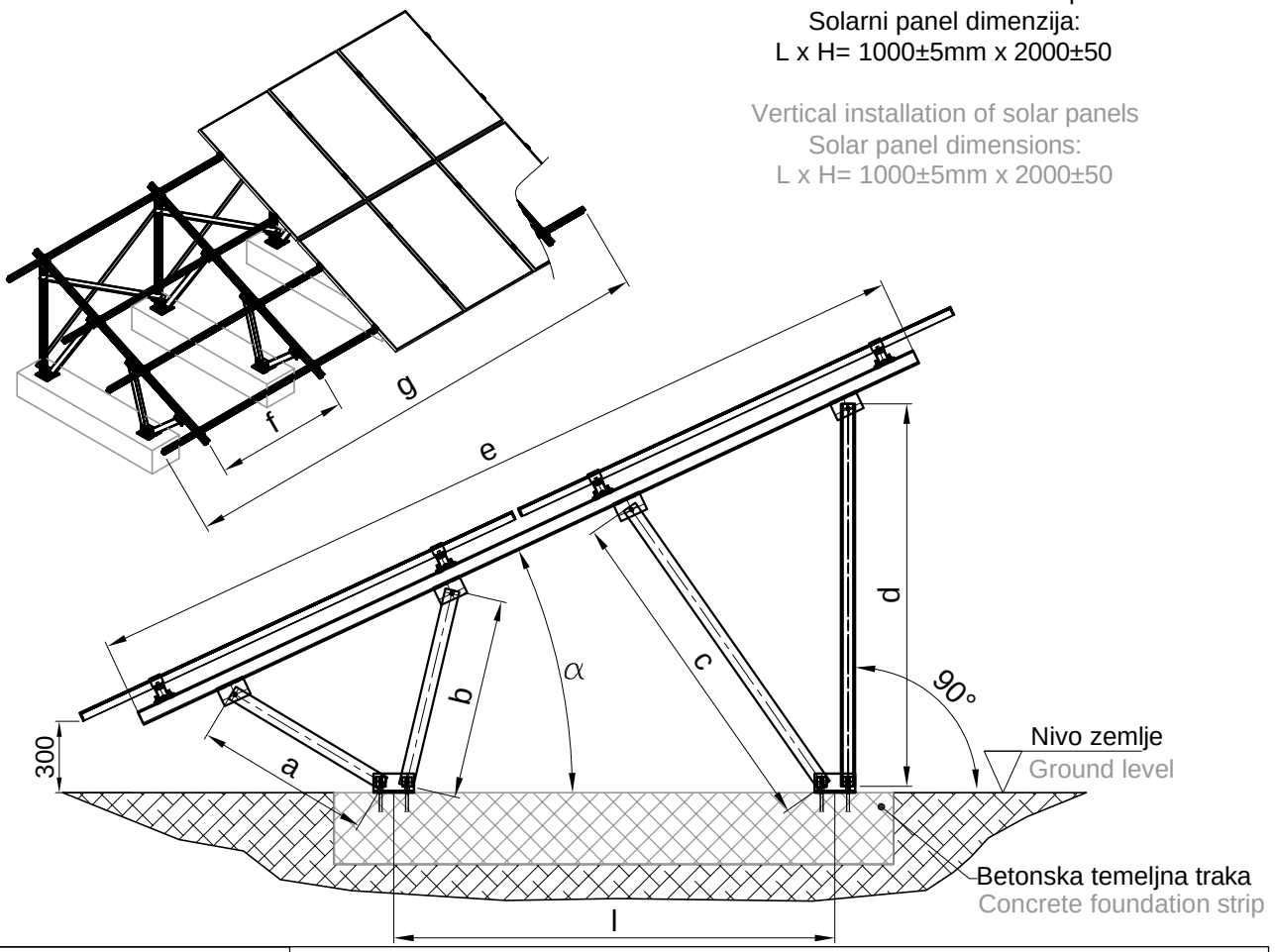
FNE-2000-V1			Dimenzija panela: L x H= 1000±5mm x 1600±50 Raspored: 2 panela vertikalno							
Kategorija terena	Brzina vjetra	α	l	a	b	c	d	e	f	g
III	30-35 m/s	25°	1500	580	760	1180	1345	2800	1700	6300
III	30-35 m/s	30°	1500	570	885	1300	1580	2800	1700	6300
			Profili:	F-0180	F-0180	F-0180	FNE-0004	FNE-0004		FNE-0004

Minimalna udaljenost solarnog panela od zemlje je 300mm.
FNE-2000-V1, jedna sekcija sadrži 2 solarna panela u poprečnom presjeku i 6 panela u podužnom presjeku.
Ukupno 12 solarnih panela u jednoj sekciji.

The minimum distance of the solar panel from the ground is 300mm.
FNE-2000-V1, one section contains 2 solar panels in cross section and 6 panels in longitudinal section. A total of 12 solar panels in one section.

Vertikalna montaža solarnih panela
Solarni panel dimenzija:
L x H= 1000±5mm x 2000±50

Vertical installation of solar panels
Solar panel dimensions:
L x H= 1000±5mm x 2000±50



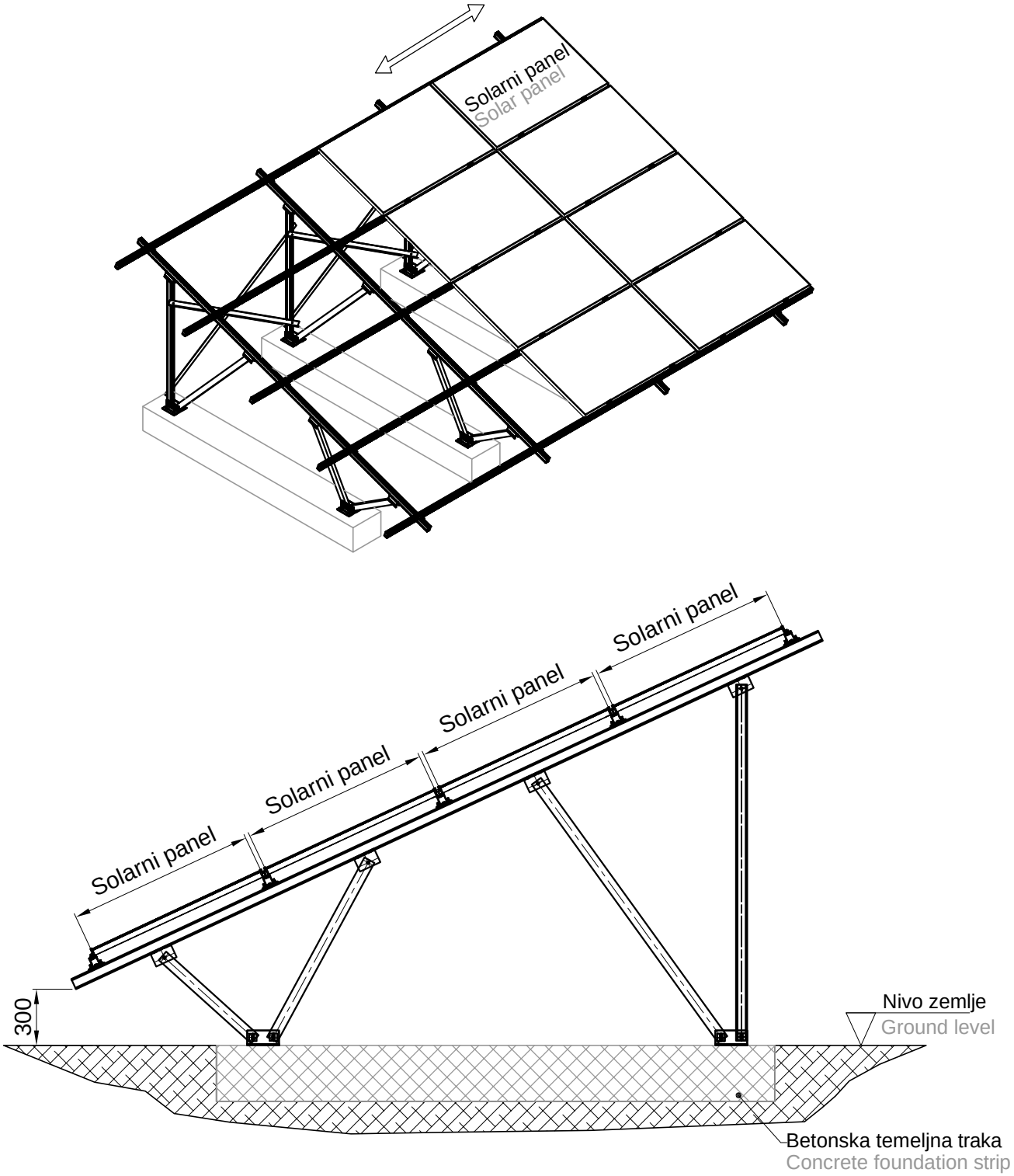
FNE-2000-V2			Dimenzija panela: L x H= 1000±5mm x 2000±50 Raspored: 2 panela vertikalno							
Kategorija terena	Brzina vjetra	α	l	a	b	c	d	e	f	g
III	do 30 m/s	20°	2000	660	715	1300	1320	3580	1700	6300
III	do 25 m/s	25°	2000	590	850	1430	1600	3580	1700	6300
III	do 20 m/s	30°	2000	565	980	1565	1875	3580	1700	6300
			Profili:	F-0180	F-0180	F-0180	FNE-0006	FNE-0006		FNE-0006

FNE-2000-V2			Dimenzija panela: L x H= 1000±5mm x 2000±50 Raspored: 2 panela vertikalno							
Kategorija terena	Brzina vjetra	α	l	a	b	c	d	e	f	g
III	35 m/s	20°	2000	660	715	1300	1320	3580	1700	6300
III	30-35 m/s	25°	2000	590	850	1430	1600	3580	1700	6300
III	25-35 m/s	30°	2000	565	980	1565	1875	3580	1700	6300
			Profili:	F-0180	F-0180	F-0180	FNE-0004	FNE-0005		FNE-0005

FNE-2000-V2, jedna sekcija sadrži 2 solarna panela u poprečnom presjeku i 6 panela u podužnom presjeku. Ukupno 12 solarnih panela u jednoj sekciji.

FNE-2000-V2, one section contains 2 solar panels in cross section and 6 panels in longitudinal section. A total of 12 solar panels in one section.

Horizontalna montaža solarnih panela
Horizontal installation of solar panels

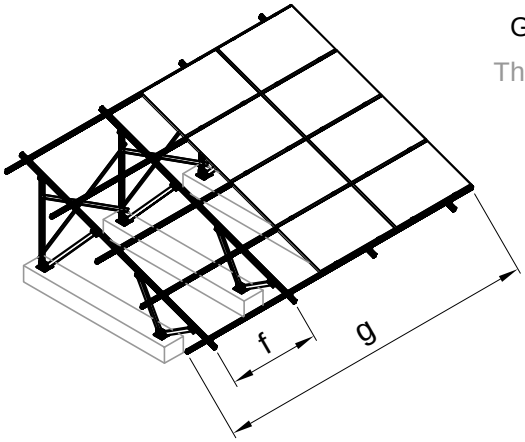


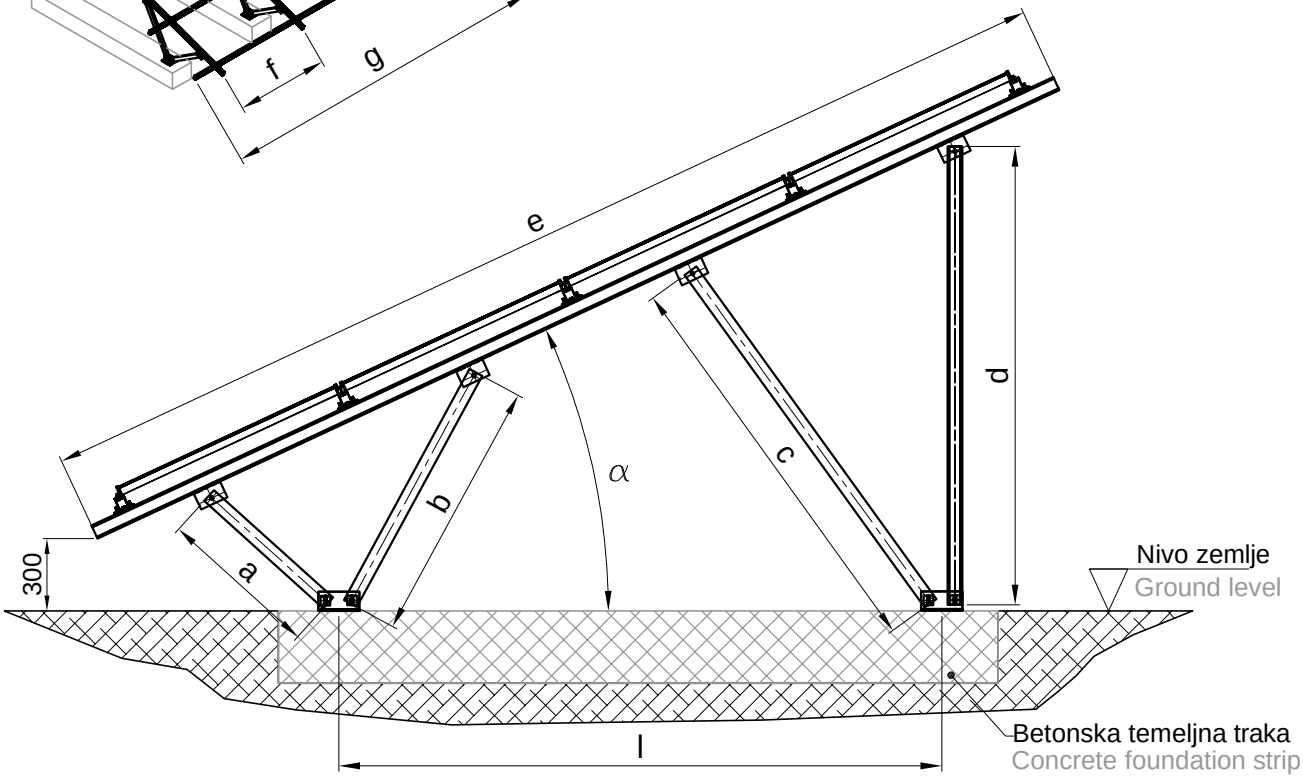
FNE-2000-H, jedna sekcija sadrži 4 solarna panela u poprečnom presjeku i 4 panela u podužnom presjeku. Ukupno 16 solarnih panela u jednoj sekciji.

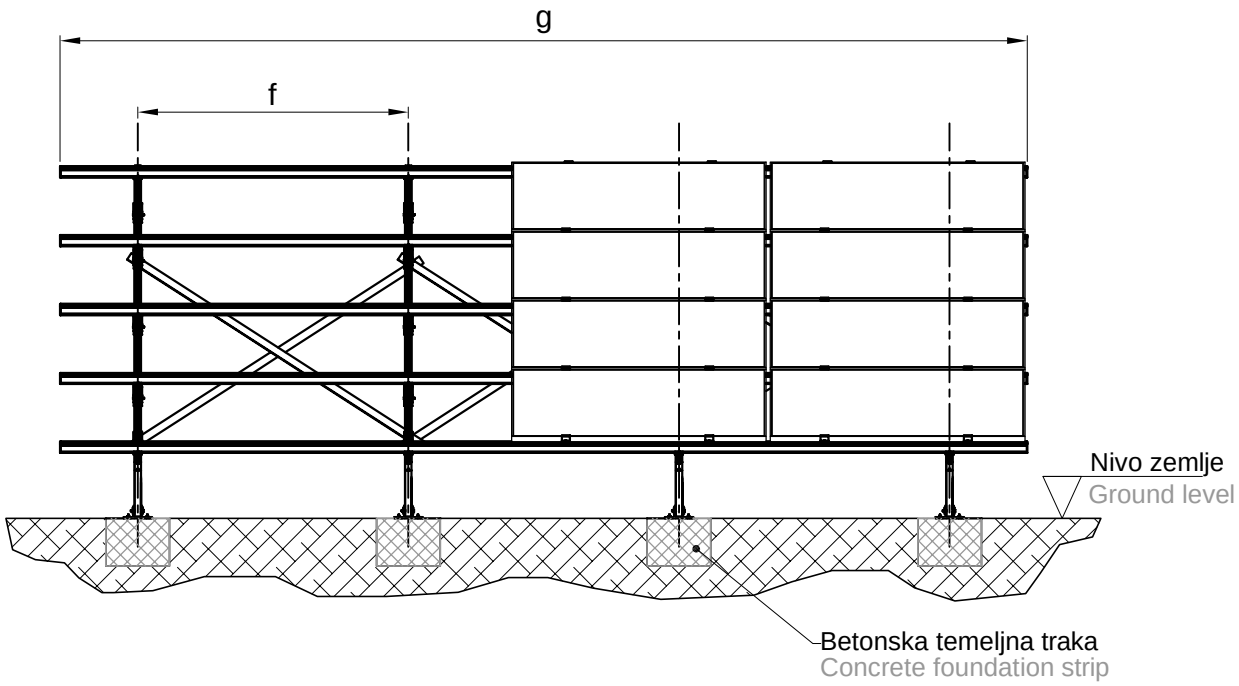
FNE-2000-H, one section contains 4 solar panels in cross section and 4 panels in longitudinal section. A total of 16 solar panels in one section.

Glavni parametri kojim su definirane različite opcije ovog sustava

The main parameters that define the various options of this system

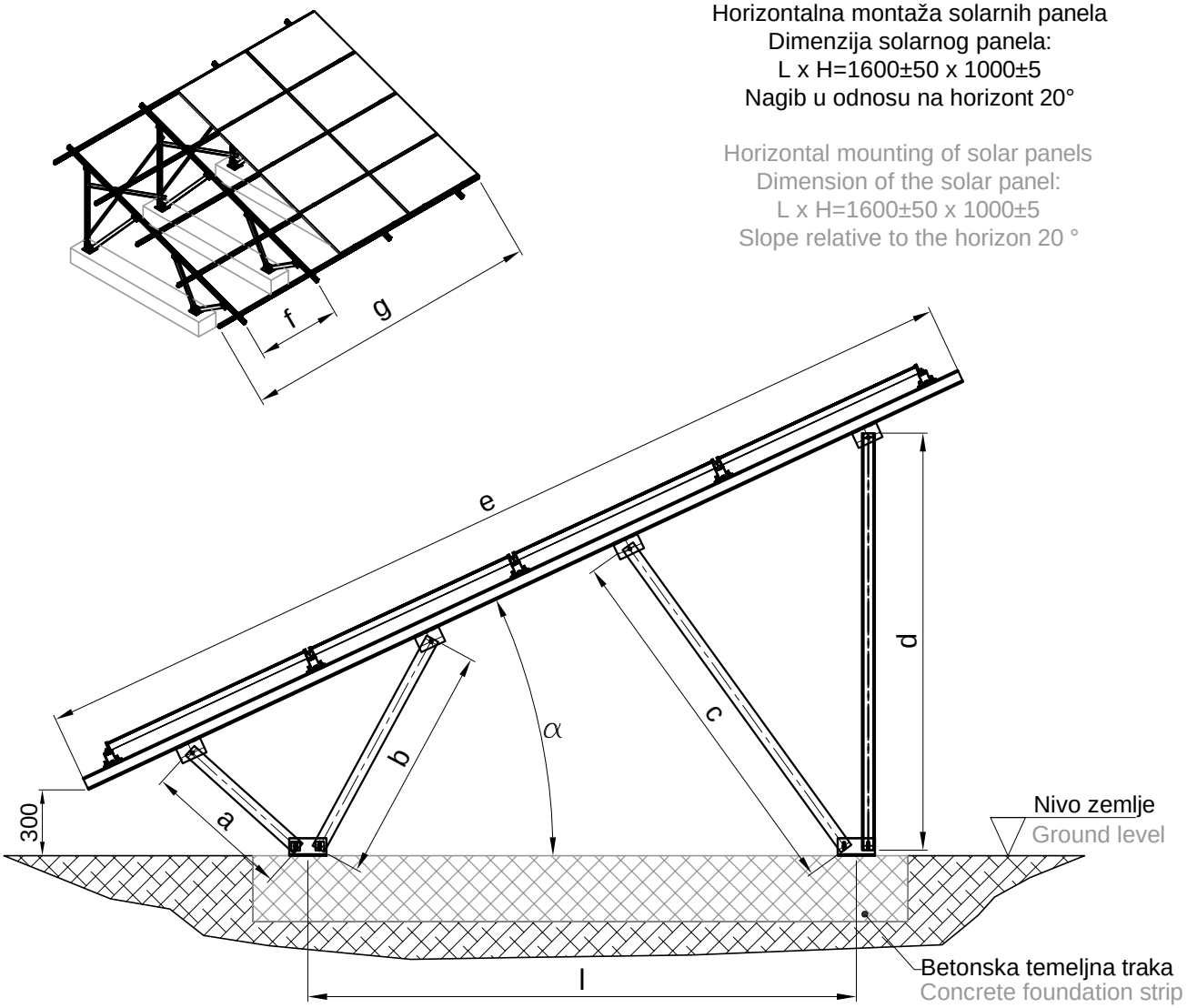






Horizontalna montaža solarnih panela
Dimenzija solarnog panela:
L x H=1600±50 x 1000±5
Nagib u odnosu na horizont 20°

Horizontal mounting of solar panels
Dimension of the solar panel:
L x H=1600±50 x 1000±5
Slope relative to the horizon 20 °



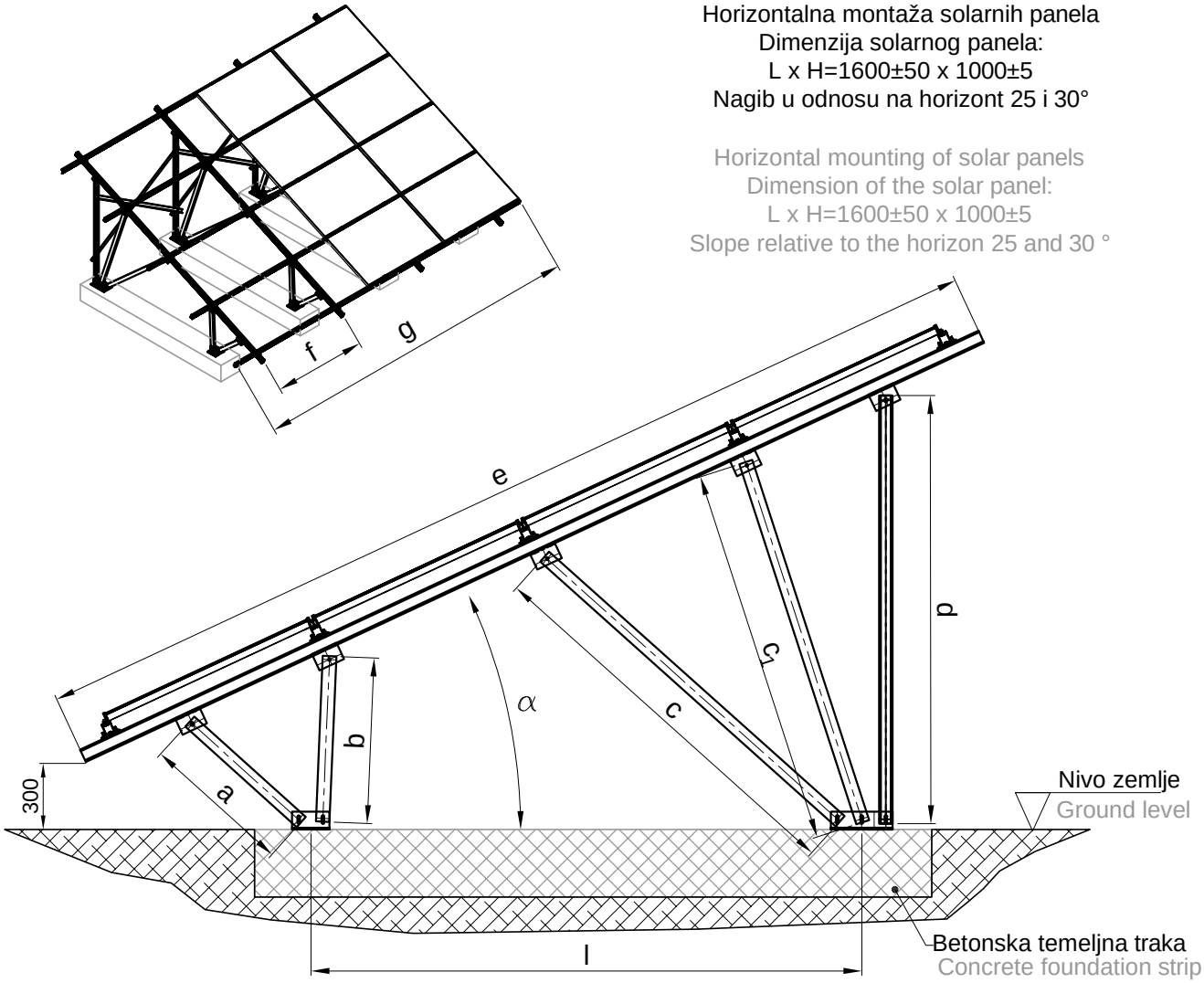
FNE-2000-H1			Dimenzija panela: L x H= 1600±50 x 1000±5 Raspored: 4 panela horizontalno							
Kategorija terena	Brzina vjetra	α	l	a	b	c	d	e	f	g
III	do 35 m/s	20°	2500	725	930	1555	1580	4400	1700	6500
			Profili:	F-0180	F-0180	F-0180	FNE-0006	FNE-0006		FNE-0006

Minimalna udaljenost solarnog panela od zemlje je 300mm.
FNE-2000-H1, jedna sekcija sadrži 4 solarna panela u poprečnom presjeku i
4 panela u podužnom presjeku. Ukupno 16 solarnih panela u jednoj sekciji.

The minimum distance of the solar panel from the ground is 300mm.
FNE-2000-H1, one section contains 4 solar panels in cross section and
4 panels in longitudinal section. A total of 16 solar panels in one section.

Horizontalna montaža solarnih panela
Dimenzija solarnog panela:
L x H=1600±50 x 1000±5
Nagib u odnosu na horizont 25 i 30°

Horizontal mounting of solar panels
Dimension of the solar panel:
L x H=1600±50 x 1000±5
Slope relative to the horizon 25 and 30 °

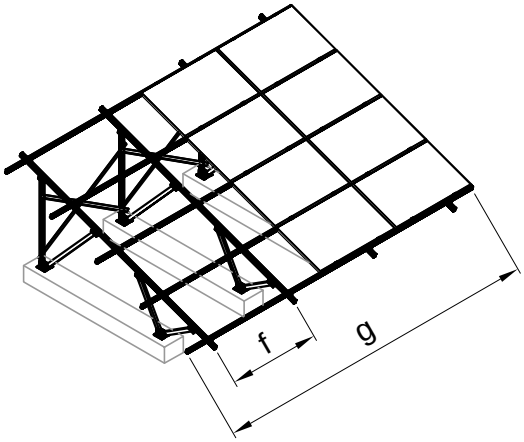


FNE-2000-H1			Dimenzija panela: L x H=1600±50 x 1000±5 Raspored: 4 panela horizontalno								
Kategorija terena	Brzina vjetra	α	l	a	b	c	c_1	d	e	f	g
III	do 35 m/s	25°	2450	665	735	1760	1680	1900	4400	1700	6500
III	do 30 m/s	30°	2300	700	810	1840	1910	2200	4400	1700	6500
			Profili:	F-0180	F-0180	F-0180	F-0180	FNE-0006	FNE-0006		FNE-0006

FNE-2000-H1			Dimenzija panela: L x H=1600±50 x 1000±5 Raspored: 4 panela horizontalno								
Kategorija terena	Brzina vjetra	α	l	a	b	c	c_1	d	e	f	g
III	30 - 35 m/s	30°	2300	700	810	1840	1910	2200	4400	1700	6500
			Profili:	F-0180	F-0180	F-0180	F-0180	FNE-0004	FNE-0005		FNE-0005

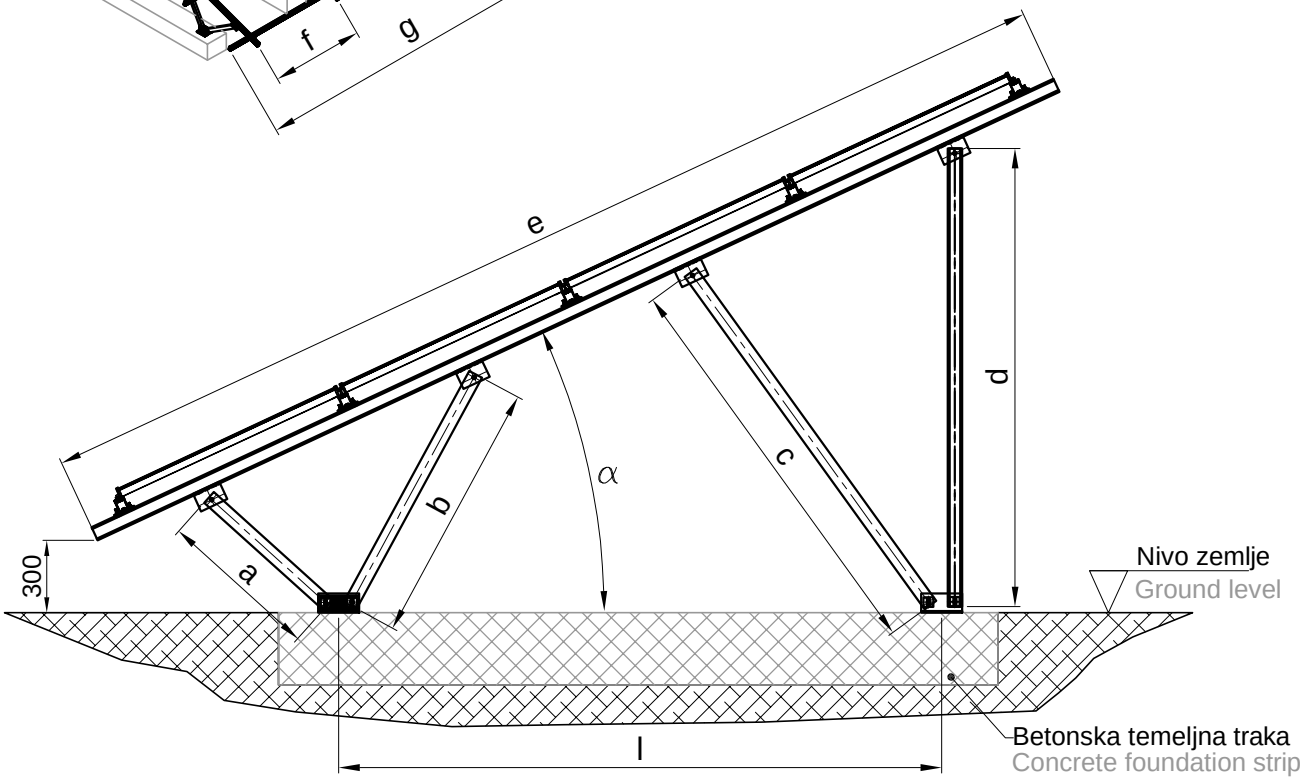
FNE-2000-H1, jedna sekcija sadrži 4 solarna panela u poprečnom presjeku i 4 panela u podužnom presjeku. Ukupno 16 solarnih panela u jednoj sekciji.

FNE-2000-H1, one section contains 4 solar panels in cross section and 4 panels in longitudinal section. A total of 16 solar panels in one section.



Horizontalna montaža solarnih panela
Dimenzija solarnog panela:
L x H=2000±50 x 1000±5
Nagib u odnosu na horizont 20°

Horizontal mounting of solar panels
Dimension of the solar panel:
L x H=2000±50 x 1000±5
Slope relative to the horizon 20 °



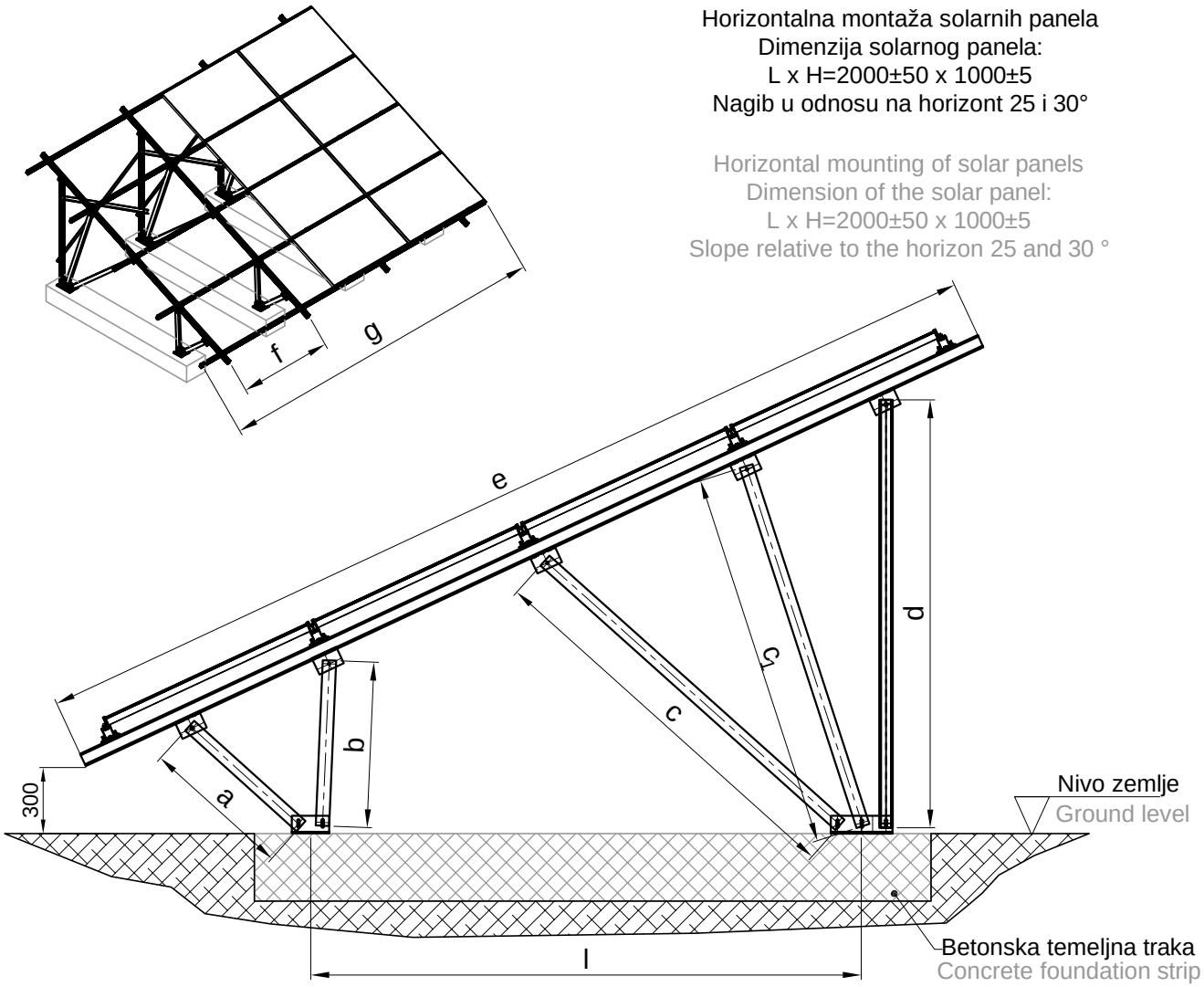
FNE-2000-H2			Dimenzija panela: L x H=2000±50 x 1000±5 Raspored: 4 panela horizontalno							
Kategorija terena	Brzina vjetra	α	l	a	b	c	d	e	f	g
III	do 35 m/s	20°	2500	725	930	1555	1580	4400	1700	6070
			Profili:	F-0180	F-0180	F-0180	FNE-0006	FNE-0006		FNE-0006

Minimalna udaljenost solarnog panela od zemlje je 300mm.
FNE-2000-H2, jedna sekcija sadrži 4 solarna panela u poprečnom presjeku i
3 panela u podužnom presjeku.
Ukupno 12 solarnih panela u jednoj sekciji.

The minimum distance of the solar panel from the ground is 300mm.
FNE-2000-H2, one section contains 4 solar panels in cross section and
3 panels in longitudinal section.
A total of 12 solar panels in one section.

Horizontalna montaža solarnih panela
Dimenzija solarnog panela:
L x H=2000±50 x 1000±5
Nagib u odnosu na horizont 25 i 30°

Horizontal mounting of solar panels
Dimension of the solar panel:
L x H=2000±50 x 1000±5
Slope relative to the horizon 25 and 30 °

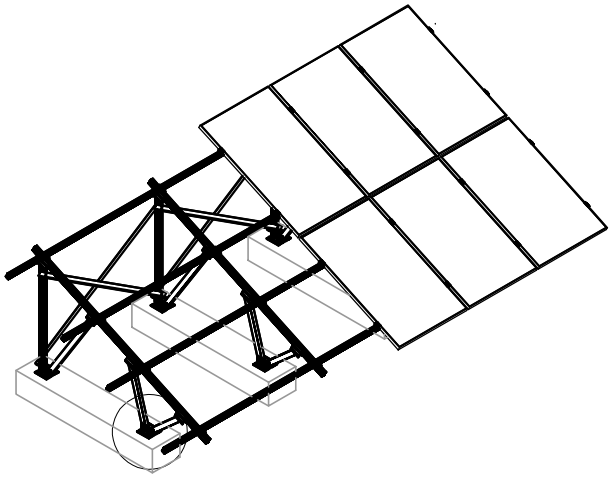


FNE-2000-H2			Dimenzija panela: L x H=2000±50 x 1000±5 Raspored: 4 panela horizontalno								
Kategorija terena	Brzina vjetra	α	l	a	b	c	c_1	d	e	f	g
III	do 35 m/s	25°	2450	665	735	1760	1680	1900	4400	1700	6070
III	do 30 m/s	30°	2300	700	810	1840	1910	2200	4400	1700	6070
			Profili:	F-0180	F-0180	F-0180	F-0180	FNE-0006	FNE-0006		FNE-0006

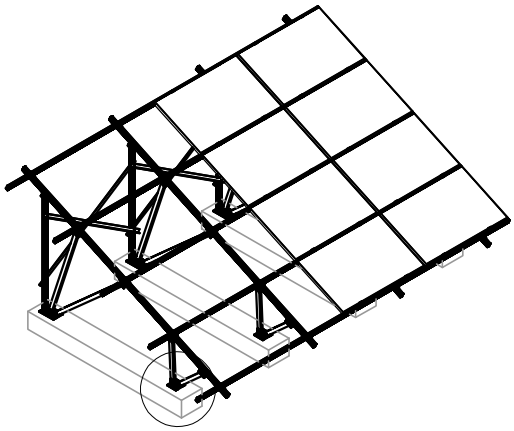
FNE-2000-H2			Dimenzija panela: L x H=2000±50 x 1000±5 Raspored: 4 panela horizontalno								
Kategorija terena	Brzina vjetra	α	l	a	b	c	c_1	d	e	f	g
III	30 - 35 m/s	30°	2300	700	810	1840	1910	2200	4400	1700	6070
			Profili:	F-0180	F-0180	F-0180	F-0180	FNE-0004	FNE-0005		FNE-0005

FNE-2000-H1, jedna sekcija sadrži 4 solarna panela u poprečnom presjeku i 3 panela u podužnom presjeku. Ukupno 12 solarnih panela u jednoj sekciji.

FNE-2000-H1, one section contains 4 solar panels in cross section and 3 panels in longitudinal section. A total of 12 solar panels in one section.

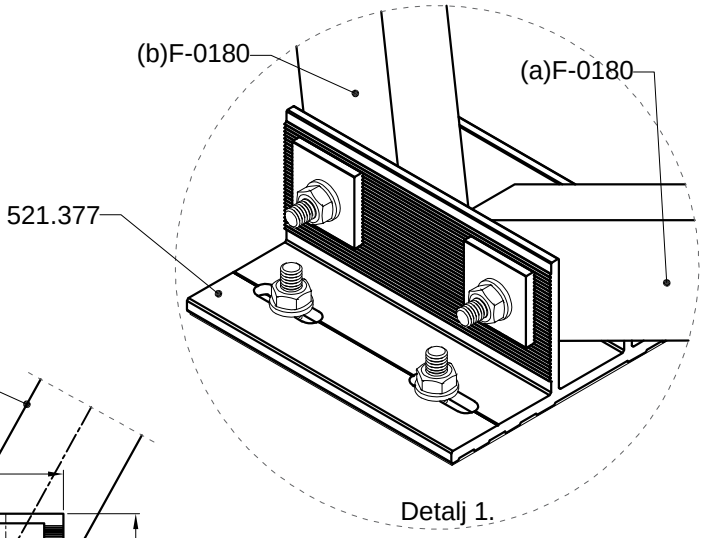


1.

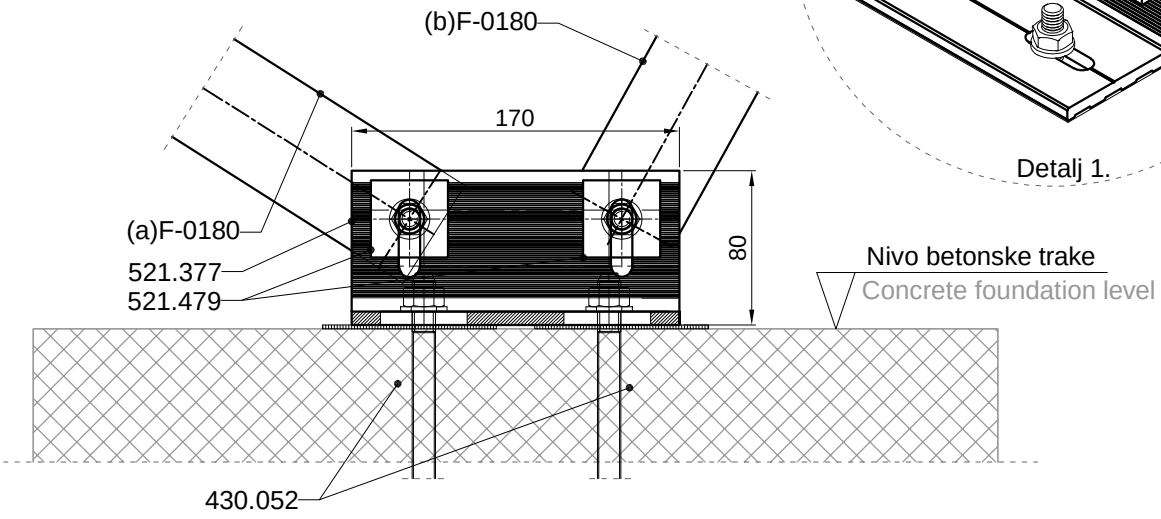


Veza konstrukcije sa betonskim temeljem, prednja stopa

Connection of the structure with the concrete foundation, front foot

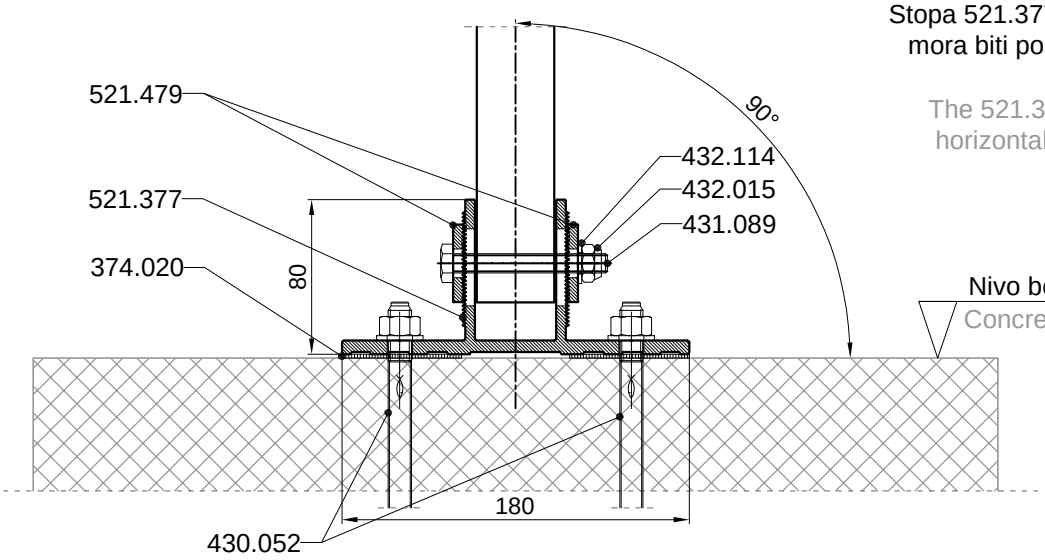


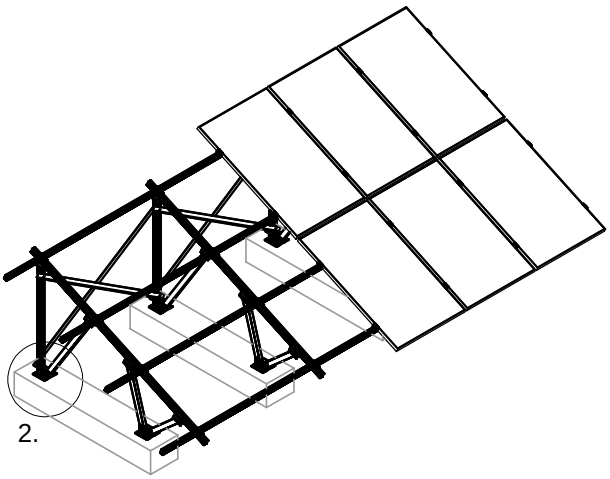
Detalj 1.

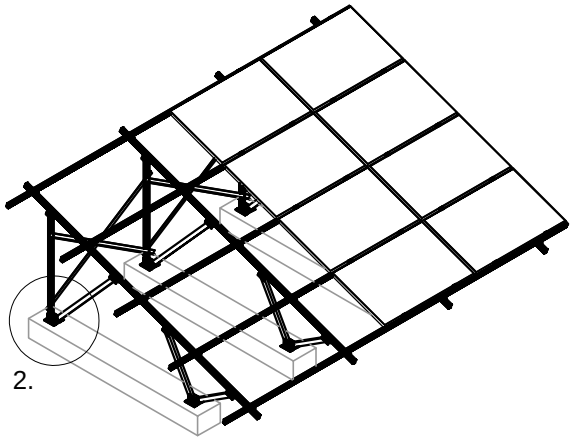


Stopa 521.377 u poprečnom presjeku mora biti postavljena horizontalno!

The 521.377 foot must be set horizontally in cross section!

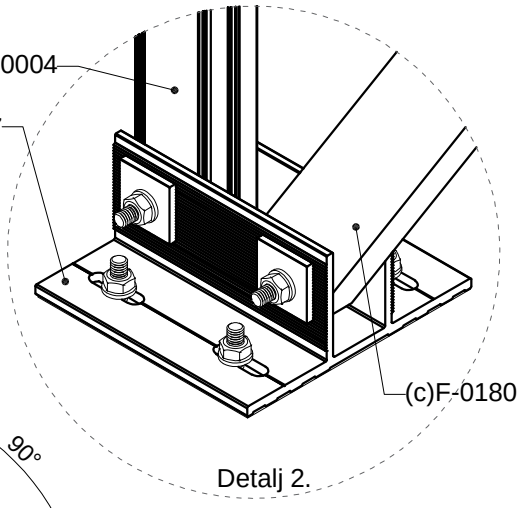


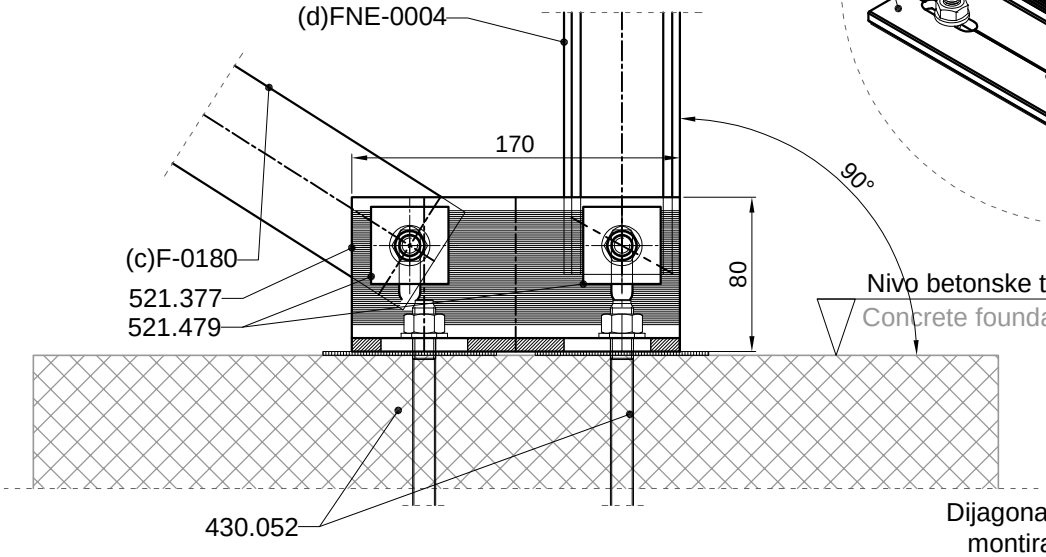




Veza konstrukcije sa betonskim temeljem, stražnja stopa

Connection of the structure with the concrete foundation, rear foot



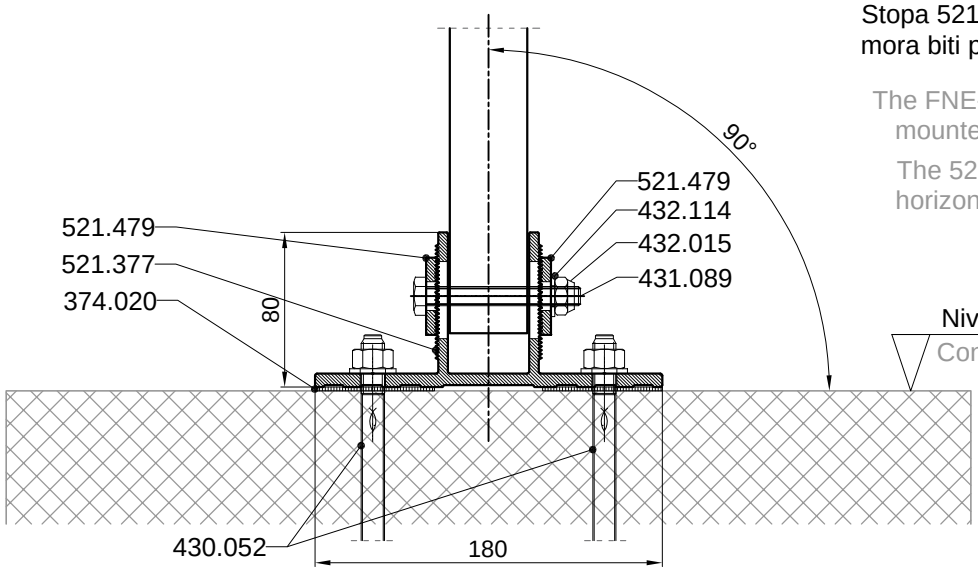


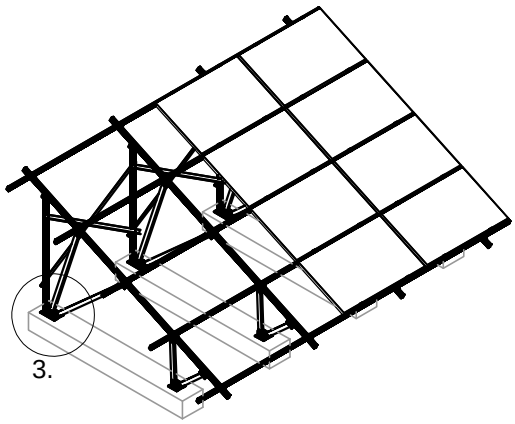
Dijagonala FNE-0004 uvijek se montira u vertikalni položaj!

Stopa 521.377 u poprečnom presjeku mora biti postavljena horizontalno!

The FNE-0004 diagonal is always mounted in a vertical position!

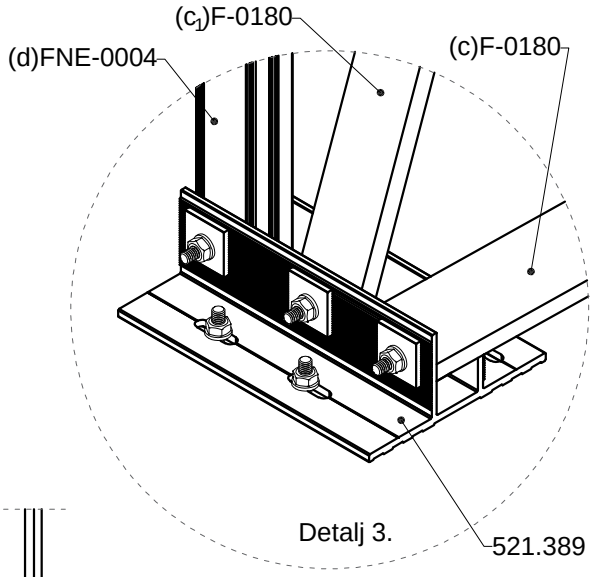
The 521.377 foot must be set horizontally in cross section!





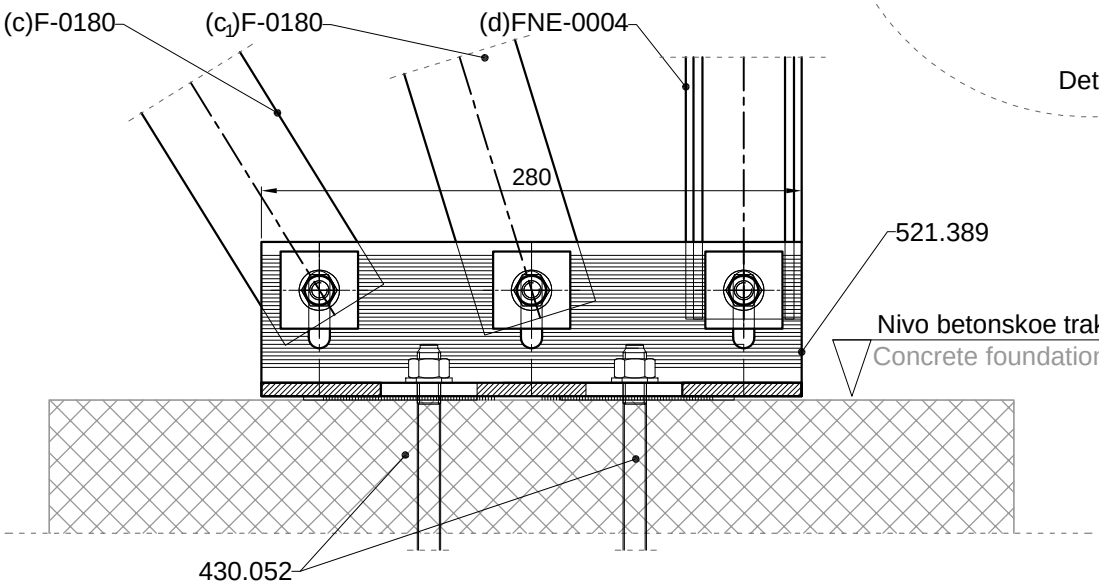
Veza konstrukcije sa betonskim temeljem, stražnja stopa

Connection of the structure with the concrete foundation, rear foot



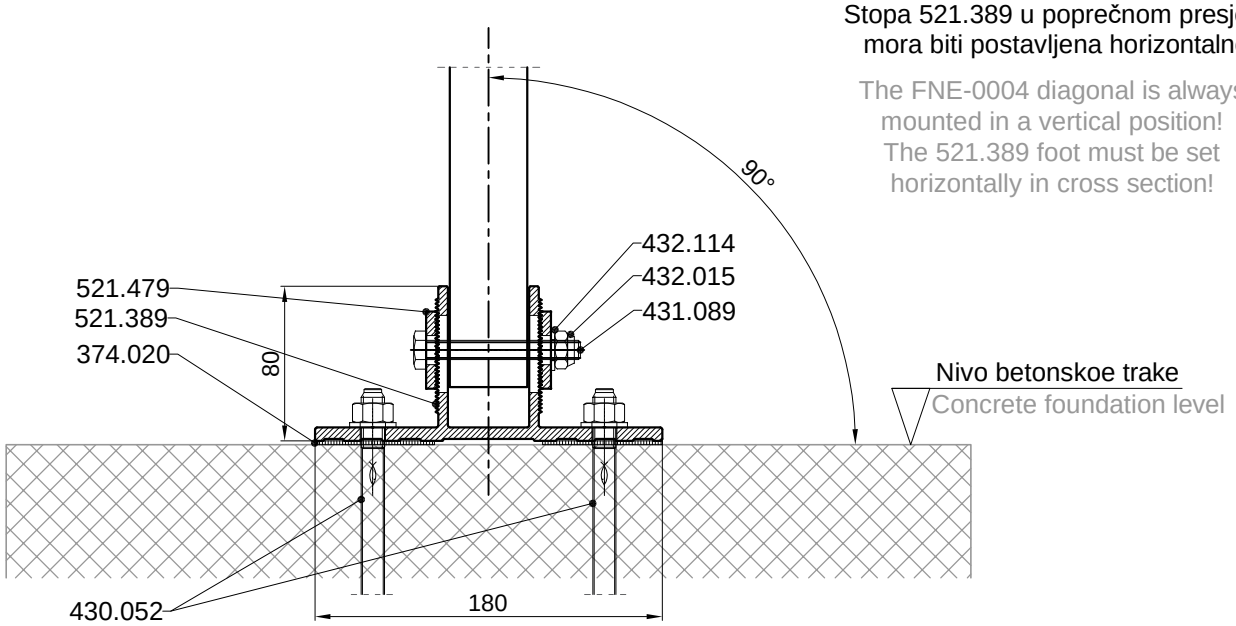
Kod sustava sa horizontalnom montažom panela i za nagibe veće od 20° dodaje se dijagonala c_1 koja se veže za stražnju stopu 521.389

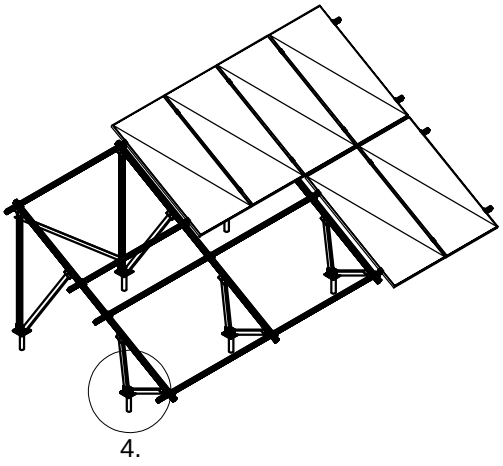
For systems with horizontal panel mounting and for inclinations greater than 20 °, a diagonal c1 is added which binds to the rear foot 521.389

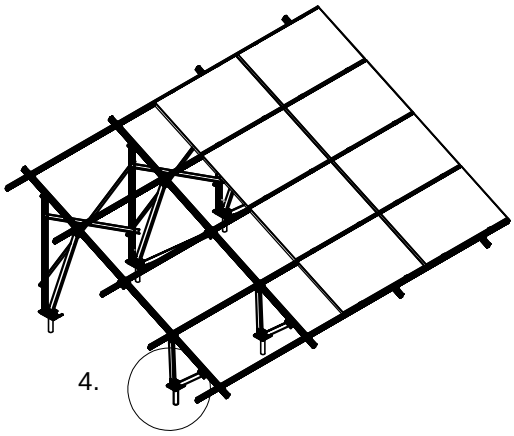


Dijagonala FNE-0004 uvijek se montira u vertikalni položaj!
Stopa 521.389 u poprečnom presjeku mora biti postavljena horizontalno!

The FNE-0004 diagonal is always mounted in a vertical position!
The 521.389 foot must be set horizontally in cross section!

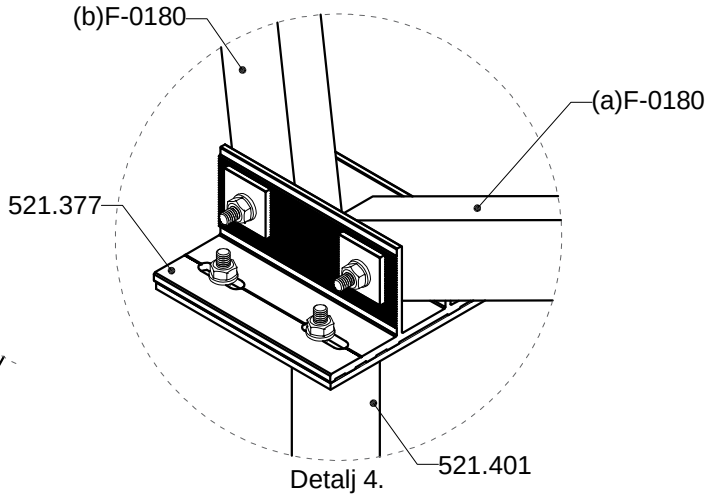


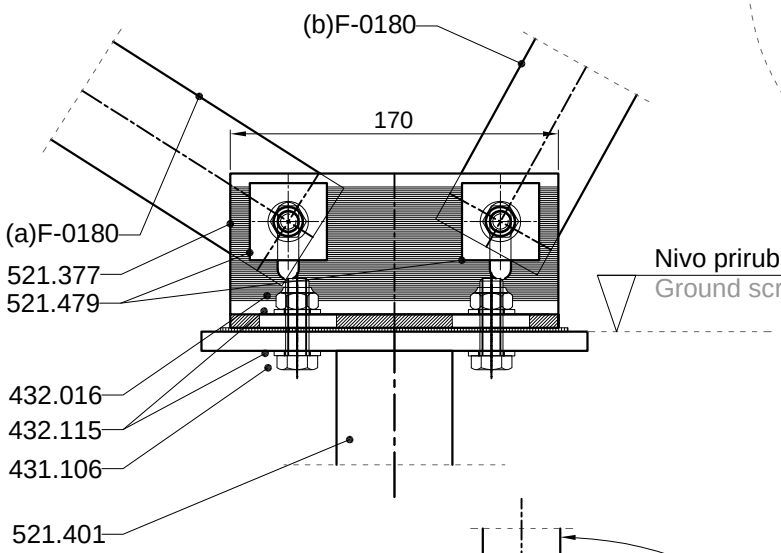




Veza konstrukcije sa vijkom za zemlju kao temelj, prednja stopa

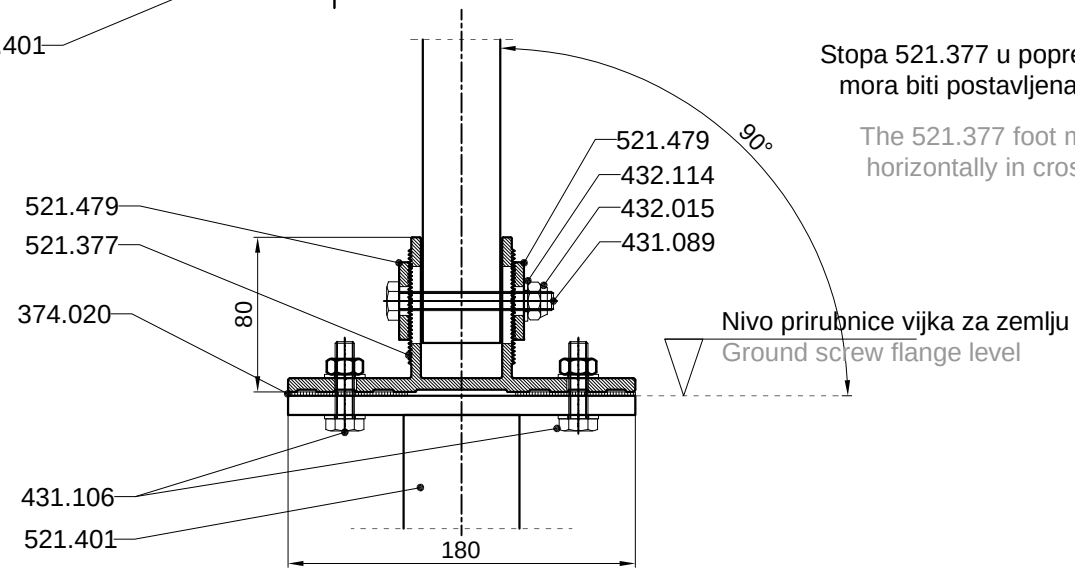
Connection of the structure with a ground screw as a foundation, front foot

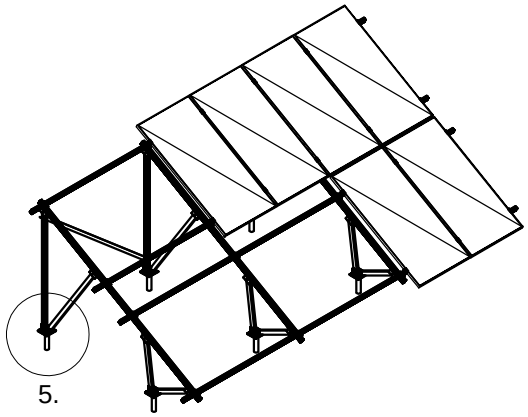


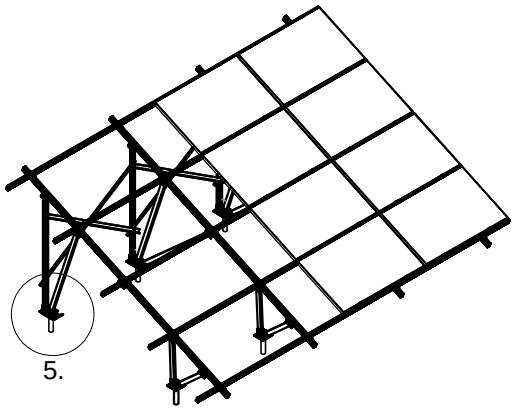


Stopa 521.377 u poprečnom presjeku mora biti postavljena horizontalno!

The 521.377 foot must be set horizontally in cross section!

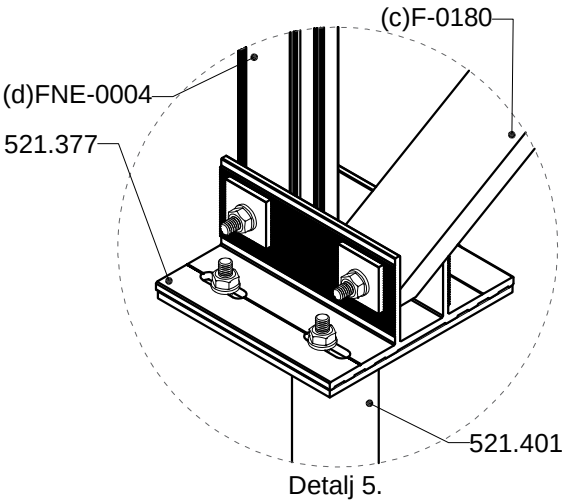


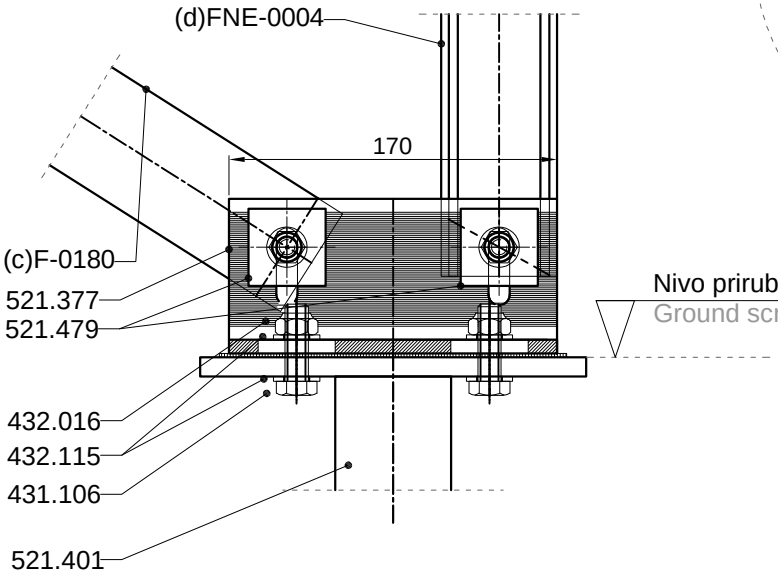




Veza konstrukcije sa vijkom za zemlju kao temelj, stražnja stopa

Connection of the structure with a ground screw as a foundation, rear foot



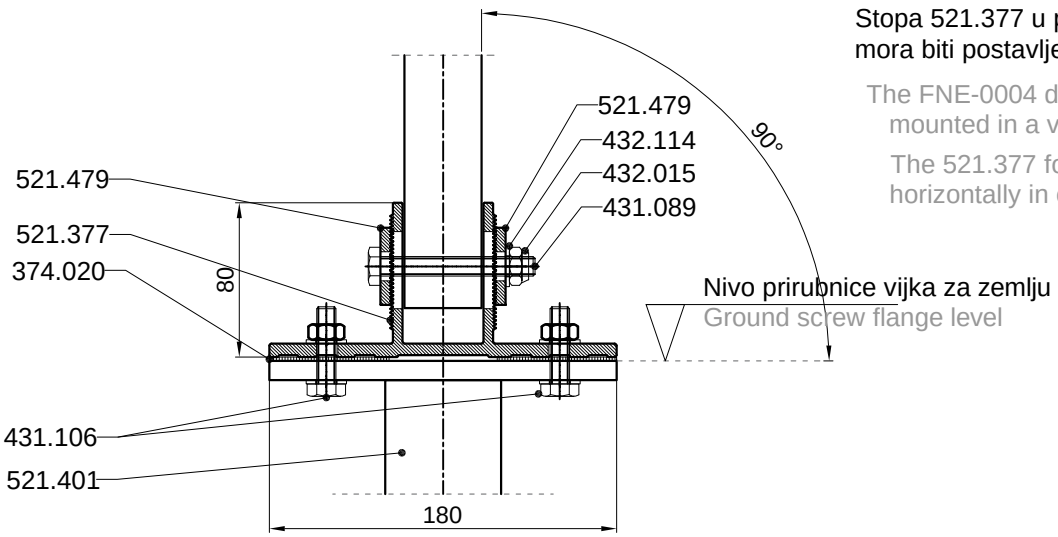


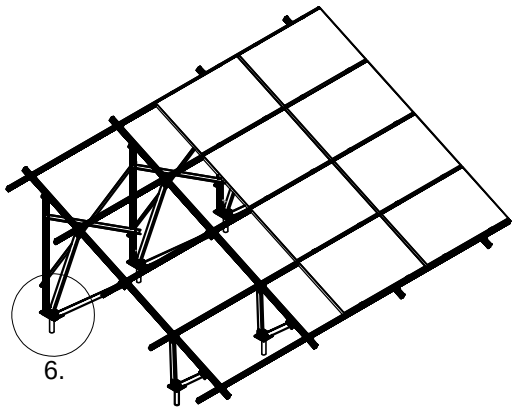
Dijagonala FNE-0004 uvijek se montira u vertikalni položaj!

Stopa 521.377 u poprečnom presjeku mora biti postavljena horizontalno!

The FNE-0004 diagonal is always mounted in a vertical position!

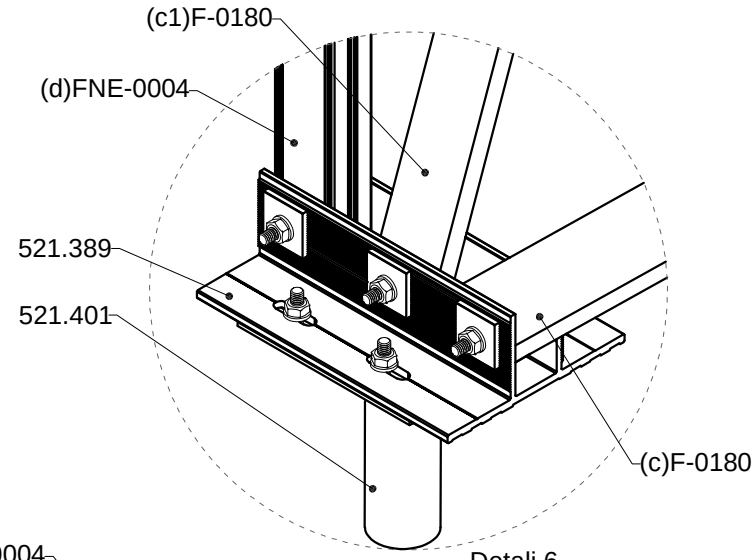
The 521.377 foot must be set horizontally in cross section!



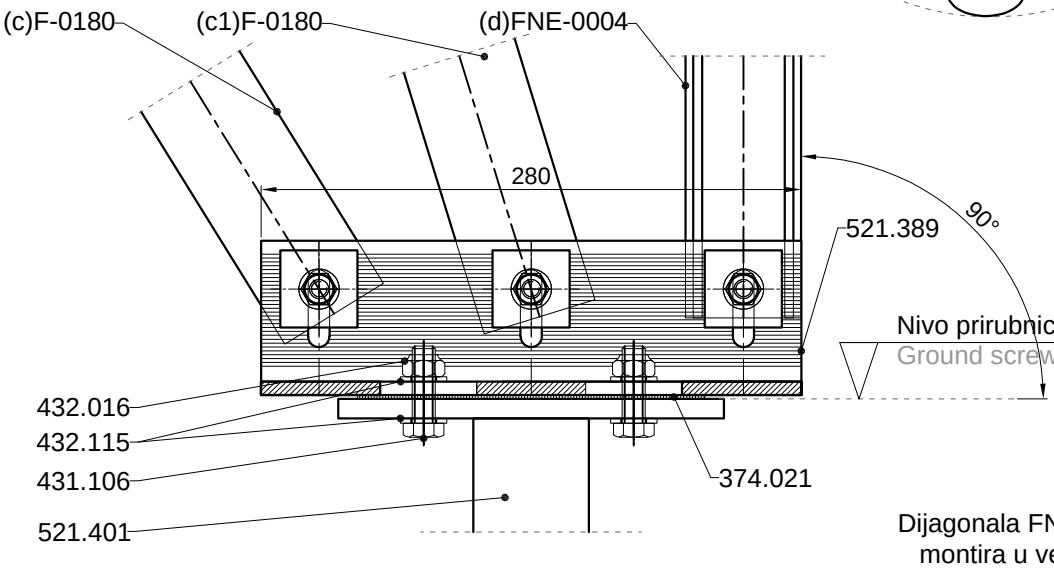


Veza konstrukcije sa vijkom za zemlju kao temelj, stražnja stopa

Connection of the structure with a ground screw as a foundation, rear foot

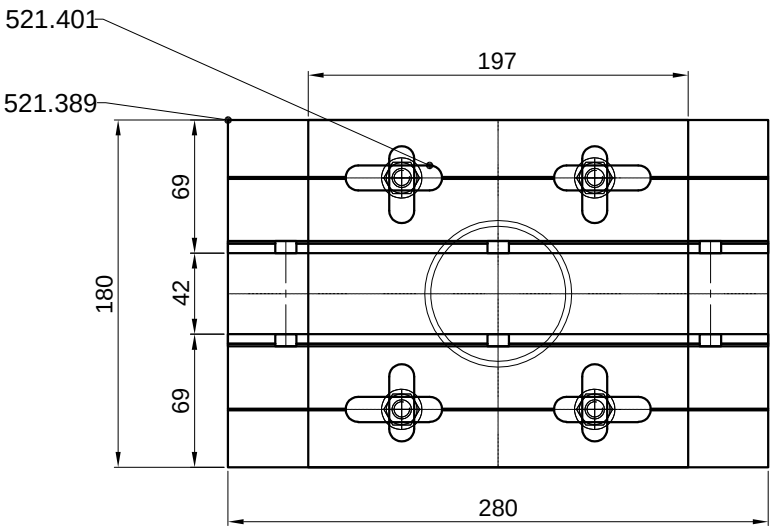


Detalj 6..



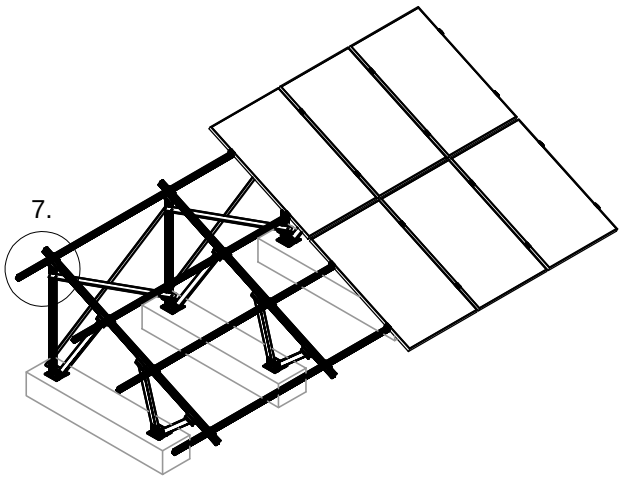
Dijagonala FNE-0004 uvijek se montira u vertikalni položaj!

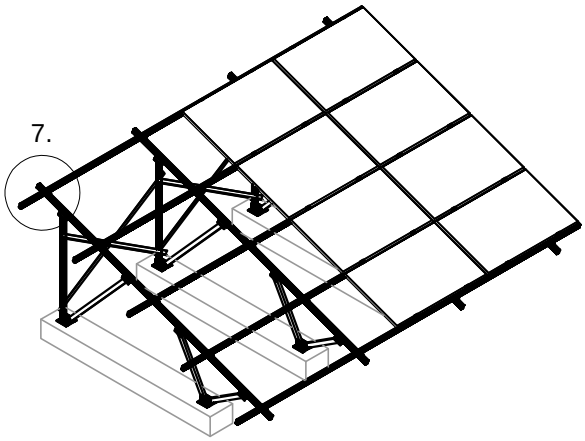
The FNE-0004 diagonal is always mounted in a vertical position!



Prilikom pozicioniranja vijka za zemlju provjeriti orijentaciju rupa koja treba biti usklađena sa stopom kako bi se mogla ostvariti vijčana veza na 4 mjesta.

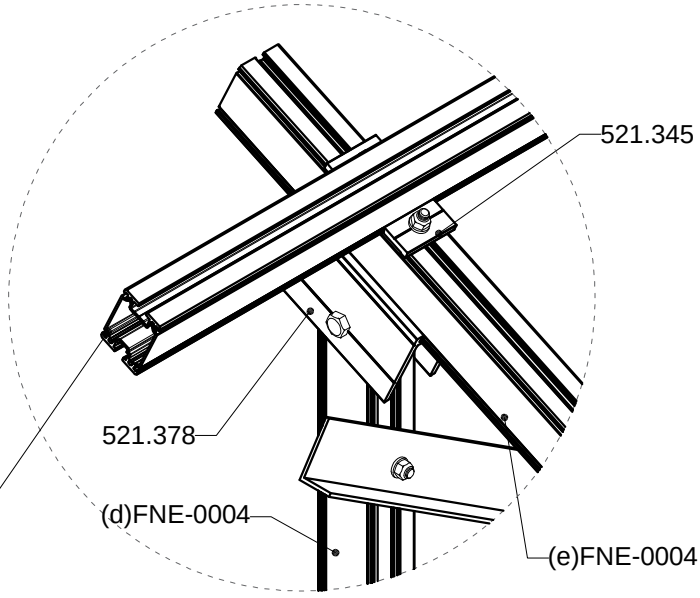
When positioning the ground screw, check the orientation of the holes to be aligned with the foot so that the screw connection can be made in 4 places.



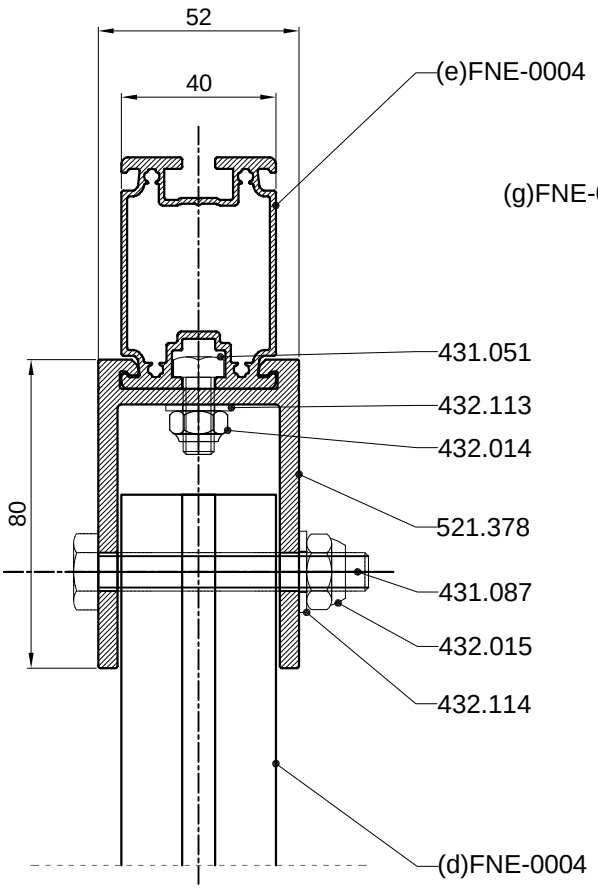


Detalj veze dijagonala (a,b,c,d) i grede u nagibu (e)
ostvaruje se preko veznika 521.378.
Veznik 521.378 se montira prije dijagonala.

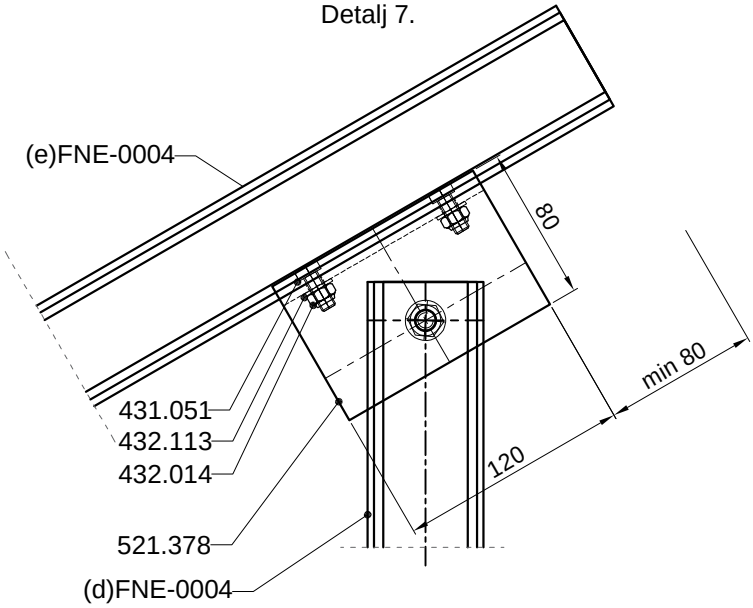
Detail of the connection of the diagonal (a,b,c,d) and
the beam in the slope (e)
is realized through the fastening 521.378.
The fastening 521.378 is mounted before the diagonal.



Detalj 7.

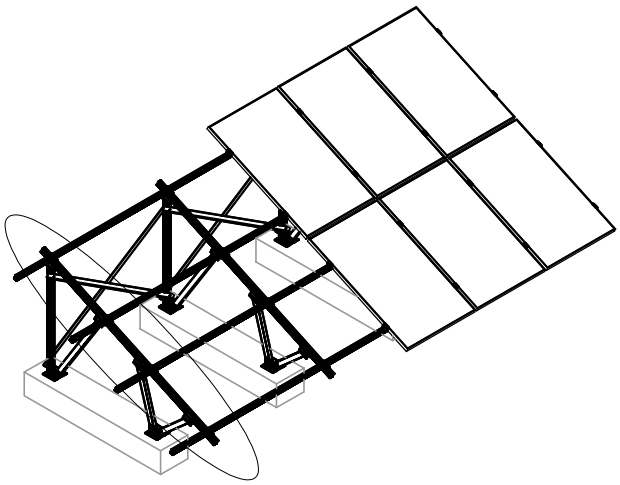


M 2:1



Točan raspored veznika 521.378 naveden je u narednim tablicama.

The exact layout of the fastening 521.378 is given in the
following tables.

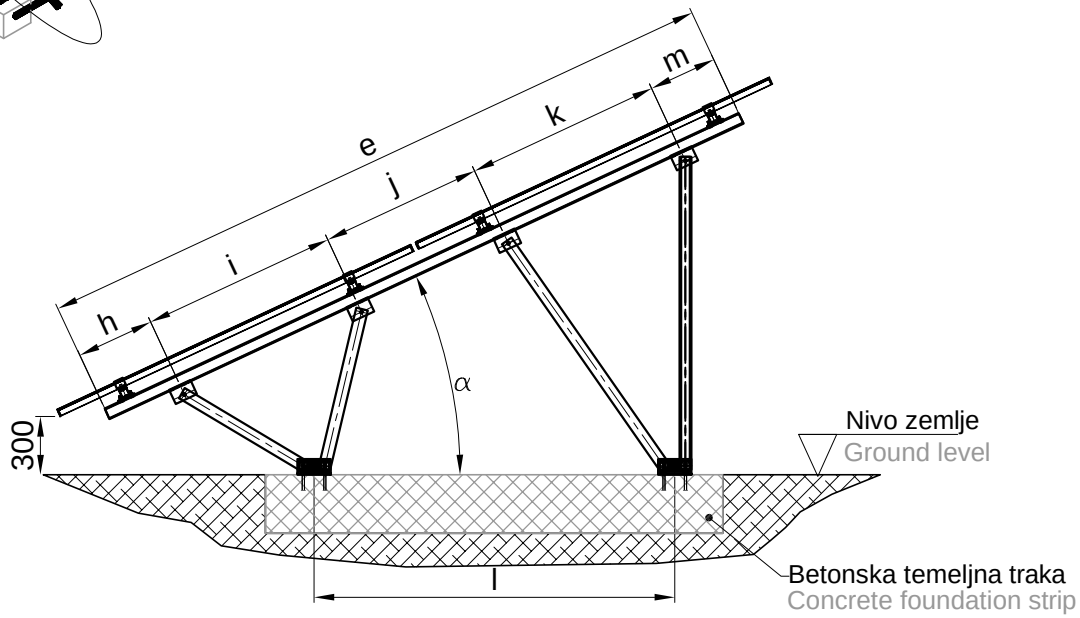


Raspored veznika 521.378 na gredi u nagibu (e) je definiran s obzirom na dimenziju solarnog panela i njegovu orjentaciju.

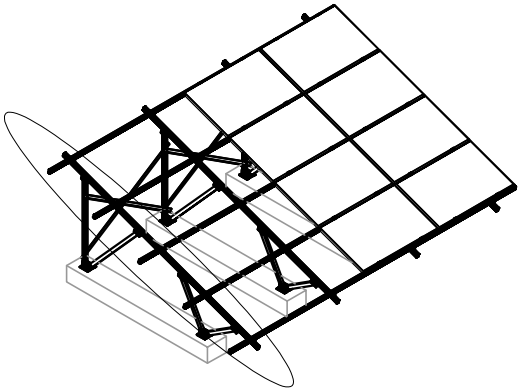
Ovaj raspored definiran je parametrima na sljedećoj shemi.

The arrangement of the connector 521.378 on the beam in the slope (e) is defined with respect to the dimension of the solar panel and its orientation.

This layout is defined by the parameters in the following diagram.



FNE-2000-V1		Dimenzija panela: 1600±50 x 1000±5 Raspored: 2 panela vertikalno					
α	l	e	h	i	j	k	m
20°	1500	2800	400	800	630	800	170
25°	1500	2800	400	800	630	800	170
30°	1500	2800	330	870	630	800	170
FNE-2000-V2		Dimenzija panela: L x H=2000±50 x 1000±5 Raspored: 2 panela vertikalno					
α	l	e	h	i	j	k	m
20°	2000	3580	400	960	824	1046	350
25°	2000	3580	470	876	822	1062	350
30°	2000	3580	541	787	826	1076	350

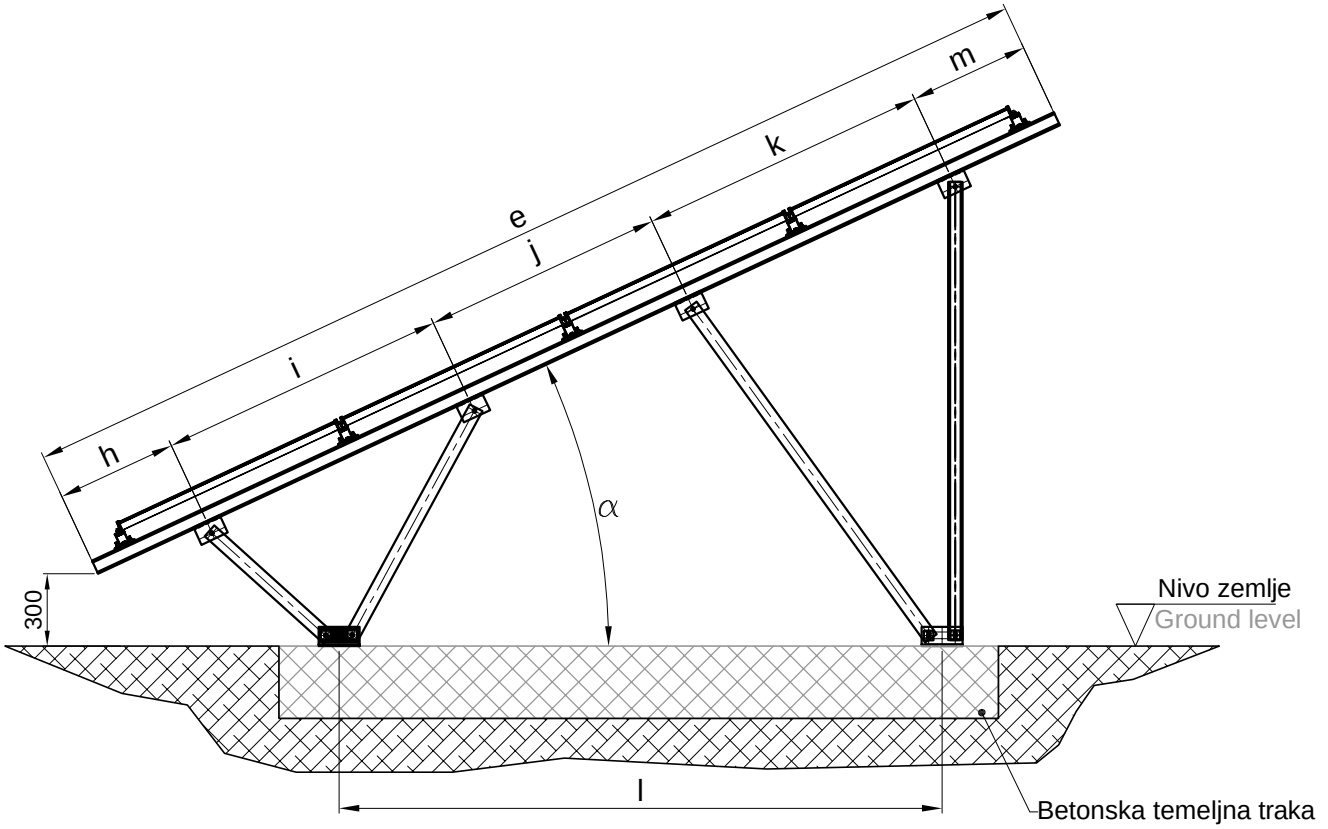


Raspored veznika 521.378 je definiran s obzirom na dimenziju solarnog panela i njegovu orijentaciju.

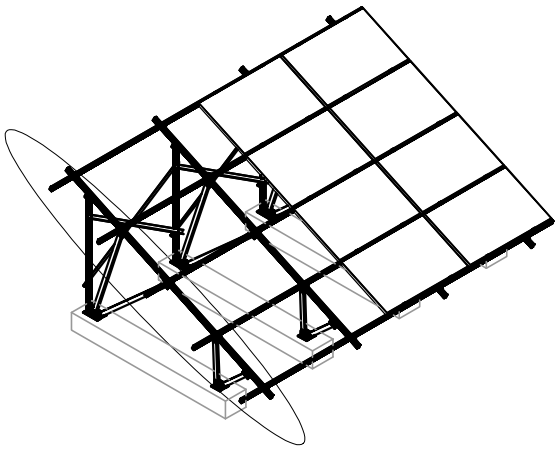
Ovaj raspored definiran je parametrima na sljedećoj shemi.

The layout of the fastening 521.378 is defined with respect to the dimension of the solar panel and its orientation.

This layout is defined by the parameters in the following diagram.



FNE-2000-H1		Dimenzija panela: LxH=1600±50 x 1000±5 Raspored: 4 panela horizontalno					
α	l	e	h	i	j	k	m
20°	2500	4400	500	1200	1000	1200	500
FNE-2000-H2		Dimenzija panela: LxH=2000±50 x 1000±5 Raspored: 4 panela horizontalno					
α	l	e	h	i	j	k	m
20°	2500	4400	500	1200	1000	1200	500

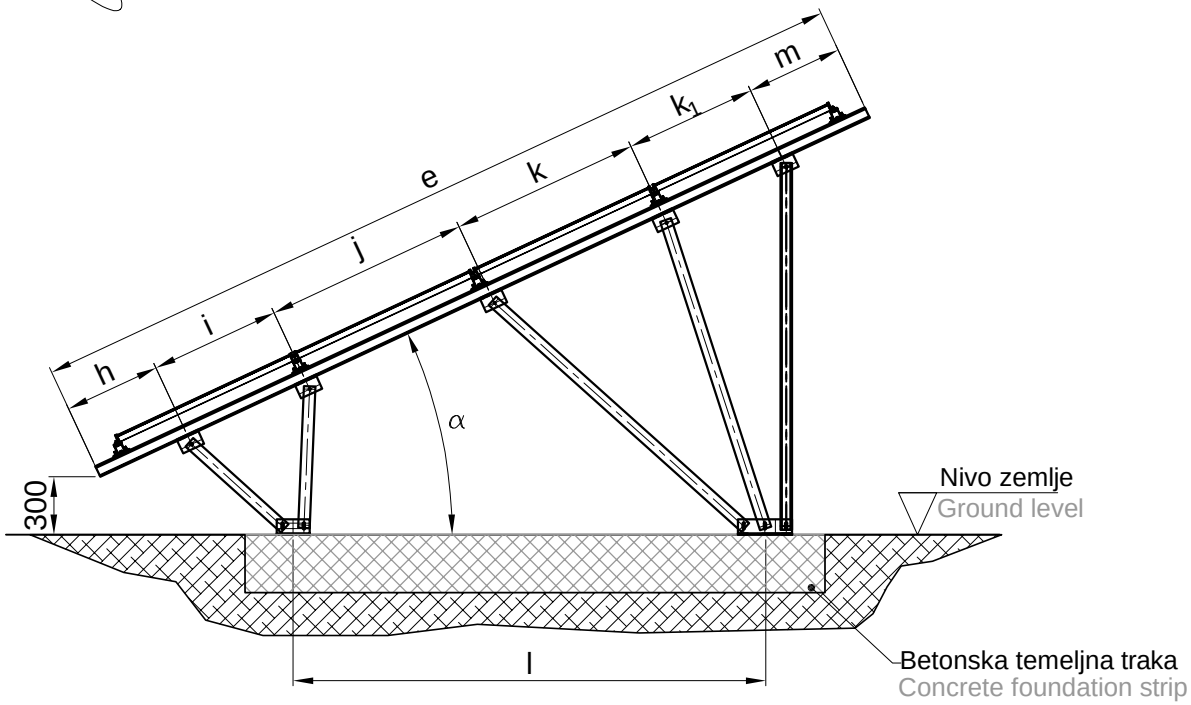


Raspored veznika 521.378 je definiran s obzirom na dimenziju solarnog panela i njegovu orijentaciju.

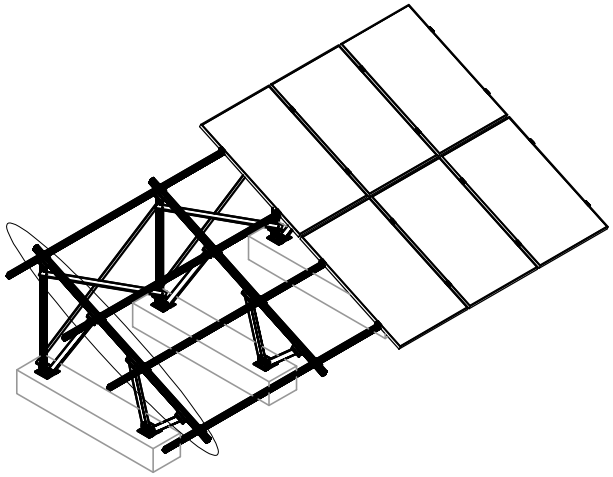
Ovaj raspored definiran je parametrima na sljedećoj shemi.

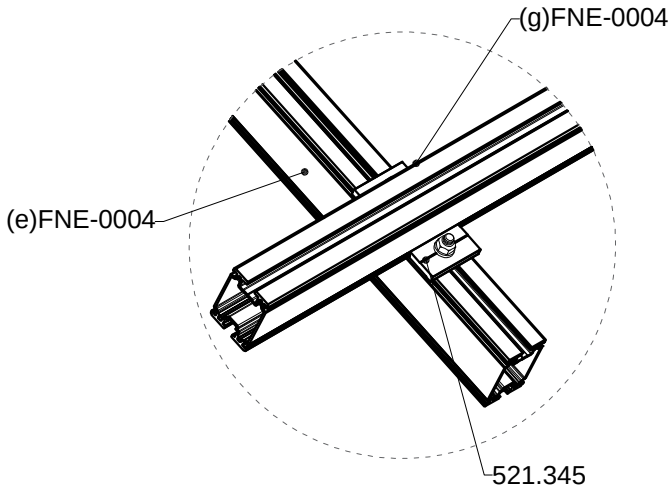
The layout of the fastening 521.378 is defined with respect to the dimension of the solar panel and its orientation.

This layout is defined by the parameters in the following diagram.



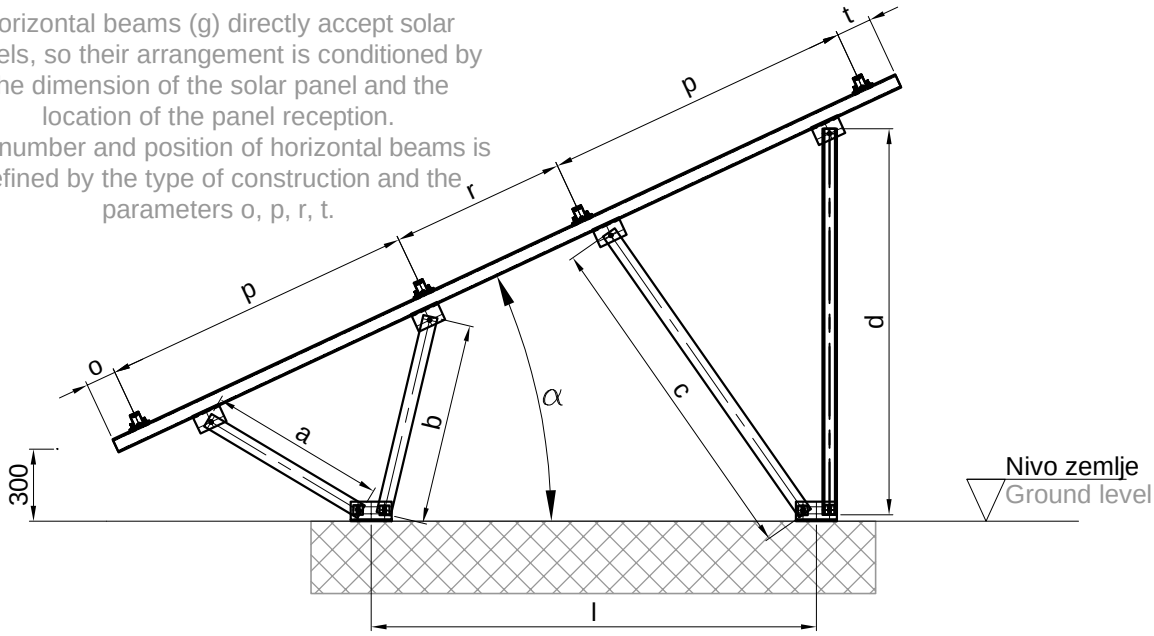
FNE-2000-H1		Dimenzija panela: LxH=1600±50 x 1000±5 Raspored: 4 panela horizontalno						
α	l	e	h	i	j	k	k_1	m
25°	2450	4400	500	675	1058	982	685	500
30°	2300	4400	500	636	1082	987	696	500
FNE-2000-H2		Dimenzija panela: LxH=2000±50 x 1000±5 Raspored: 4 panela horizontalno						
α	l	e	h	i	j	k	k_1	m
25°	2450	4400	500	675	1058	982	685	500
30°	2300	4400	500	636	1082	987	696	500

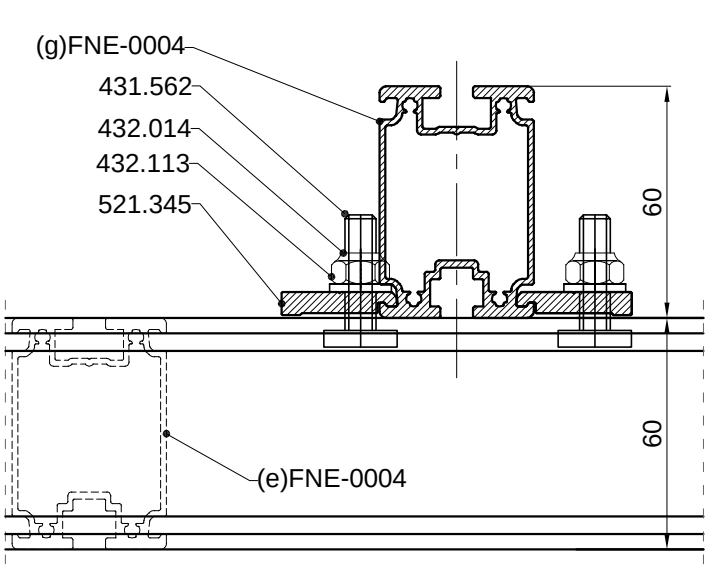


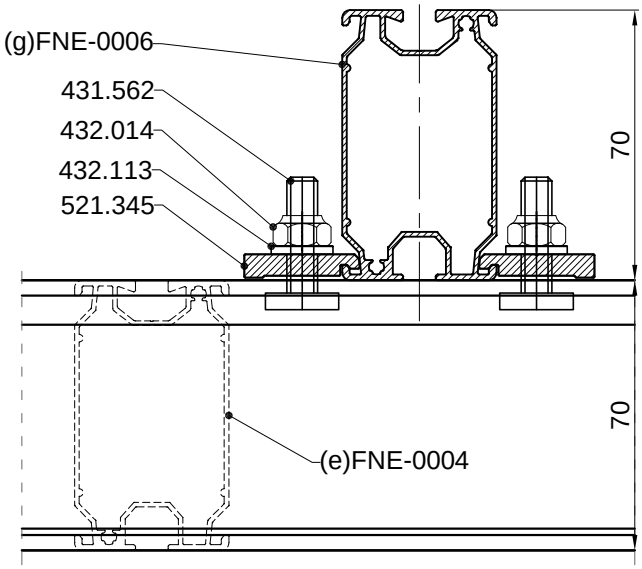


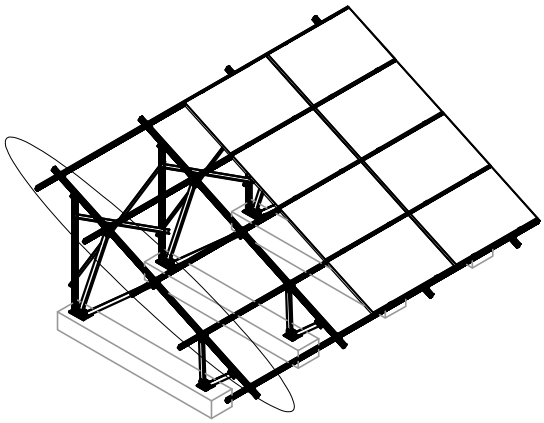
Horizontalne grede (g) direktno prihvataju solarne panele, pa je njihov raspored uvjetovan dimenzijom solarnog panela i mjestom prihvata panela.
Broj i pozicija horizontalnih greda definirana je tipom konstrukcije i parametrima o, p, r, t.

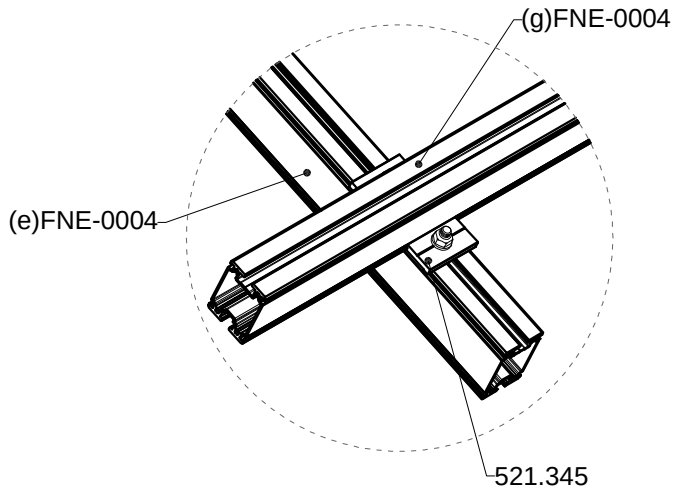
Horizontal beams (g) directly accept solar panels, so their arrangement is conditioned by the dimension of the solar panel and the location of the panel reception.
The number and position of horizontal beams is defined by the type of construction and the parameters o, p, r, t.





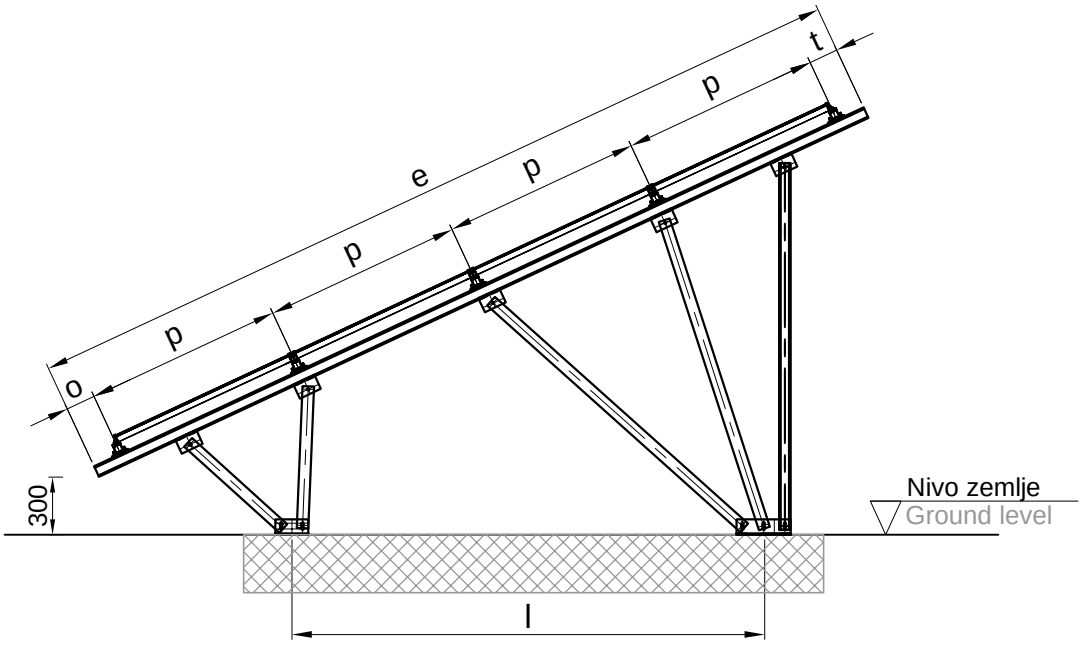


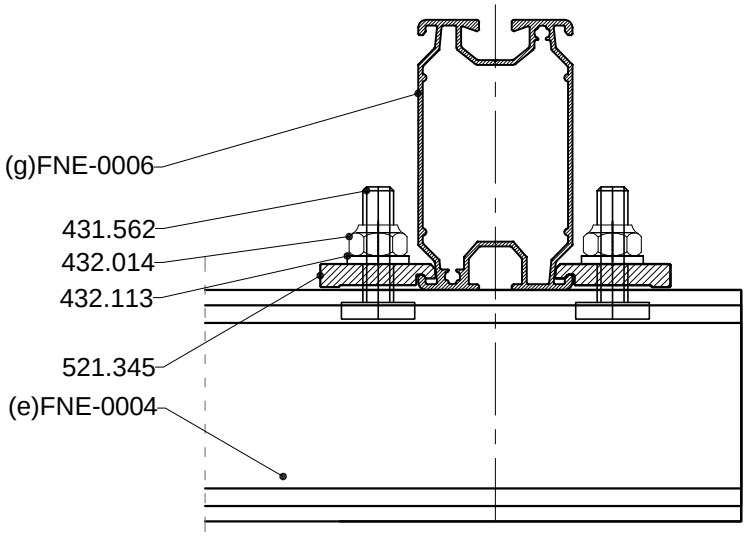


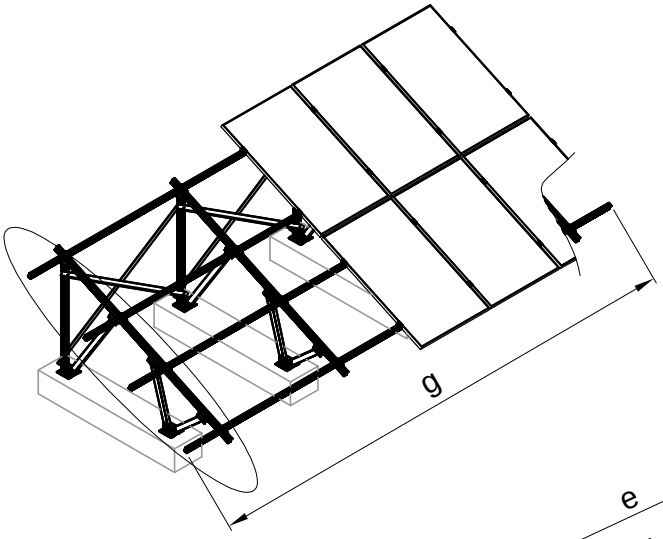


Horizontalne grede (g) direktno prihvataju solarne panele, pa je njihov raspored uvjetovan dimenzijom solarnog panela i mjestom prihvata panela.
Broj i pozicija horizontalnih greda definirana je tipom konstrukcije i parametrima o, p, t.

Horizontal beams (g) directly accept solar panels, so their arrangement is conditioned by the dimension of the solar panel and the location of the panel reception.
The number and position of horizontal beams is defined by the type of construction and the parameters o, p, t.

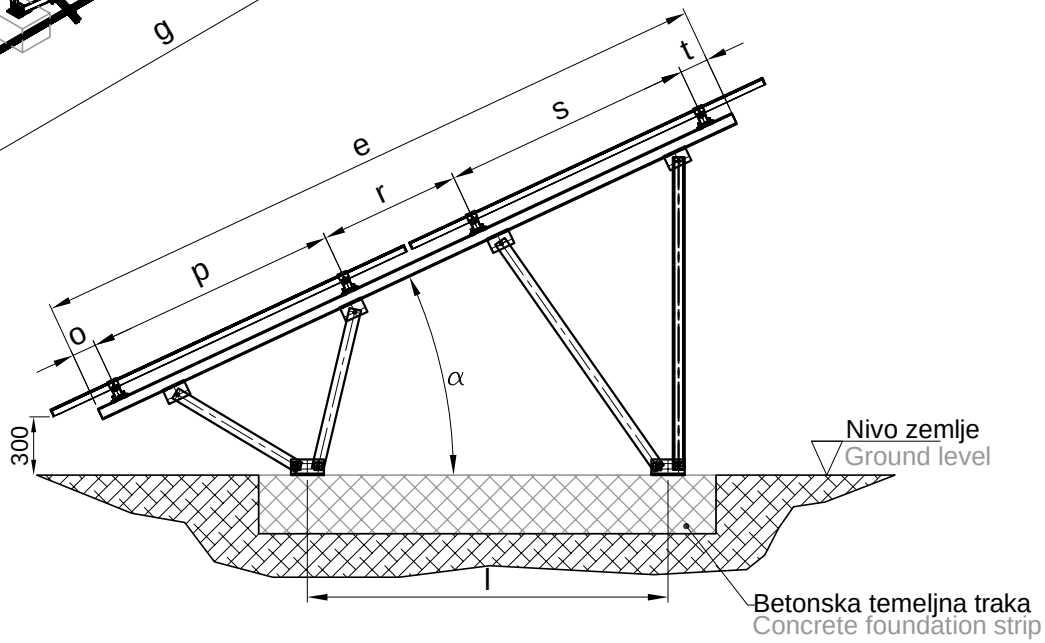






Pozicija horizontalnih greda (g) u presjeku definirane su prema shemi ispod i definiranim parametrima o, p, r, s, t.

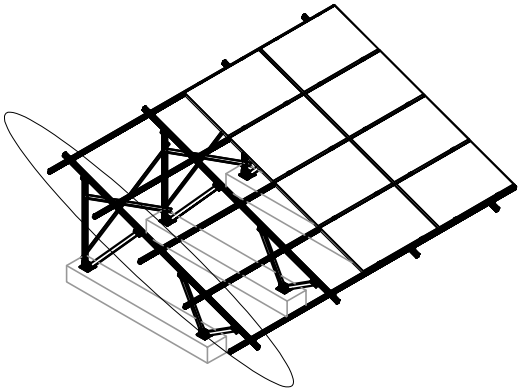
The positions of the horizontal beams (g) in the cross section are defined according to the scheme below and the defined parameters o, p, r, s, t.



FNE-2000-V1		Dimenzija panela: L x H= 1000±5 x 1600±50 Raspored: 2 panela uspravno					
α	l	e	o	p	r	s	t
20°	1500	2800	137	900	725	900	137
25°	1500	2800	137	900	725	900	137
30°	1500	2800	137	900	725	900	137
FNE-2000-V2		Dimenzija panela: L x H= 1000±5 x 2000±50 Raspored: 2 panela uspravno					
α	l	e	o	p	r	s	t
20°	2000	3580	127	1300	725	1300	127
25°	2000	3580	127	1300	725	1300	127
30°	2000	3580	127	1300	725	1300	127

Kod pozicioniranja horizontalnih greda dozvoljena su odstupanja od zadatih mjera u toleranciji ±30mm.

When positioning horizontal beams, deviations from the specified measures are permitted in tolerance ±30mm.

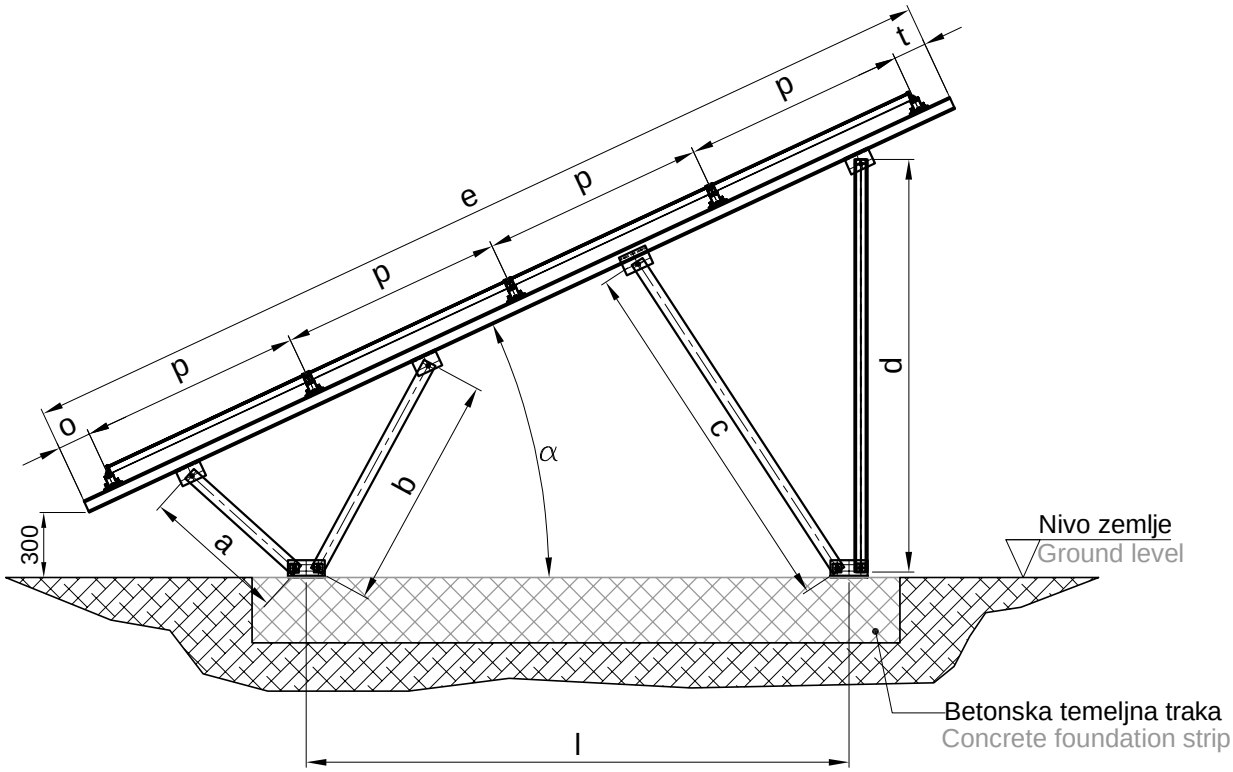


Pozicija horizontalnih greda (g) u presjeku definirane su prema shemi ispod i definiranim parametrima o, p, t.

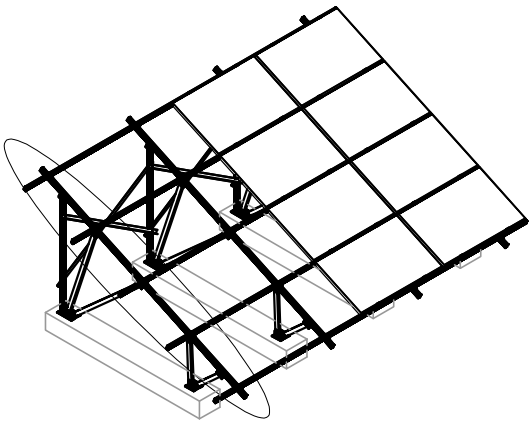
Solarni panel dimenzija LxH=2000x1000
Horizontalna montaža

The positions of the horizontal beams (g) in the cross section are defined according to the scheme below and the defined parameters o, p,t.

Solar panel dimensions LxH=2000x1000
Horizontal mounting



FNE-2000-H2		Dimenzija panela: LxH=2000x1000 Raspored: 4 panela horizontalno			
α	l	e	o	p	t
25°	2450	4400	152	1022	152
30°	2300	4400	152	1022	152
20°	2500	4400	152	1022	152

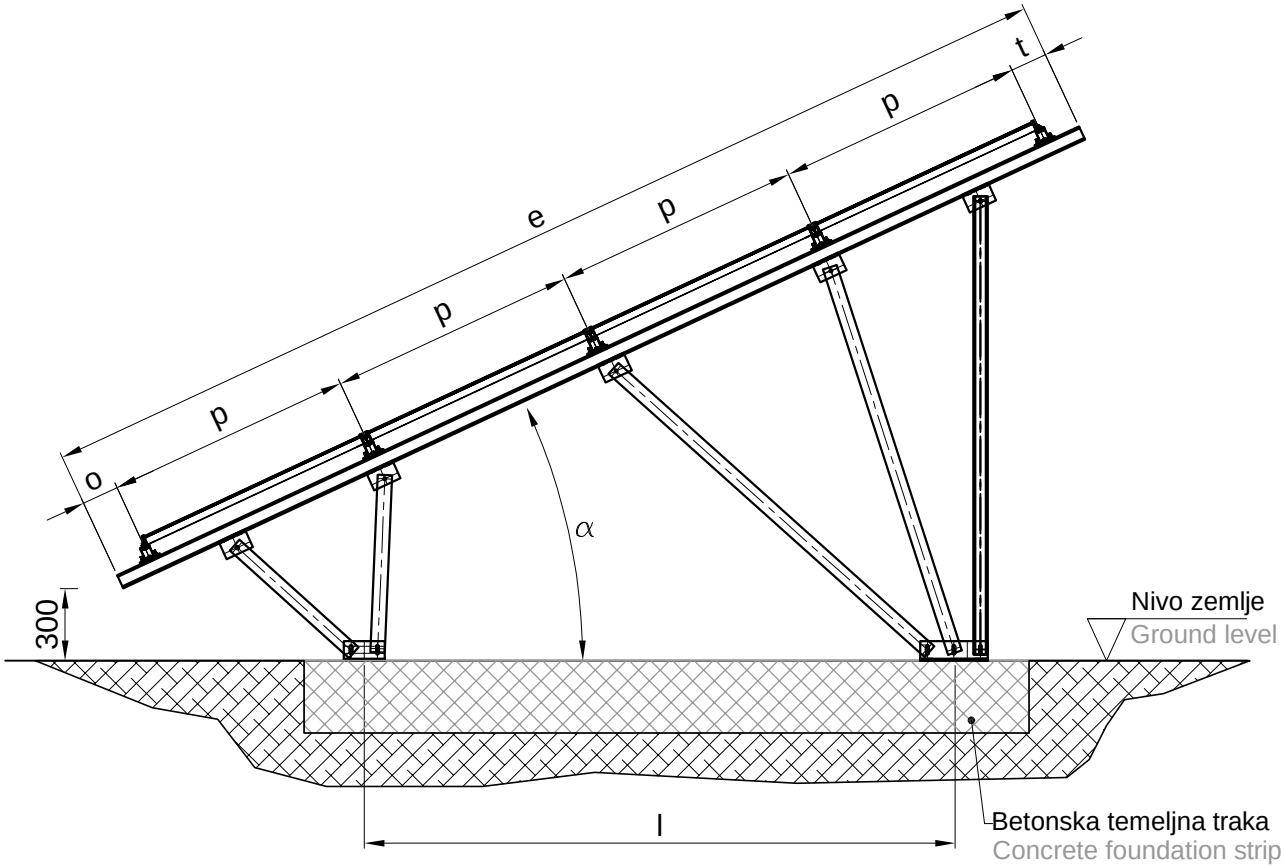


Pozicija horizontalnih greda u presjeku definirane su prema shemi ispod i definiranim parametrima o, p, t.

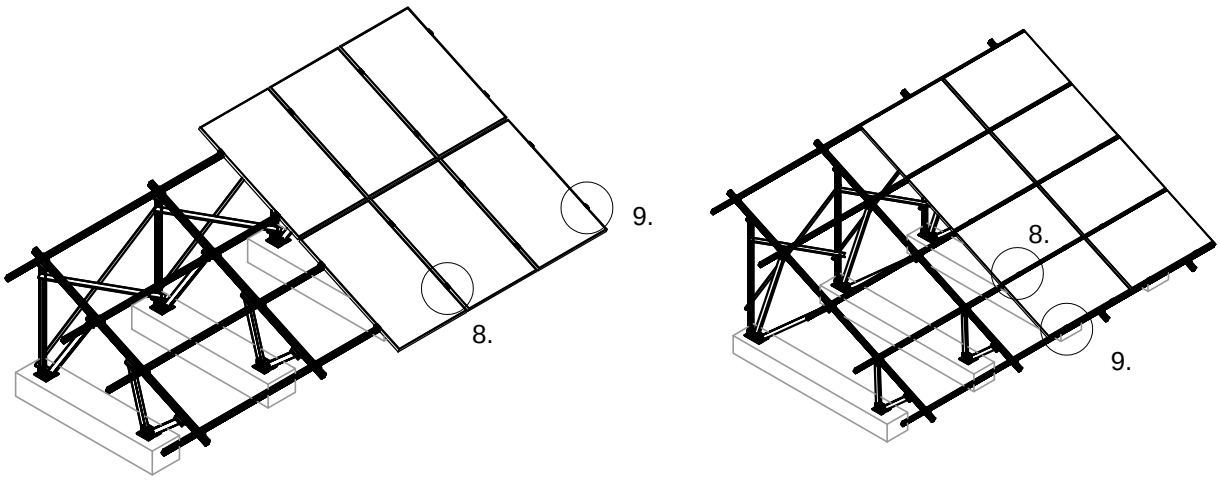
Solarni panel dimenzija LxH=1600x1000
Horizontalna montaža

The positions of the horizontal beams in the cross section are defined according to the scheme below and the defined parameters o, p, t.

Solar panel dimensions LxH=1600x1000
Horizontal mounting

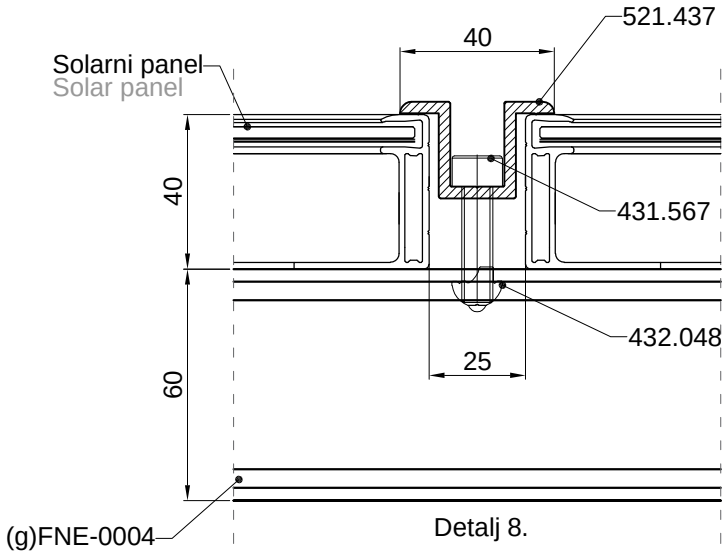


FNE-2000-H1		Dimenzija panela: LxH=1600x1000 Raspored: 4 panela horizontalno			
α	l	e	o	p	t
25°	2450	4400	152	1022	152
30°	2300	4400	152	1022	152
20°	2500	4400	152	1022	152



Srednji spoj 2 panela i sekundarnog nosača

Middle connection of 2 panels and secondary support



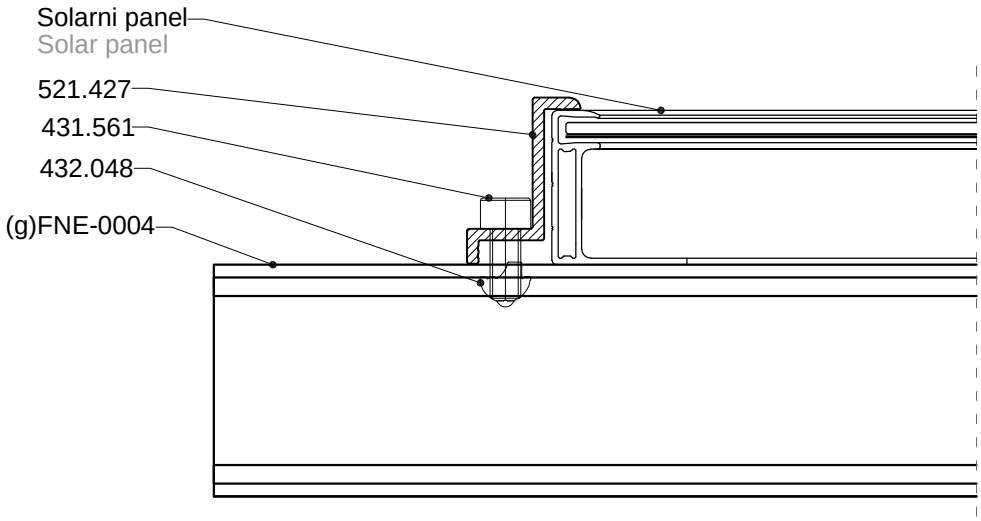
Detalj 8.

Detalj kopči i veze solarnog panela sa aluminijskom konstruakcijom.

Prilikom montaže solarnih panela, voditi računa da je razmak između panela 25mm, kako bi se osigurao prostor za rad elemanata pri temperaturnim razlikama.

Detail of connections of the solar panel with the aluminum construction.

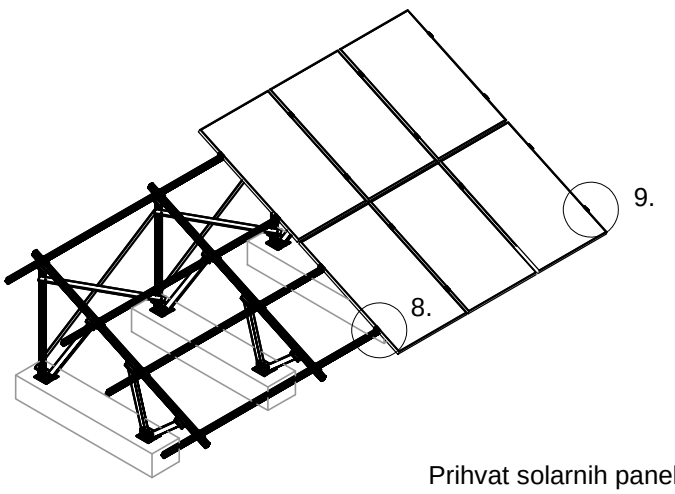
When installing solar panels, take into account that the distance between the panels is 25mm, to ensure the space operation of the elements at temperature differences.

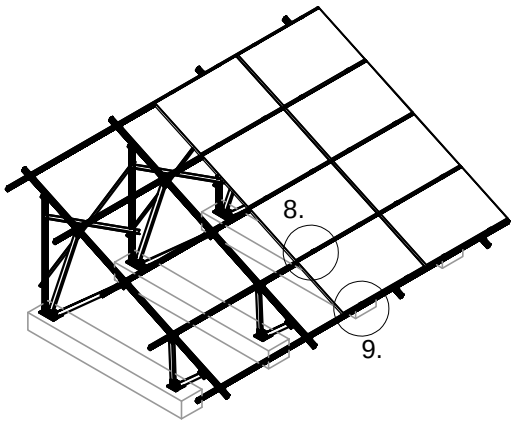


Detalj 9.

Spoj rubnog panela i sekundarnog nosača

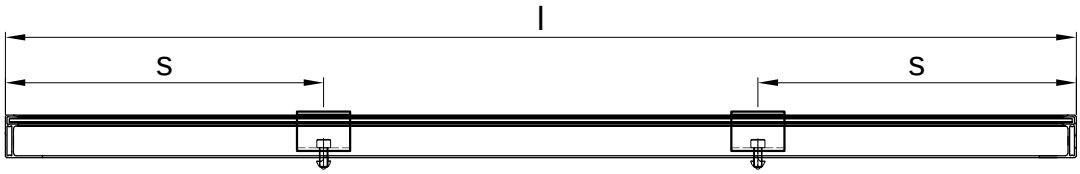
The joint of the edge panel and the secondary support





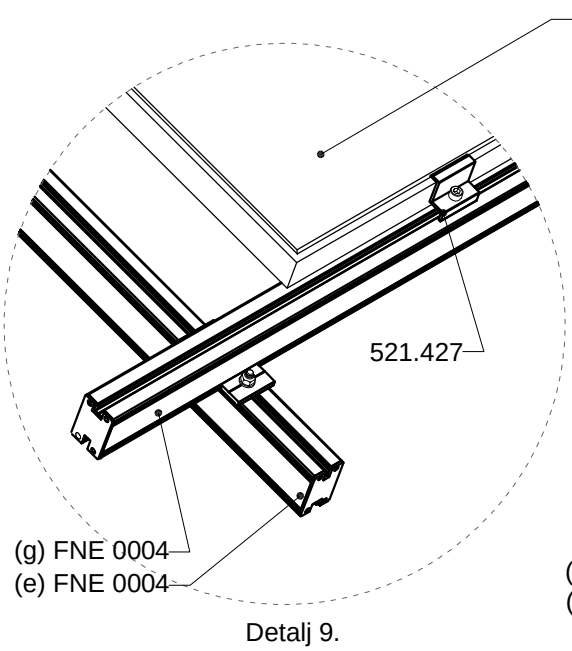
Prihvat solarnih panela definiran je od strane proizvođača panela.
Generalno prihvat panela može se definirati kao na shemi ispod:

The fastening of solar panels is defined by the panel manufacturer. The general fastening of the panel can be defined as in the diagram below:

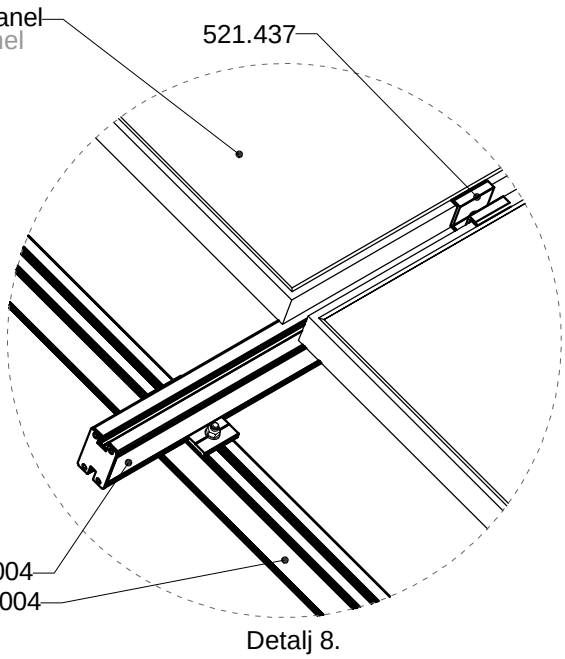


340 < s < 1/4L

Solarni panel L x H= 1600±5 x 1000±50 : s=340-400mm Solar panel L x H= 1600±5 x 1000±50: s=340-400mm
Solarni panel L x H= 2000±5 x 1000±50 : s=340-500mm Solar panel L x H= 2000±5 x 1000±50: s=340-500mm



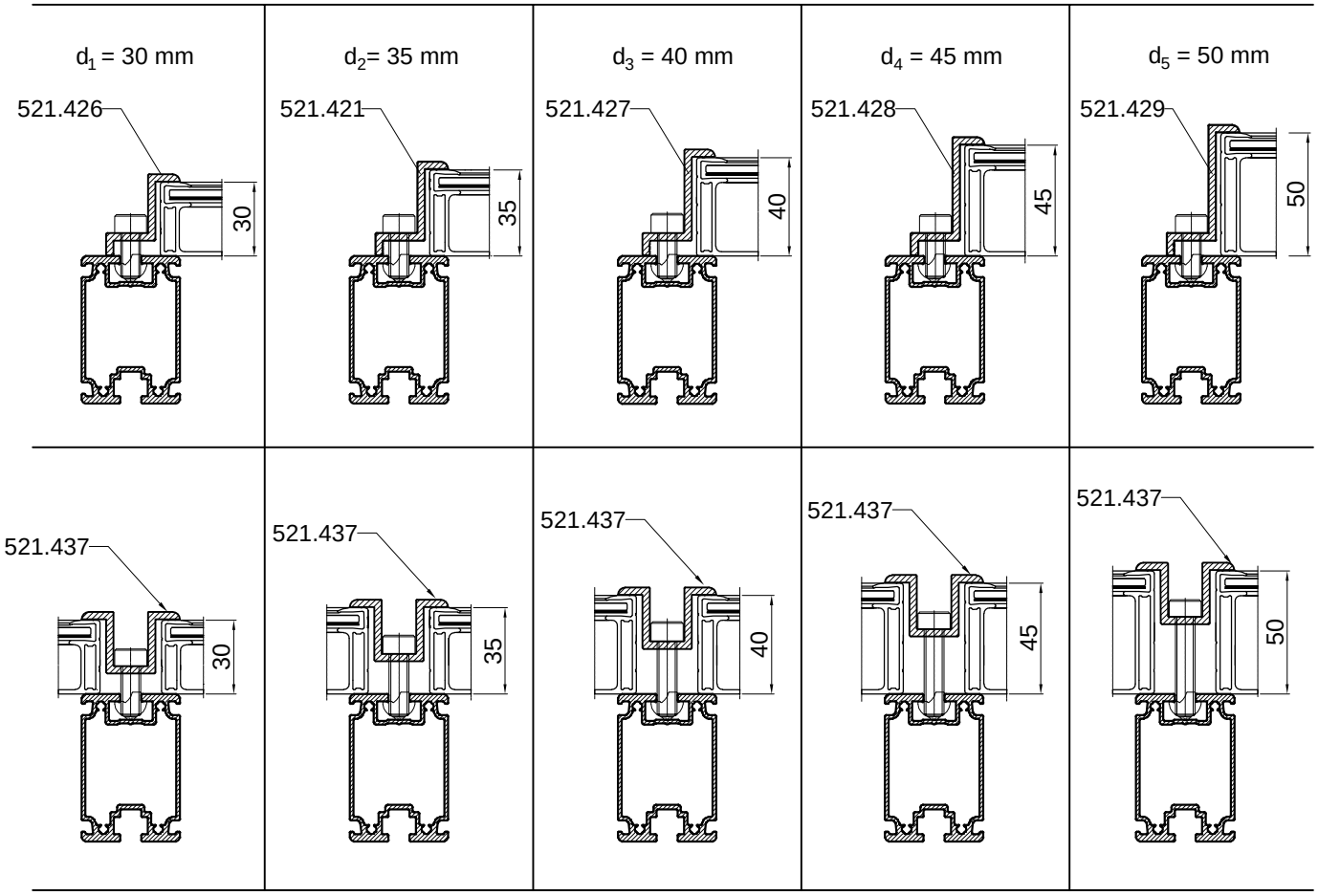
Detalj 9.



Detalj 8.

Dimenzije kopči i vijaka za različite visine solarnih panela
Dimensions of side holders and screws for different solar panel heights

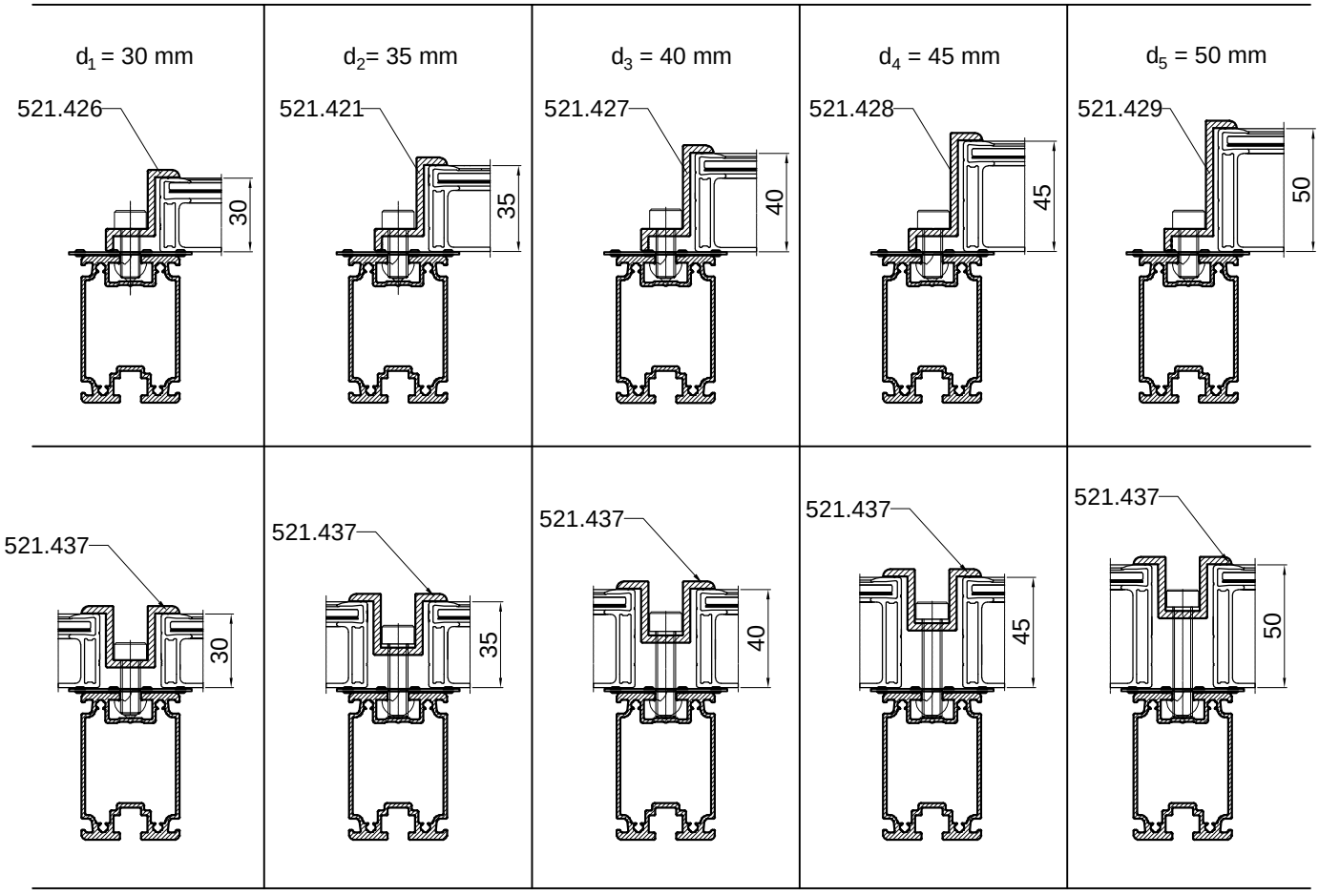
Visina panela (d) Panel height (d)		Korišteni vijak za bočnu kopču Used screw for side holder-single sided	Korišteni vijak za srednju kopču Used screw for side holder-double sided
d_1	30 mm	Vijak M8x18 431.561	Vijak M8x20 431.565
d_2	35 mm	Vijak M8x18 431.561	Vijak M8x25 431.560
d_3	40 mm	Vijak M8x18 431.561	Vijak M8x30 431.567
d_4	45 mm	Vijak M8x18 431.561	Vijak M8x35 431.568
d_5	50 mm	Vijak M8x18 431.561	Vijak M8x40 431.566



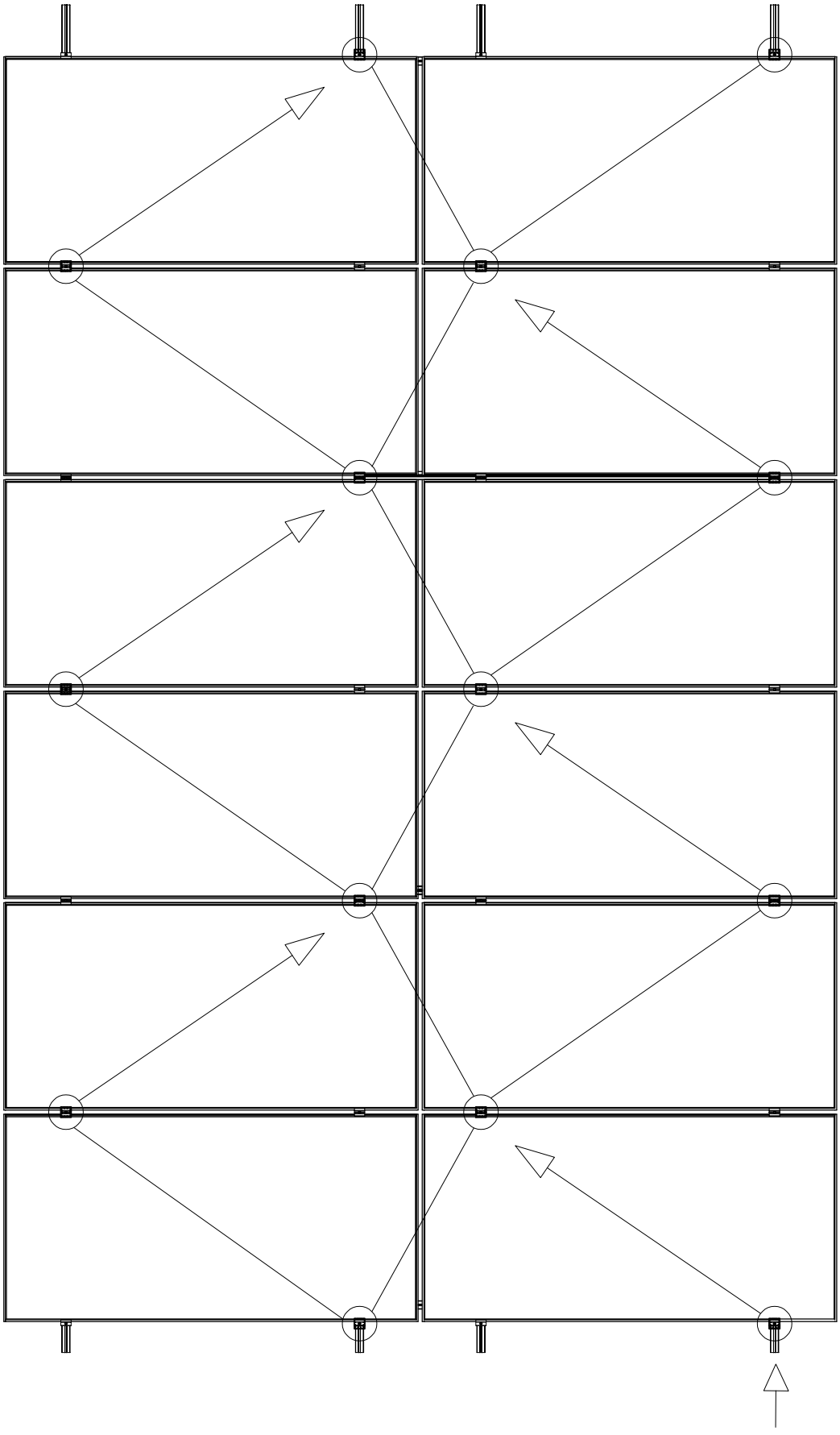
Detalj kopči s pločicom za galvanski kontakt 522.001. Preporučen broj pločica za jednu sekciju od 12 vertikalno montiranih panela je 6, odnosno pola od ukupnog broja korištenih kopči.

Detail with the galvanic contact plate 522.001. The recommended number of plates for one section of 12 vertically-mounted panels is 6, that is half of the total number of clamps used.

Visina panela (d) Panel height (d)		Korišteni vijak za bočnu kopču Used screw for side holder-single sided	Korišteni vijak za srednju kopču Used screw for side holder-double sided
d_1	30 mm	Vijak M8x20 431.565	Vijak M8x22 431.559 + podloška 432.129
d_2	35 mm	Vijak M8x20 431.565	Vijak M8x30 431.567 + podloška 432.129
d_3	40 mm	Vijak M8x20 431.565	Vijak M8x35 431.568 + podloška 432.129
d_4	45 mm	Vijak M8x20 431.565	Vijak M8x40 431.566 + podloška 432.129
d_5	50 mm	Vijak M8x20 431.565	Vijak M8x45 431.569 + podloška 432.129

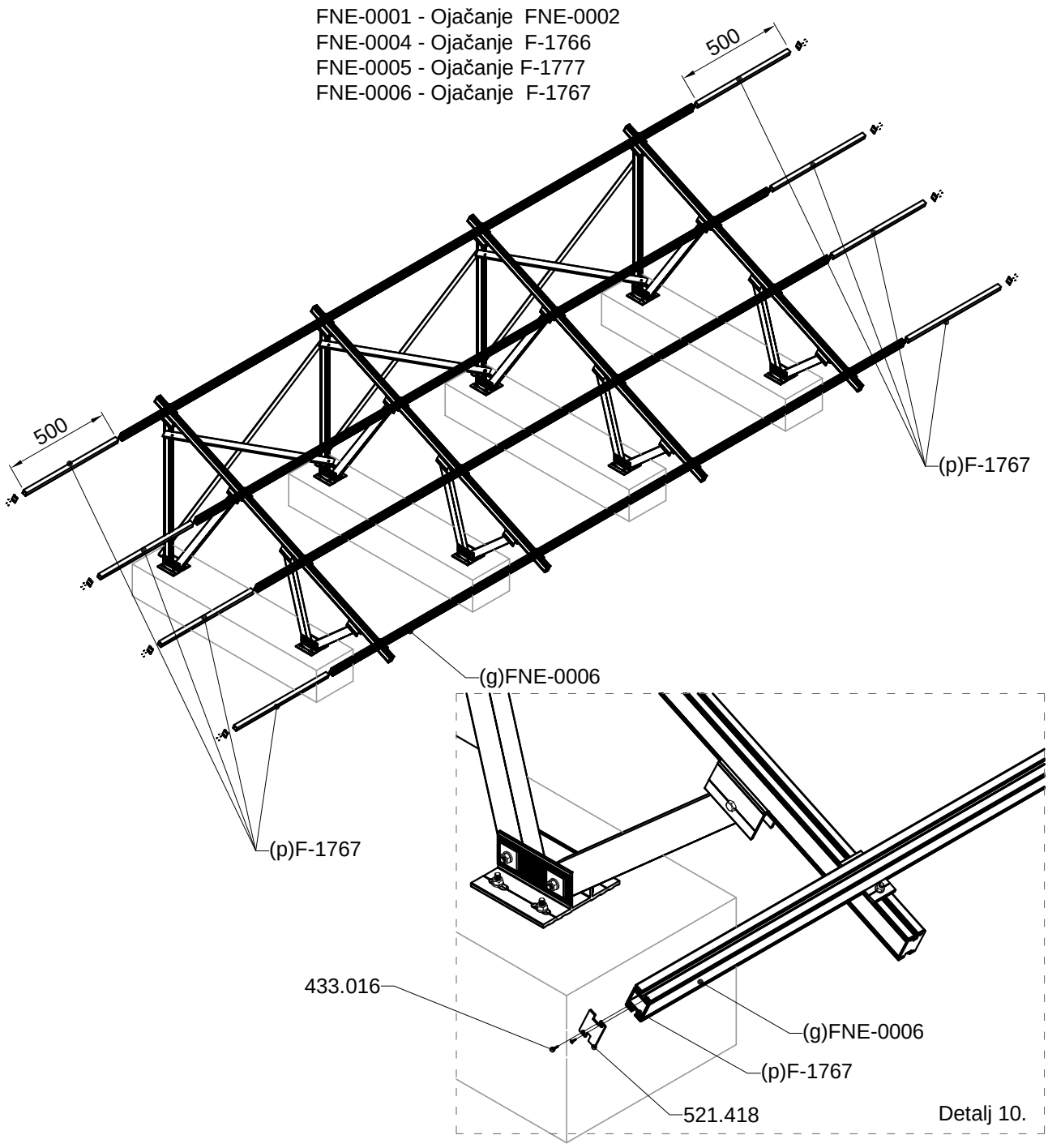


Prikaz prijedloga rasporeda pločica za galvanski kontakt.
Proposal of the layout how side holders should be arranged.



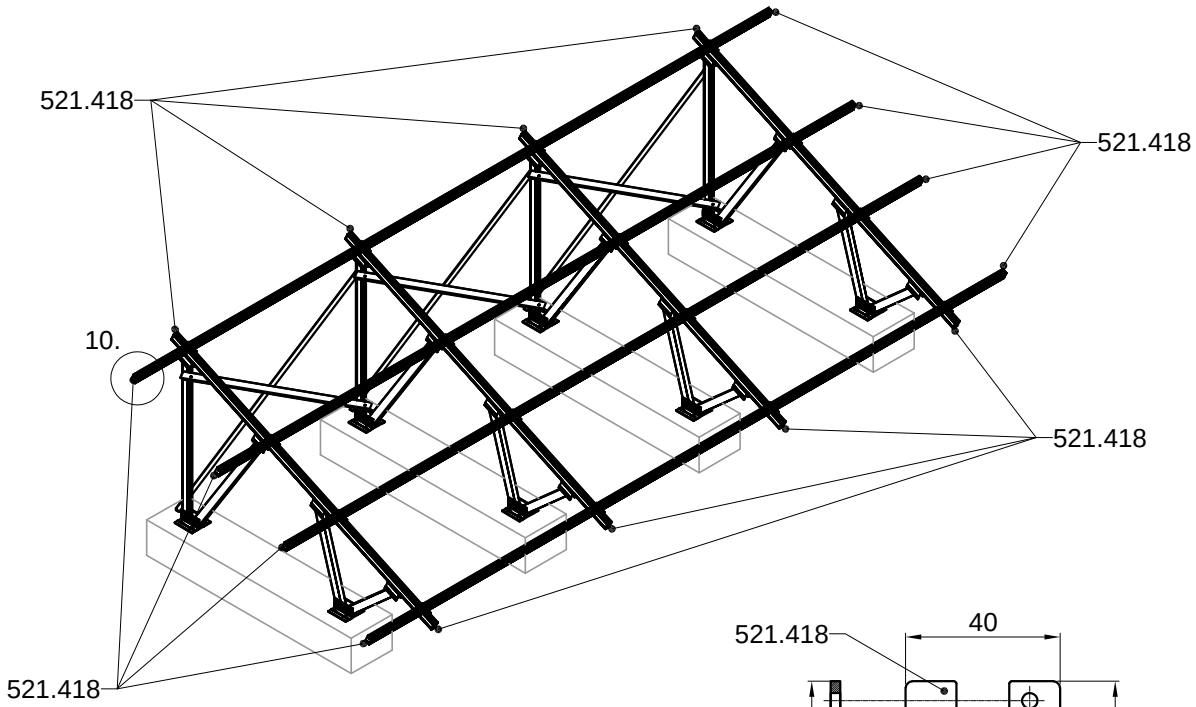
Konzolni prepusti horizontalne grede (g) na rubu konstrukcije su od 550mm -700mm. Ovakva konzola zahtjeva ojačanje sustava kako bi se umanjili progibi greda (g) pri maksimalnim opterećenjima te eliminirao i namjanji mogući utjecaj na solarne panele.
Ojačanje greda izvodi se na način da se u grede ugradi profil ojačanja za navedeni profil i jednostavno osigura sa čepom na kraju cijevi od ispadanja.
Pri ugradnji ojačanja konzola, ojačanja uvući u cijev minimalno 100mm, tako da ojačanje bude pozicionirano na osloncu iznad grede (e).

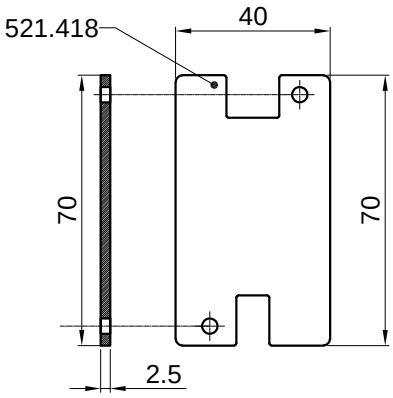
Cantilever overhangs of the horizontal beam (g) at the edge of the structure are from 550mm -700mm. Such a bracket requires reinforcement of the system in order to reduce the deflections of the beams (g) at maximum loads and to eliminate and reduce the possible impact on the solar panels.
The reinforcement of the beams is performed by installing a reinforcement profile for the specified profile in the beams and simply securing them with a plug at the end of the pipe from falling out.
When installing the bracket reinforcement, pull the reinforcement into the pipe at least 100 mm so that the reinforcement is positioned on the support above the beam (s).

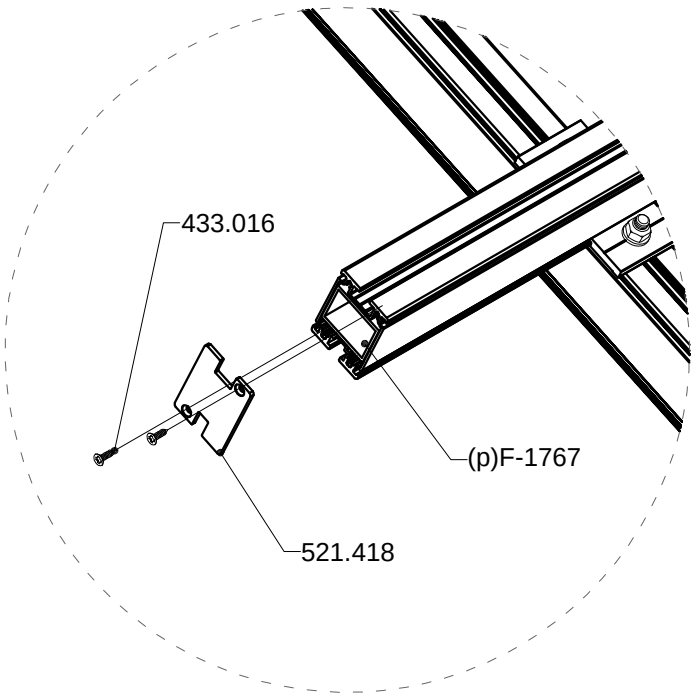


Na sve horizontalne grede (g) i grede u nagibu (e) potrebno je montirati čepove na krajeve. Čepovi služe kako bi se spriječio ulazak vode i stvaranje osinjaka koji mogu prouzrokovati otežan pristup konstrukciji.

On all horizontal beams and sloping beams it is necessary to mount plugs at the ends. The plugs serve to prevent water from entering and the formation of wasps which can cause difficult access to the structure.



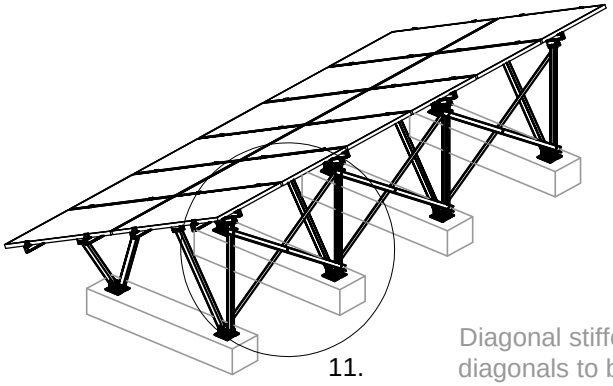




Detalj 10.

Profil FNE 0001 koristi čep 521.392
Profil FNE 0004 koristi čep 521.390
Profil FNE 0005 koristi čep 521.391
Profil FNE 0006 koristi čep 521.418

Profile FNE 0001 uses plug 521.392
Profile FNE 0004 uses plug 521.390
Profile FNE 0005 uses plug 521.391
Profile FNE 0006 uses plug 521.418



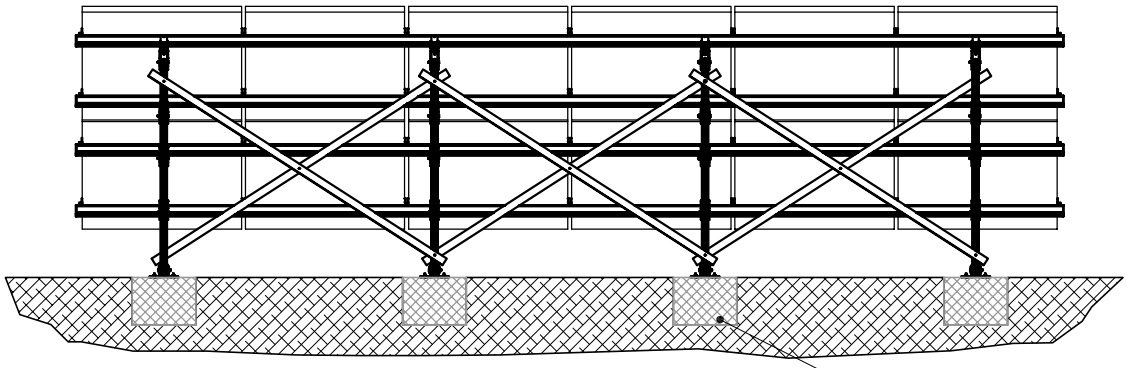
11.

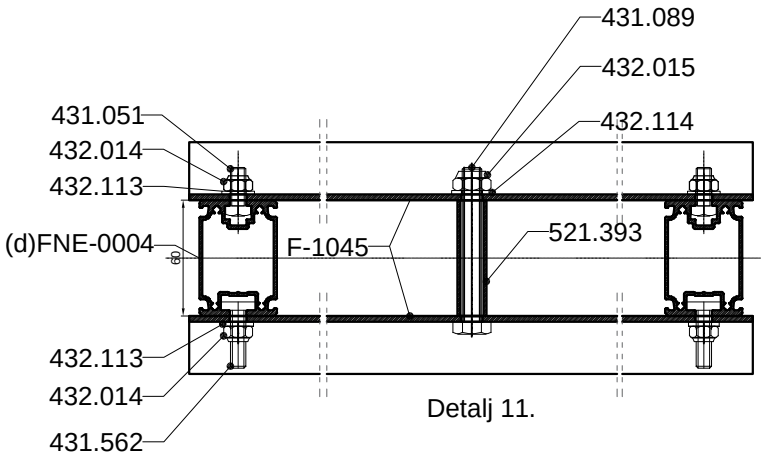
Montaža dijagonalnih ukruta

Dijagonalne ukrute potrebno je montirati na svako polje sekcije i to po dvije dijagonale da grade X. Jedna dijagonala se montira na vanjsku stranu stražnjih kosnika (d), a druga sa unutarnje strane. Dijagonale je potrebno međusobno povezati u sjecištu.

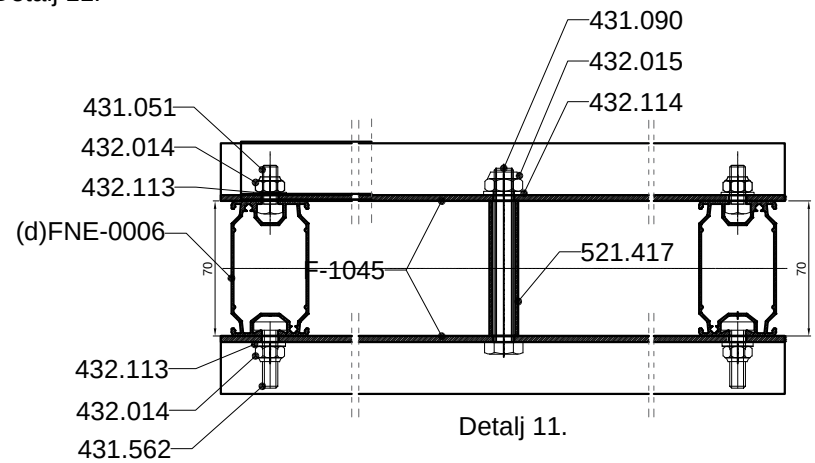
Installation of diagonal stiffeners

Diagonal stiffeners need to be mounted on each field of the section, two diagonals to build X. One diagonal is mounted on the outside of the rear mowers (d), and the other on the inside. Diagonals need to be interconnected at the intersection.

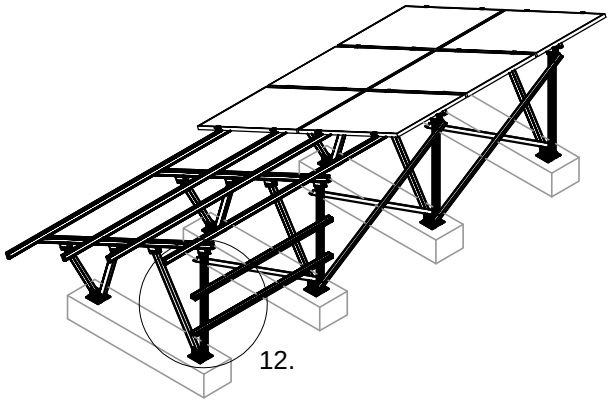




Detalj 11.



Detalj 11.

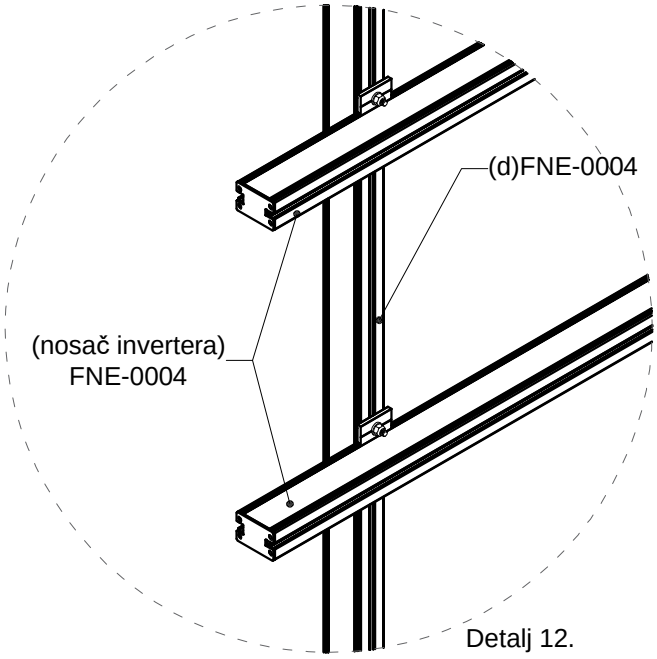


Za potrebe montaže invertera i druge elektroopreme na konstrukciju, je moguće ugraditi nosače za invertere umjesto vanjske dijagonale.

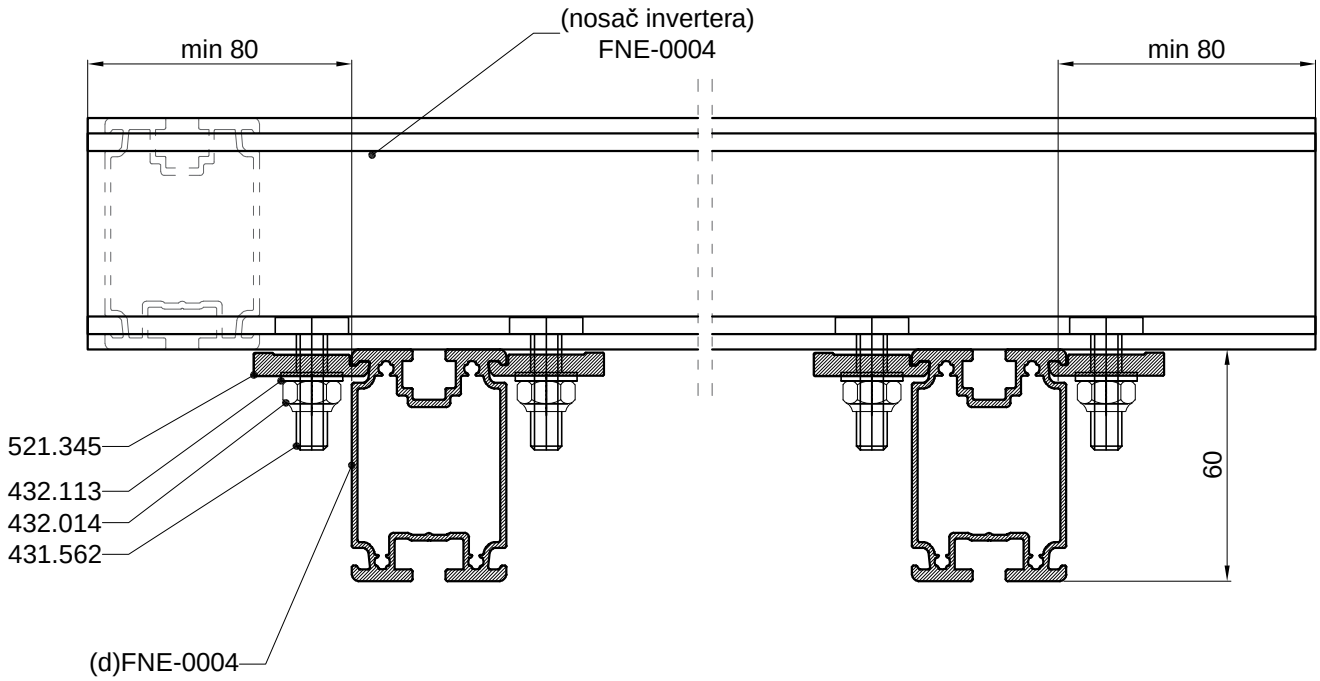
For the purpose of mounting inverters and other electrical equipment on the structure, it is possible to install inverter brackets instead of the outer diagonal.

Nosač invertera ima mogućnost podešavanja po visini kao i međusobni razmak nosača.
Svaki nosač ima utor za vijak tako da nije potrebno dodatno obrađivanje nosača kako bi se na njih instalirali inverteri i druga elektro oprema.

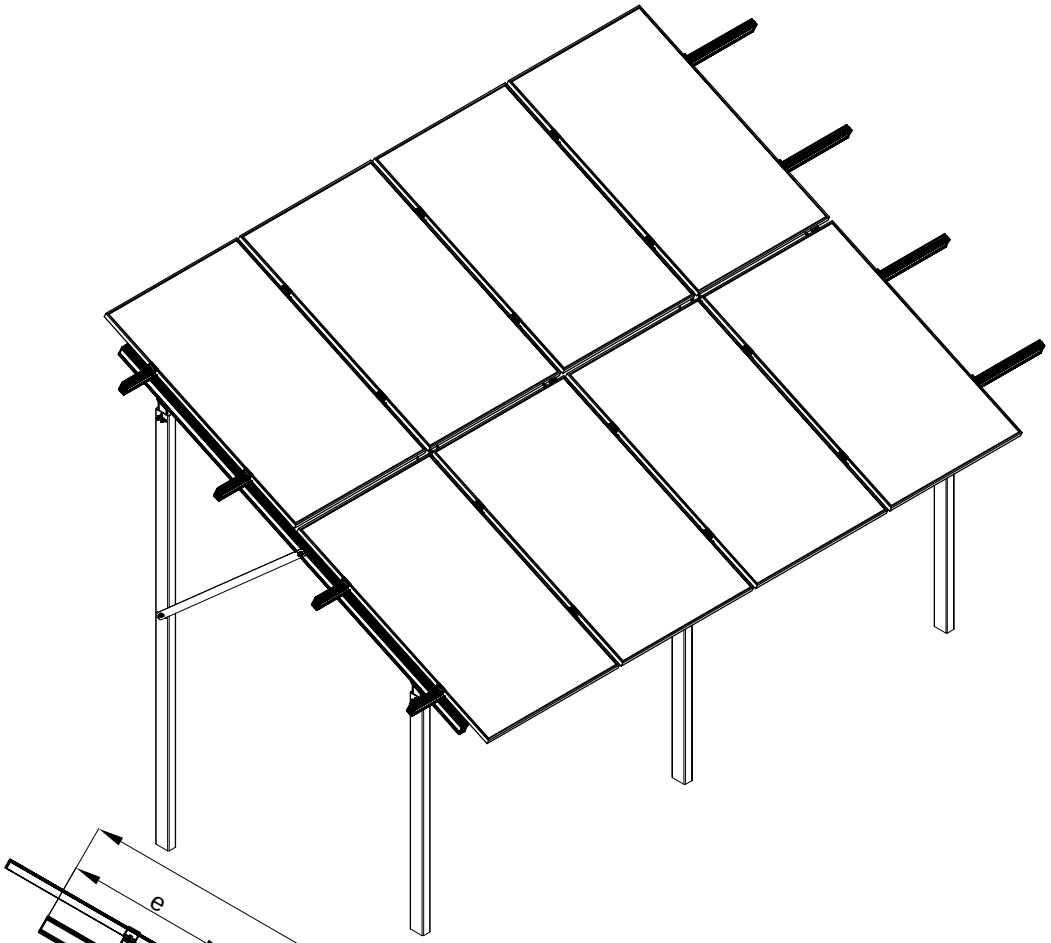
The inverter bracket has the possibility of height adjustment as well as the distance between the brackets.
Each bracket has a screw slot so that no additional machining of the bracket is required to install inverters and other electrical equipment on them.

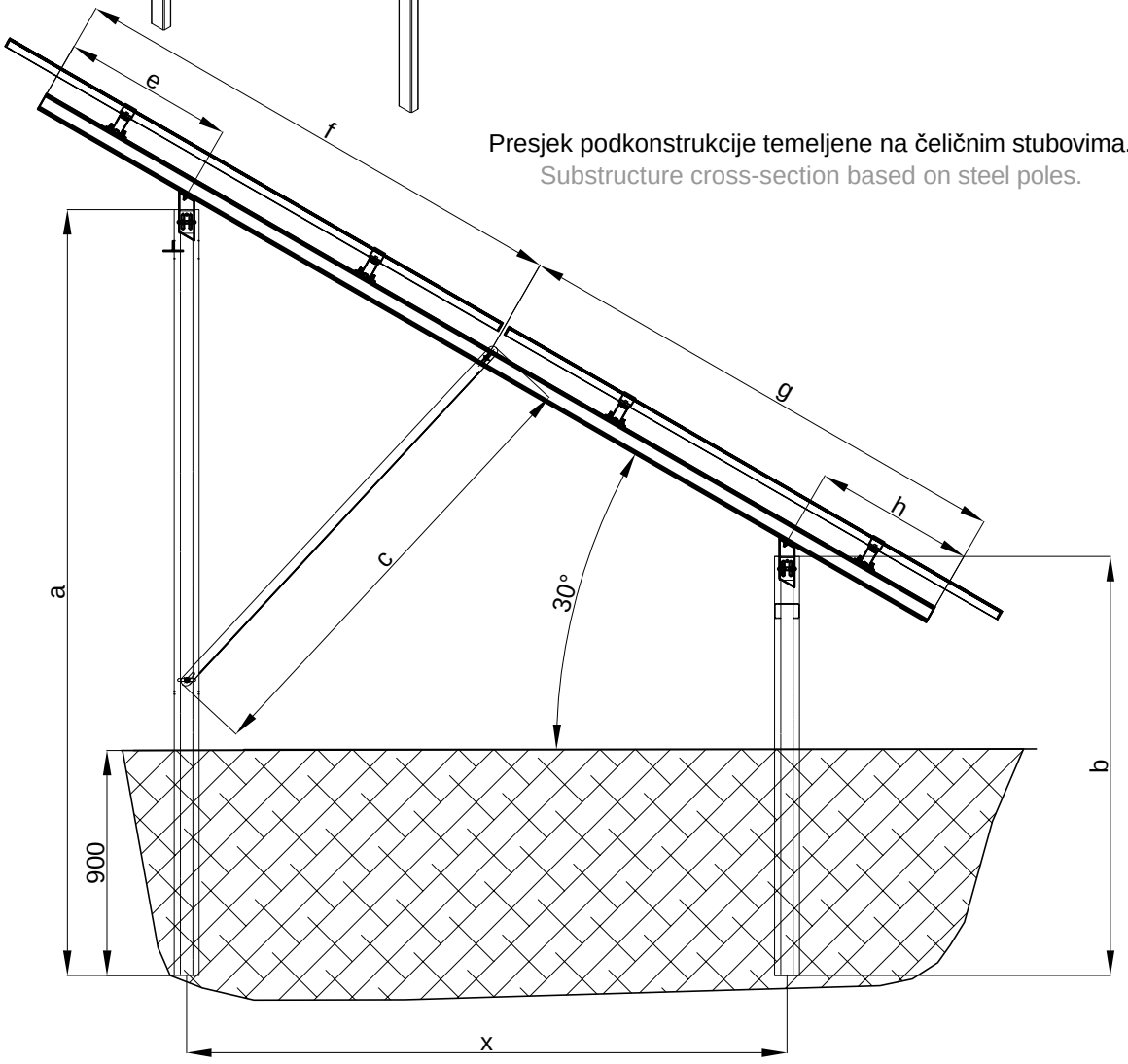


Detalj 12.

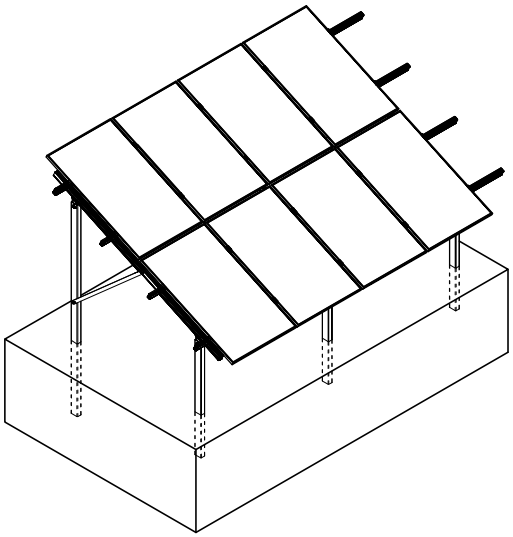


Primarna čelična podkonstrukcija
Primary steel substructure





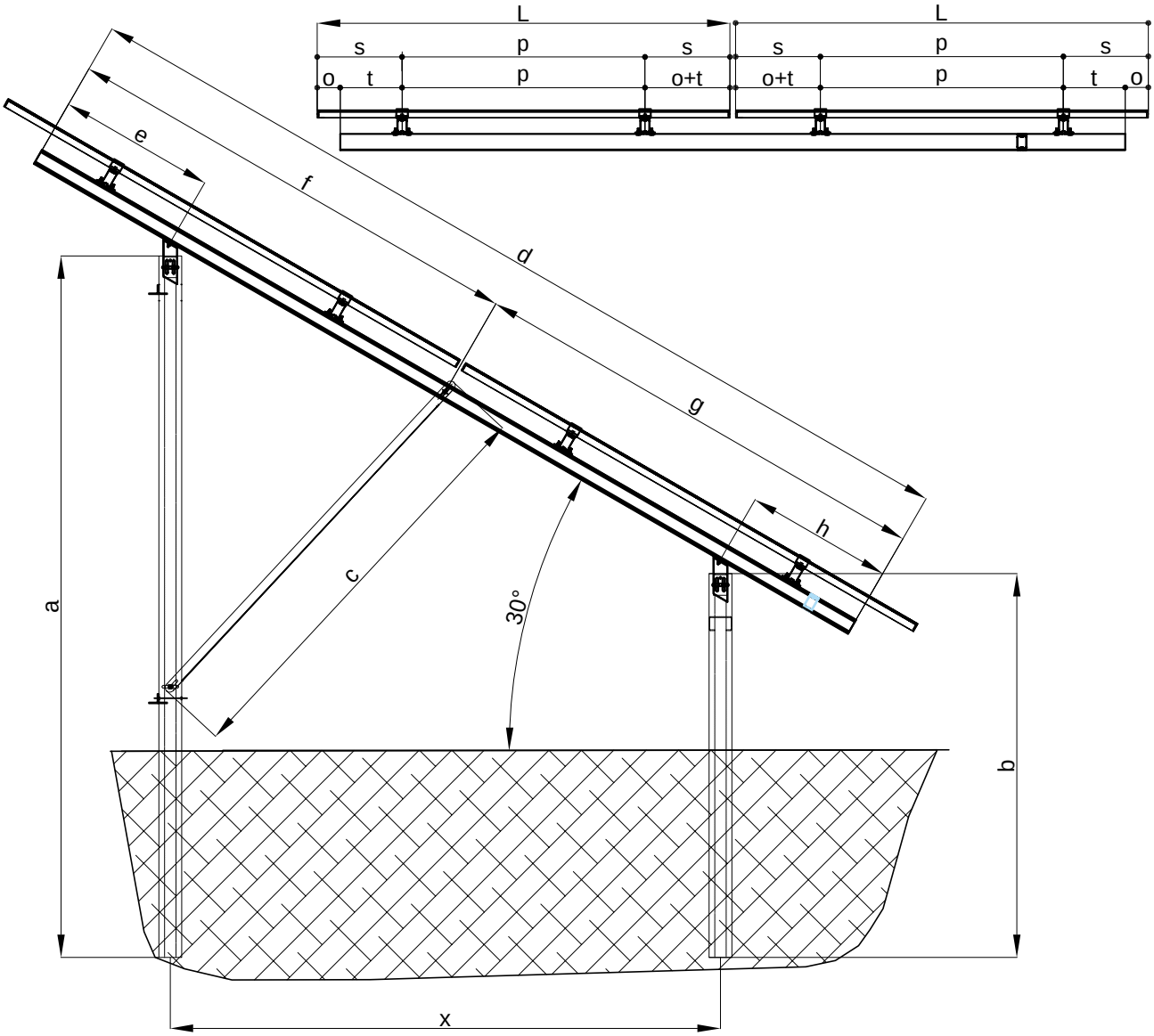
Presjek podkonstrukcije temeljene na čeličnim stubovima.
Substructure cross-section based on steel poles.

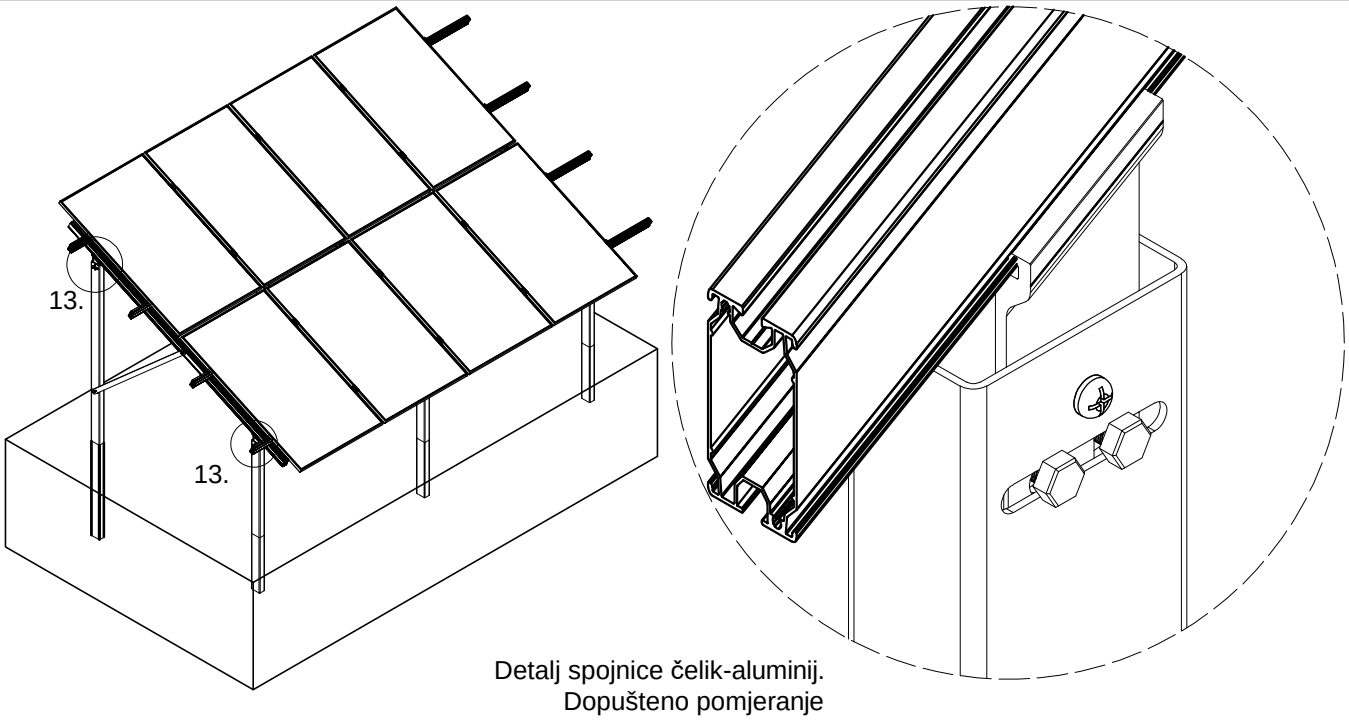


Prikaz rasporeda solarnih panela prilikom vertikalne montaže na čelik - aluminij podkonstrukciji.

Layout of solar panels for vertical mounting on steel - aluminium substructure.

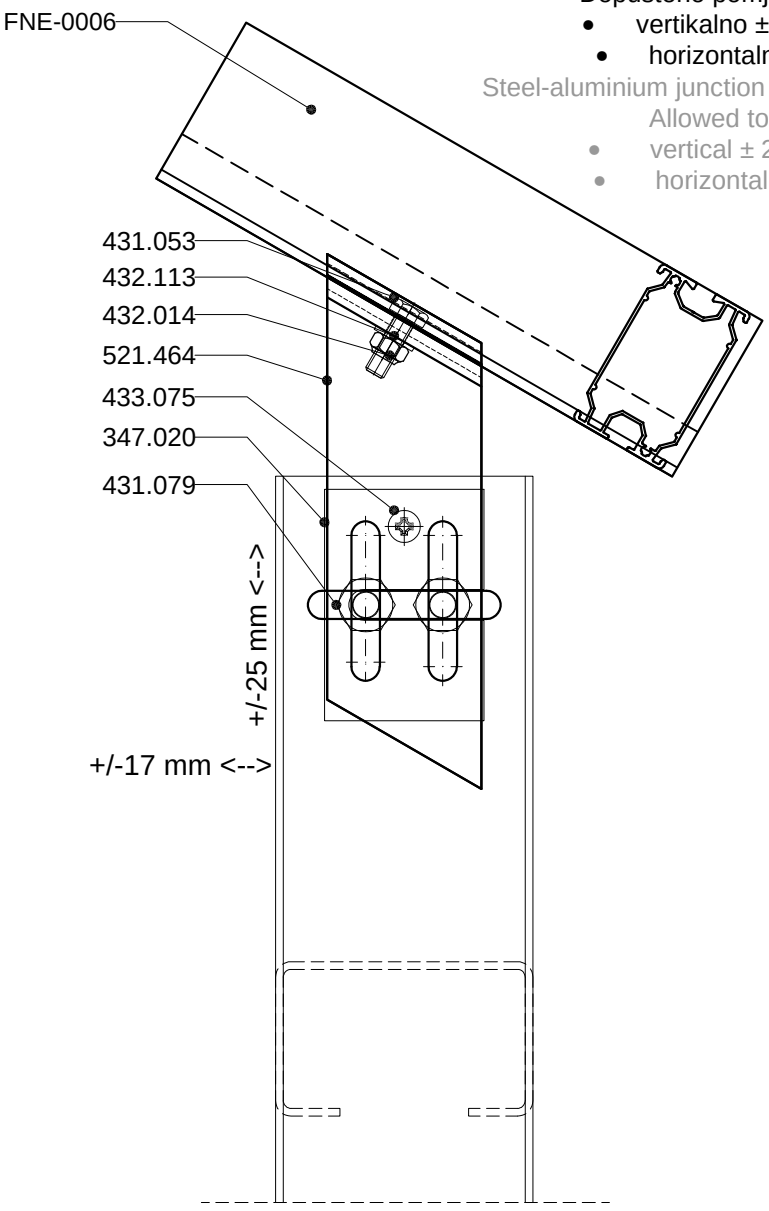
Dimenzija panela: L x H=2279±2 x 1134±2					
α	a	b	c	d	x
30°	3061	1675	1839	4100	2400
α	p	s	o	t	
30°	1599-1139	340-570	240	100-330	
α	e	f	g	h	
30°	687	2050	2050	643	

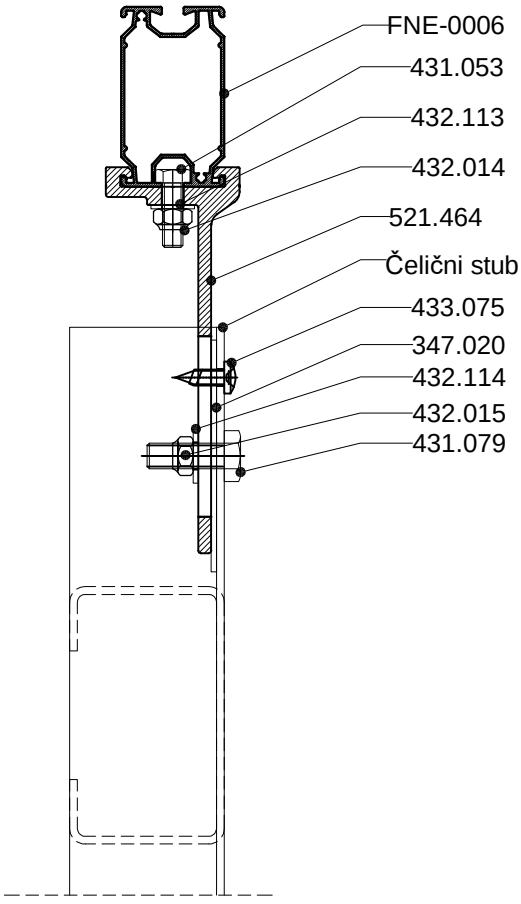


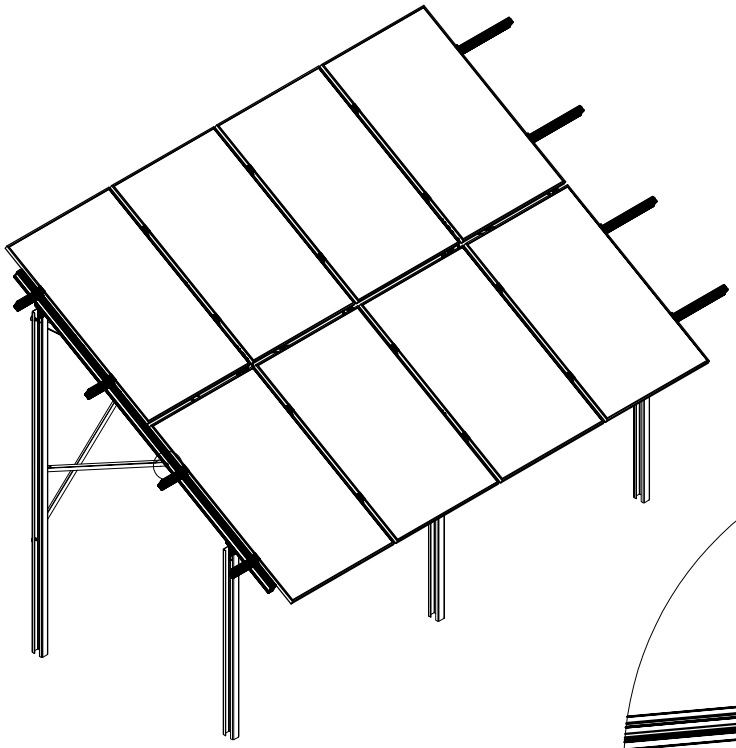


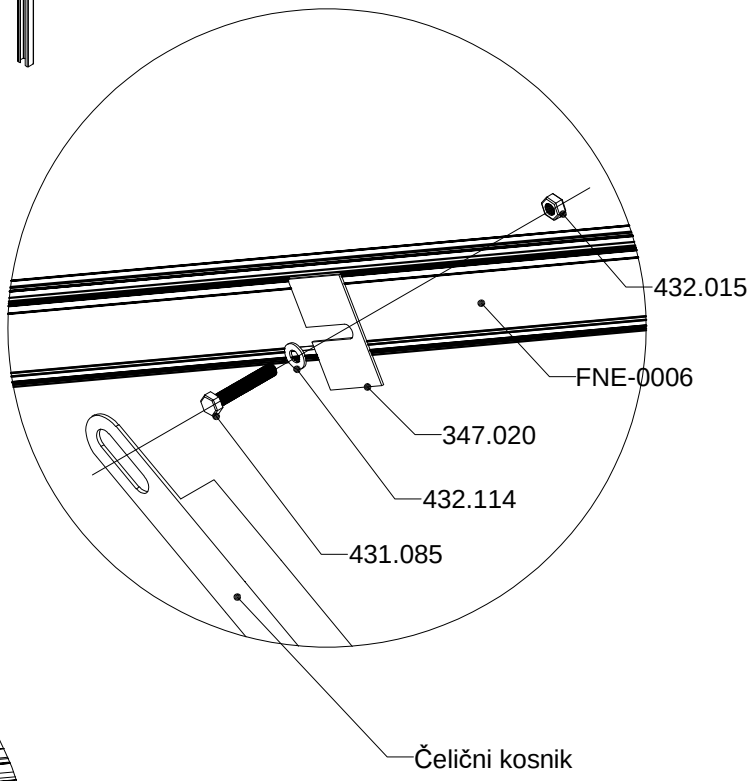
Detalj spojnice čelik-aluminij.
Dopušteno pomjeranje
- vertikalno ±25mm
- horizontalno ±17

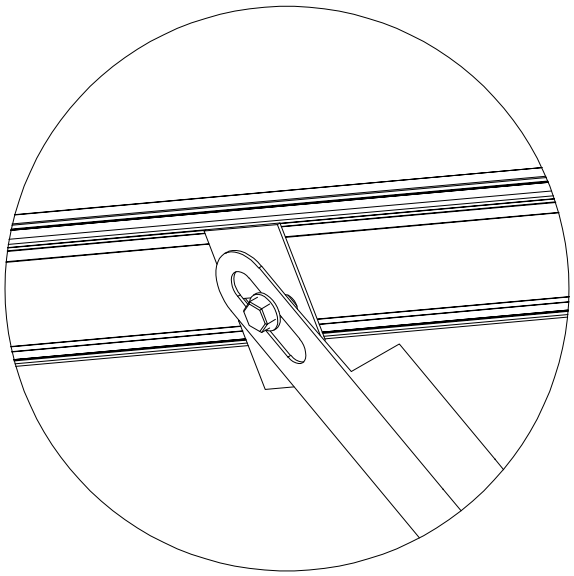
Steel-aluminium junction detail.
Allowed to move
- vertical ± 25 mm
- horizontal ± 177







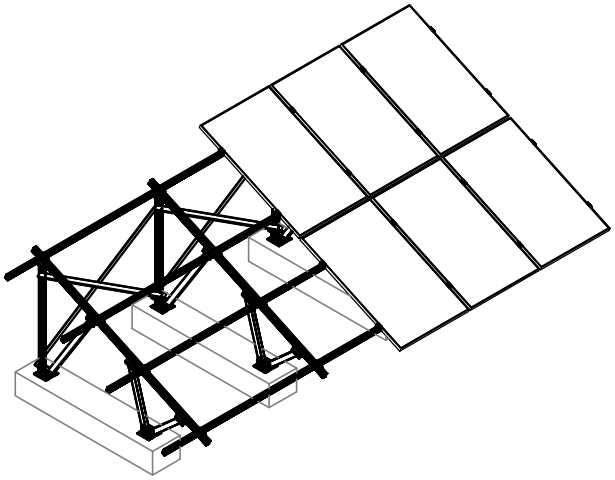




Prikaz spoja čelične ukrute s aluminijskim profilom FNE-0006.
Korišten je vijak M10x60 (431.085), matica M10 (432.015) i podloška U10 (432.114).

Layout of the steel crossbar connection with aluminium profile FNE-0006.
Screw M10x60 (431.085), nut M10(432.015) and washer U10 (432.114) are used.

Obrada i montaža
Processing and montage



Za analizu aluminijske podkonstrukcije za fotonaponske elektrane najvažnije je definirati solarni panel.

Na osnovu solarnog panela i lokacijskih uvjeta projektant izabire optimalnu aluminijsku konstrukciju i način slaganja solarnih panela.

Nakon odabira tipa konstrukcije definira se tip temeljenja solarne konstrukcije.

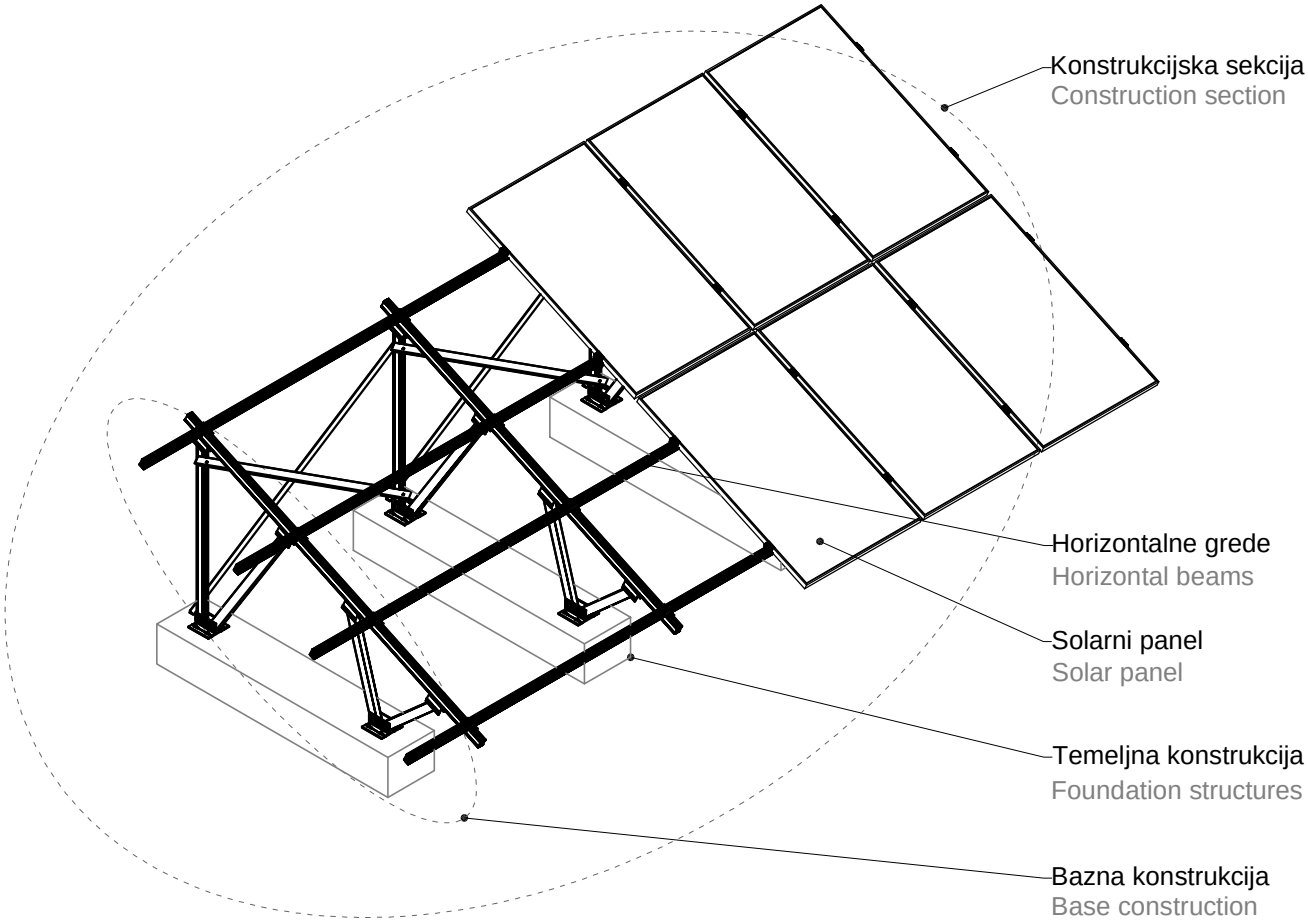
Temeljenje se može izvesti preko armirano betonskih temeljnih traka ili vijaka za zemlju.

For the analysis of the aluminum substructure for photovoltaic power plants, the most important thing is to define a solar panel.

Based on the solar panel and location conditions, the designer chooses the optimal aluminum construction and the way of assembling the solar panels.

After selecting the type of construction, the type of foundation of the solar construction is defined.

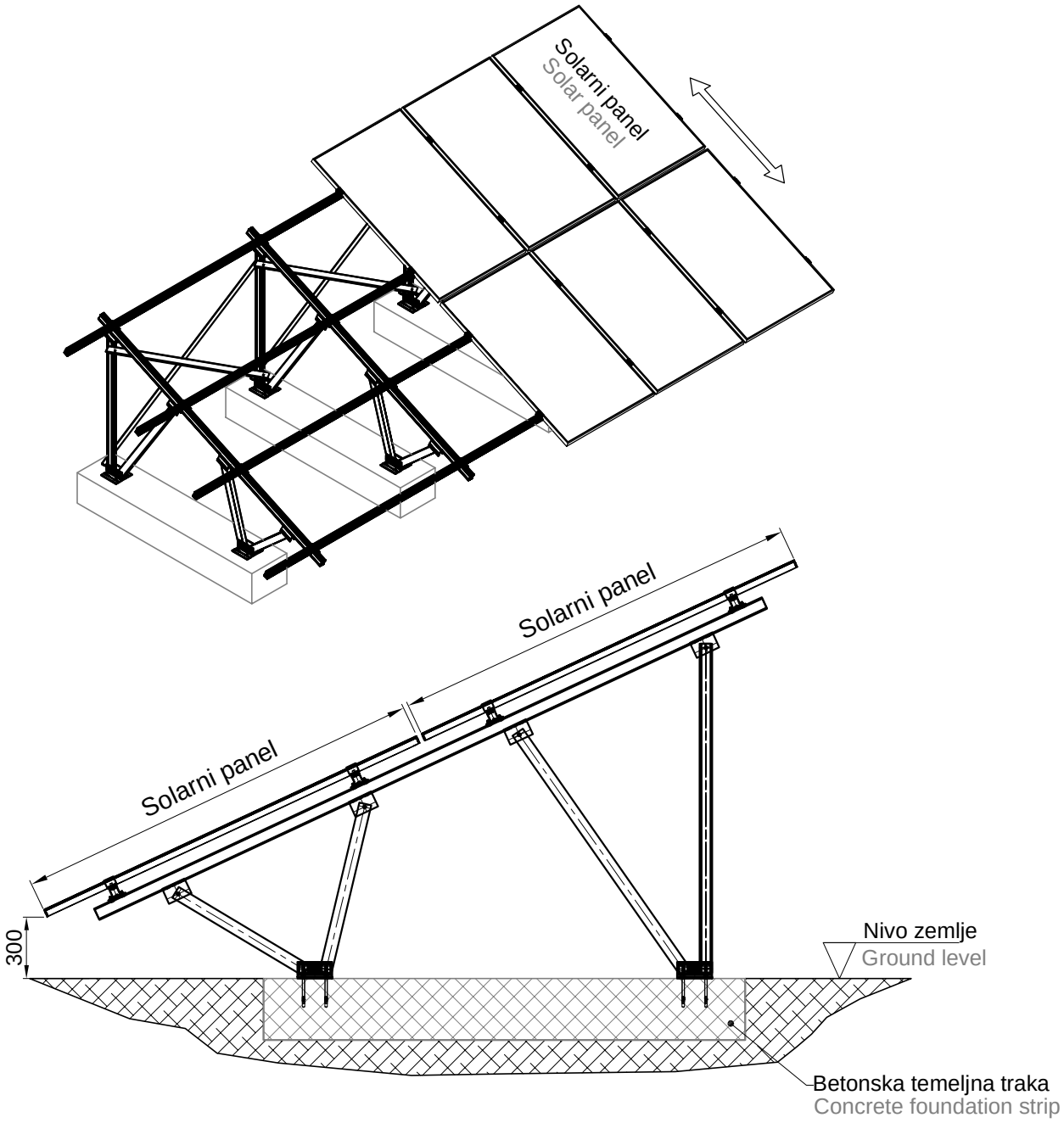
The foundation can be done over reinforced concrete foundation strips or screws for the ground.



Jedna sekcija montira se sa 4 bazne konstrukcije koje su međusobno povezane horizontalnim gredama.
Svaka sekcija je dizajnirana da nosi određeni broj solarnih panela orjentiranih horizontalno ili uspravno.

One section is mounted with 4 base structures that are interconnected by horizontal beams.
Each section is designed to bear specific number of solar panels oriented landscape or portrait.

Vertikalna montaža solarnih panela
Vertical installation of solar panels

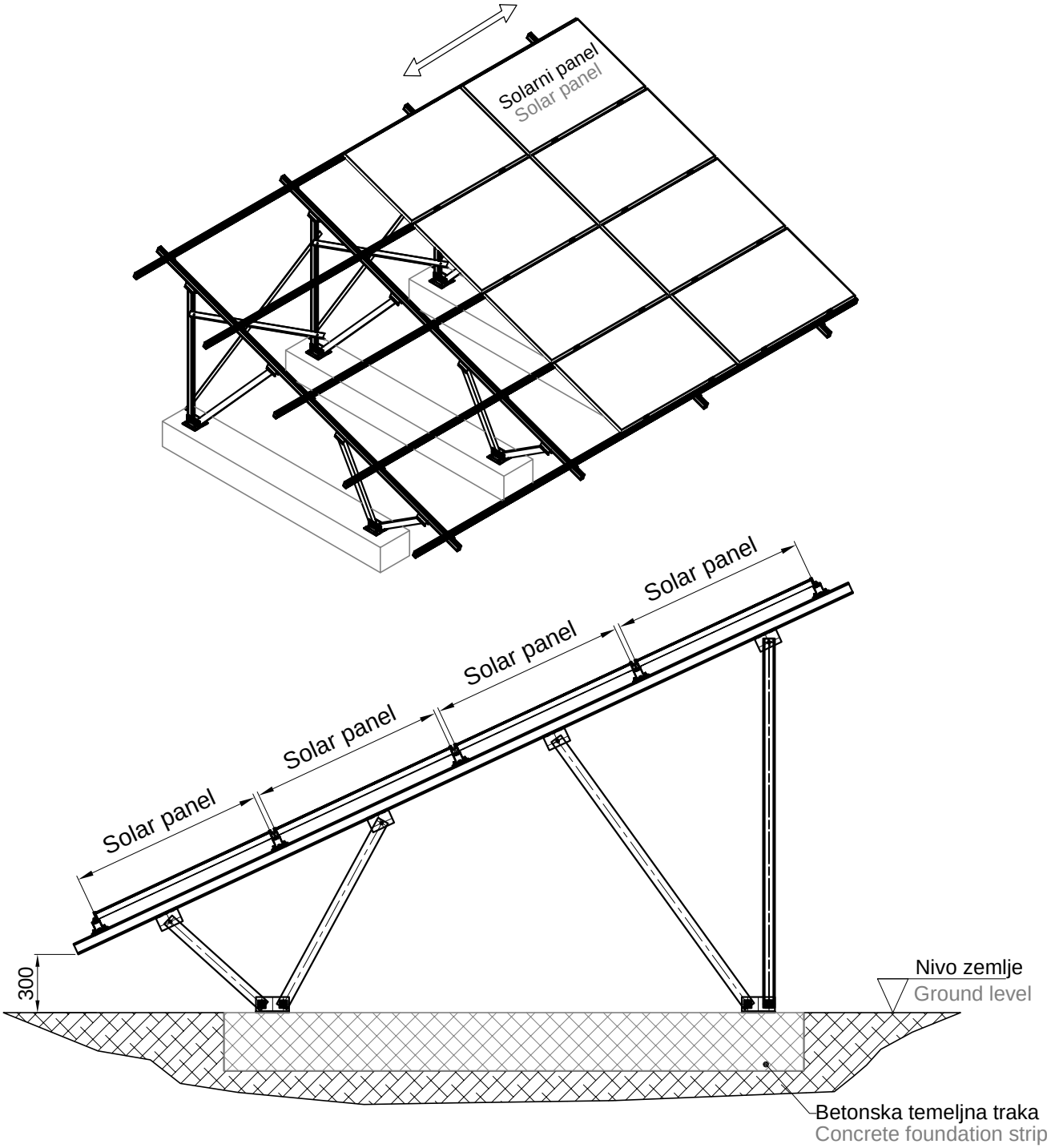


Vertikalna orijentacija najčešći je primjer montaže solarnih panela na ovakvim konstrukcijama. Ovakva orijentacija solarnog panela dozvoljava veću flekisbilnost prilikom montaže podkonstrukcije, tako da se greške u montaži u potpunosti eliminiraju. S druge strane podkonstrukcija je manjih dimenzija.
FNE 2000 projektirana je tako da nije potrebna nikakva dodatna obrada ne terenu, sve se svodi na čistu i jednostavnu montažu. Proces montaže opisan je kroz sljedeće korake.

Vertical orientation is the most common example of mounting solar panels on such structures. This orientation of the solar panel allows greater flexibility when mounting the substructure, so that installation errors are completely eliminated. On the other hand, the substructure is smaller.
FNE 2000 is designed so that no additional processing is required in the field and everything comes down to plain and easy installation. The assembly process is described through the following steps.

Horizontalna montaža solarnih panela

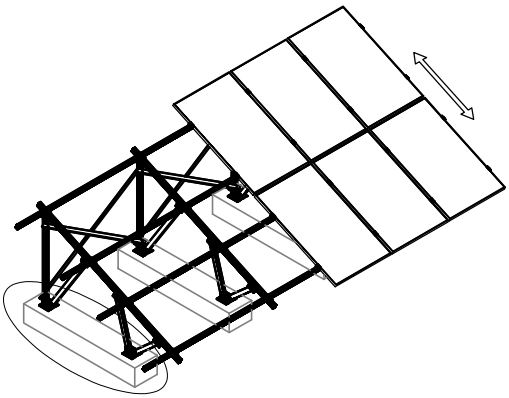
Horizontal installation of solar panels



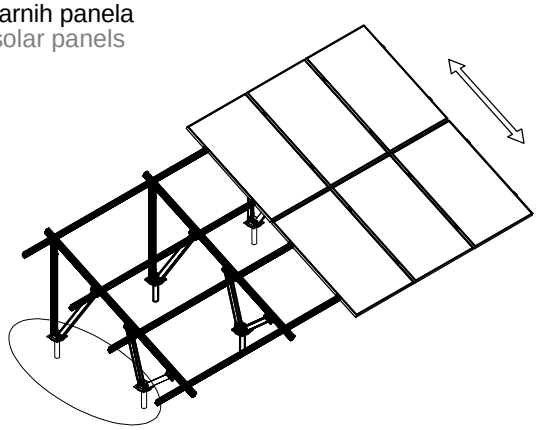
Horizontalna montaža solarnih panela, najčešće se primjenjuje zbog manje visine same konstrukcije, pa tako i manje izloženosti. Princip montaže je isti kao kod vertikalne montaže, a razlika se događa tek kod montaže horizontalnih greda.

Horizontal mounting of solar panels is most often used due to the lower height of the structure itself, and thus less exposure. The principle of mounting is the same as with vertical mounting, and the difference is difficult when mounting horizontal beams.

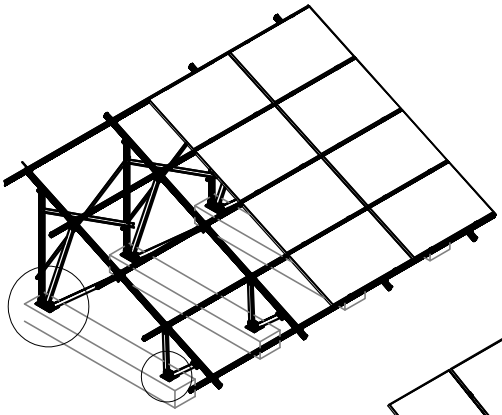
Vertikalna montaža solarnih panela
Vertical installation of solar panels

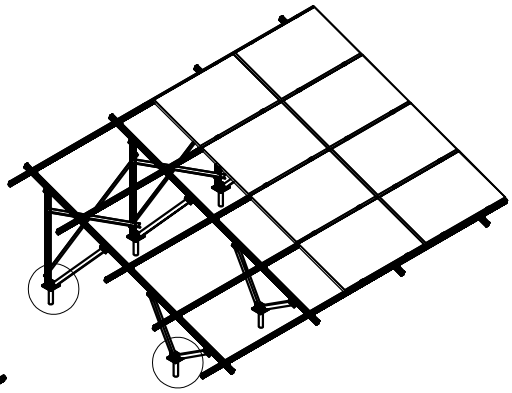


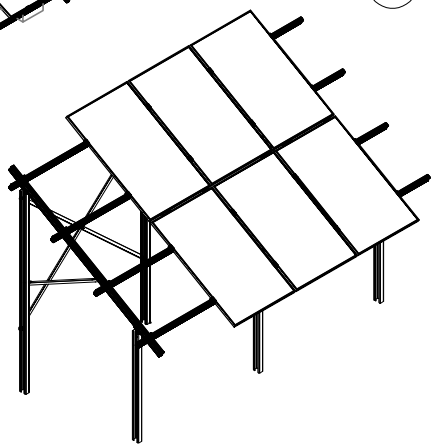
1. Temeljenje na armirano betonskim temeljnim trakama
1. Foundation on reinforced concrete foundation strips



2. Temeljenje na vijcima za zemlju.
2. Foundation on ground screws.







3. Primarna čelična podkonstrukcija
3. Primary steel substruction

Prvi korak je definiranje temeljne konstrukcije. Temeljnu konstrukciju odabire projektant, a njen točan raspored i specifične detalje o kojima trebamo voditi računa opisani su u narednim stranicama.

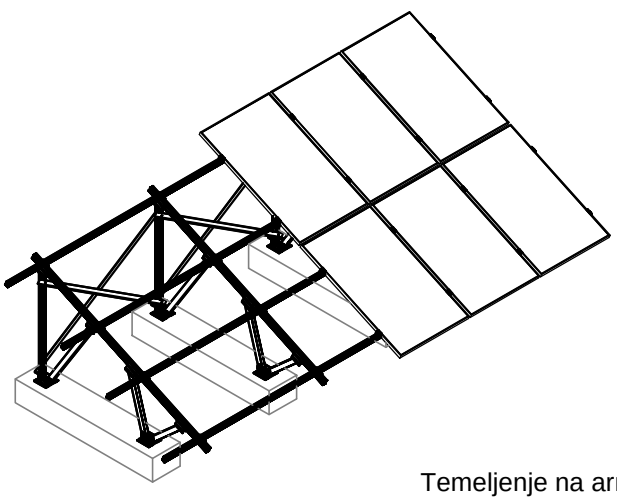
Temeljna konstrukcija najčešće se izvodi u dva tipa i to:

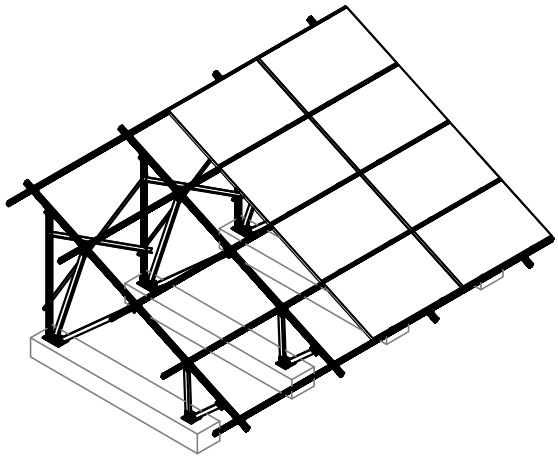
1. Temeljenje na armirano betonskim temeljnim trakama
2. Temeljenje na vijcima za zemlju.
3. Primarna čelična podkonstrukcija

The first step is to define the foundation structure. The basic construction is chosen by the designer, and its exact layout and specific details that we need to take into account are described in the following pages.

The basic construction is usually carried out in two types:

1. Foundation on reinforced concrete foundation strips
2. Foundation on ground screws.
3. Primary steel substructure.

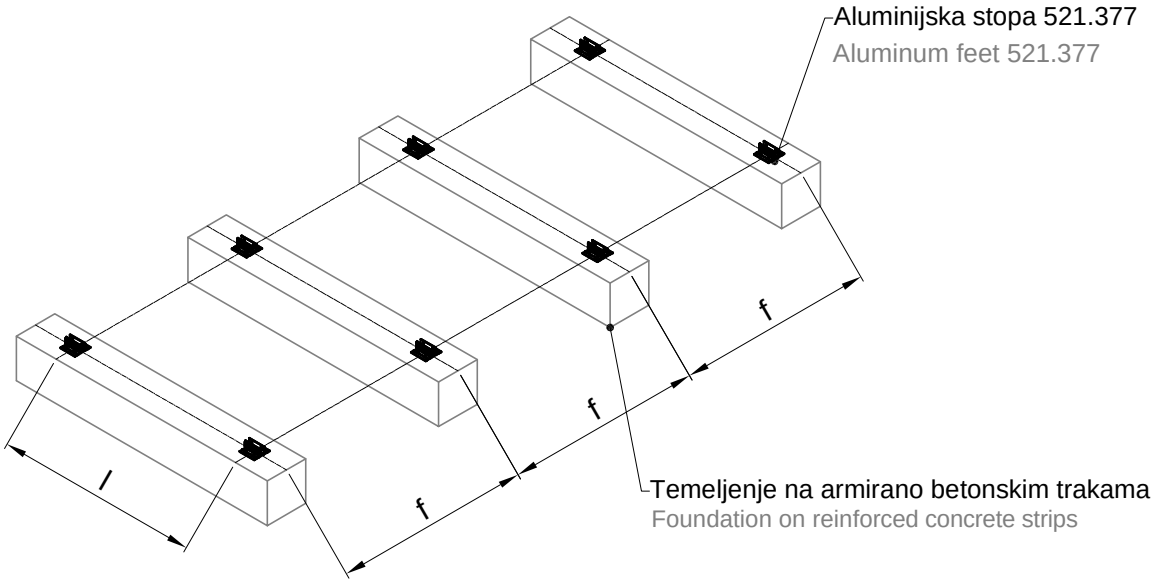




Temeljenje na armirano betonskim trakama
Foundation on reinforced concrete strips

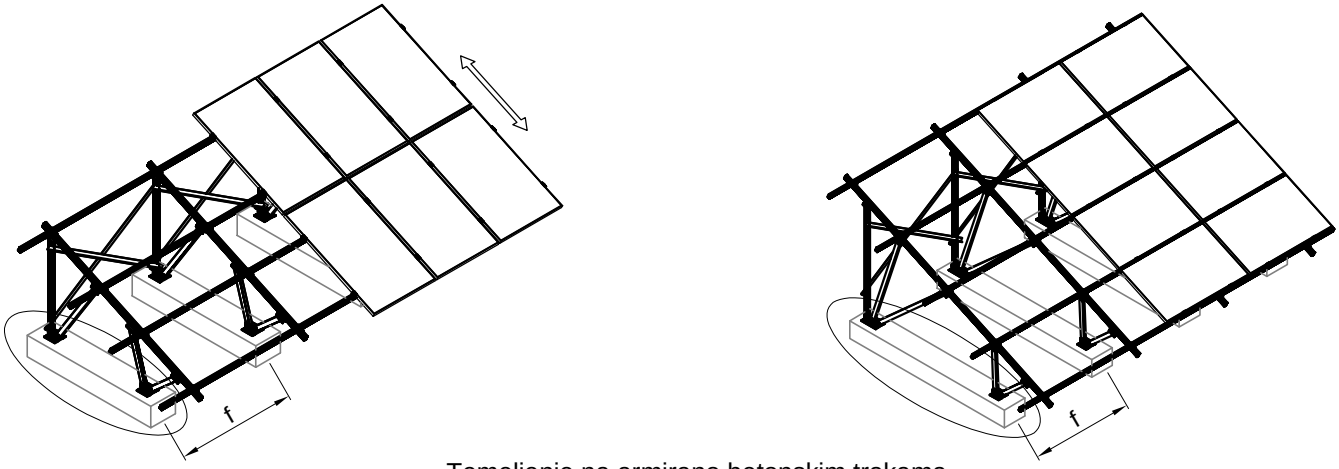
Kod armirano betonskih temeljnih traka jako je bitno poštivati minimalne dimenzije temeljne trake koja je uvjetovana aluminijskim stopama 521.377 za širinu te potrebnom dužinom anker vijka za visinu temeljne trake. Zbog toga minimalna širina temeljne trake je 350mm, a visina 300mm. Preporučuje se ići sa većim dimenzijama, a iste će treba odrediti projektant fotonaponske elektrane.

In the case of reinforced concrete foundation strips, it is very important to respect the minimum dimensions of the foundation strip, which is conditioned by the aluminum feet 521,377 for the width and the required length of the anchor bolt for the height of the foundation strip. Therefore, the minimum width of the foundation strip is 350mm, and the height is 300mm. It is recommended to go with larger dimensions, and the same will need to be determined by the designer of the photovoltaic power plant.



Svaka aluminijska konstrukcija definirana je svojim parametrima, tako se parametri "l" i "f" odnose na osovinski razmak temeljnih stopa. Prilikom izrade armirano betonskih traka potrebno je uzeti ove parametre u obzir. Horizontalni osovinski razmak temeljnih traka "f" može se izvesti sa tolerancijom od ±50mm, dok se razmak "l" treba poštivati maksimalno točno, jer on direktno utječe na nagib solarnih panela. Razmak stopa "l" mora biti jednak na svakoj temeljnoj traci.

Each aluminum structure is defined by its parameters, so the parameters "l" and "f" refer to the axial distance of the foundation feet. When making reinforced concrete strips, it is necessary to take these parameters into account. The horizontal axis distance of the foundation strips "f" can be made with a tolerance of ± 50 mm, while the distance "l" should be observed as accurately as possible, because it directly affects the slope of the solar panels. The spacing of the "l" feet must be the same on each base strip.

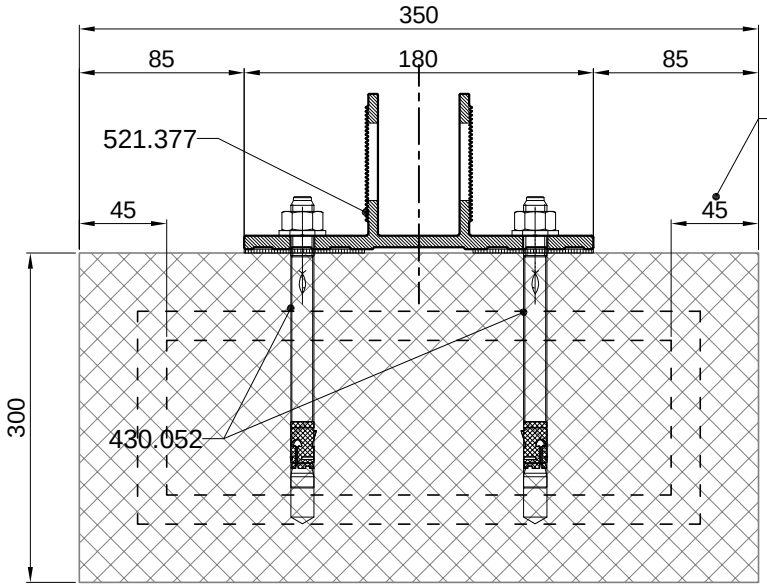


Temeljenje na armirano betonskim trakama

Foundation on reinforced concrete strips

Minimalna dimenzija temeljne trake uvjetovana je aluminijskim stopama 521.377 i odabranim ankerom.
Zbog toga minimalna širina temeljne trake je 350mm, a visina 300mm.
Preporučuje se ići sa većim dimenzijama, a iste će treba odrediti projektant fotonaponske elektrane.

The minimum dimension of the foundation strip is conditioned by the aluminum feet 521.377 and the selected anchor. Therefore, the minimum width of the foundation strip is 350mm, and the height is 300mm. It is recommended to go with larger dimensions, and the same will need to be determined by the designer of the photovoltaic power plant.

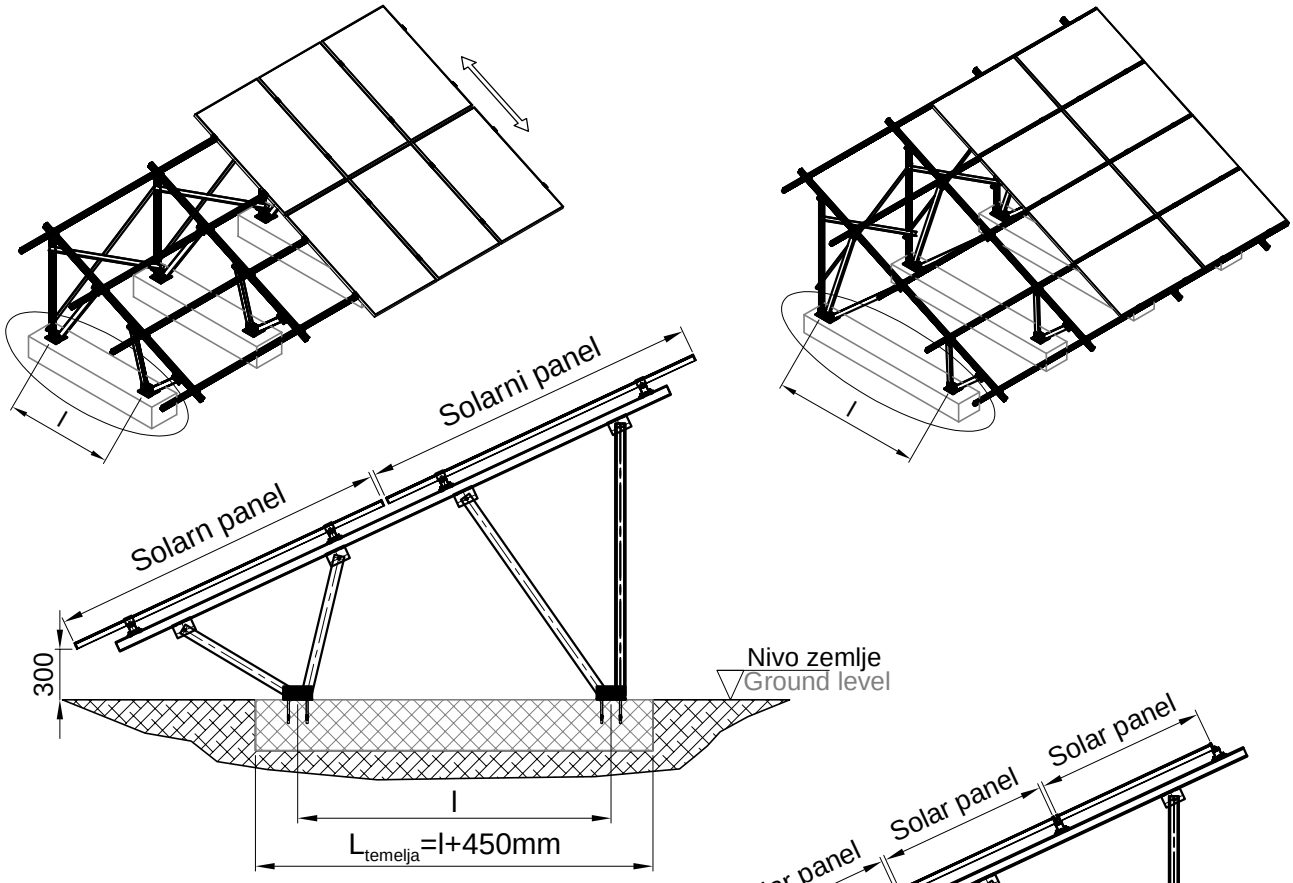


Minimalna širina konstrukcijskih elemenata unutar temeljne trake

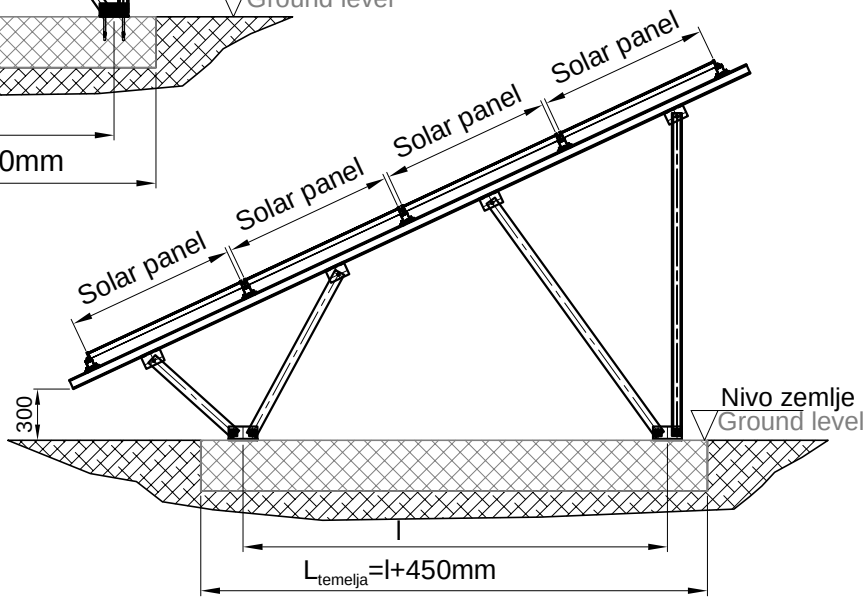
Minimum construction width elements inside of the foundation strip

Horizontalni osovinski razmak temeljnih traka "f" može se izvesti sa tolerancijom od ±50mm.
Visinska razlika između pojedinih armirano betonskih temeljnih traka treba biti u toleranciji ±5mm.

The horizontal axial distance of the foundation strips "f" can be reported with a tolerance of ± 50mm. The height difference between individual reinforced concrete foundation strips should be within a tolerance of ± 5mm.



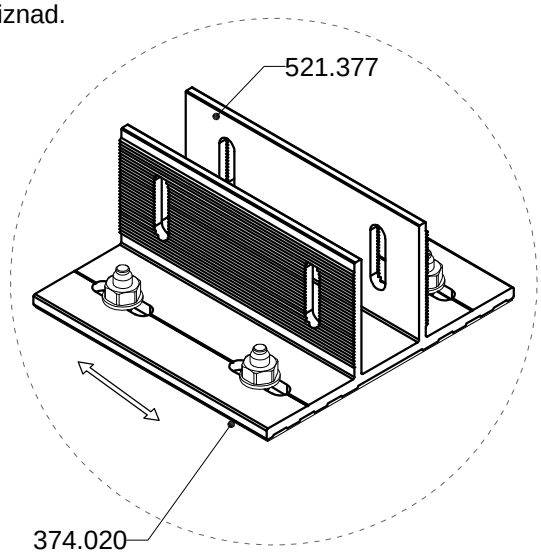
Temeljenje na armirano betonskim trakama
Foundation on reinforced concrete strips

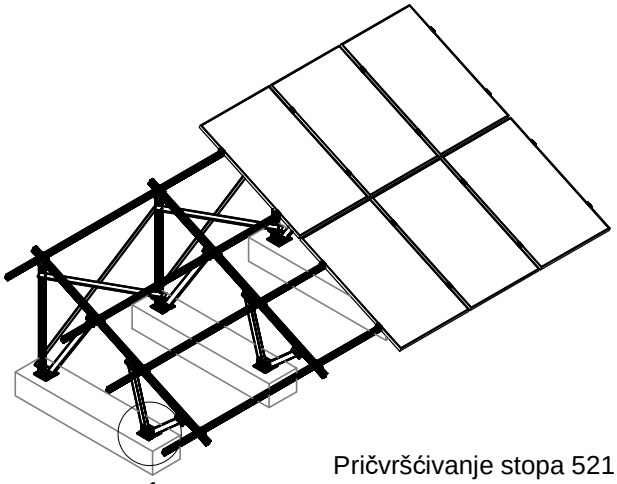


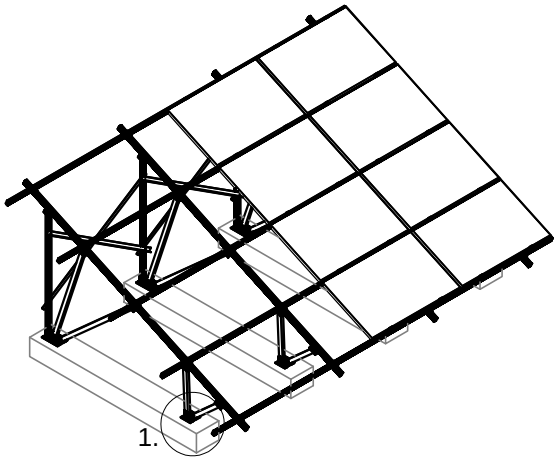
Minimalna dužina armiranobetonskih temeljnih traka definirana je na shemi iznad.

Razmak "l" treba poštivati maksimalno točno, jer on direktno utječe na nagib solarnih panela. Razmak stopa "l" mora biti jednak na svakoj temeljnoj traci. Kako bi se postigla maksimalna točnost pri montaži konstrukcije FNE 2000, aluminijske stope 521.377 dizajnirane su na način da dozvoljavaju fino podešavanje ±40mm.
Prije montaže aluminijskih stopa potrebno je ispod njih ugraditi PVC distancere kako bi se ublažilo trenje između betona i aluminija.

The "l" spacing should be observed as accurately as possible, as it directly affects the slope of the solar panels. The anchor spacing "l" must be the same on each base strip. In order to achieve maximum accuracy when assembling the FNE 2000 structure, aluminum feet 521.377 are designed to allow fine adjustment ± 40mm. Before installing aluminum feet, it is necessary to install PVC spacers under them in order to alleviate the friction between concrete and aluminum.

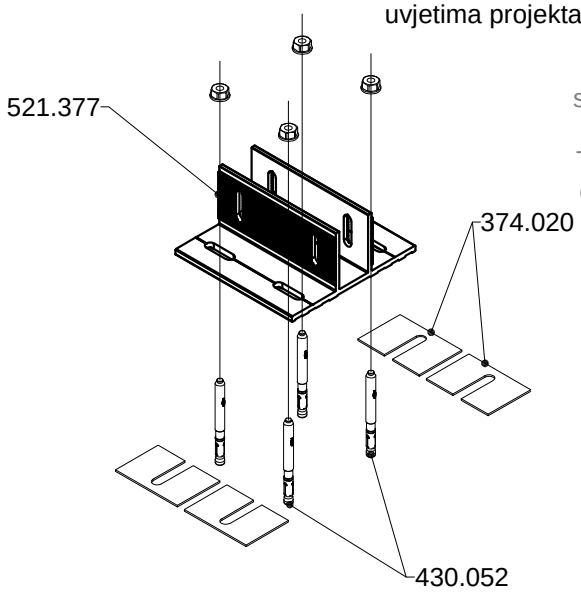


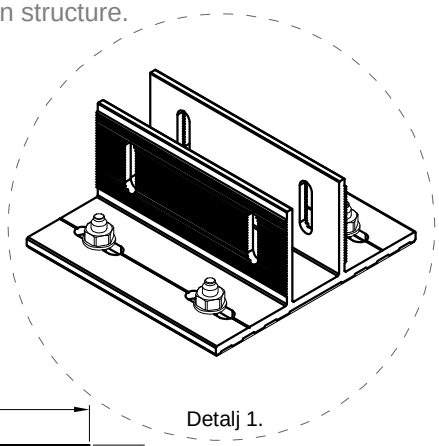


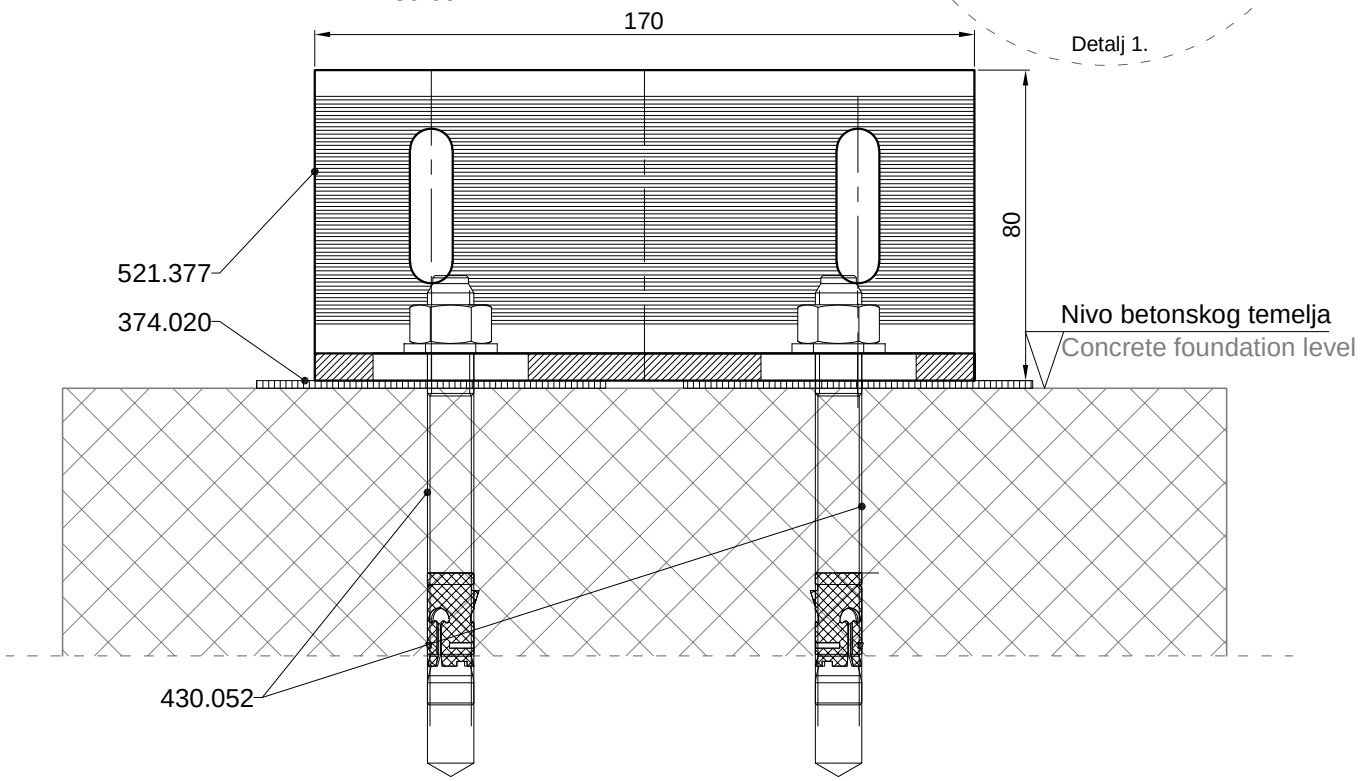


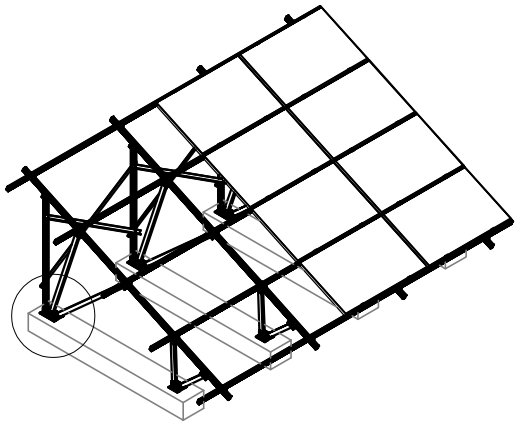
Pričvršćivanje stopa 521.377 za armirano betonske temeljne trake izvodi se sa anker vijcima koji su dimenzionirani i propisani od projektanta.
Ove ankere potrebno je dimenzionirati prema satičkim uvjetima projekta te kvaliteti betona temeljne konstrukcije.

Fastening of feet 521.377 for reinforced concrete foundation strips is performed with anchor bolts that are dimensioned and prescribed by the designer.
These anchors need to be dimensioned according to the satic conditions of the project and the quality of the concrete of the foundation structure.



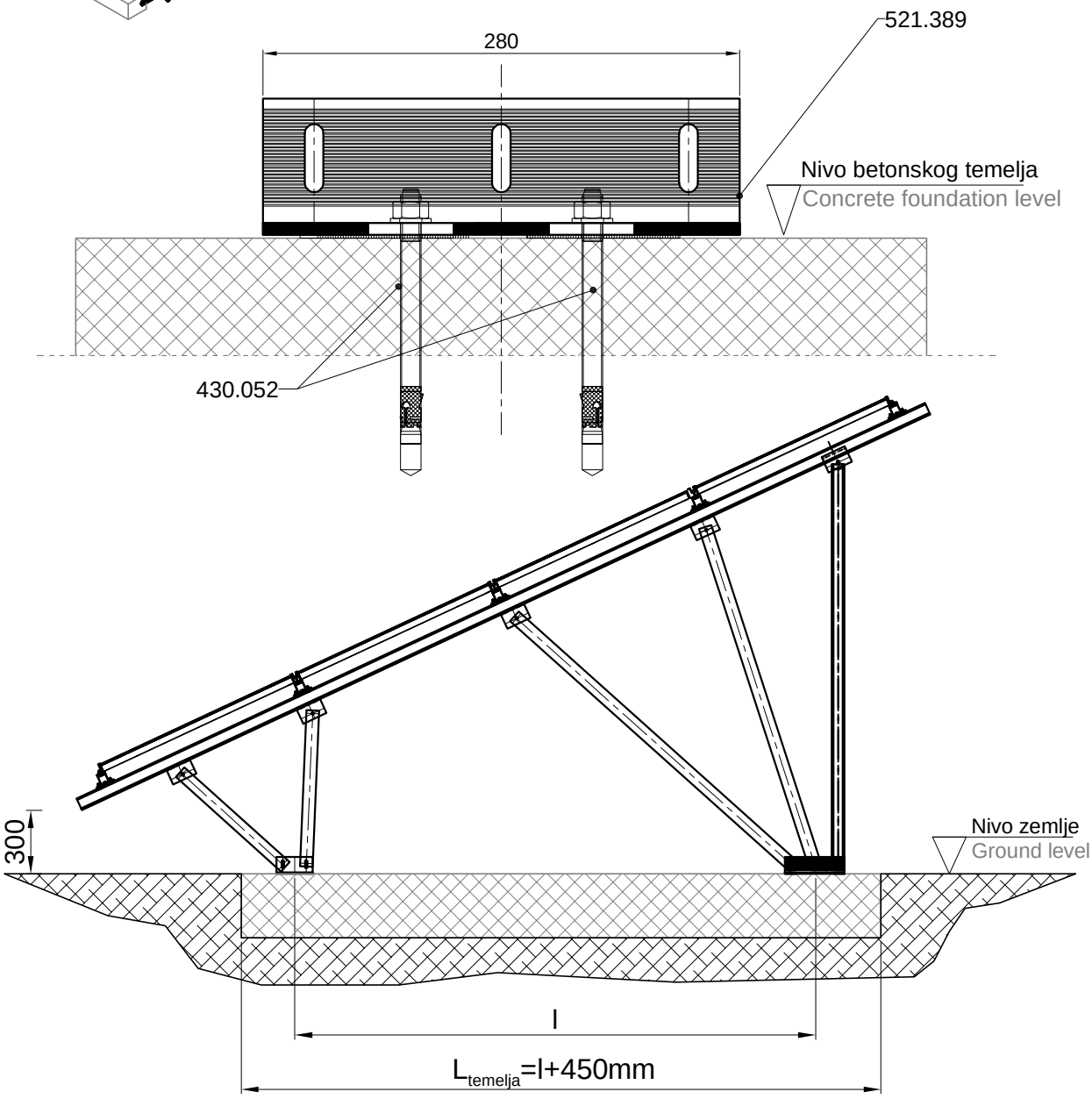






Veza konstrukcije sa betonskim temeljem, stražnja stopa. Kod sustava sa horizontalnom montažom panela i za nagibe veće od 20° dodaje se dijagonala c_1 koja se veže za stražnju stopu 521.389

Connection of the structure with the concrete foundation, rear anchor. For systems with horizontal panel mounting and for inclinations greater than 20 °, a diagonal c_1 is added which binds to the rear anchor 521.389



Kod ove opcije, obratiti pažnju na pozicioniranje stražnje stope. Uvijek se udaljenost "l" mjeri od sredine stope 521.389.

With this option, pay attention to the positioning of the rear anchor. The distance "l" is always measured from the middle of the rate 521.389.

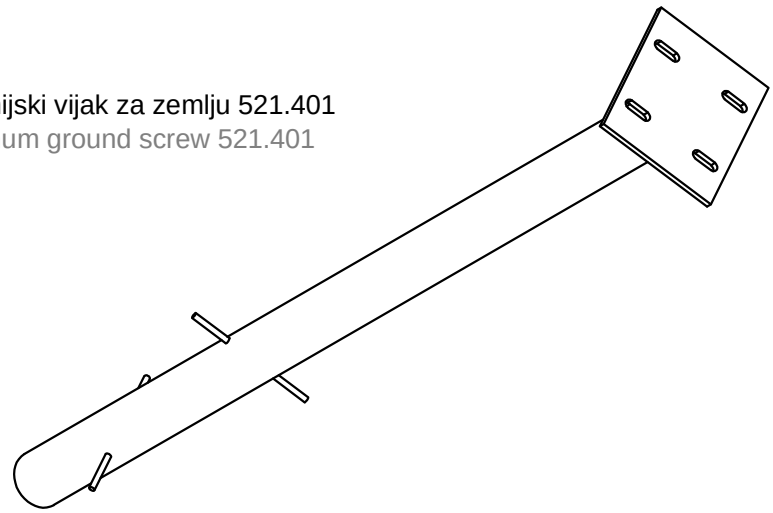
Vijci za zemlju

Sustavi vijčanih temelja alternativni su način temljenja koji se zbog svoje ekonomičnosti, brze i jednostavne montaže, sve više primjenjuje.
S tim ciljem Feal je razvio svoj anker vijak koji se primjenjuje za sve tipove konstrukcije, kao i za sve vrste tla poštujući u nastavku opis ugradnje tog vijka.
U svom sustavu Feal posjeduje dvije vrste anker vijka, jedan izveden kao aluminijski 521.401 i drugi izveden kao čelični - pocinčani vijak 435.009.

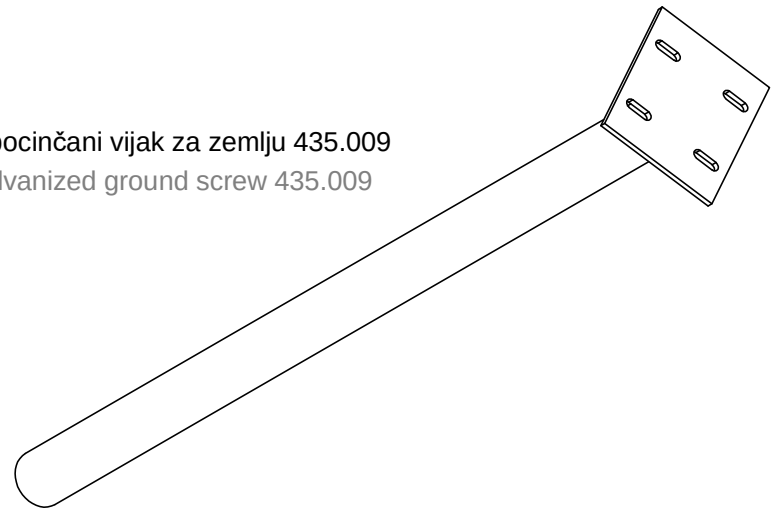
Ground screw

Screw foundation systems are an alternative method of foundation that is increasingly used due to its economy, quick and easy installation.
To this end, Feal has developed its anchor bolt, which is applicable to all types of construction, as well as to all types of soil, following the description of the installation of this bolt.
In its system, Feal has two types of anchor bolts, one made as aluminum 521,401 and the other made as steel - galvanized screw 435,009.

Aluminijski vijak za zemlju 521.401
Aluminum ground screw 521.401

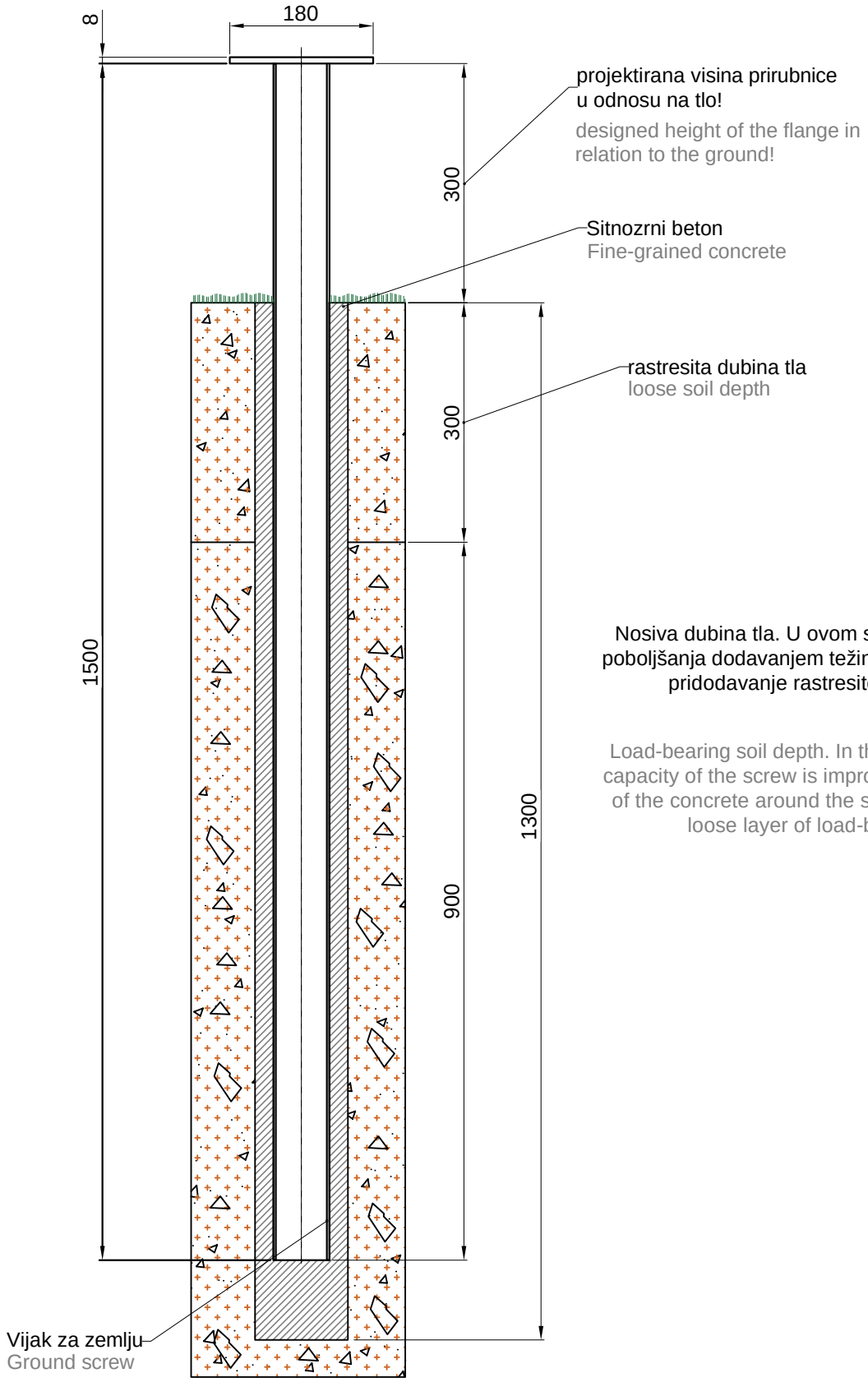


Čelični-pocinčani vijak za zemlju 435.009
Steel-galvanized ground screw 435.009



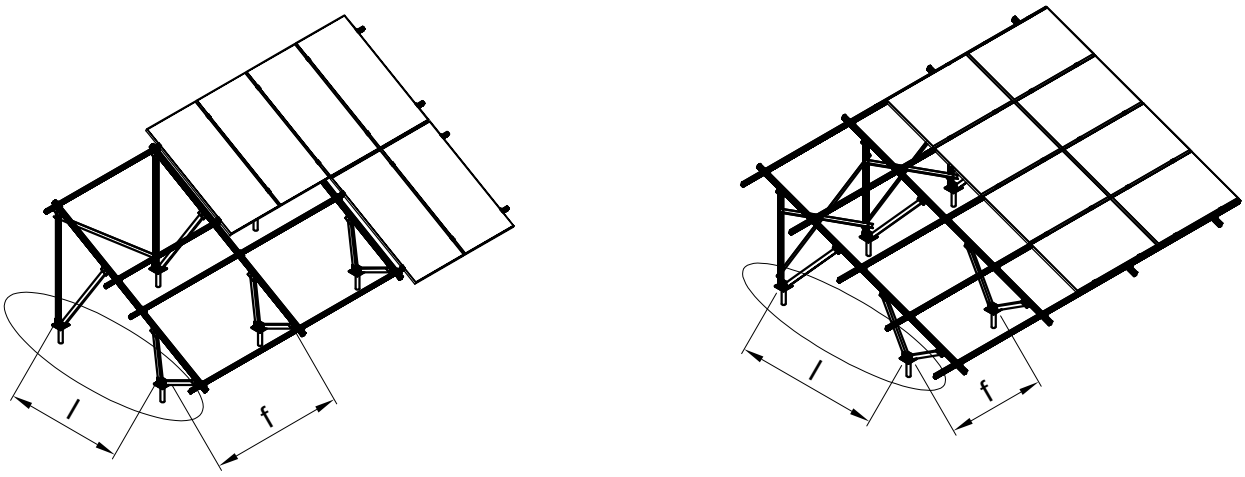
Kod krških terena ugradnja vijka izvodi se na način da se uradi predrupa, kako bi se vijak mogao ugraditi. Nakon ugradnje i pozicioniranja vijka, rupu zapunimo sitnozrnim betonom čime pridonosimo nosivosti samog vijka.

In karst terrains, the installation of the screw is performed in a way that a pre-hole is made, so that the screw can be installed. After installation and positioning of the screw, the hole is filled with fine-grained concrete, which contributes to the load-bearing capacity of the screw itself.



Nosiva dubina tla. U ovom slučaju nosivost vijka je poboljšanja dodavanjem težine betona oko vijka kao i pridodavanje rastresitog sloja nosivosti

Load-bearing soil depth. In this case the load-bearing capacity of the screw is improved by adding the weight of the concrete around the screw as well as adding a loose layer of load-bearing capacity.



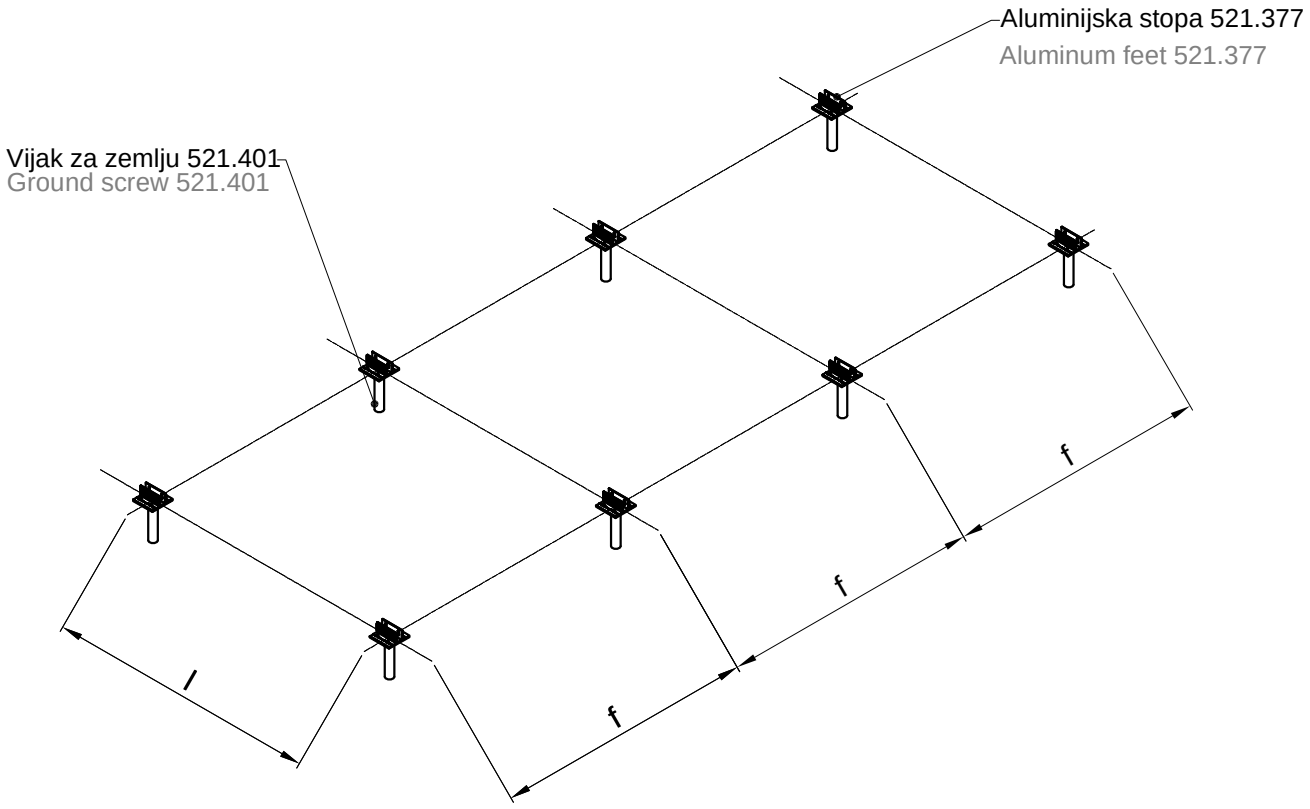
Temeljenje na vijcima za zemlju
Foundation on ground screws

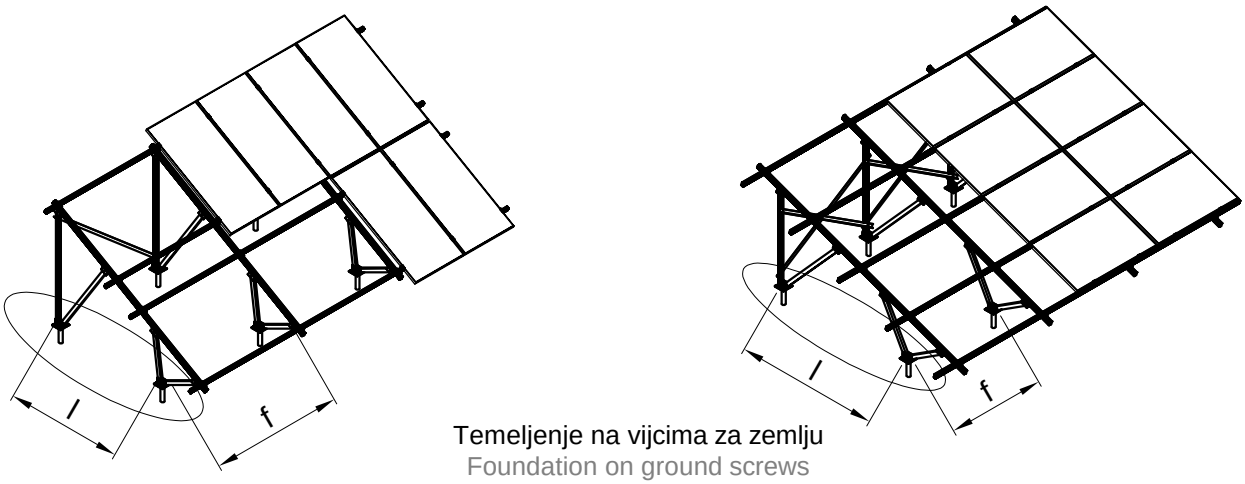
Kod temeljne konstrukcije u obliku vijka za zemlju, također je potrebno poštivati definirane razmake "f" i "l" za pojedinu konstrukciju.

Horizontalni osovinski razmak temeljnih traka "f" može se izvesti sa tolerancijom od ±50mm. Visinska razlika između pojedinih prirubnica vijka za zemlju treba biti u toleranciji ±5mm.

In the case of a foundation structure in the form of a screw for the ground, it is also necessary to respect the defined distances "f" and "l" for each structure.

The horizontal axial distance of the foundation strips "f" can be reported with a tolerance of ± 50mm.The height difference between the individual ground screw flanges should be within a tolerance of ± 5mm

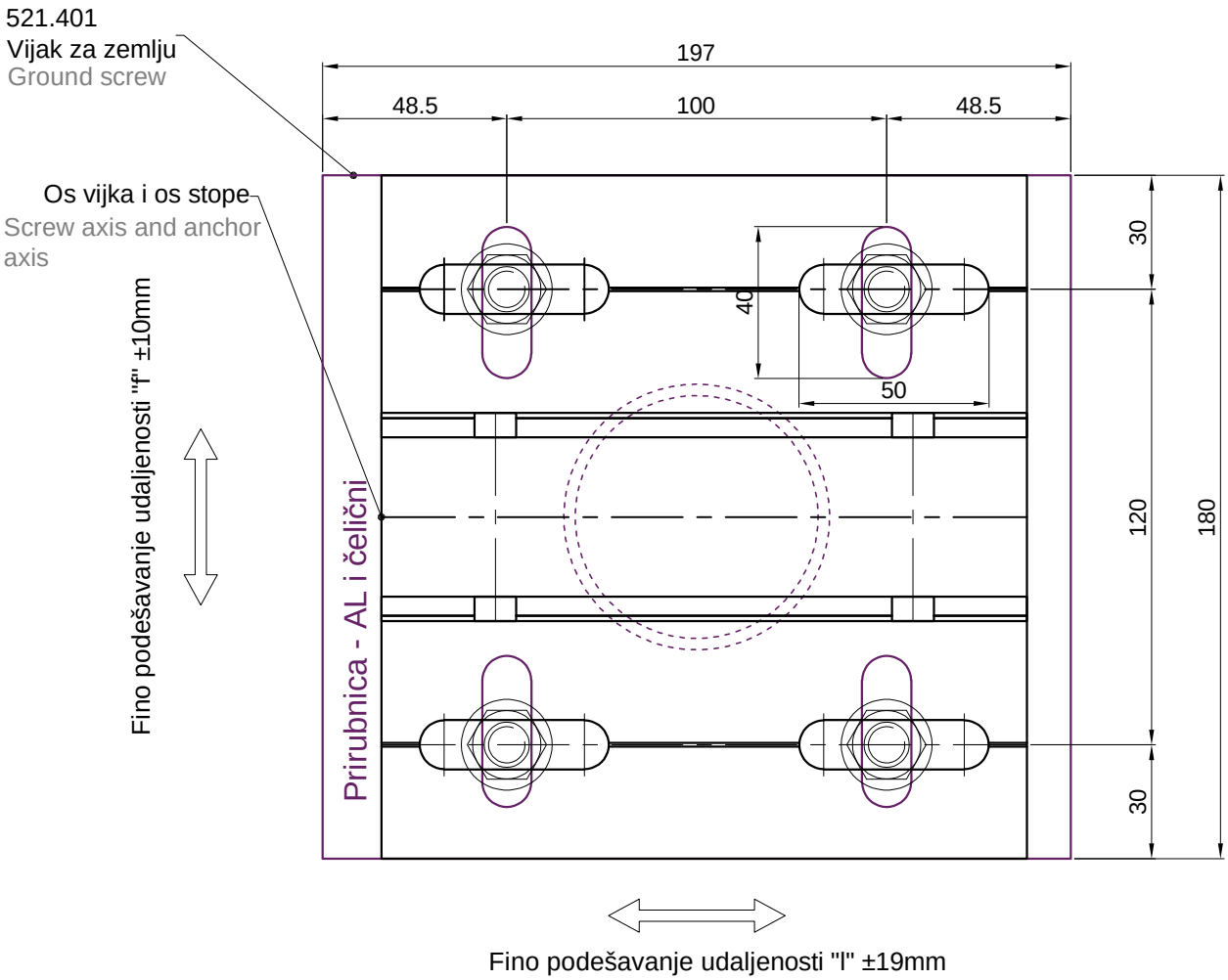


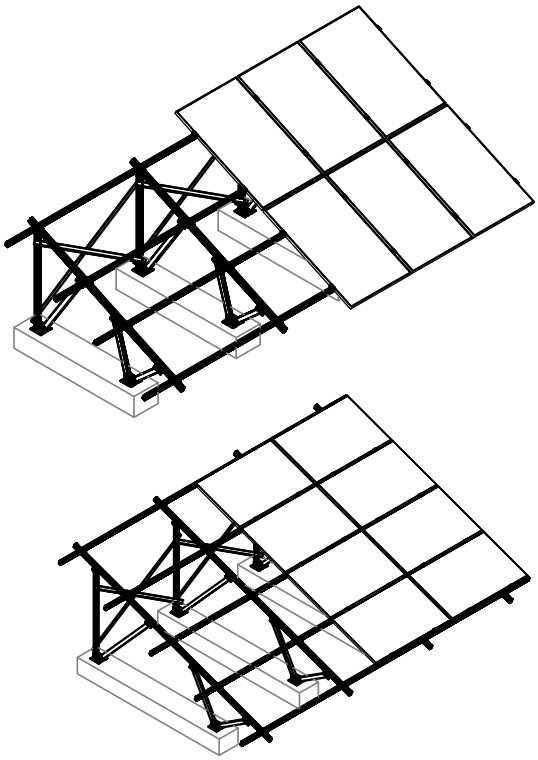


Temeljenje na vijcima za zemlju
Foundation on ground screws

Kod ugradnje vijaka za zemlju jako je važno da se osovine vijaka i osovine stopa poklope. Ovo je bitno jer se na taj način ostvaruje preklop rupa u oba elementa preko kojih se ostvaruje veza.

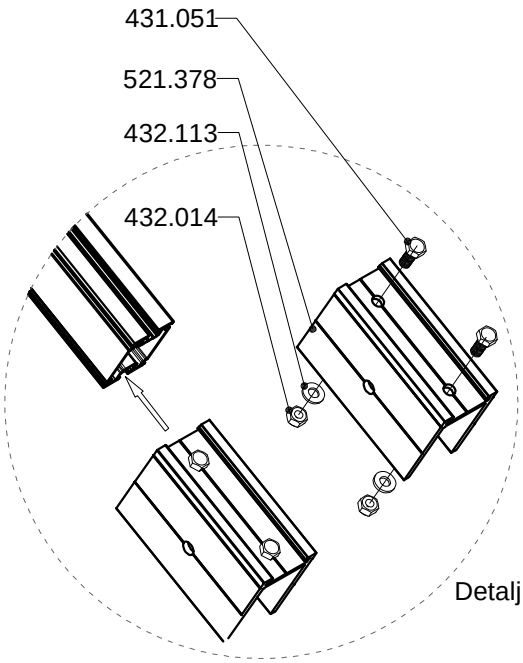
When installing ground screws, it is very important that the screw axis and the anchor axis overlap. This is important because in this way the holes in both elements through which the connection is made are folded.





Kao drugi korak montaže je predmontaža grede u nagibu pod oznakom "e" i veznika 521.378.
Za svaku opciju definiran je točan osovinski razmak veznika koji se mora poštivati kako bi se postigao projektirani nagib solarnih panela.

The second step of the assembly is the pre-assembly, the beams in the slope marked "e" and the connector 521.378.
For each option, the exact axle spacing of the connector is defined, which must be respected in order to achieve the designed inclination of the solar panels.



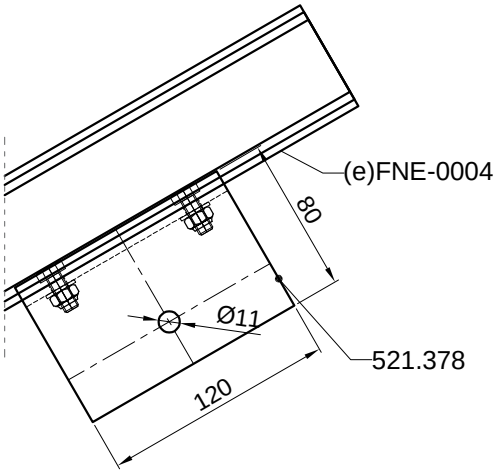
Detalj 5.

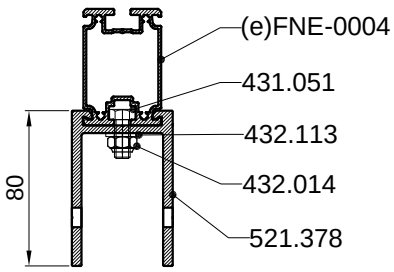
U veznik 521.378 potrebno je ugraditi vijčanu vezu,
vijak M 8/20 (431.051),
sigurnosnu maticu M8 (432.014)
i podlošku (432.113).
Vijke ugraditi u veznik, ali ih držati opuštene kako bi se veznik sa vijcima mogao navući na profil (e)FNE-0004, zatim pozicionirati i zategnuti.

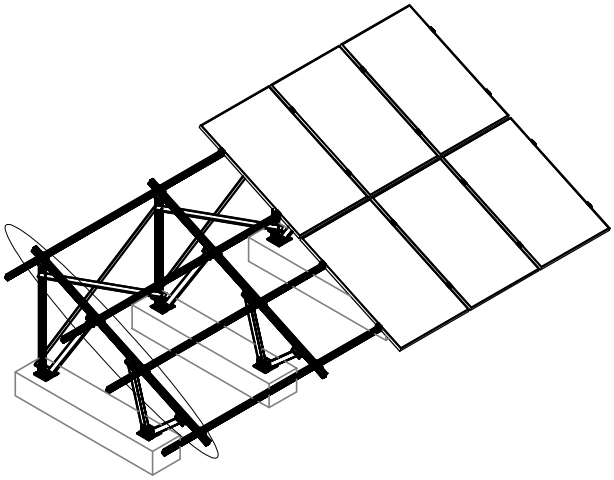
In the connector 521.378 it is necessary to install a screw connection,
screw M 8/20 (431,051),
safety nut M8 (432.014)
and washer (432.113).
Install the screws in the connector, but keep them loose so that the screw connector can be pulled onto the (e)FNE-0004 profile, then positioned and tightened.

U konačnom položaju vijčanu vezu učvrstiti uporabom moment ključa i silom od 8 Nm.

In the final position tighten the screw connection using a torque wrench and a force of 8 Nm.

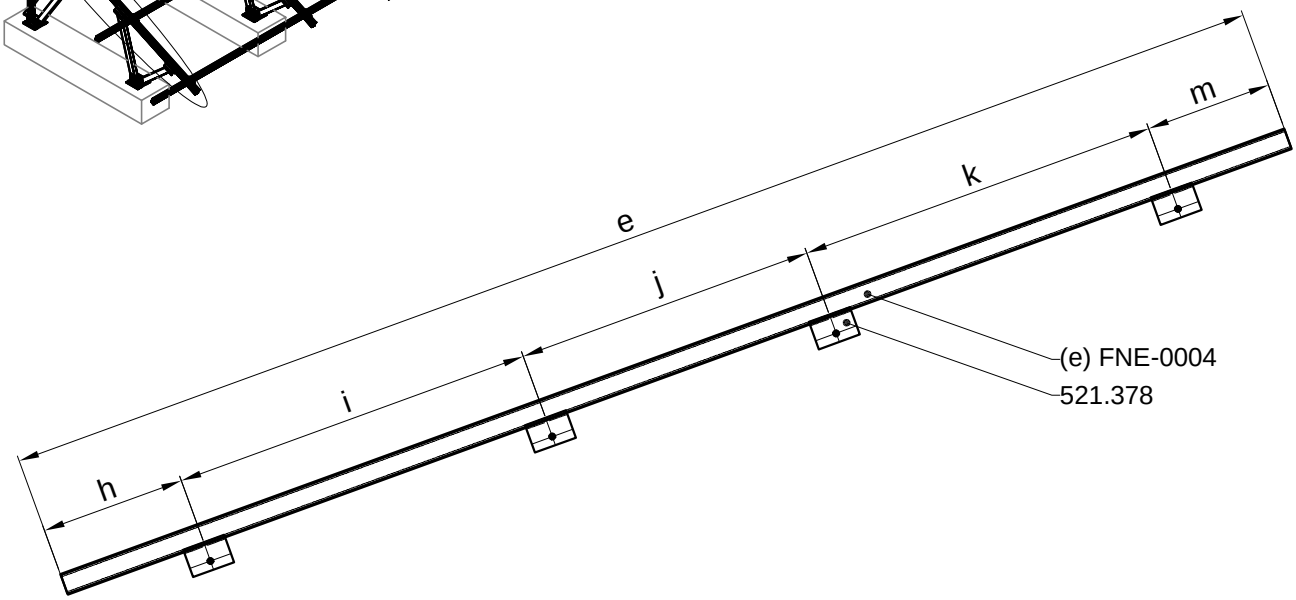




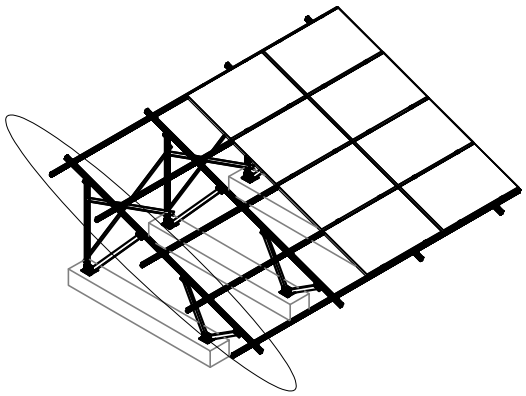


Montaža veznika 521.378 i točan položaj na kosoj gredi "e" dat je za svaku varijantu posebno.

Mounting of the connector 521.378 and the exact position on the sloping beam "e" is given for each variant separately.

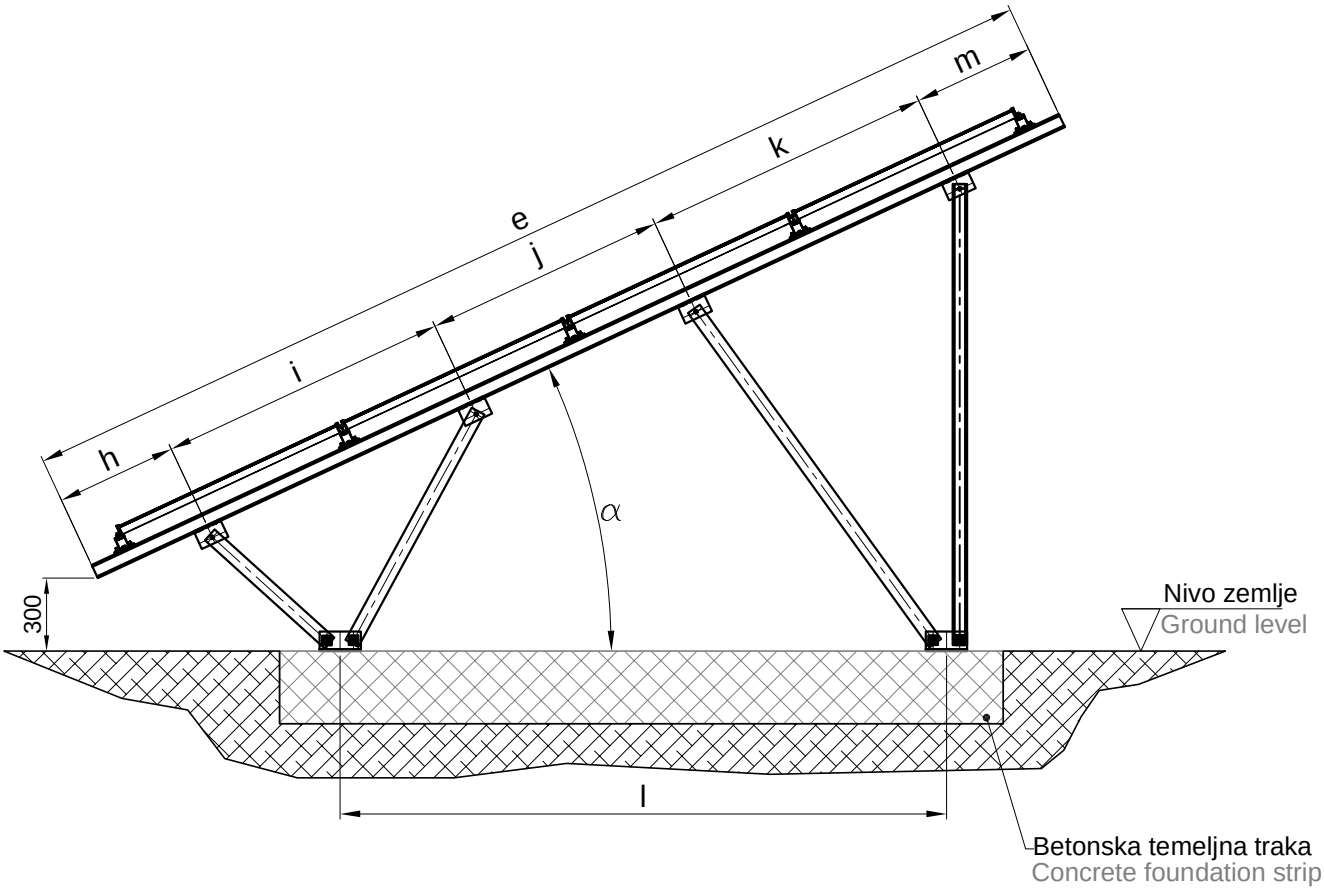


FNE-2000-V1		Dimenzija panela: LxH=1000±5 x 1600±50 Raspored: 2 panela uspravno					
α	l	e	h	i	j	k	m
20°	1500	2800	400	800	630	800	170
25°	1500	2800	400	800	630	800	170
30°	1500	2800	330	870	630	800	170
FNE-2000-V2		Dimenzija panela: LxH=1000±5 x 2000±50 Raspored: 2 panela uspravno					
α	l	e	h	i	j	k	m
20°	2000	3580	400	960	824	1046	350
25°	2000	3580	470	876	822	1062	350
30°	2000	3580	541	787	826	1076	350

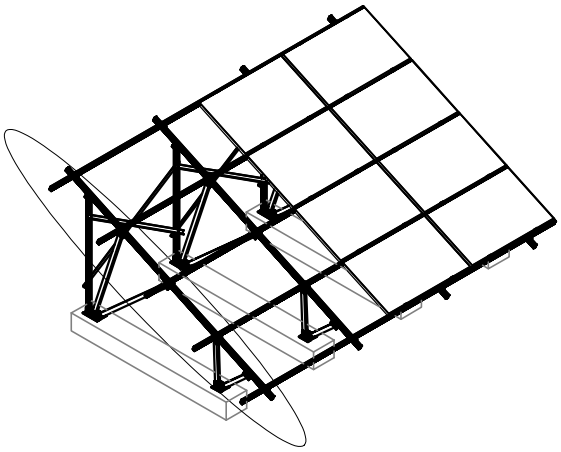


Raspored veznika 521.378 je definiran s obzirom na dimenziju solarnog panela i njegovu orjentaciju.

The layout of the fastening 521.378 is defined with respect to the dimension of the solar panel and its orientation.

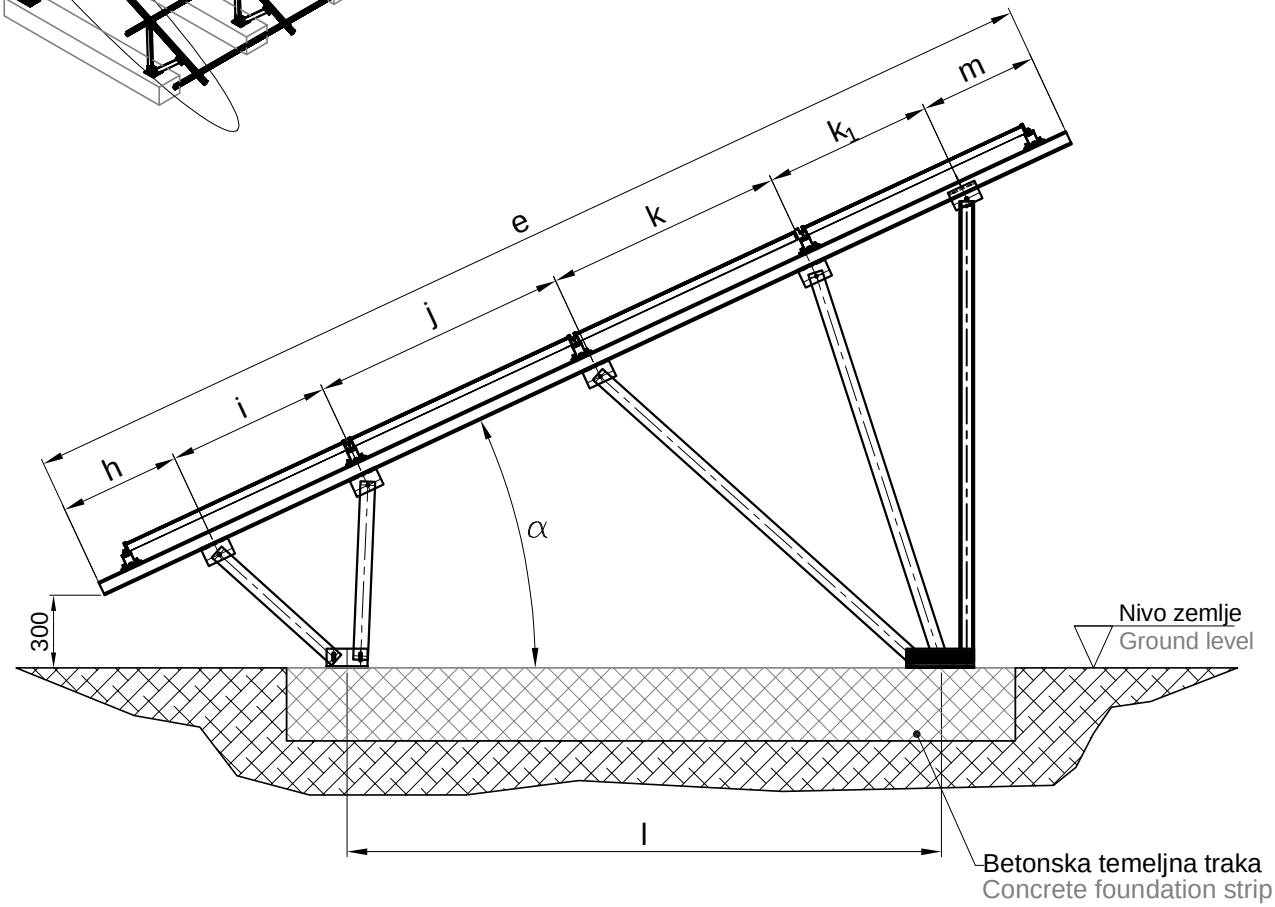


FNE-2000-H		Dimenzija panela: LxH=1600±50 x1000±5; 2000±50 x 1000±5 Raspored: 4 panela horizontalno					
α	l	e	h	i	j	k	m
20°	2500	4400	500	1200	1000	1200	500



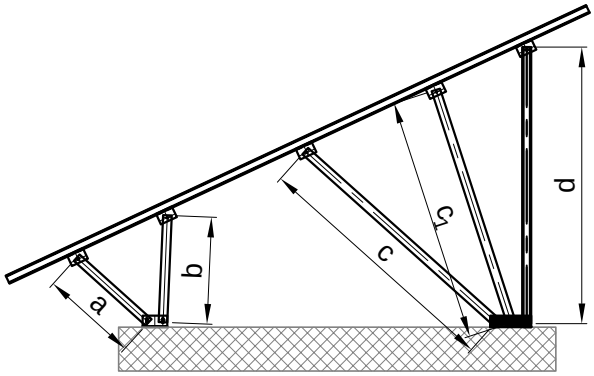
Raspored veznika 521.378 je definiran s obzirom na dimenziju solarnog panela i njegovu orjentaciju.

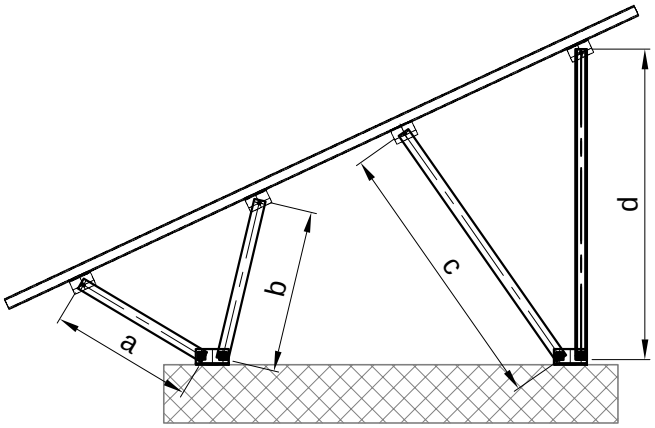
The layout of the fastening 521.378 is defined with respect to the dimension of the solar panel and its orientation.



FNE-2000-H1		Dimenzija panela: LxH=1600±50 x1000±5; 2000±50 x 1000±5 Raspored: 4 panela horizontalno						
α	l	e	h	i	j	k	k_1	m
25°	2450	4400	500	675	1058	982	685	500
30°	2300	4400	500	636	1082	987	696	500

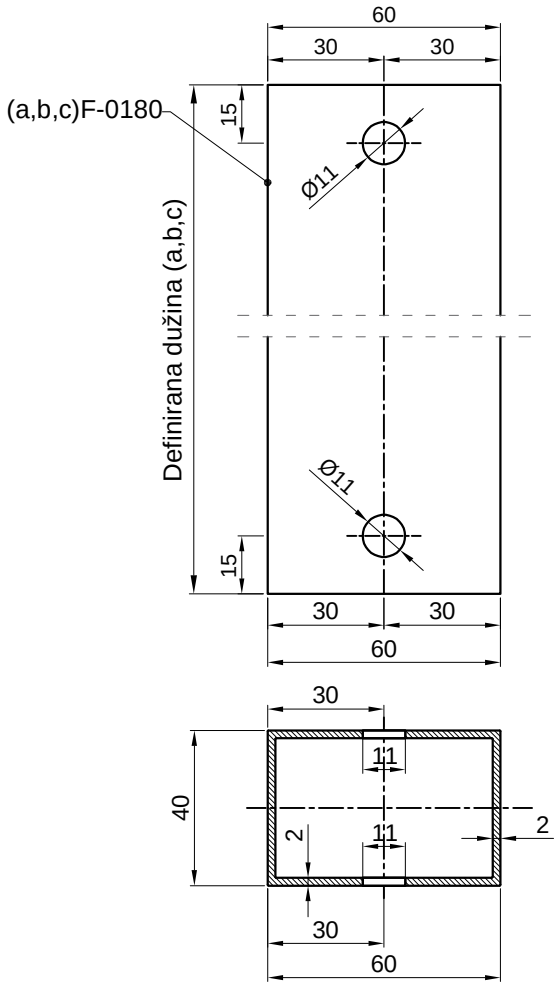
Dijagonale (a, b, c(c_1), d) za svaku varijantu trebaju biti obrađene s obje strane kako je naznačeno na crtežu ispod. Točne dimenzije dijagonala za svaku opciju navedene su u reznim listama i presjecima.

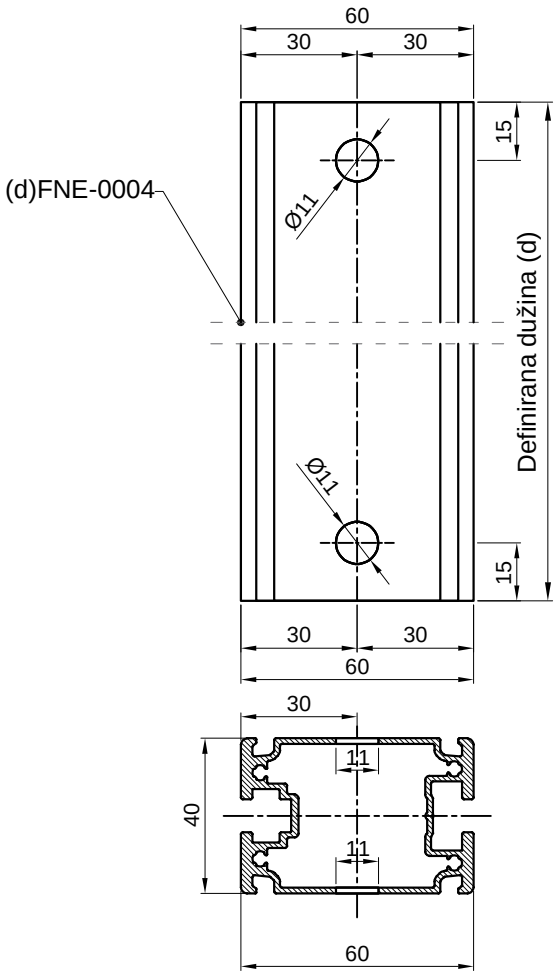


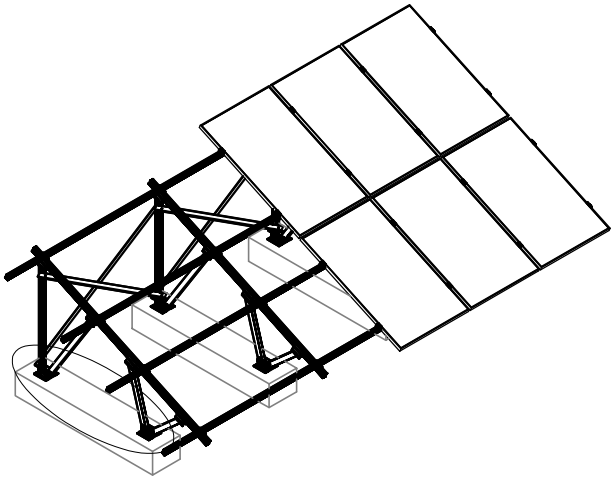


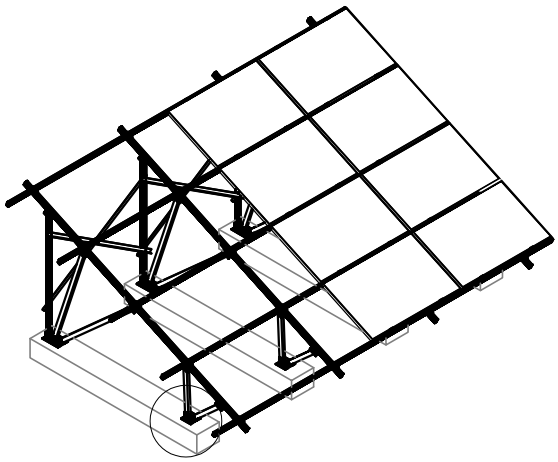
The diagonals (a, b, c(c_1), d) for each variant should be processed, on both sides as indicated in the drawing below. The exact dimensions of the diagonals for each option are given in the cutting lists and in the cross-sections.

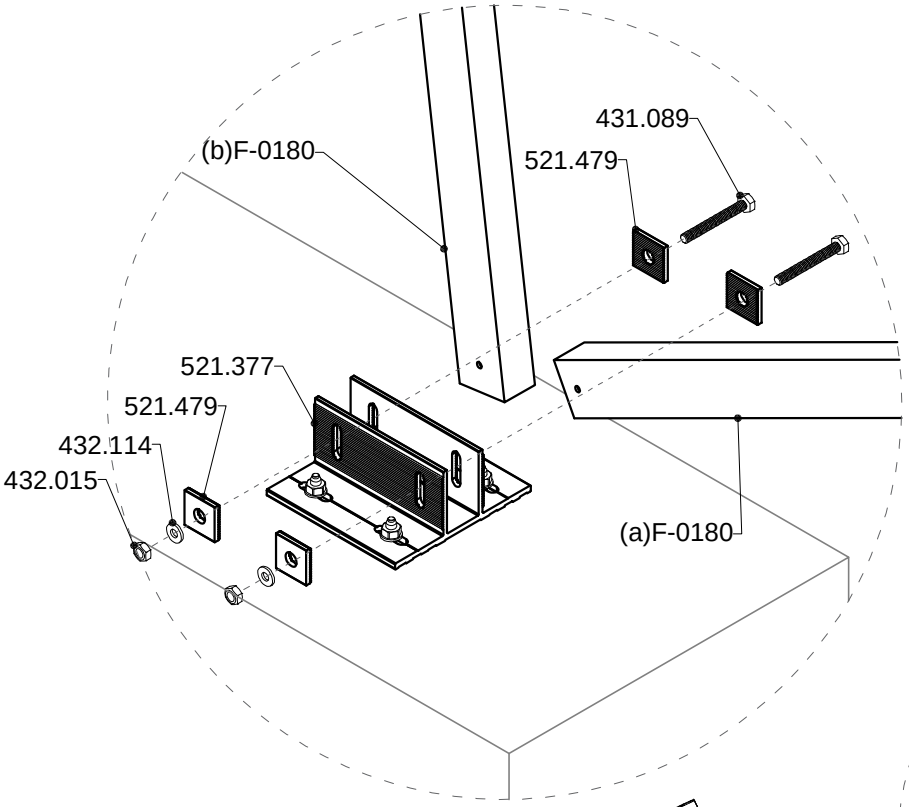
Dijagonale i njihove oznake
Diagonals and their designations





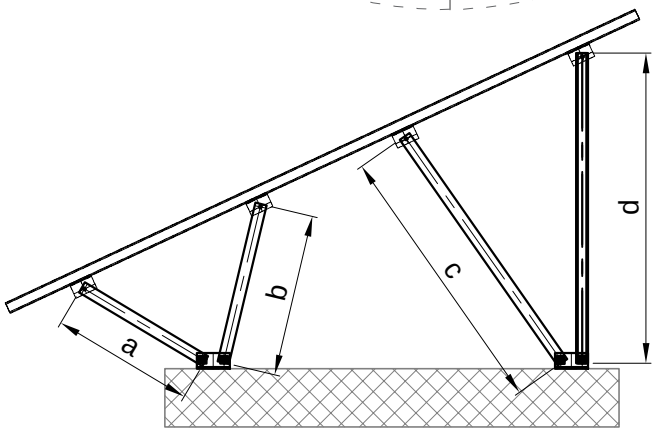




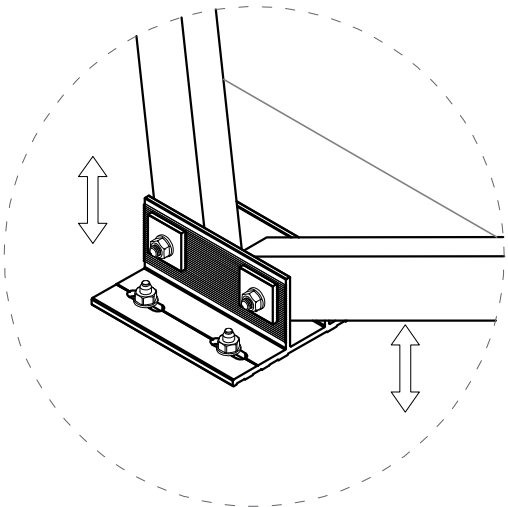


Treći korak montaže, spajaju se dijagonale sa stopama 521.377. Spajanje dijagonala sa stopama izvodi se vijčanom vezom i aluminijskim pločicama 521.479. Prilikom ovog koraka sve sastaviti, a vezu ostaviti opuštenu dok se dijagonale ne pozicioniraju u konačni položaj.

The third step, assembly diagonals with feet 521.377.
The connection of the diagonal with the feet is performed with a screw connection and aluminum plates 521.479. During this step, assemble everything and leave the connection relaxed until the diagonals are positioned in the final position.

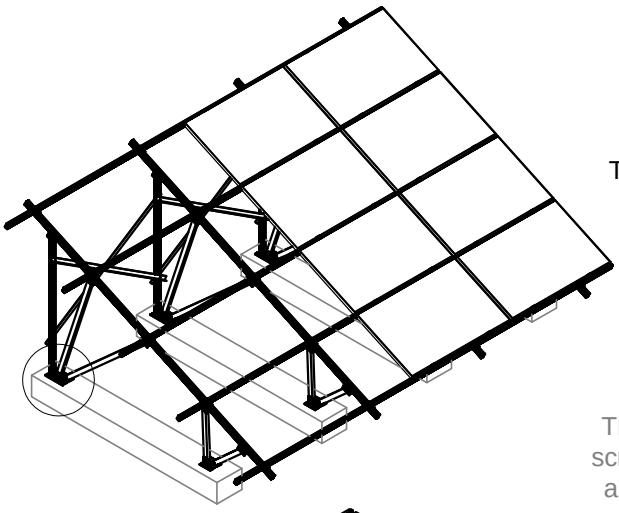


Na ovakav način namontirati sve 4 dijagonale.
Mount all 4 diagonals in this way.



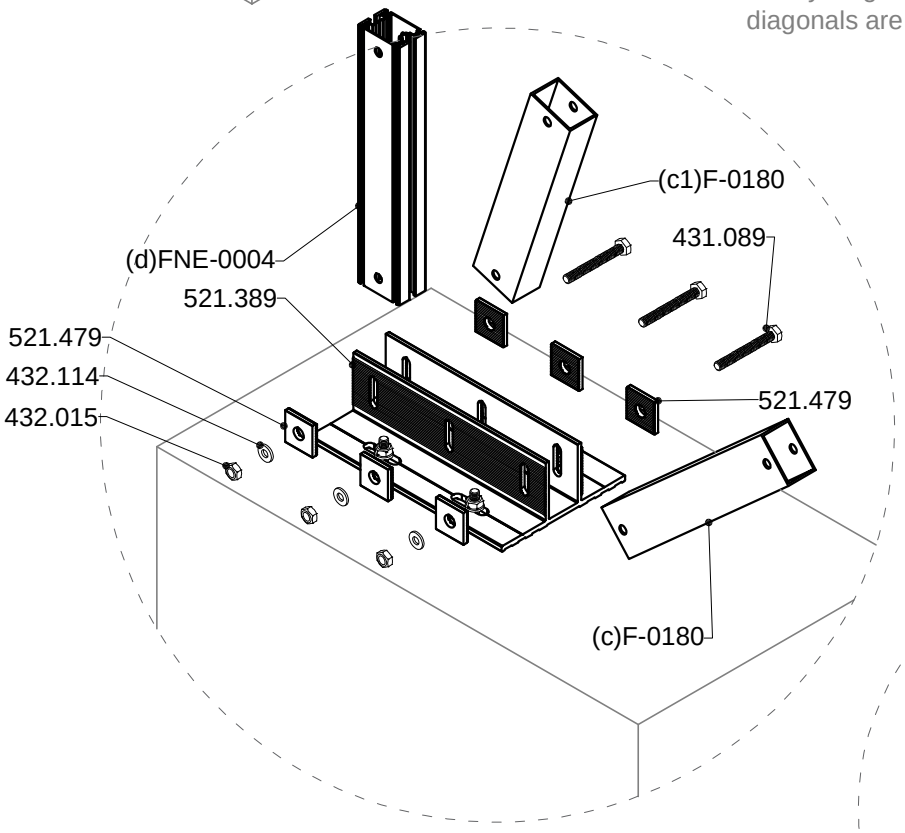
Aluminijska stopa 521.377 dizajnirana je tako da dozvoljava 40mm vertikalnog podešavanja dijagonala, te će se na ovom mjestu kompenzirati sve neravnine i konstrukcija dovesti u jedan nivo.

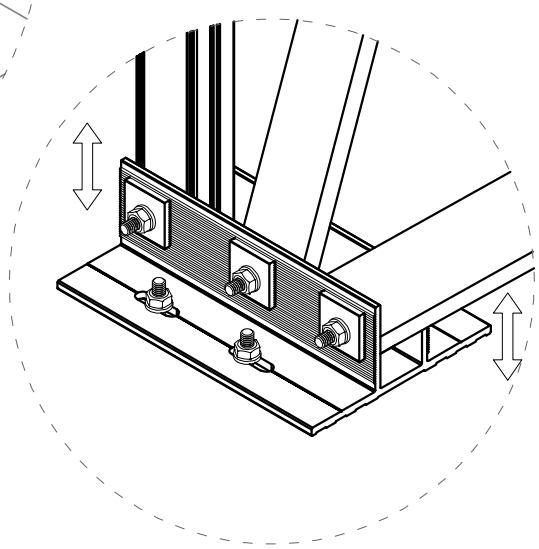
Aluminum anchor 521.377 is designed to allow 40mm vertical adjustment of the diagonal, and at this point all the unevenness will be compensated and the structure will be brought to one level.

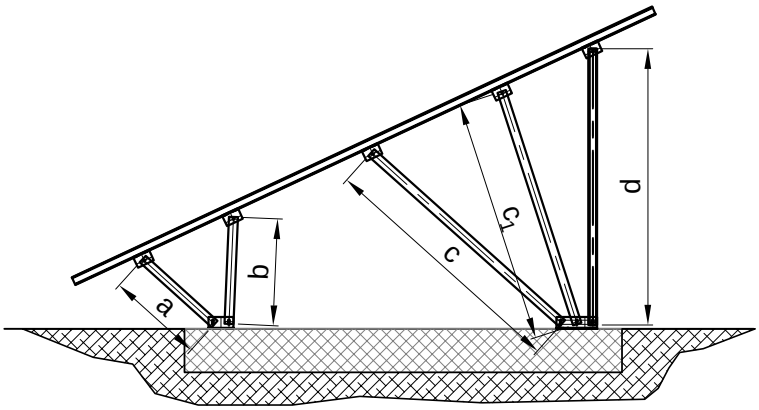


Treći korak montaže, spajaju se dijagonale sa stopama 521.389. Spajanje dijagonala sa stopama izvodi se vijčanom vezom i aluminijskim pločicama 521.479. Prilikom ovog koraka sve sastaviti, a vezu ostaviti opuštenu dok se dijagonale ne pozicioniraju u konačni položaj.

The third step, assembly diagonals with feet 521.389. The connection of the diagonal with the feet is performed with a screw connection and aluminum plates 521.479. During this step, assemble everything and leave the connection relaxed until the diagonals are positioned in the final position.



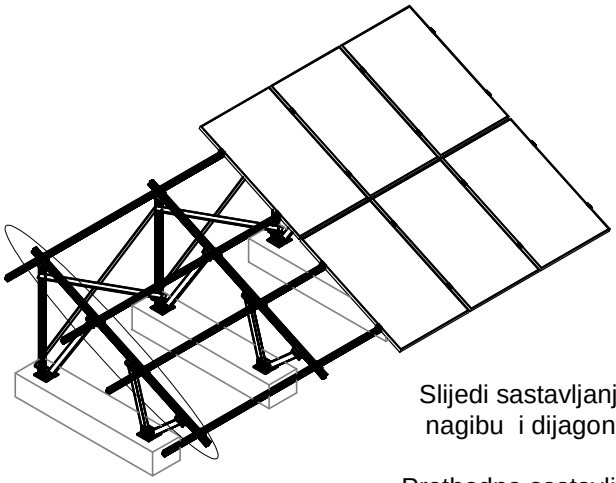


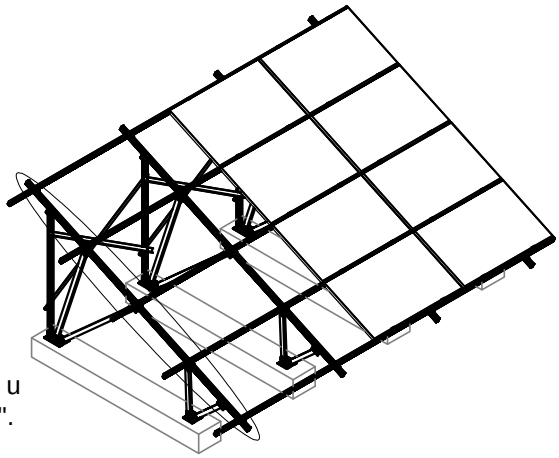


Na ovakav način namontirati svih 5 dijagonala.
Mount all 5 diagonals in this way.

Aluminijska stopa 521.389 dizajnirana je tako da dozvoljava 40mm vertikalnog podešavanja dijagonala, te će se na ovom mjestu kompenzirati sve neravnine i konstrukcija dovesti u jedan nivo.

Aluminum anchor 521.389 is designed to allow 40mm vertical adjustment of the diagonal, and at this point all the unevenness will be compensated and the structure will be brought to one level.





Slijedi sastavljanje grede "e" u nagibu i dijagonala "a,b,c,d".

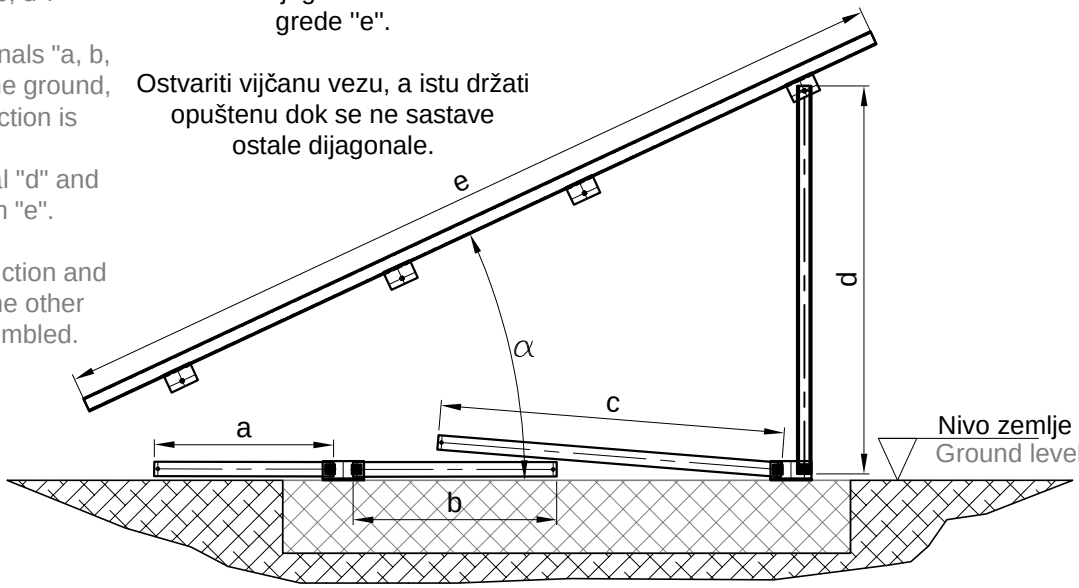
Prethodno sastavljene dijagonale "a,b,c" nalaze se slobodno položene na tlo, a prva veza ostvaruje se između dijagonale "d" i kose grede "e".

Ostvariti vijčanu vezu, a istu držati opuštenu dok se ne sastave ostale dijagonale.

Next is the assembly of the beam "e" in the slope and the diagonals "a, b, c, d".

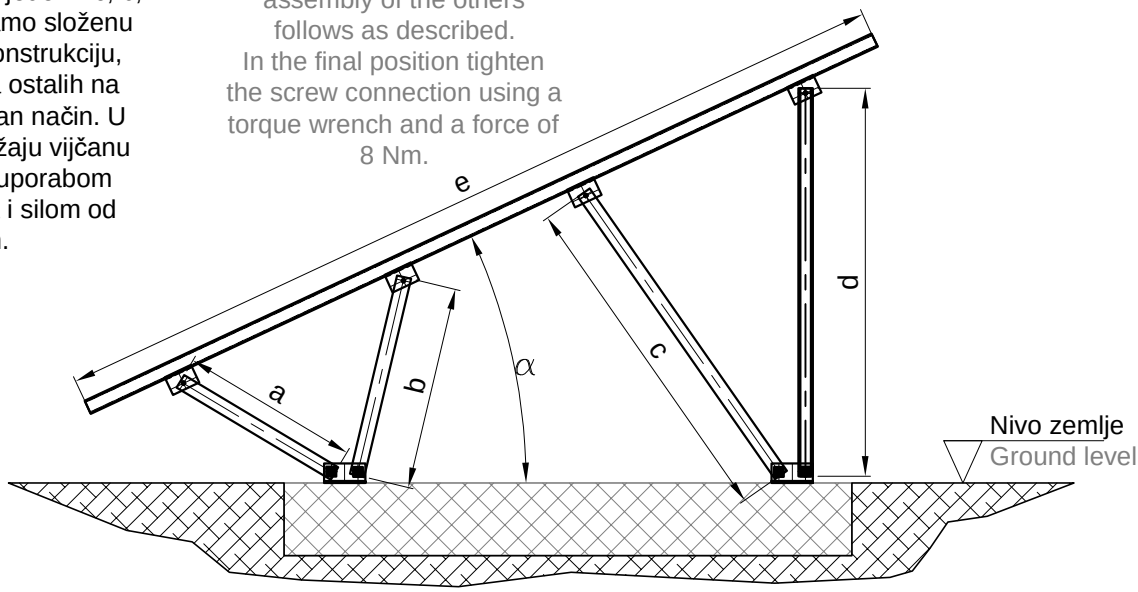
Pre-assembled diagonals "a, b, c" are freely laid on the ground, and the first connection is made between the diagonal "d" and the oblique beam "e".

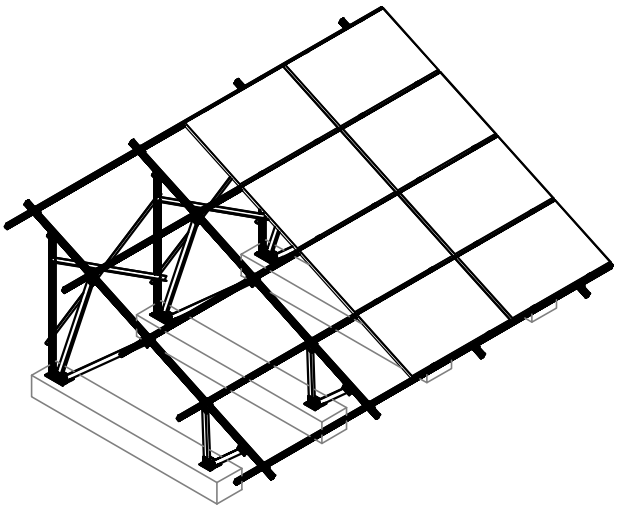
Make a screw connection and keep it loose until the other diagonals are assembled.



Nakon prve veze, ostvaruju se ostale veze slijedom "c, b, a". Sad kad imamo složenu jednu baznu konstrukciju, slijedi montaža ostalih na prethodno opisan način. U konačnom položaju vijčanu vezu učvrstiti uporabom moment ključa i silom od 8 Nm.

After the first connection, other connections are made in sequence c, b, a. Now that we have assembled one base structure, the assembly of the others follows as described. In the final position tighten the screw connection using a torque wrench and a force of 8 Nm.





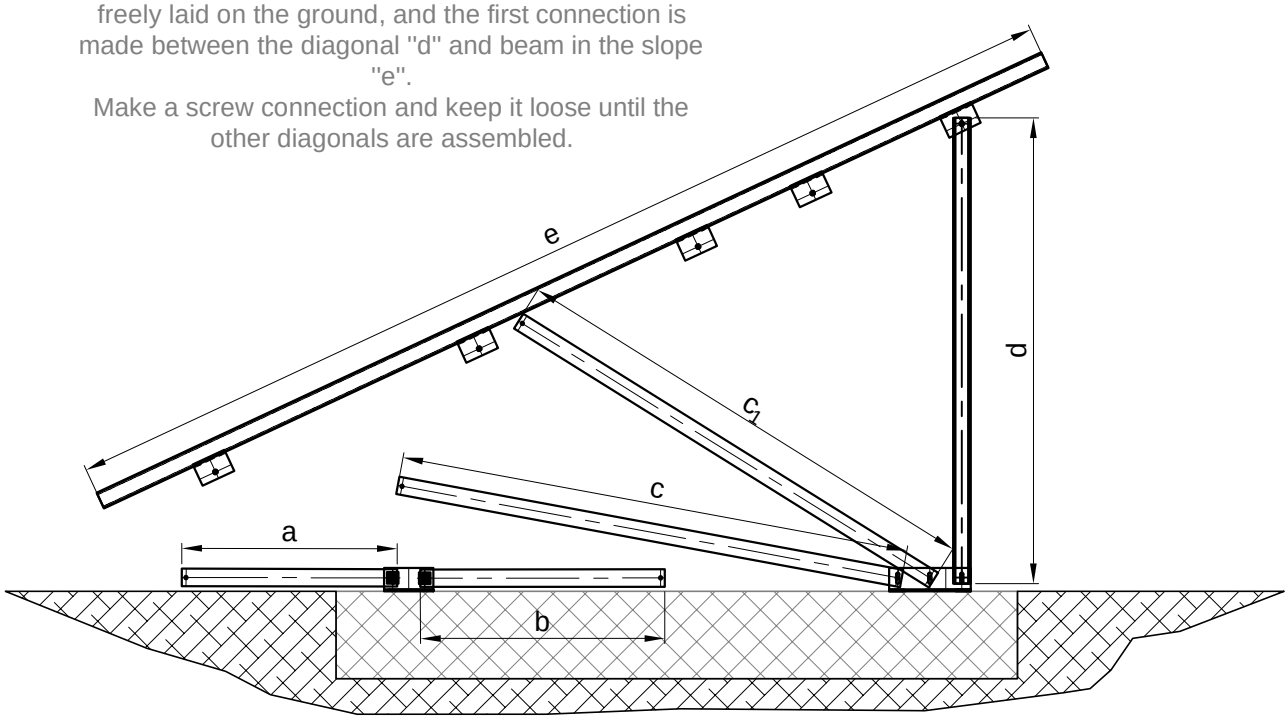
Slijedi sastavljanje grede "e" u nagibu i dijagonala "a,b,c, c_1,d".

Prethodno sastavljene dijagonale "a,b,c,c_1" nalaze se slobodno položene na tlo, a prva veza ostvaruje se između dijagonale "d" i kose grede "e".

Ostvariti vijčanu vezu, a istu držati opuštenu dok se ne sastave ostale dijagonale.

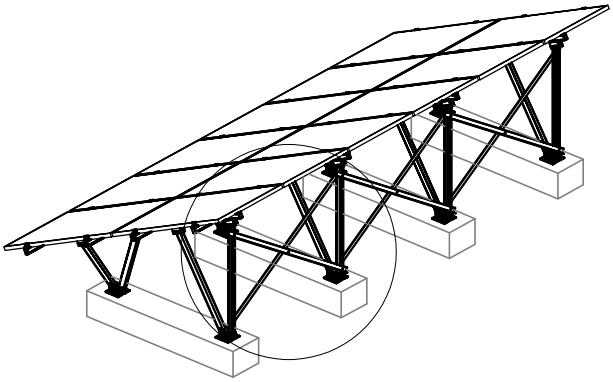
The following is the assembly of the beam in the slope "e" and the diagonals "a, b, c, c_1, d".

The previously assembled diagonals "a, b, c, c_1" are freely laid on the ground, and the first connection is made between the diagonal "d" and beam in the slope "e".
Make a screw connection and keep it loose until the other diagonals are assembled.



Nakon prve veze, ostvaruju se ostale veze slijedom "c_1, c, b, a". Sad kad imamo složenu jednu baznu konstrukciju, slijedi montaža ostalih na prethodno opisan način. U konačnom položaju vijčanu vezu učvrstiti uporabom moment ključa i silom od 20 Nm.

After the first connection, other connections are made in sequence c_1, c, b, a.
Now that we have assembled one base structure, the assembly of the others follows as described.
In the final position tighten the screw connection using a torque wrench and a force of 20 Nm.

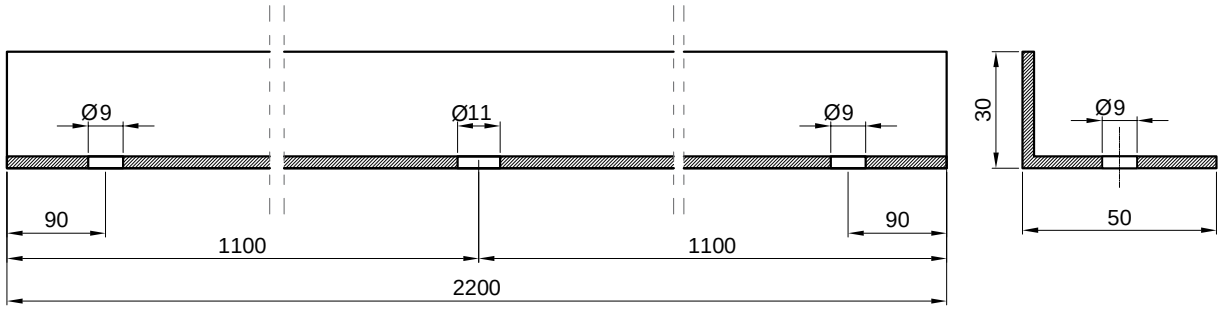


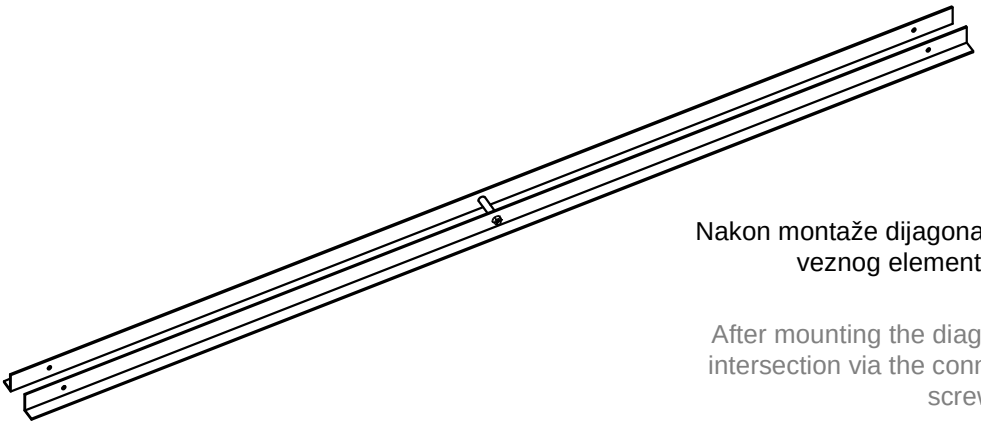
Nakon što su sastavljene sve 4 osnovne konstrukcije na razmaku "f" definiranim u 1. koraku, prije montaže horizontalnih greda potrebno je osnovnu konstrukciju povezati dijagonalama F-1045.

After all 4 basic structures have been assembled at the distance "f" defined in step 1, before assembling the horizontal beams, it is necessary to connect the basic structure with diagonals F-1045.

Za sve konstrukcije sistema FNE 2000 dijagonale su jednake dužine i obrade, kako je naznačeno na skici ispod.

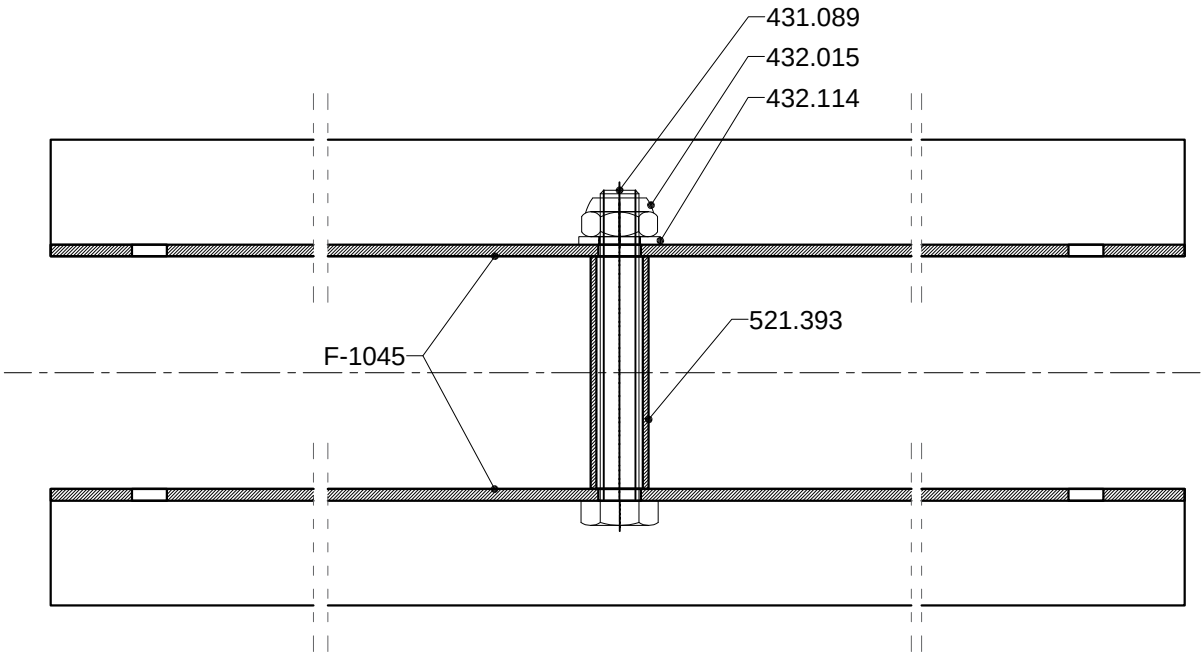
For all constructions of the FNE 2000 system, the diagonals are of equal length and machining, as indicated in the sketch below.

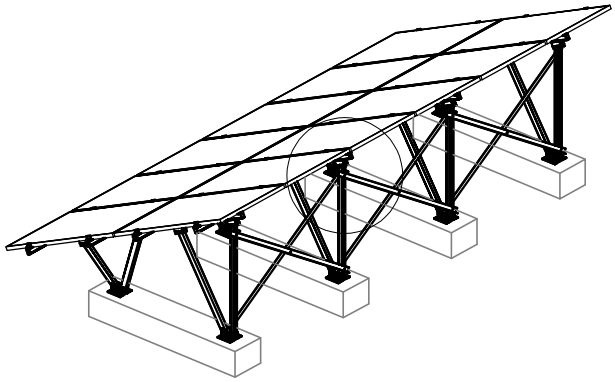




Nakon montaže dijagonala iste se povežu u sjecištu preko veznog elementa 521.393 i vijčane veze.

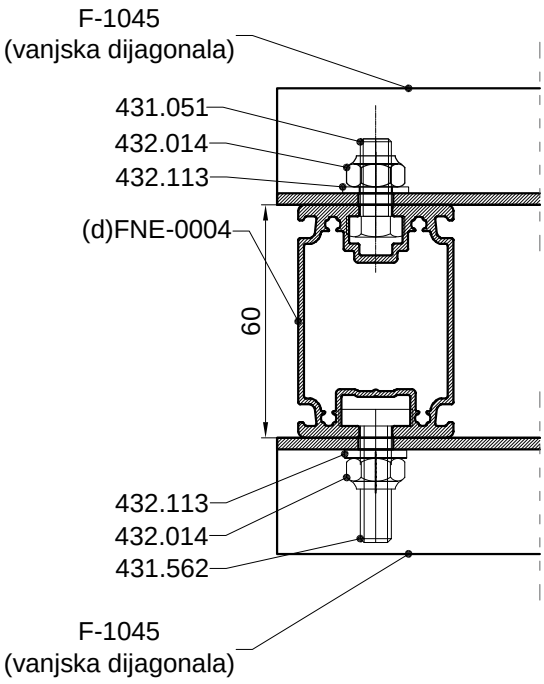
After mounting the diagonals, they are connected at the intersection via the connecting element 521.393 and the screw connection.

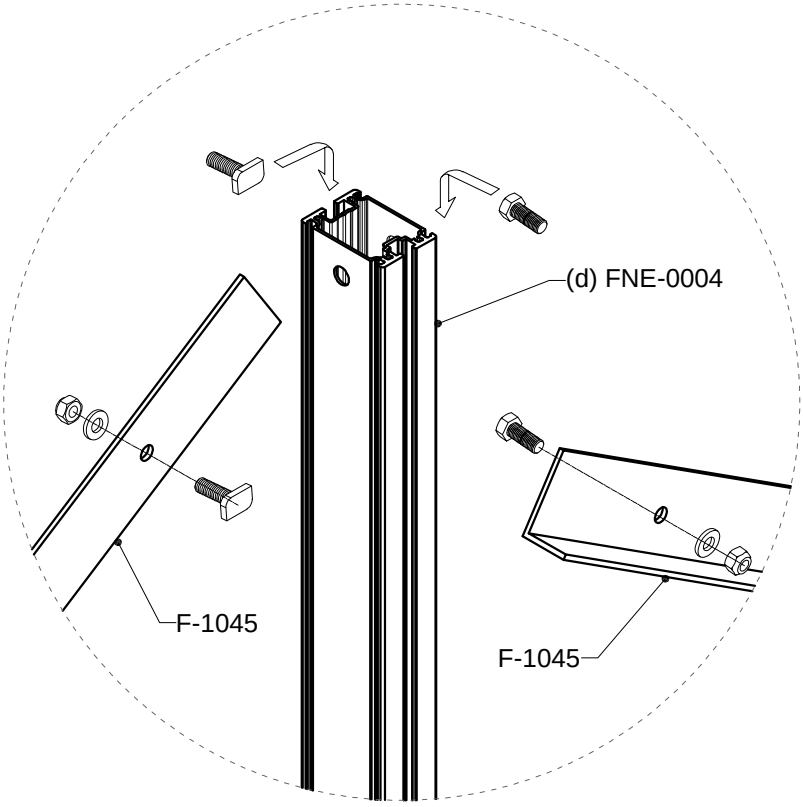


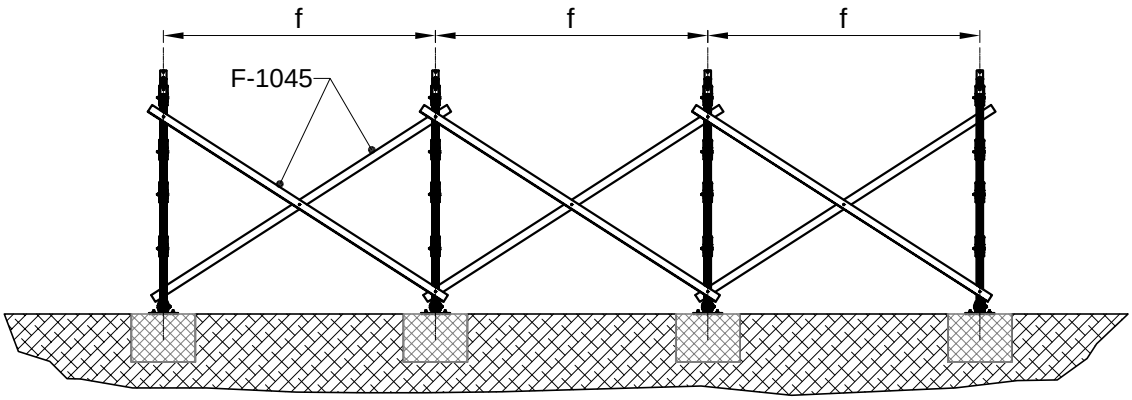


Razlikujemo unutarnju i vanjsku vijčanu vezu dijagonala, a ona je uvjetovana dizajnom profila vertikalne dijagonale (d).

We distinguish between internal and external screw connection of the diagonal, and it is conditioned by the design of the profile of the vertical diagonal (d).



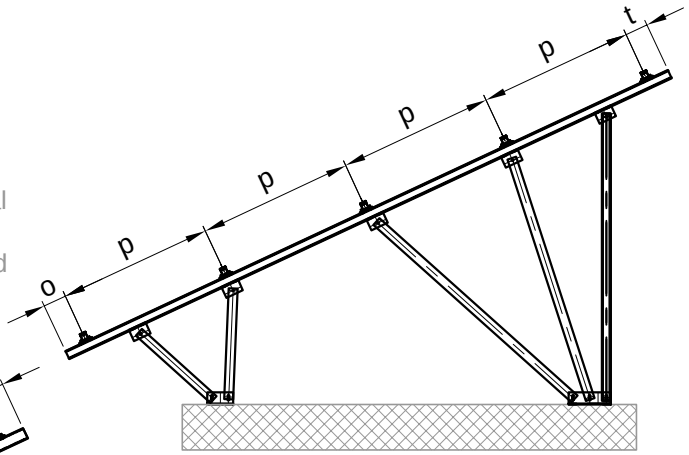


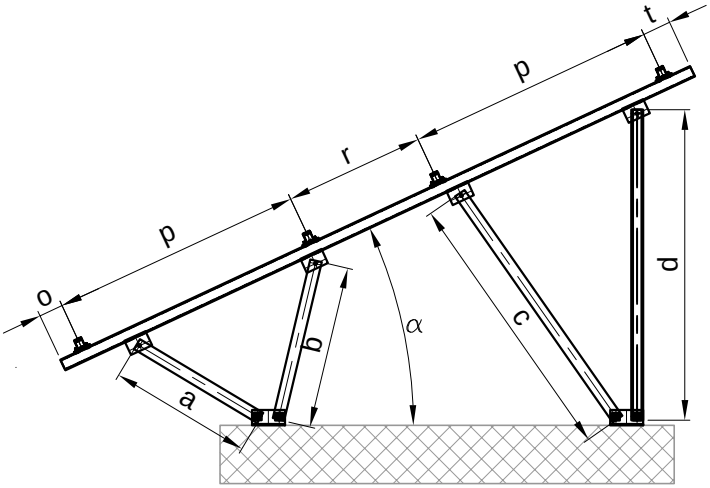


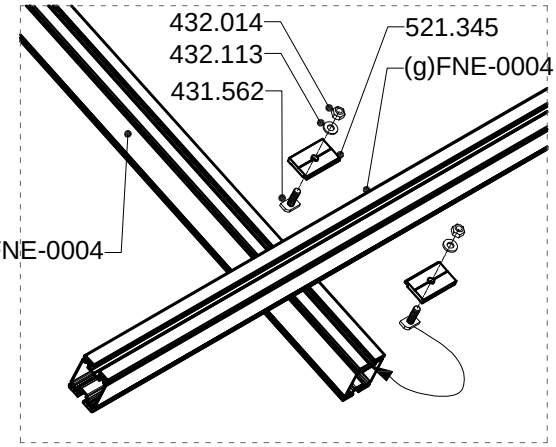
Nakon konačnog pozicioniranja sve vijčane veze učvrstiti uporabom moment ključa i silom od .
After final positioning, tighten all screw connections using a torque wrench and a force of 8 Nm.

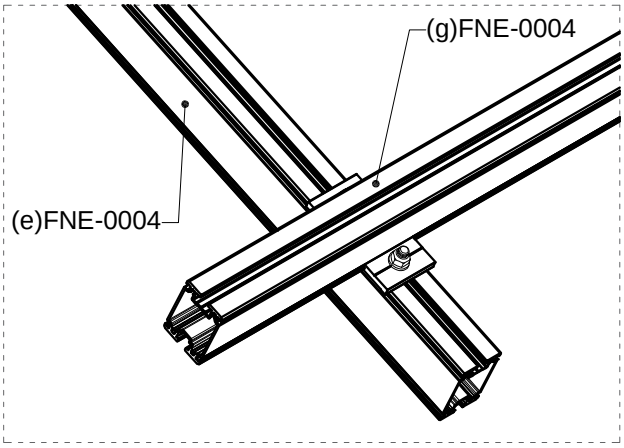
Nakon montaže dijagonala, pristupa se montaži horizontalnih greda (g). Broj i pozicija horizontalnih greda definirana je tipom konstrukcije i parametrima o, p, t i r parametrom kod vertikalne montaze.

After mounting the diagonal, the mounting of the horizontal beams (g) is approached. The number and position of horizontal beams is defined by the type of construction and parameters o, p, t and parameter r or vertical mounting.



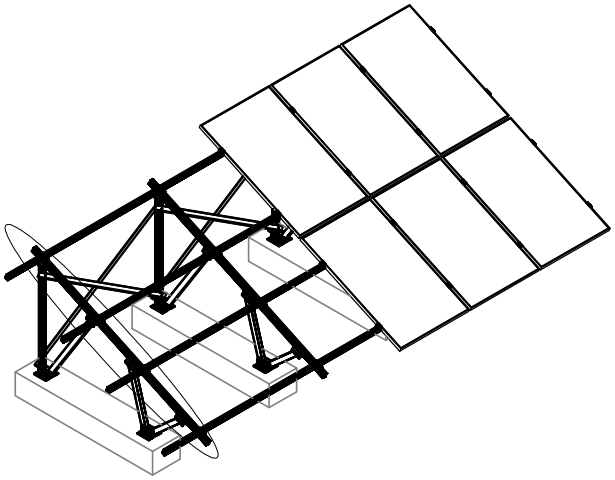






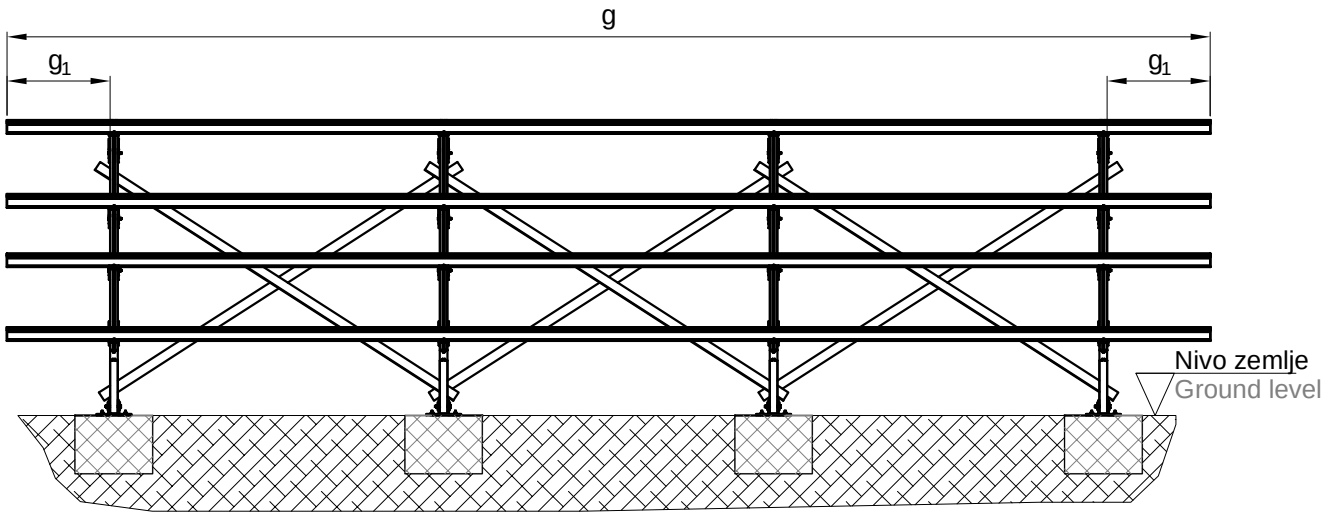
Za lakšu montažu horizontalnih greda (g)FNE-0004, prethodno se sastavi vijčana veza i pločica 521.345, a ista ostavi opuštena.
Takav spoj se navuče na profil grede u nagibu (e), a nakon pozicioniranja učvrsti .
Točan raspored horizontalnih greda (g) dat je u presjecima za svaku varijantu.
Uvijek se montira od najniže grede prema vrhu sekcije.
Vijčanu vezu učvrstiti uporabom moment ključa i silom od 10-13 Nm.

For easier installation of horizontal beams FNE-0004, pre-assembled screw connection and plate 521.345, and the same left relaxed.
Such a joint is pulled on the profile of the beam in the slope (e), and after positioning it is fastened.
The exact arrangement of the horizontal beams(g) is given in the cross sections for each variant.
It is always mounted from the lowest beam to the top of the section.
Tighten the screw connection using a torque wrench and a force of 10-13 Nm.



Prilikom montaže horizontalnih greda (g) potrebno je voditi računa i o horizontalnom pozicioniranju u odnosu na baznu konstrukciju.

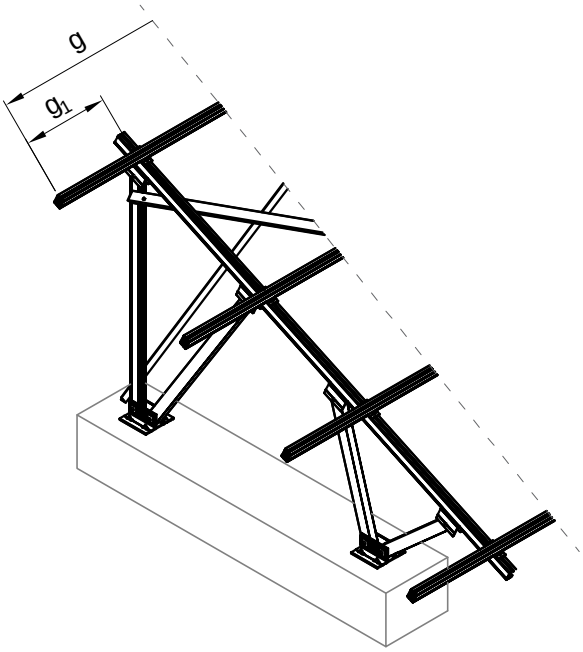
When mounting horizontal beams (g), it is necessary to take into account the horizontal positioning in relation to the base structure.



Prilikom horizontalnog pozicioniranja horizontalnih greda (g), voditi računa da vrijednost g_1 bude jednaka na obje strane sekcije.

Vrijednost prepusta (g_1) ne smije biti nikad manja od 50mm.

$$g_1 = \frac{g-(3 \cdot f+40)}{2}$$



When horizontally positioning horizontal beams (g), take care that the value of g_1 is equal on both sides of the section.

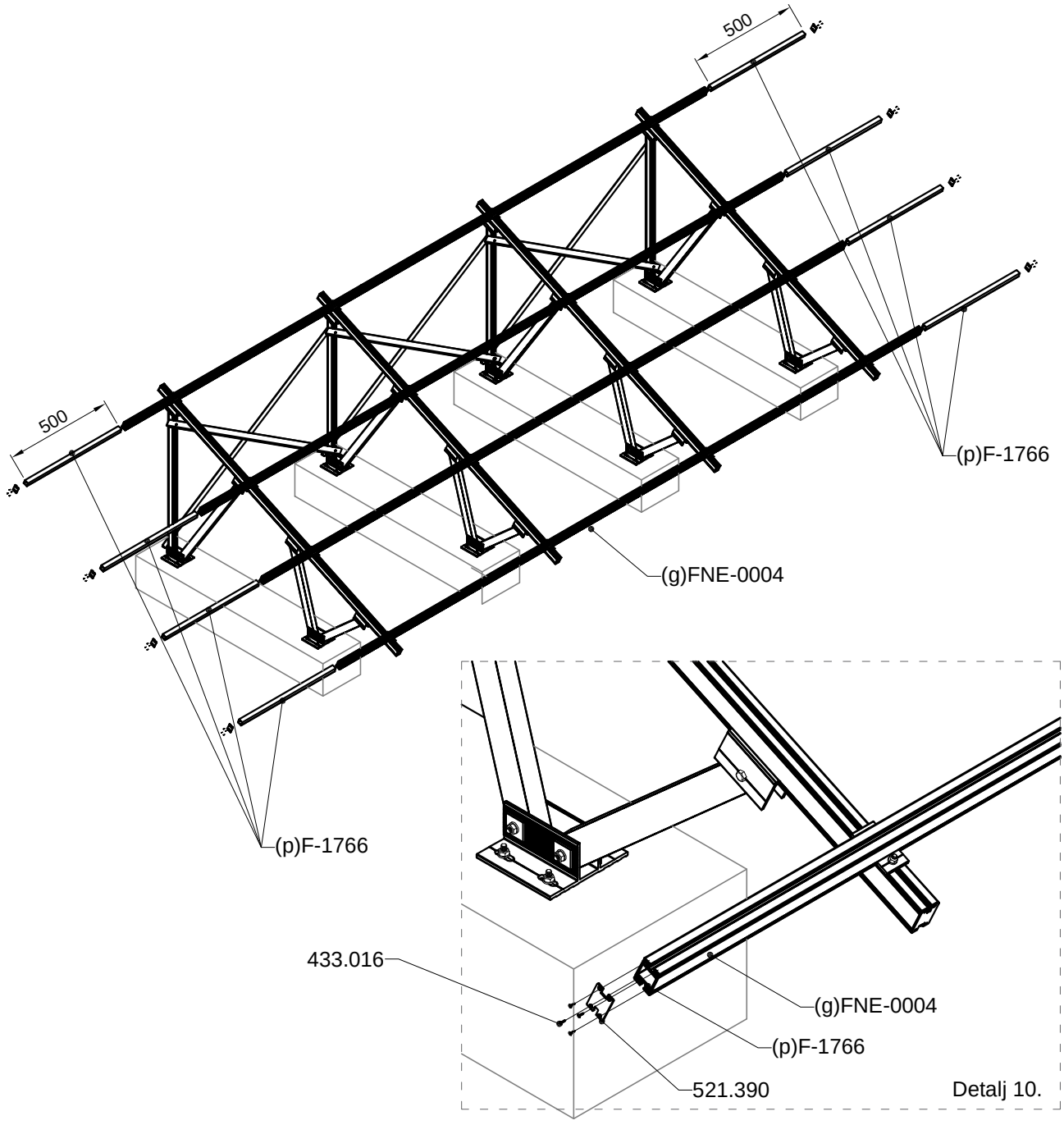
The overflow value (g_1) must never be less than 50mm.

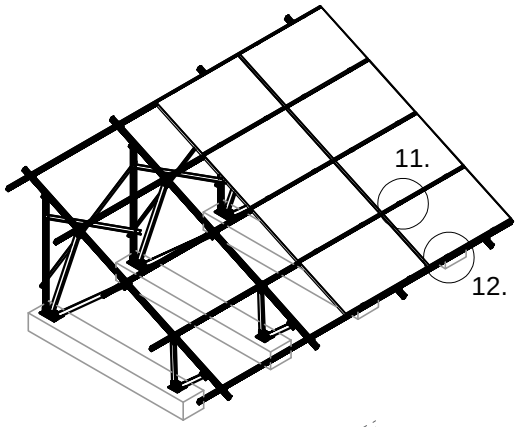
$$g_1 = \frac{g-(3 \cdot f+40)}{2}$$

Konzolni prepusti horizontalne grede (g) na rubu konstrukcije su od 550mm -700mm. Ovakva konzola zahtjeva ojačanje sustava kako bi se umanjili progibi greda (g) pri maksimalnim opterećenjima te eliminirao i namjanji mogući utjecaj na solarne panele. Ojačanje greda izvodi se na način da se u grede ugradi profil ojačanja za navedeni profil i jednostavno osigura sa čepom na kraju cijevi od ispadanja.
Pri ugradnji ojačanja konzola, ojačanja uvući u cijev minimalno 100mm, tako da ojačanje bude pozicionirano na osloncu iznad grede (e).

Cantilever overhangs of the horizontal beam (g) at the edge of the structure are from 550mm -700mm. Such a bracket requires reinforcement of the system in order to reduce the deflections of the beams (g) at maximum loads and to eliminate and reduce the possible impact on the solar panels.
The reinforcement of the beams is performed by installing a reinforcement profile for the specified profile in the beams and simply securing them with a plug at the end of the pipe from falling out. When installing the bracket reinforcement, pull the reinforcement into the pipe at least 100 mm so that the reinforcement is positioned on the support above the beam (s).

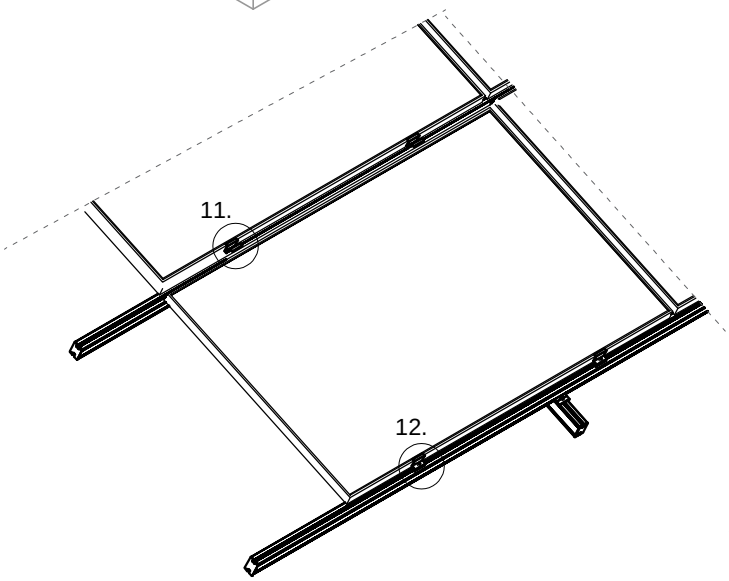
FNE-0001 - Ojačanje FNE-0002
FNE-0004 - Ojačanje (p)F-1766
FNE-0005 - Ojačanje F-1777
FNE-0006 - Ojačanje (p) F-1767





Nakon završene montaže konstrukcije, slijedi montaža solarnih panela. Montaža se izvodi od jednog ruba prema drugom te od vrha prema dnu.
Zbog lakše montaže preporučuje se da se kopče i matice sa oprugom prethodno povežu te kao opuštene montiraju prije panela.

After the assembly of the structure is completed, the installation of solar panels follows. Mounting is performed from one edge to the other and from top to bottom. For easier installation, it is recommended that the spring-loaded buckles and nuts be pre-connected and mounted as loose before the panel.



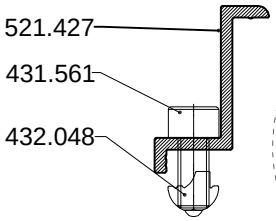
12. Jednostrana kopča za panele

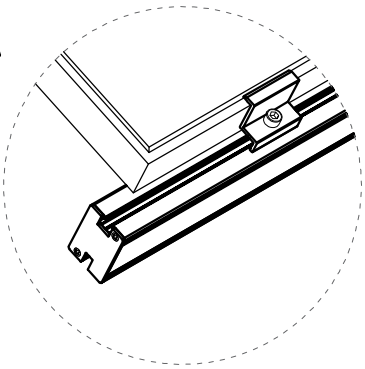
Pričvršćivanje krajnjih panela izvodi se kopčom 521.427
i veznim elementima 431.561 i 432.048.

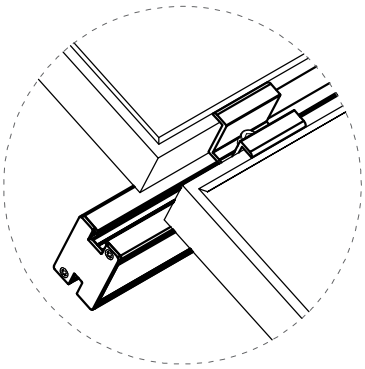
Rubne kopče učvrstiti uporabom moment ključa i silom od 8-10 Nm.

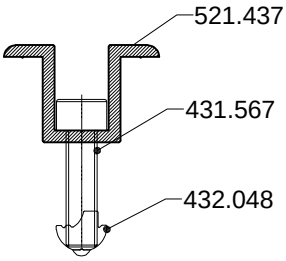
Fastening of the end panels is performed with a 521.427 clip and connecting elements 431.561 and 432.048.

Secure the edge clips using a torque wrench and a force of 8-10 Nm.









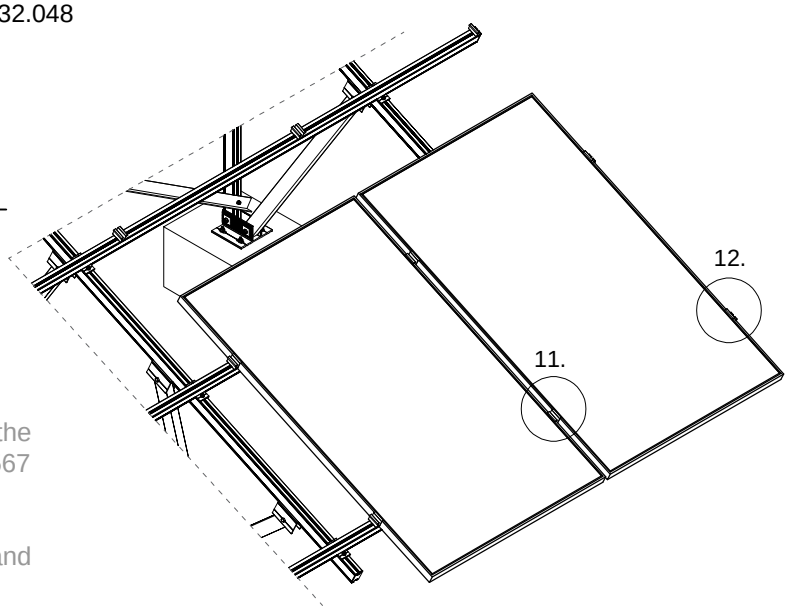
11. Srednja kopča

Pričvršćivanje srednjih panela izvodi kopčom 521.437 i veznim elementima 431.567 i 432.048.

Srednje kopče učvrstiti uporabom moment ključa i silom od 8-10 Nm.

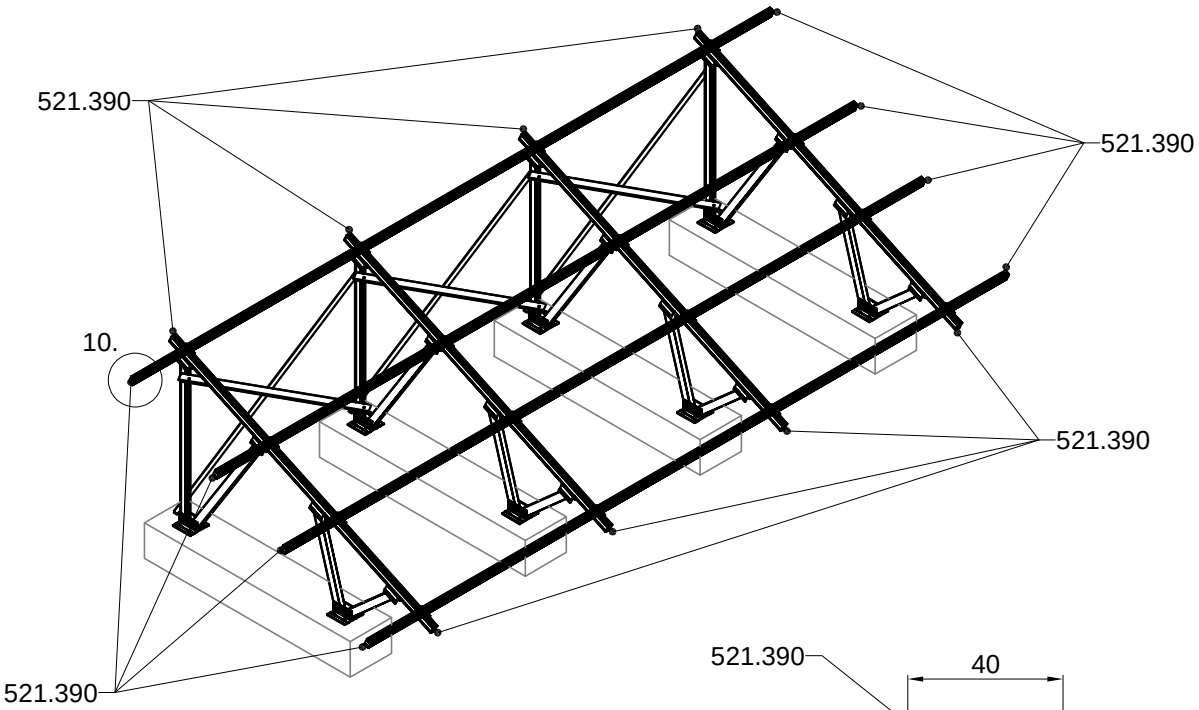
Fastening of the middle panels is performed with the 521.437 buckle and connecting elements 431.567 and 432.048.

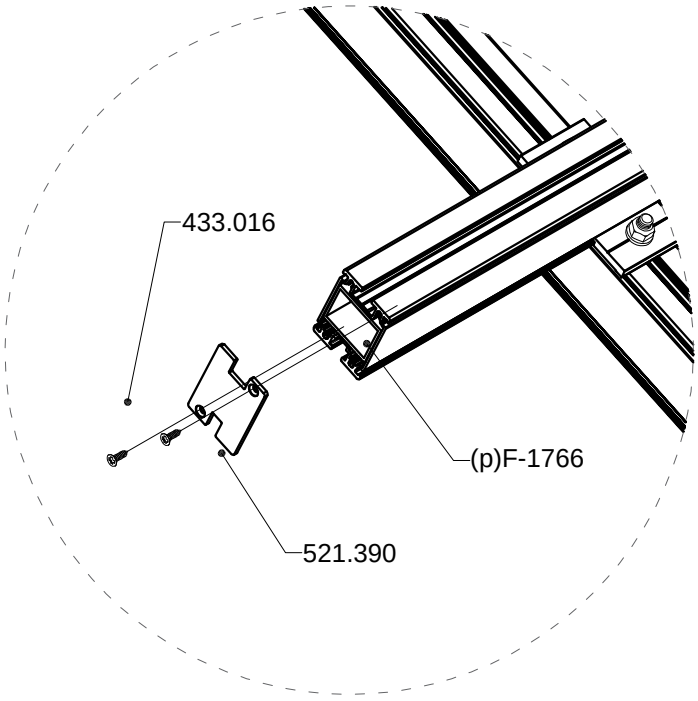
Tighten the middle clips using a torque wrench and a force of 8-10 Nm.



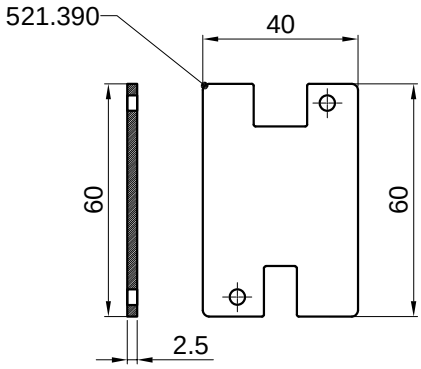
Na sve horizontalne grede (g) i grede u nagibu (e) potrebno je montirati čepove na krajeve. Čepovi služe kako bi se spriječio ulazak vode i stvaranje osinjaka koji mogu prouzrokovati otežan pristup konstrukciji.

On all horizontal beams and sloping beams it is necessary to mount plugs at the ends. The plugs serve to prevent water from entering and the formation of wasp's nest which can cause difficult access to the structure.



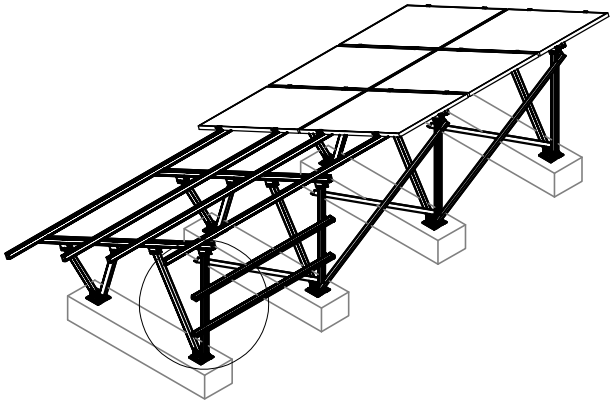


Detalj 10.



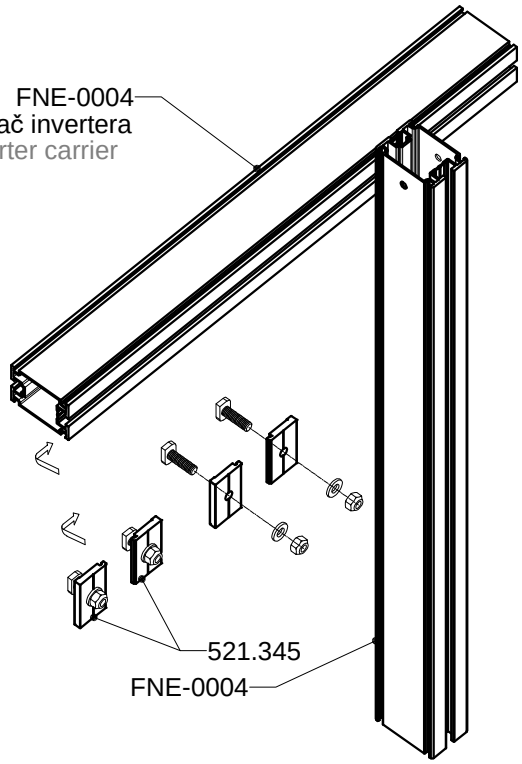
Profil FNE 0001 koristi čep 521.392
Profil FNE 0004 koristi čep 521.390
Profil FNE 0005 koristi čep 521.391
Profil FNE 0006 koristi čep 521.418

Profile FNE 0001 uses plug 521.392
Profile FNE 0004 uses plug 521.390
Profile FNE 0005 uses plug 521.391
Profile FNE 0006 uses plug 521.418



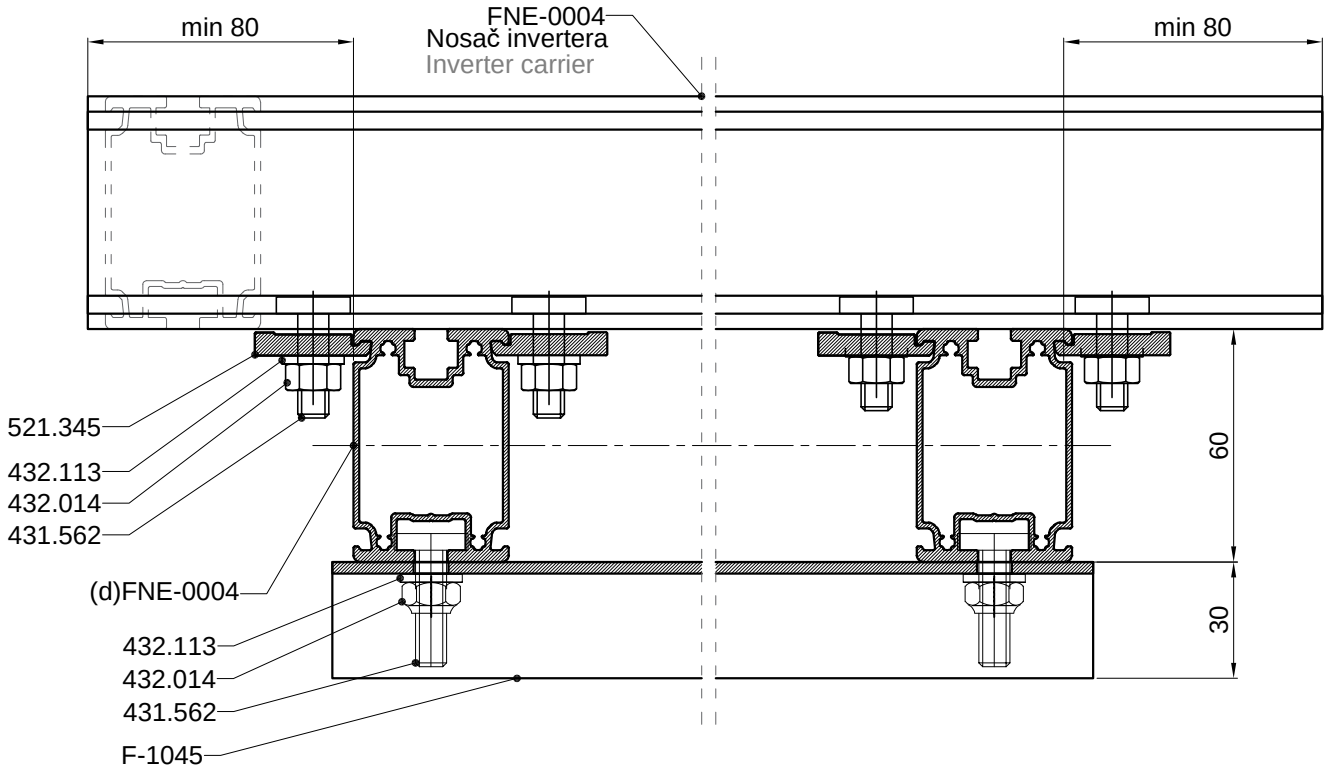
Za potrebe montaže invertera i druge elektro opreme na konstrukciju je moguće ugraditi, umjesto vanjske dijagonale, nosače za invertere.

For the purpose of mounting inverters and other electrical equipment on the structure it is possible to install inverter brackets instead of the outer diagonal.



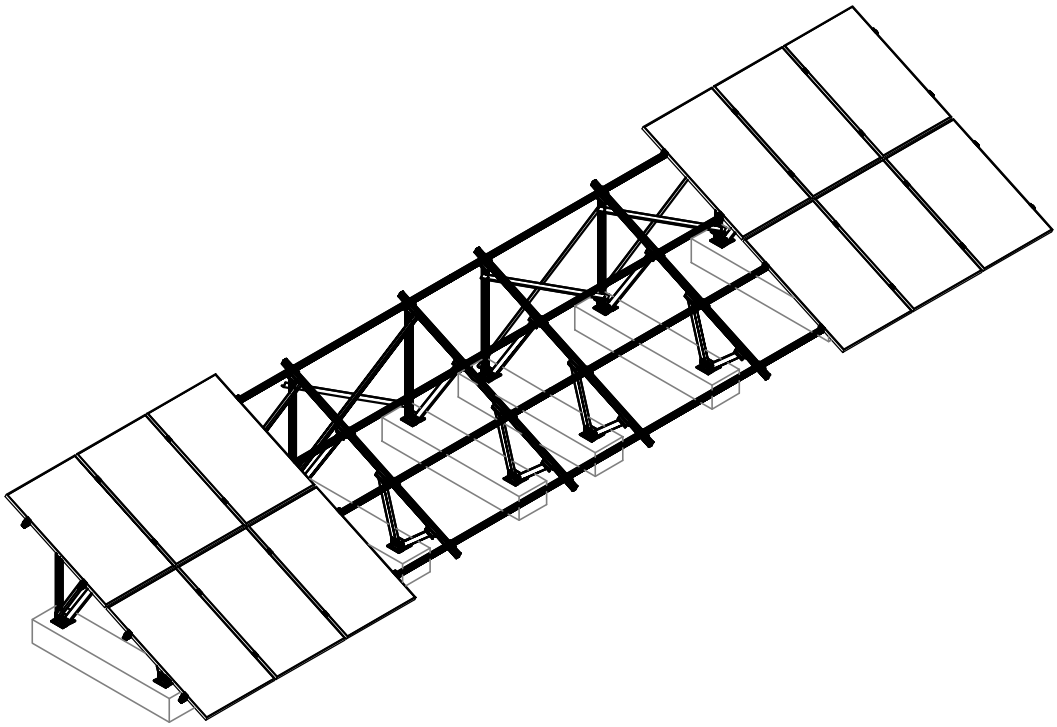
Nosač invertera ima mogućnost podešavanja po visini kao i međusobni razmak nosača.
Svaki nosač ima utor za vijak tako da nije potrebno dodatno obrađivanje nosača kako bi se na njih instalirali inverteri i druga elektro oprema.
Za lakšu montažu kopče i vijke prethodno montirate.

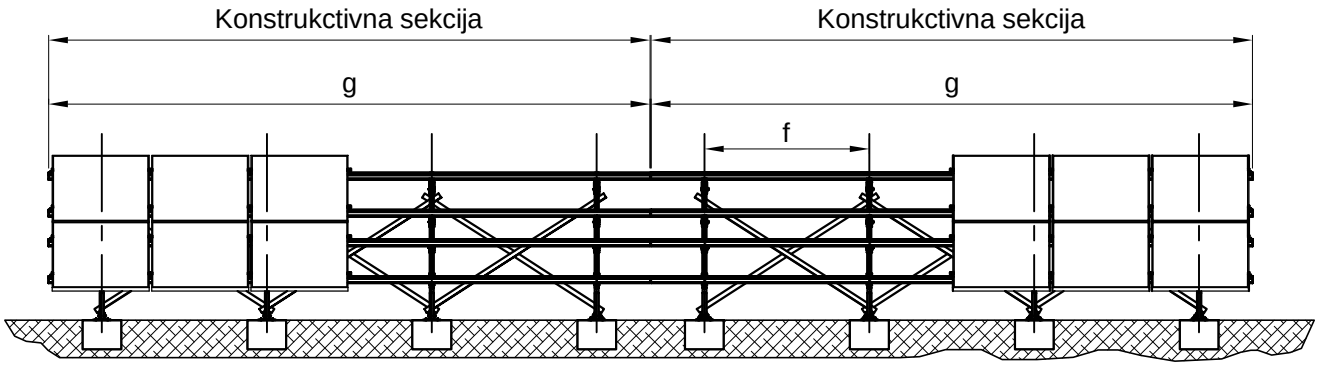
The inverter bracket has the possibility of height adjustment as well as the distance between the brackets.
Each bracket has a screw slot so that no additional machining of the bracket is required to install inverters and other electrical equipment on them.
For easier installation, pre-assemble the clasps and screws.



Za elektrane sa više sekcija u jednom nizu, potrebno je izvršiti međuspobno povezivanje sekcija.
Međusobna veza ostvaruje se preko horizontalnih greda (g).
Maksimalna dužina koja se ostvaruje povezivanjem je 40m.

For power plants with several sections in one row, it is necessary to interconnect the sections.
The mutual connection is realized through horizontal beams (g).
The maximum length that is achieved by connecting is 40m.



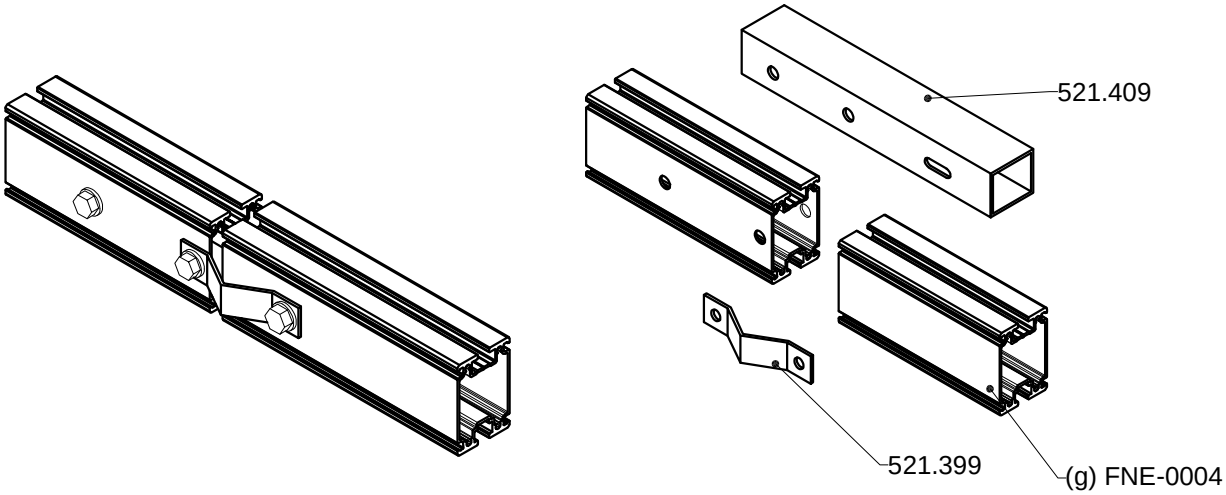


Kod elektrana u nizu konstruktivna sekcija se ponavlja, a međusobna veza se ostvaruje spojnim elementima.

In a series of power plants, the constructive section is repeated, and the interconnection is realized by connecting elements.

Ukoliko se fotonaponska elektrana sastoji od više sekcija, njihovo međusobno povezivanje je nužno i ostvaruje se preko horizontalnih greda (g).
Veza horizontalnih greda (g) ostvaruje se veznim elementom unutar cijevi i vijcima.
Spojni element dozvoljava rad konstrukcije pri temperaturnim razlikama.

If the photovoltaic power plant consists of several sections, their interconnection is necessary and is realized through horizontal beams (g). The connection of horizontal beams (g) is realized by a connecting element inside the pipe and screws. The connecting element allows the construction the absorption of thermal expansions due to temperature changes.

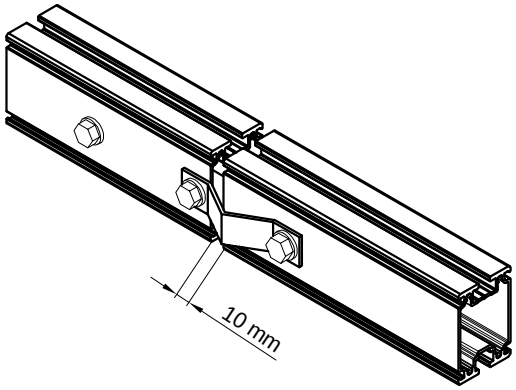


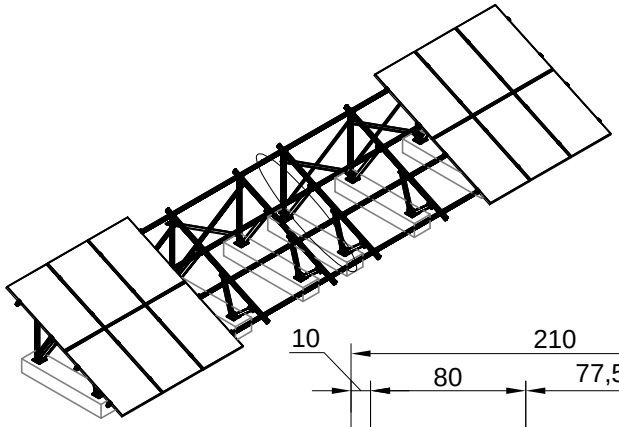
Kod konstrukcija čija je ukupna dužina manja od 40m spojeve izvesti sa 2 vijka M8x60 (431.060). Predvidjeti minimalno 10mm razmaka između dvije sekcije.

Po preporuci projektanta elektroinstalacija, moguće je izvesti povezivanje dilatacije veznim elementom 521.409, a čija je uloga da se ostavi jedna cjelina svih sekcija koja i na taj način se ostvari bolje uzemljenje konstrukcije.

For constructions with a total length of less than 40 m, make connections with 2 M8x60 screws (431.060). Provide a minimum of 10mm distance between the two sections.

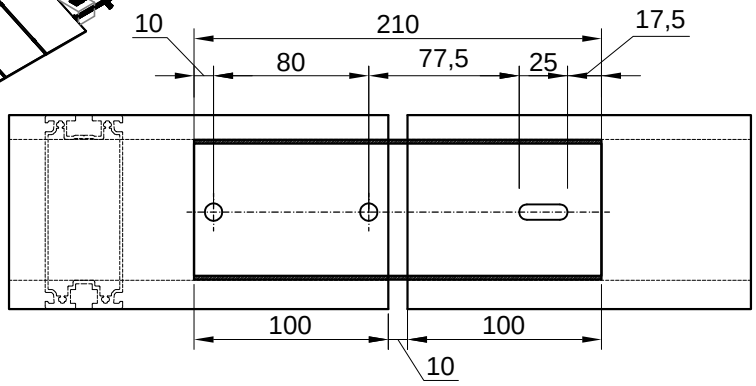
According to the recommendation of the designer of electrical installations, it is possible to report the connection of the expansion joint with the connecting element 521.409, whose role is to leave one unit of all sections, which in this way achieves better grounding of the structure.

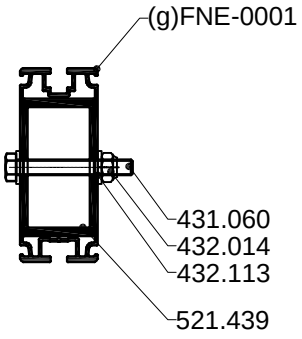


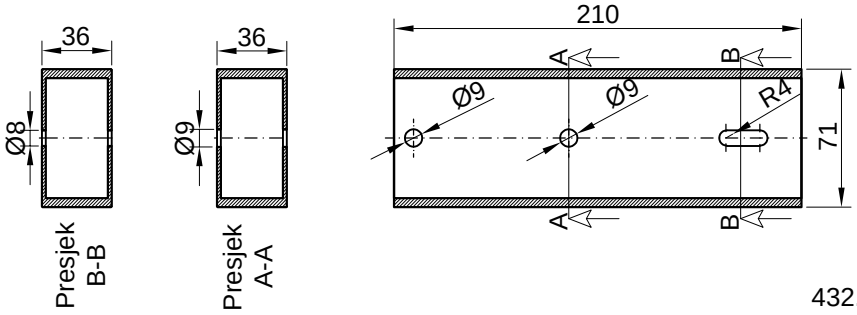


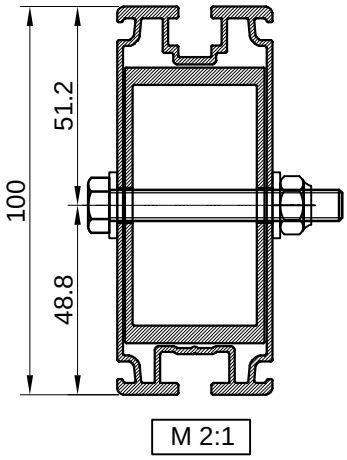
Detalj veze sekundarnih greda (g) FNE-0001
Veza horizontalnih greda (g) ostvaruje se veznim elementom unutar cijevi i vijcima. Spojni element dozvoljava rad konstrukcije pri temperaturnim razlikama.

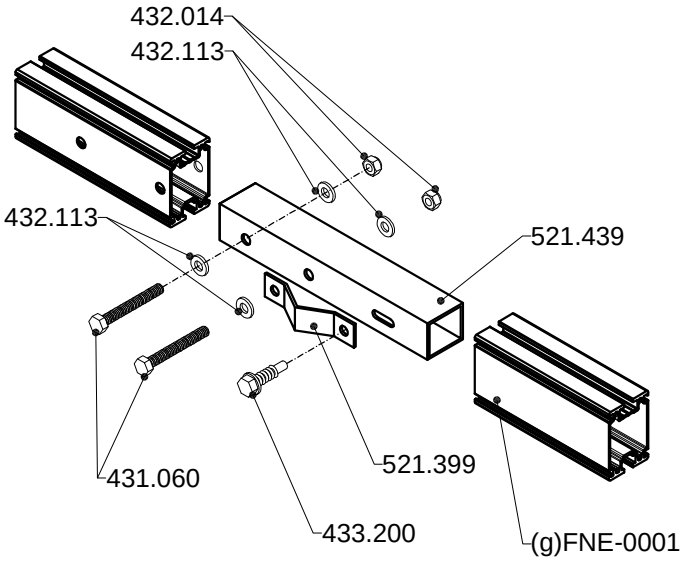
Detail of the secondary carrier connection (g) FNE-0001
The connection of horizontal beams (g) is realized by a connecting element inside the pipe and screws. The connecting element allows the construction the absorption of thermal expansions due to temperature changes.





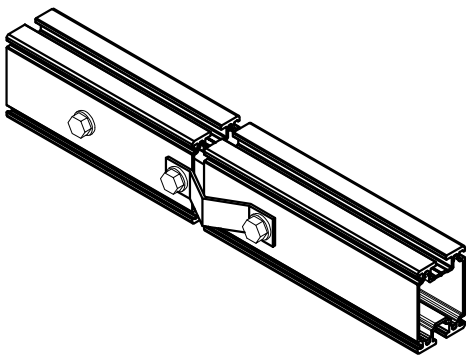


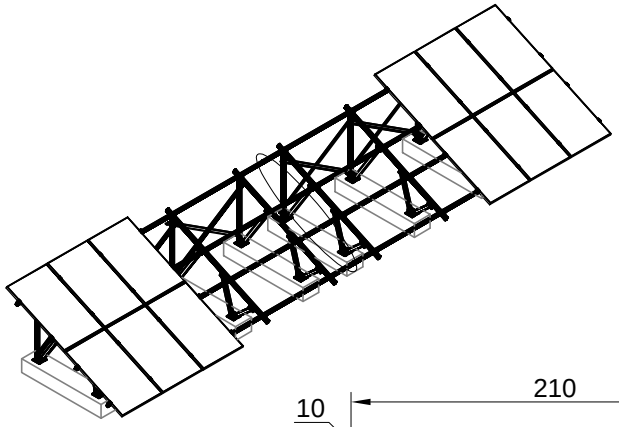




Produživanje horizontalne grede (g) FNE-0001 radi se preko veznog elementa 521.439,
a sve prema naznačenom detalju.
Prilikom ostvarivanja veze potrebno je ostaviti minimalno 10mm dilataciju između horizontalnih greda (g) FNE-0001.

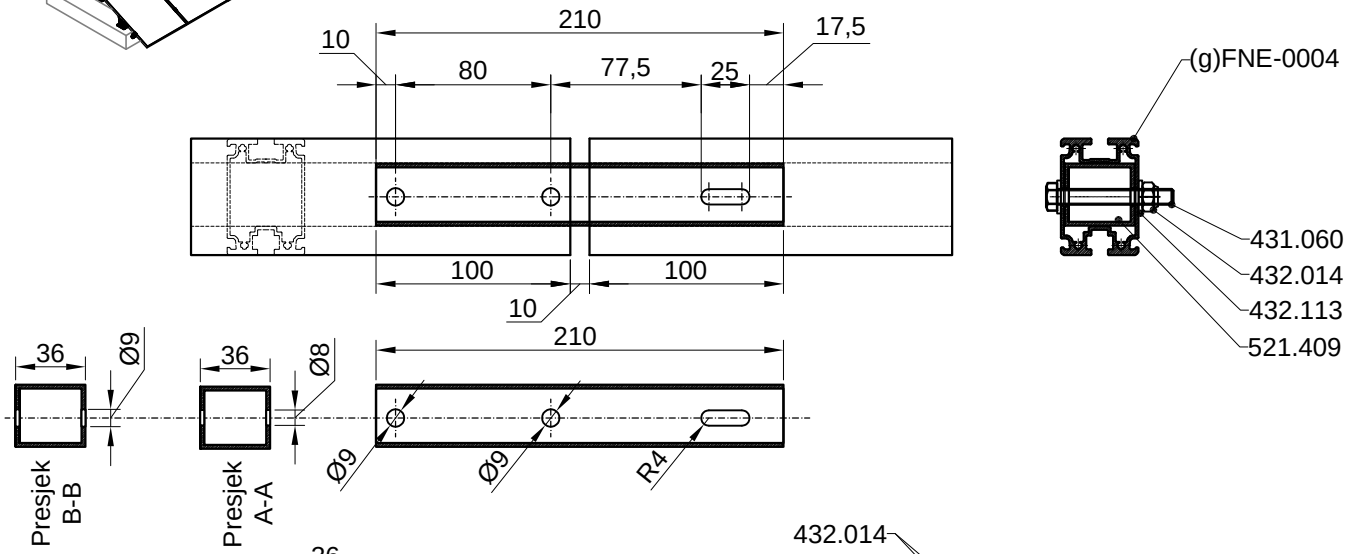
Extension of the horizontal beam (g) FNE-0001 is done through the connecting element 521.439,
and all according to the indicated detail.
When making the connection, it is necessary to leave a minimum of 10 mm dilatation between the horizontal beams (g) FNE-0001.

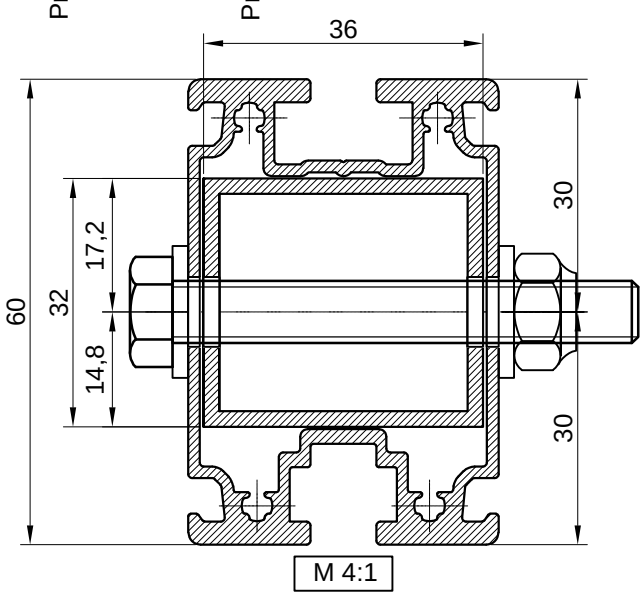


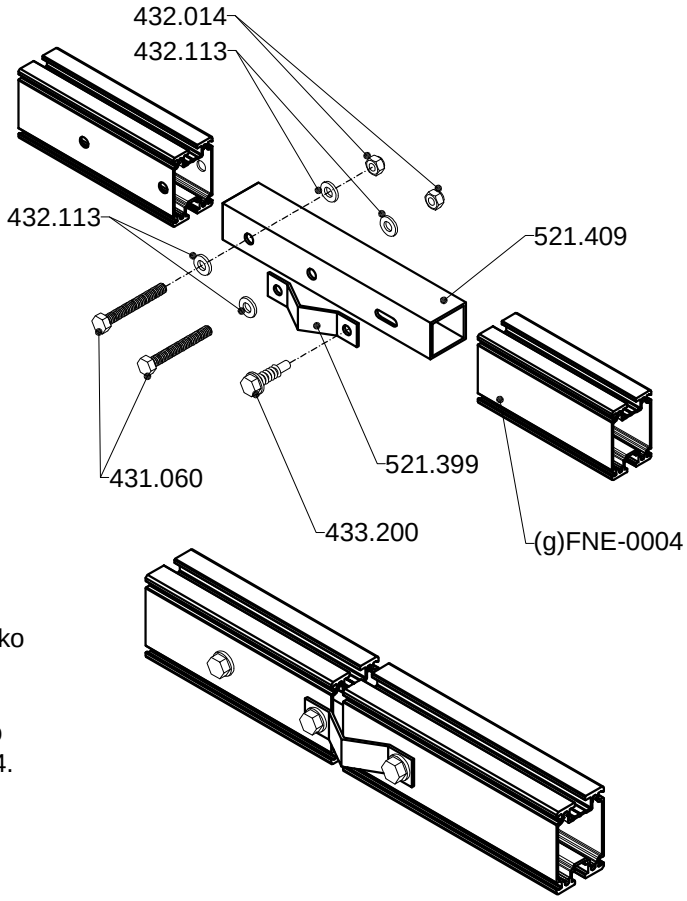


Detalj veze sekundarnih greda (g) FNE-0004
Veza horizontalnih greda (g) ostvaruje se veznim elementom unutar cijevi i vijcima. Spojni element dozvoljava rad konstrukcije pri temperaturnim razlikama.

Detail of the secondary carrier connection (g) FNE-0004
The connection of horizontal beams (g) is realized by a connecting element inside the pipe and screws. The connecting element allows the construction the absorption of thermal expansions due to temperature changes.

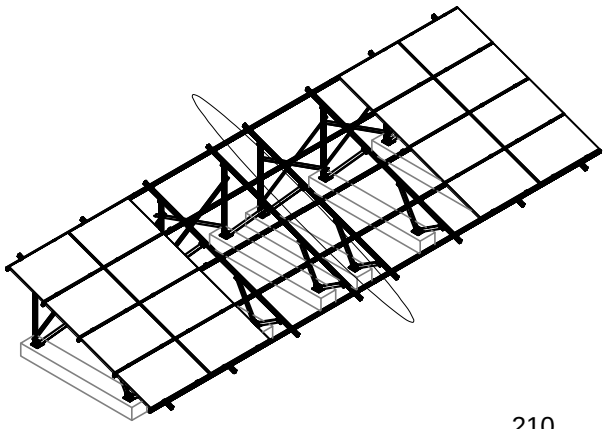






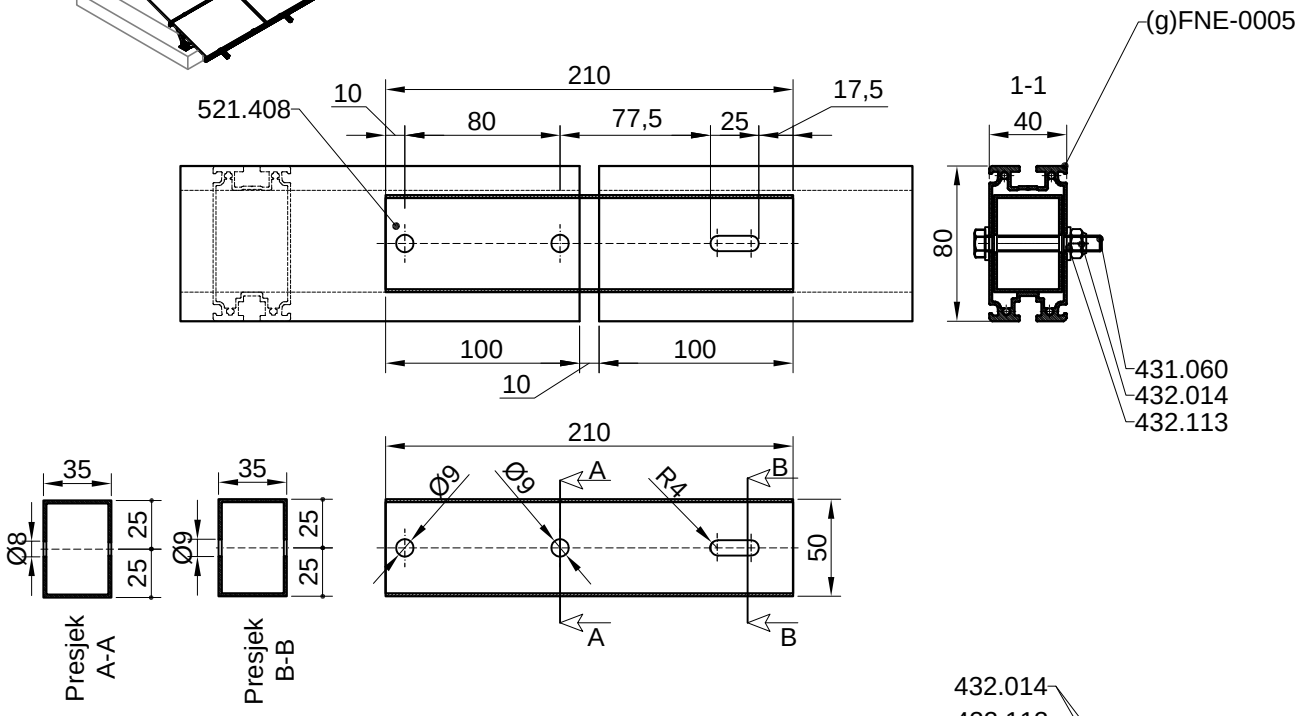
Produživanje horizontalne grede (g) FNE-0004 radi se preko veznog elementa 521.409,
a sve prema naznačenom detalju.
Prilikom ostvarivanja veze potrebno je ostaviti minimalno 10mm dilataciju između horizontalnih greda (g) FNE-0004.

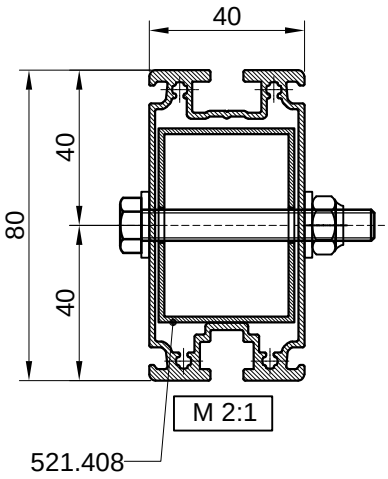
Extension of the horizontal beam (g) FNE-0004 is done through the connecting element 521.409,
and all according to the indicated detail.
When making the connection, it is necessary to leave a minimum of 10 mm dilatation between the horizontal beams (g) FNE-0004.

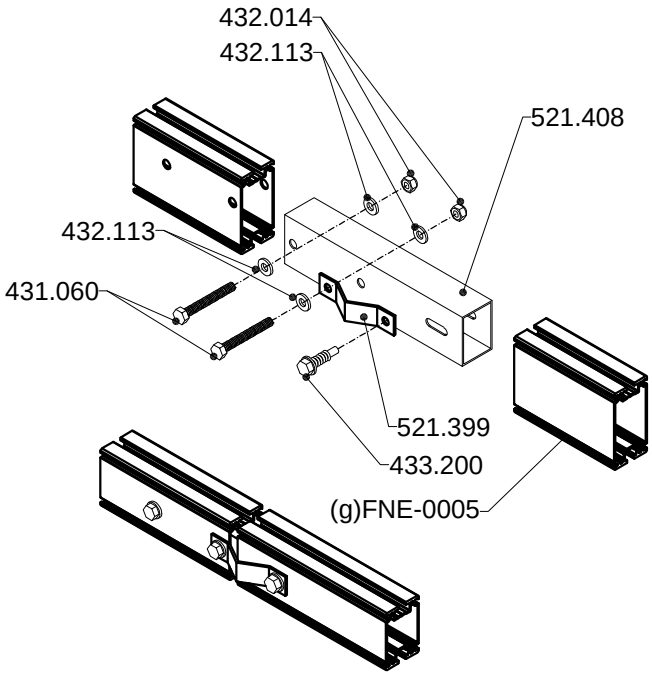


Detalj veze sekundarnih greda (g) FNE-0005
Veza horizontalnih greda (g) ostvaruje se veznim elementom unutar cijevi i vijcima. Spojni element dozvoljava rad konstrukcije pri temperaturnim razlikama.

Detail of the secondary carrier connection (g) FNE-0005
The connection of horizontal beams (g) is realized by a connecting element inside the pipe and screws. The connecting element allows the construction the absorption of thermal expansions due to temperature changes.

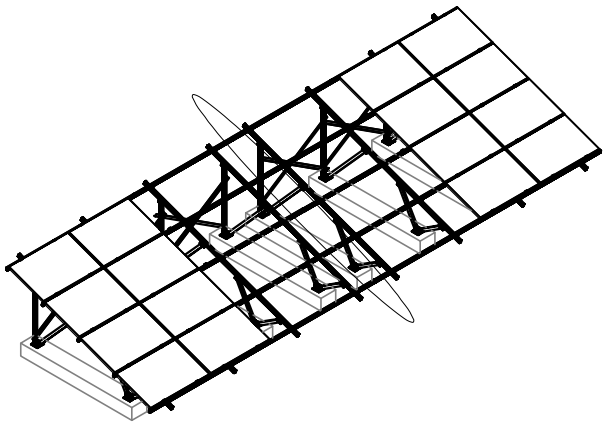






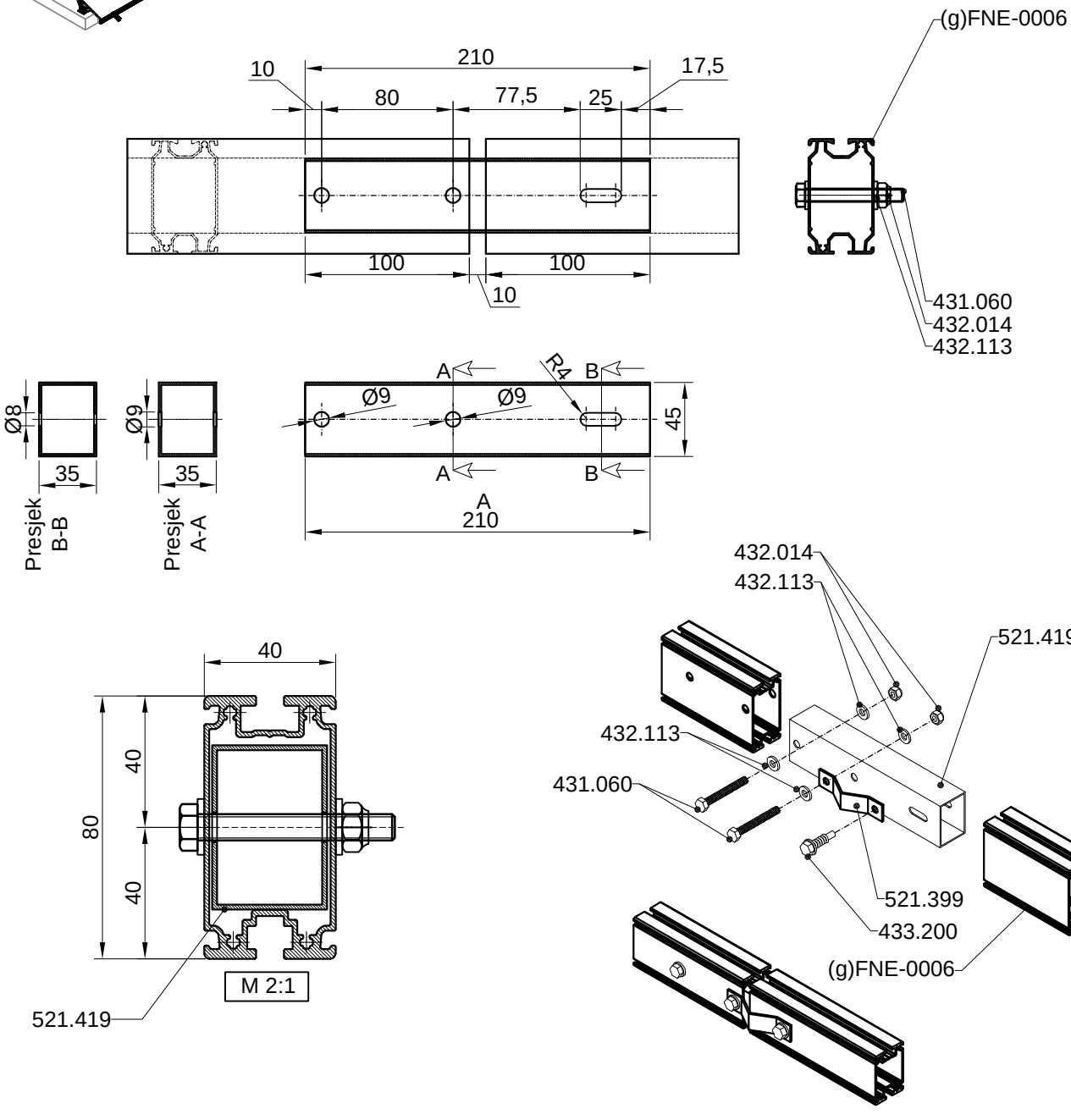
Produživanje horizontalne grede (g) FNE-0005 radi se preko veznog elementa 521.408,
a sve prema naznačenom detalju.
Prilikom ostvarivanja veze potrebno je ostaviti minimalno 10mm dilataciju između horizontalnih greda (g) FNE-0005.

Extension of the horizontal beam (g) FNE-0005 is done through the connecting element 521.408,
and all according to the indicated detail.
When making the connection, it is necessary to leave a minimum of 10 mm dilatation between the horizontal beams (g) FNE-0005.



Detalj veze sekundarnih greda (g) FNE-0006.
Veza horizontalnih greda (g) ostvaruje se veznim elementom unutar cijevi i vijcima. Spojni element dozvoljava rad konstrukcije pri temperaturnim razlikama.

Detail of the secondary carrier connection (g) FNE-0006
The connection of horizontal beams (g) is realized by a connecting element inside the pipe and screws. The connecting element allows the construction the absorption of thermal expansions due to temperature changes.



Produživanje horizontalne grede (g) FNE-0006 radi se preko veznog elementa 521.419,
a sve prema naznačenom detalju.
Prilikom ostvarivanja veze potrebno je ostaviti minimalno 10mm dilataciju između horizontalnih greda (g) FNE-0006.

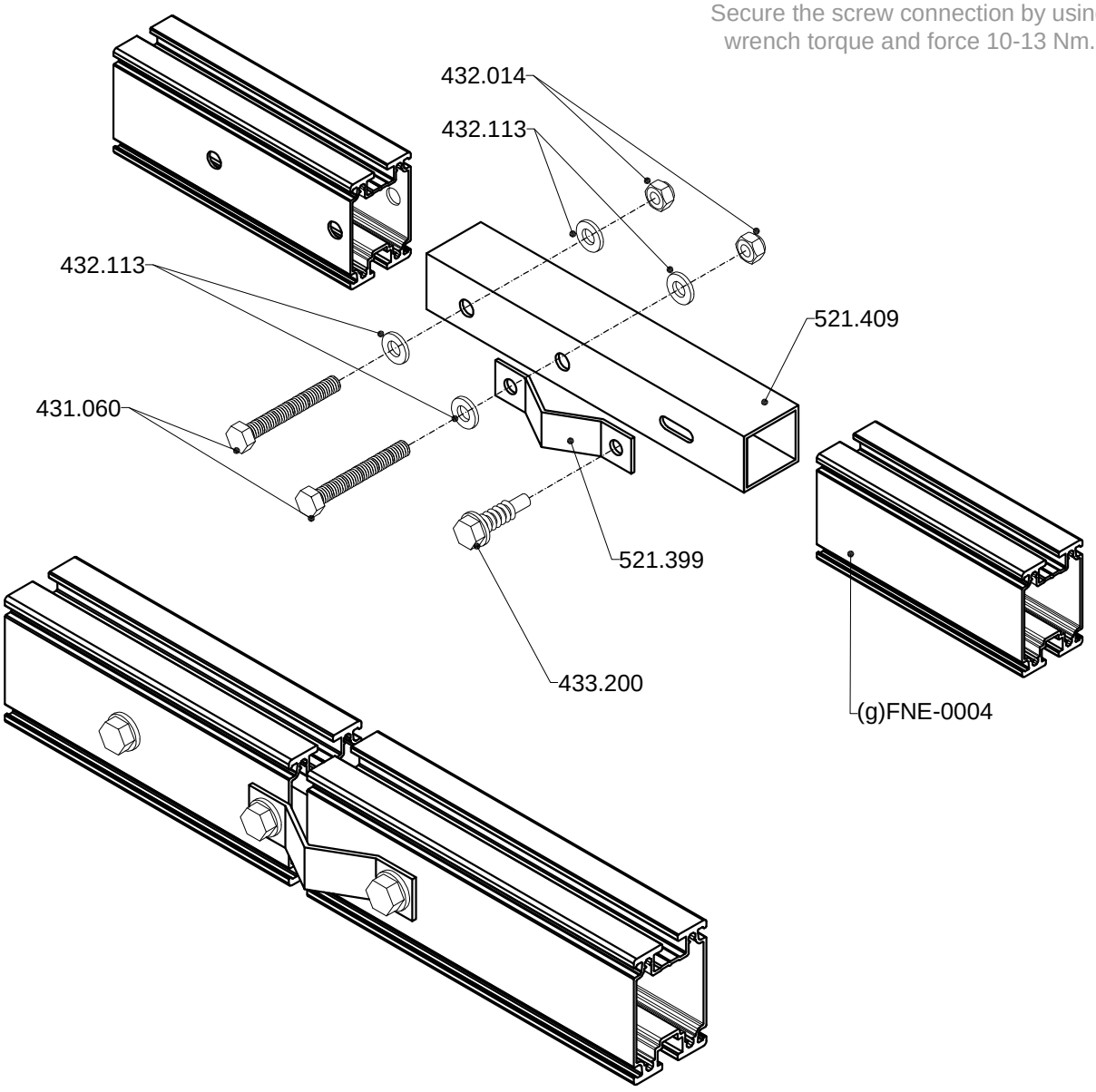
Extension of the horizontal beam (g) FNE-0001 is done through the connecting element 521.419,
and all according to the indicated detail.
When making the connection, it is necessary to leave a minimum of 10 mm dilatation between the horizontal beams (g) FNE-0006.

Kod ostvarivanja veze horizontalnih greda (g), ugrađuje se premosnica dilatacije, kao dodatni element. Premosnica dilatacije je poboljšanje veze kako bi se poboljšala povezanost elemenata i time pridonijelo boljem uzemljenju svih elemenata.
Premosnica je također izrađena od aluminija, a oblikovana je tako da omogući pravilan rad dilatacije.

When making the connection of horizontal beams (g), a dilatation bypass is installed, as an additional element. The dilatation bypass is to improve the connection in order to improve the connectivity of the elements and thus contribute to a better grounding of all elements.
The bypass is also made of aluminum and is designed to allow proper dilatation operation.

Vijčanu vezu učvrstiti uporabom moment ključa i silom 10-13 Nm.

Secure the screw connection by using wrench torque and force 10-13 Nm.



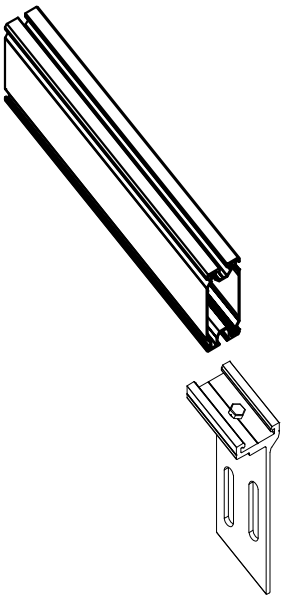
Primarna čelična podkonstrukcija

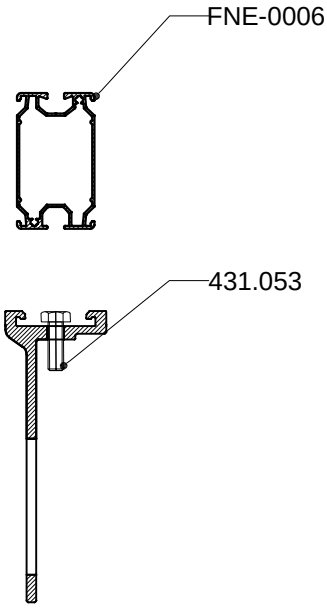
Primary steel substructure

Spajanje aluminijske spojnice s vertikalnom gredom
Connecting aluminium connector to the vertical beam

Obrada i montaža gdje primarna konstrukcija od čelika počinje tako što aluminijsku spojnicu spajamo s vertikalnom gredom kao što je prikazano na slici.

Processing and assembly of the primary steel structure begins by connecting the aluminum connector to the vertical beam as shown in the picture.

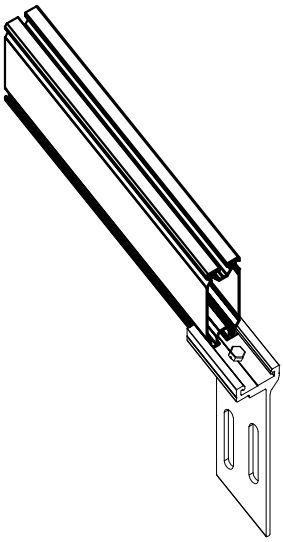


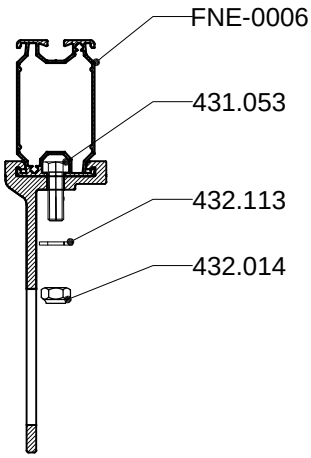


1.

Prvo ubacujemo vijak 431.053 u aluminijsku spojnicu.

First, insert screw 431.053 into the aluminum connector.





2.

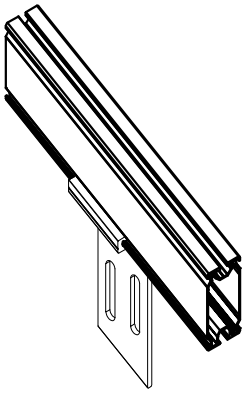
Nakon toga uvlačimo vertiklanu gredu u aluminijsku spojnicu.

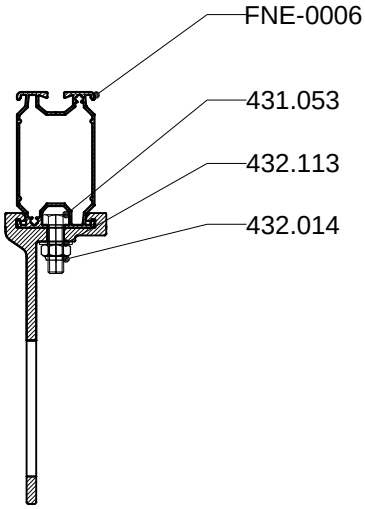
After that, insert the vertical beam into the aluminum connector.

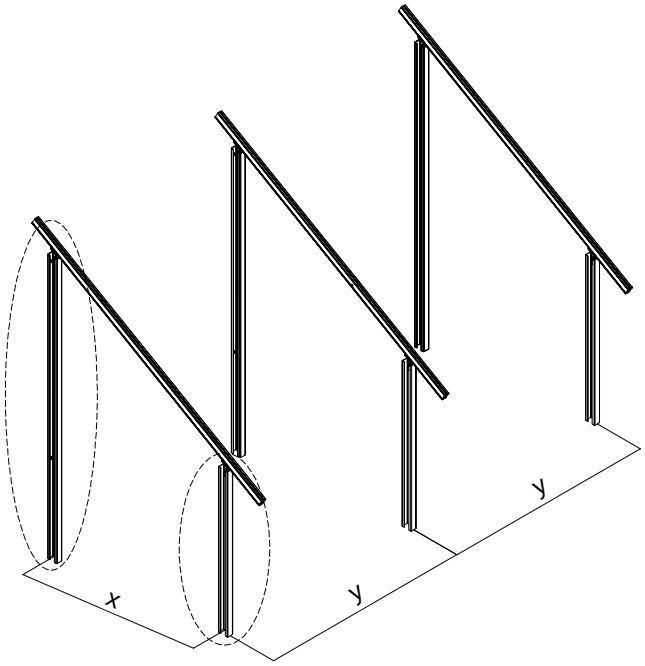
3.

Kada vertikalnu gredu dovedemo u odgovarajući položaj lagano stegnemo vijčanu vezu.

When the vertical beam is brought into the right position, tighten the screw.







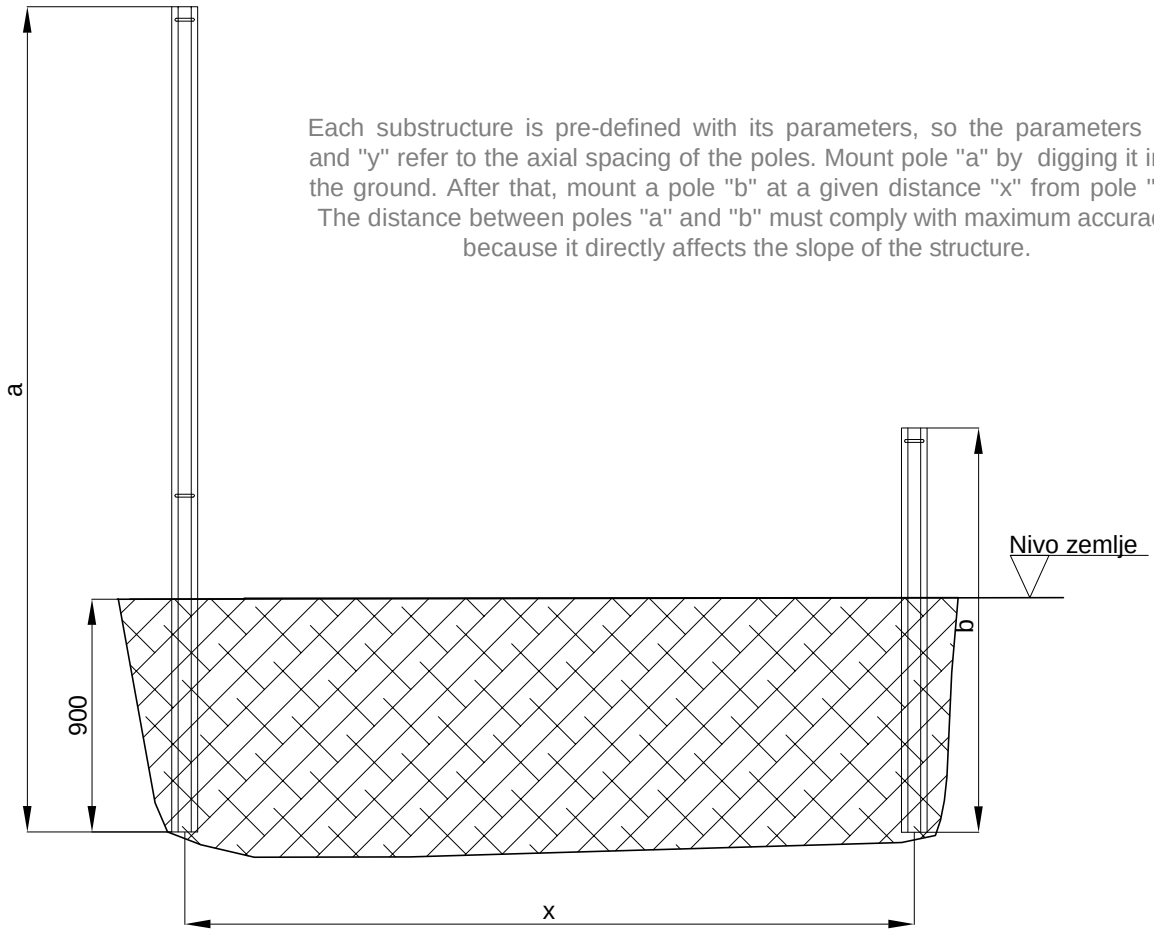
Montiranje stubova

Svi elementi podkonstrukcije prije montaže se prethodno obrade i kao takvi donose na mjesto predviđeno za montažu podkonstrukcije.
Moguć je proračun za različite nagibe. Za svaki nagib potreban je samostalan proračun.
Montaža počinje odabirom najpogodnije podkonstrukcije.

All elements of the substructure are processed before the assembly and as such are brought to the place intended for substructure assembly.Calculation is possible for different slopes. All the other slopes require a separate calculations. Assembly starts by selecting the most suitable substructure.

Svaka podkonstrukcija unaprijed je definirana svojim parametrima. Tako se parametri "x" i "y" odnose na osovinski razmak stupova "a" i "b". Montiramo stup "a" koji ukopavamo u zemlju 900 mm. Nakon toga montiramo stup "b" na zadanoj udaljenosti "x" od stupa "a". Razmak između stupova "a" i "b" se mora poštivati maksimalno točno jer izravno utječe na nagib konstrukcije.

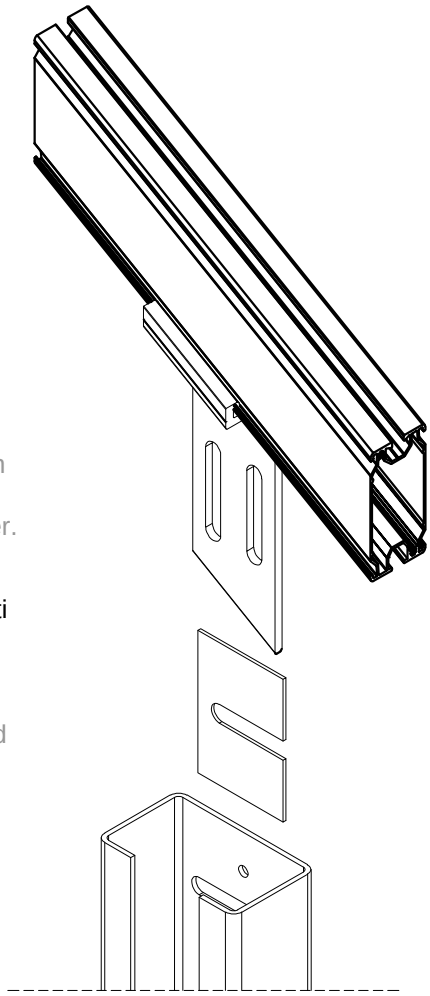
Each substructure is pre-defined with its parameters, so the parameters "x" and "y" refer to the axial spacing of the poles. Mount pole "a" by digging it into the ground. After that, mount a pole "b" at a given distance "x" from pole "a". The distance between poles "a" and "b" must comply with maximum accuracy because it directly affects the slope of the structure.

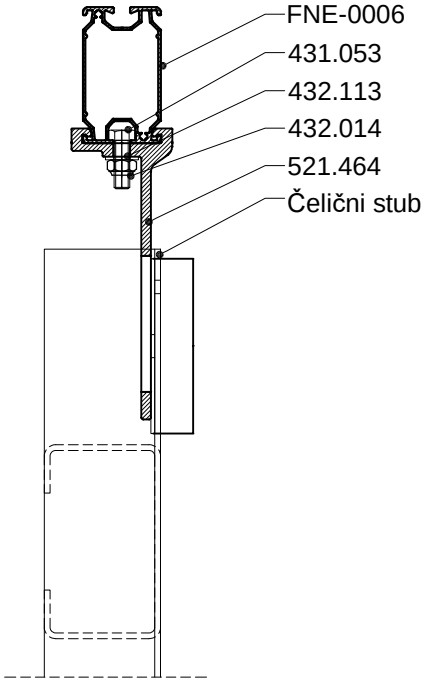


Montiranje aluminijske spojnice

Nakon spoja al. spojnice i vertikalne grede vršimo spajanje sa čeličnom podkonstrukcijom. Pomoću PVC distancera potrebno je osigurati da ne dođe do kontakta između pocinčanog čeličnog stuba i aluminijske spojnice.

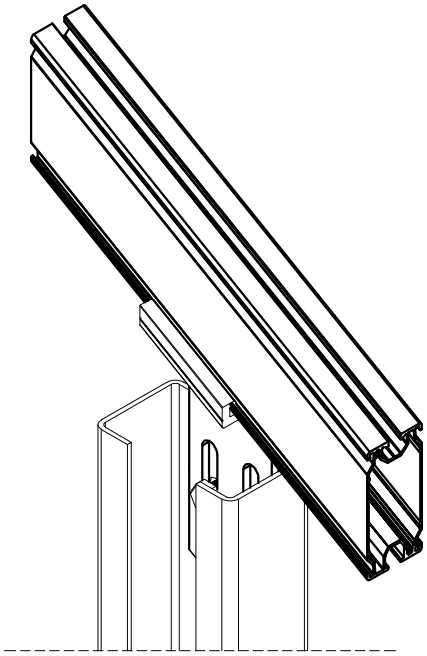
After aluminum connector and vertical beam are connected, connect it with steel substructure. It is necessary to ensure that there is no contact between the galvanized steel pole and the aluminum connector using a PVC spacer.

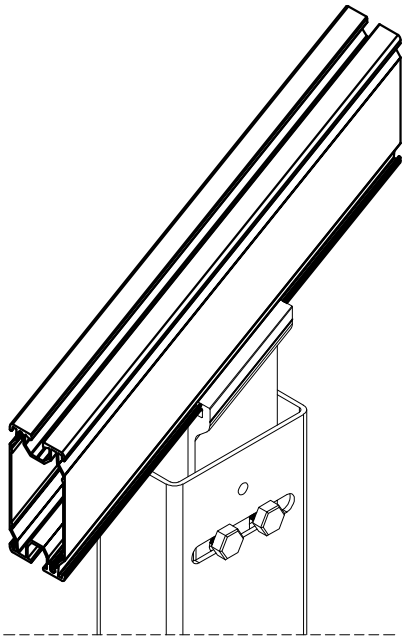


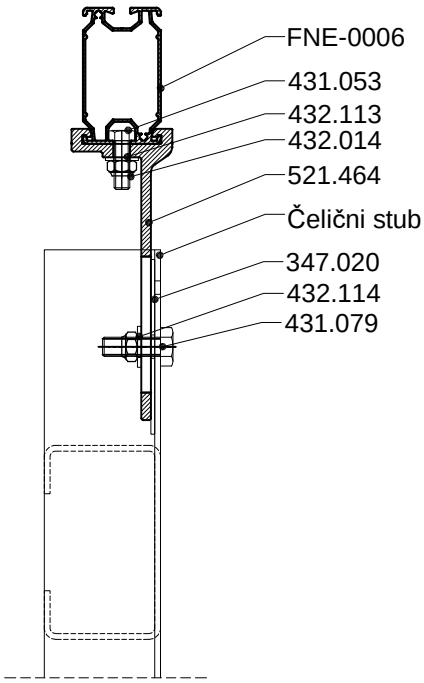


Vijčanu vezu 431.053 i 432.014 učvrstiti uporabom moment ključa i silom od 10-13 Nm.

Tighten the screw connection 431.053 and 432.014 using a torque wrench and a force of 10-13 Nm.

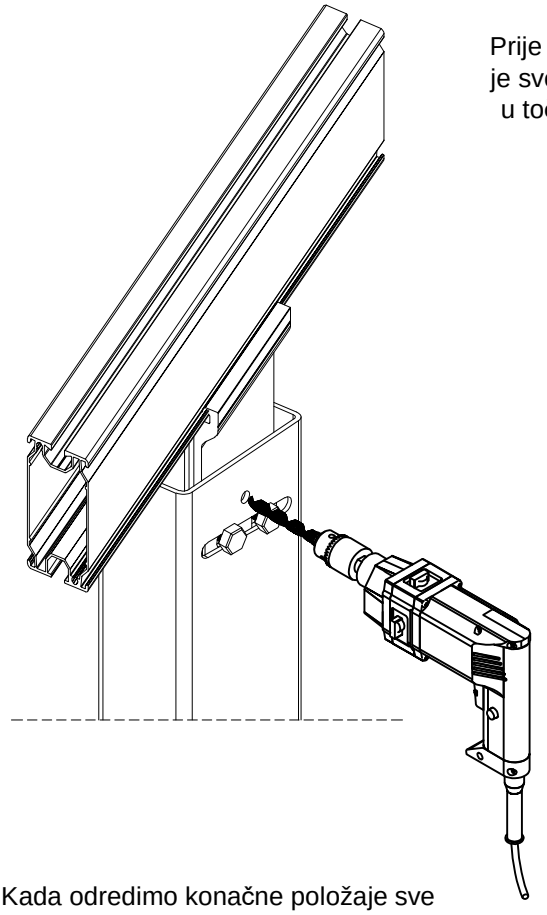






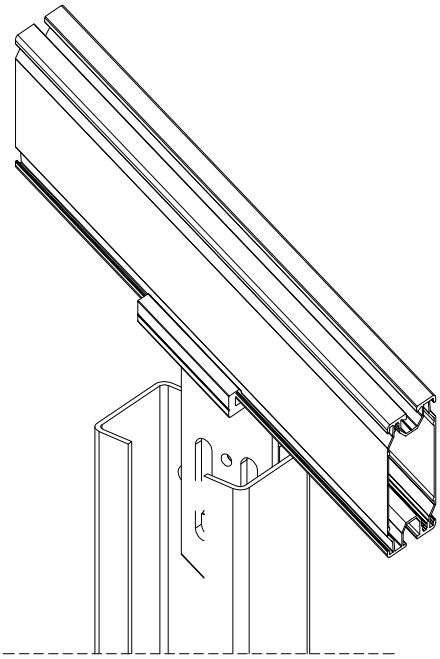
Vijčanu vezu 431.079 i 432.015 učvrstiti uporabom moment ključa i silom od 20-25 Nm a ostale vijke M10 na spojevima čelične potkonstrkcije stegnuti silom 20-25 Nm.

Fasten screw connection 431.079 and 432.015 using a torque wrench and a force of 20-25 Nm, and tighten the other M10 screws on the connections of the steel substructure with a force of 20-25 Nm.



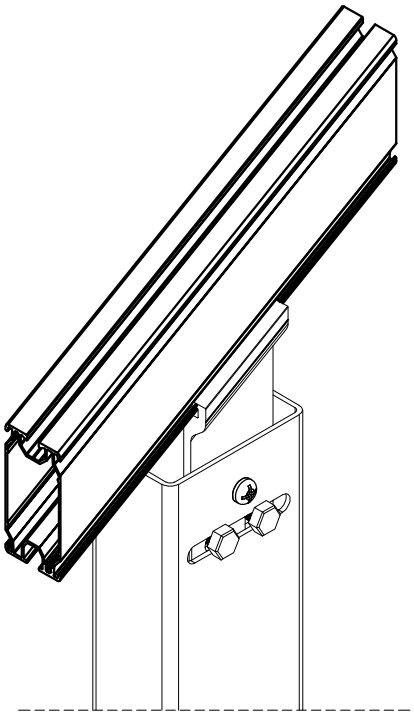
Prije nego stegnemo sve veze potrebno je sve elemente podkonstrukcije dovesti u točan položaj koristeći zidarsko uže.

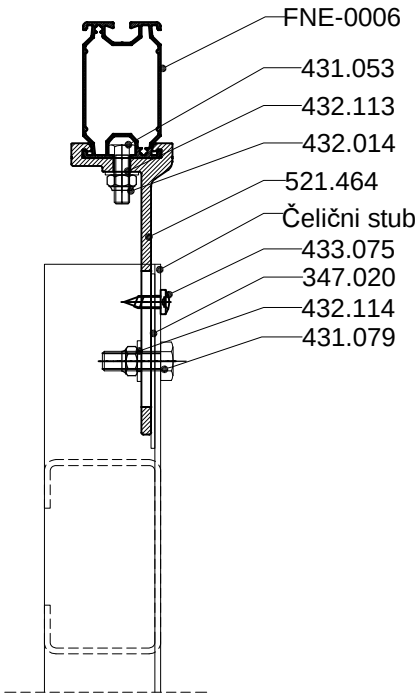
Before tightening all the connections, it is necessary to bring all the elements of the substructure into the correct position using a mason's line.

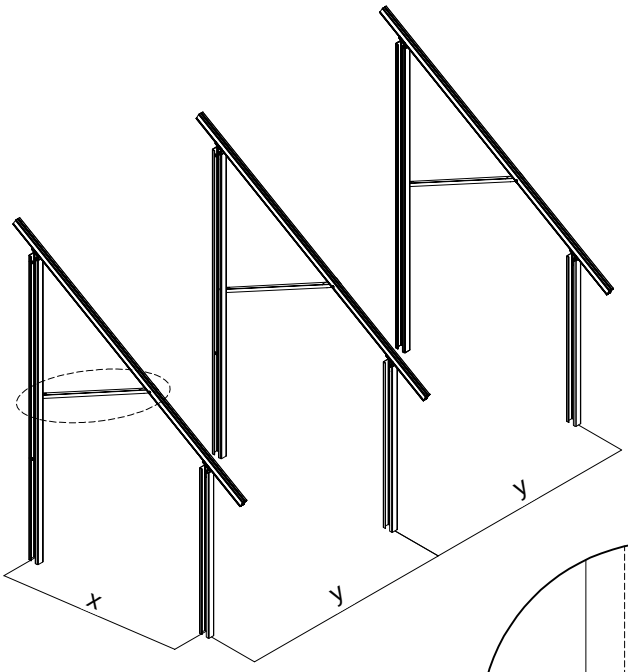


Kada odredimo konačne položaje sve veze učvršćujemo. Nakon toga ubušimo rupu i zavijamo samourezujući vijak 433.075.

When the final positions are determined, fasten all the connections. After that, drill a hole and screw in the self-tapping screw 433.075.



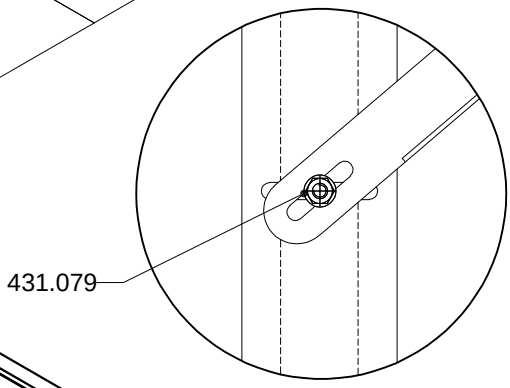


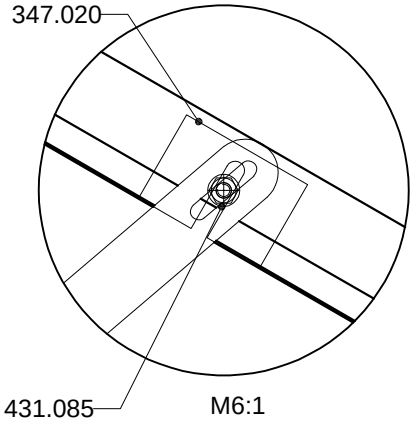


Montiranje kosnika

Nakon montiranja primarne podkonstrukcije montiramo kosnike na predviđena mjesta.

After mounting the primary substructure, we mount the crossbars in the designated places.



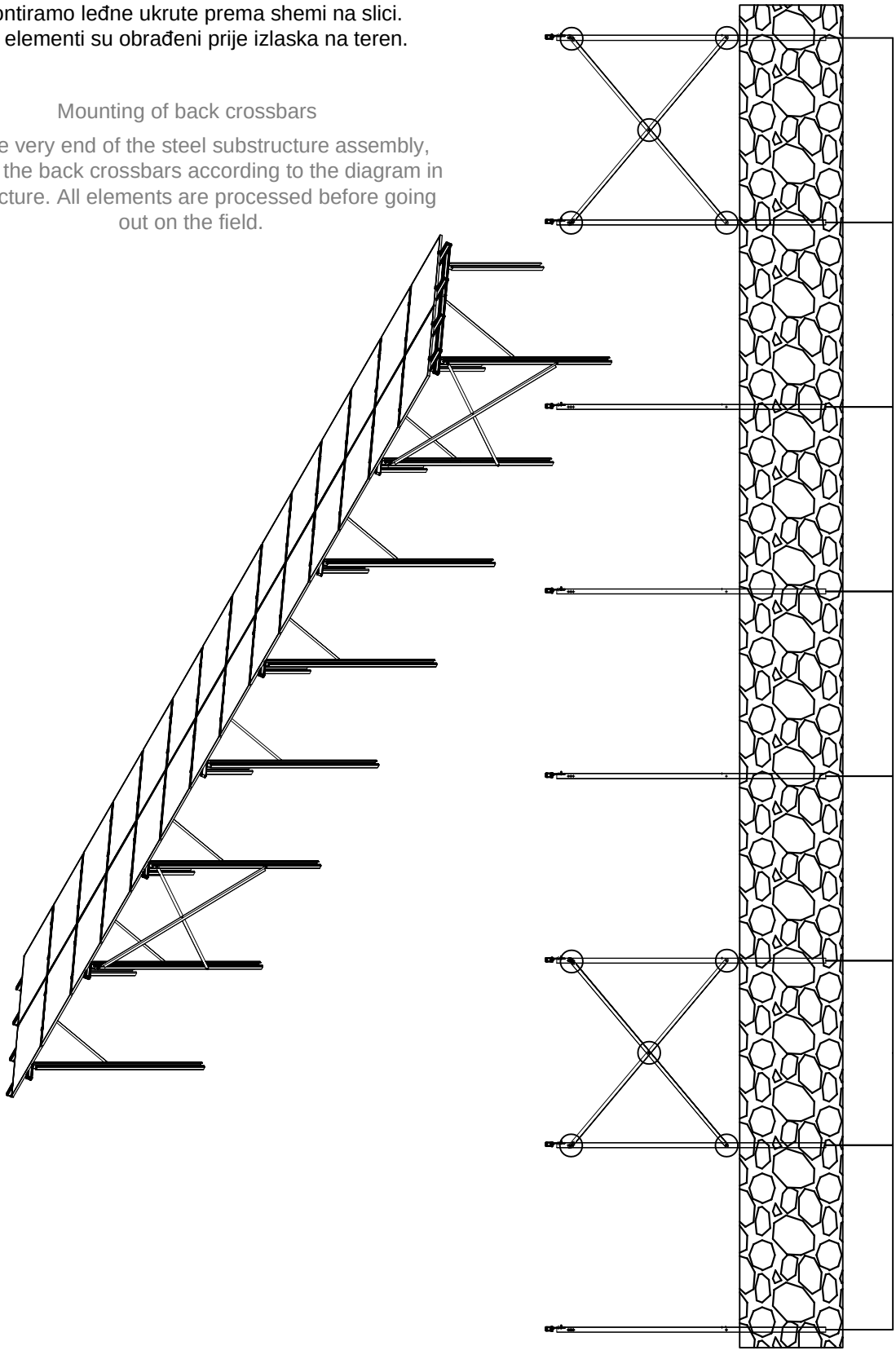


Montiranje leđnih ukruta

Na samom kraju montaže čelične podkonstrukcije montiramo leđne ukrute prema shemi na slici. Svi elementi su obrađeni prije izlaska na teren.

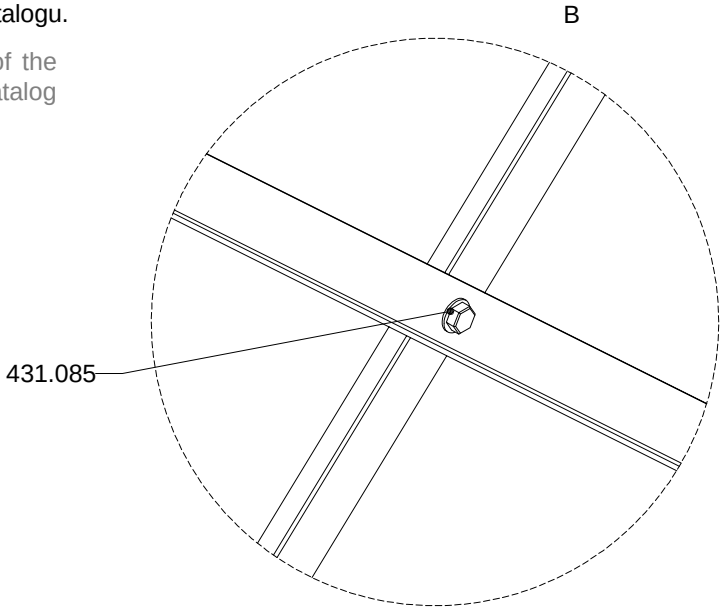
Mounting of back crossbars

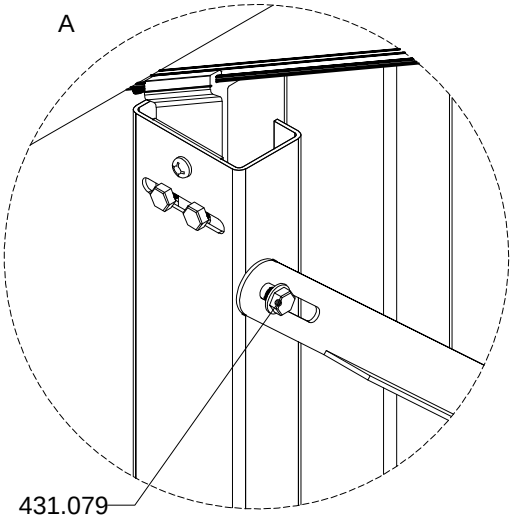
At the very end of the steel substructure assembly, mount the back crossbars according to the diagram in the picture. All elements are processed before going out on the field.

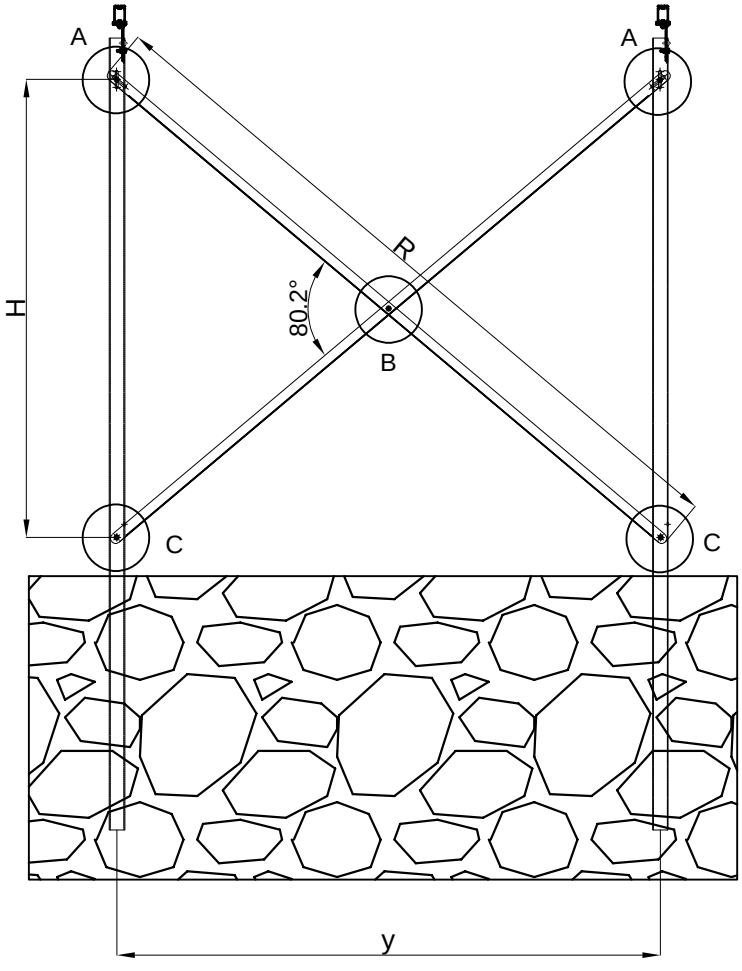


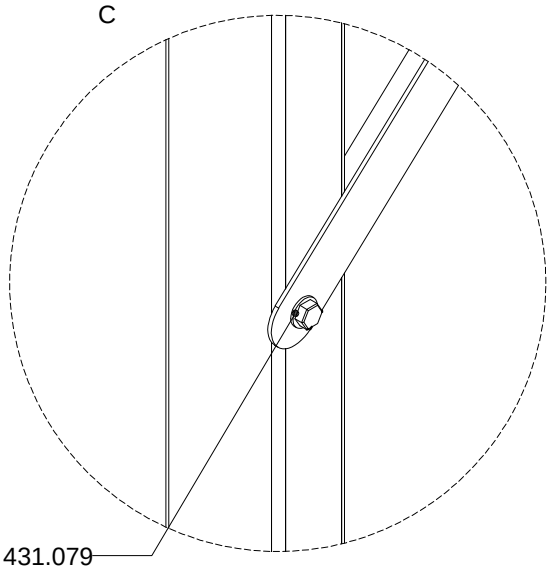
Nakon montiranja leđnih ukruta, nastavlja se montaža karakteristična za montažu opisanu ranije u katalogu.

After mounting the back crossbars the rest of the assembly is as described earlier in the catalog continues.









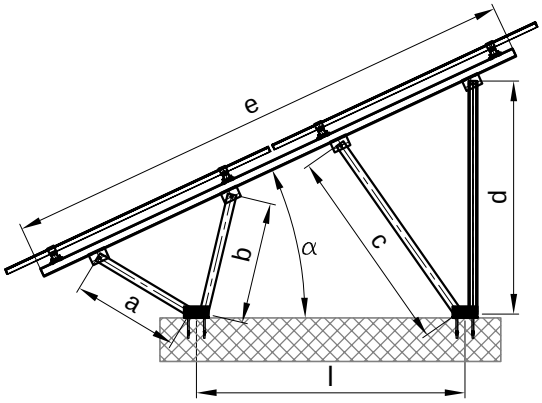
Rezne liste
Cutting lists

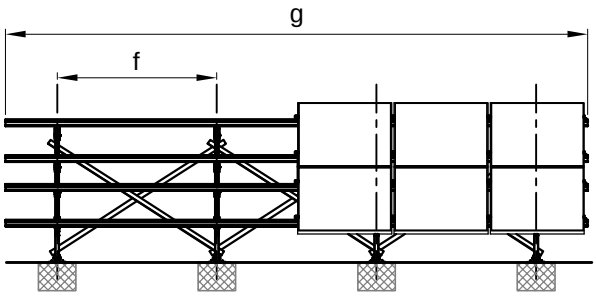
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 1600±50x40
Nagib:	20°
Kategorija terena:	III
Brzina vjetra:	< 35 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5 x 1600±50x40
Slope:	20°
Ground category:	III
Wind speed:	< 35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=605	90-90	4
F-0180	Dijagonala b	Diagonal b	L=635	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1050	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1110	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=2800	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006 (p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35
PVC	PVC		
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

1. Veza temeljne konstrukcije - beton		The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50		32

2. Veza temeljne konstrukcije - vijak za zemlju		The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

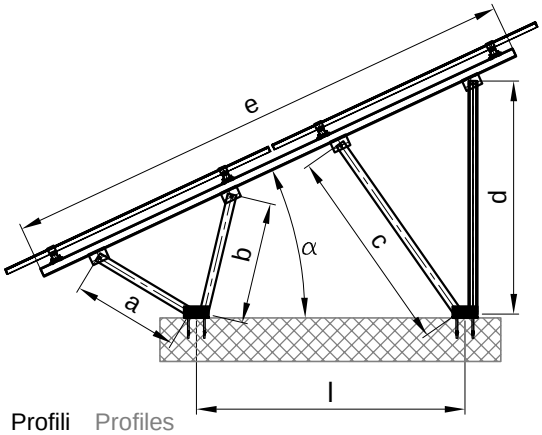
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

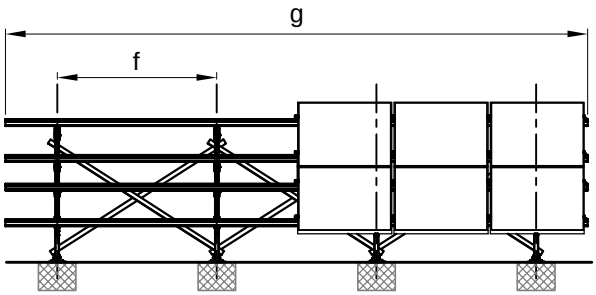
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 1600±50x40
Nagib:	25°
Kategorija terena:	III
Brzina vjetra:	< 30 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5 x 1600±50x40
Slope:	25°
Ground category:	III
Wind speed:	< 30 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=580	90-90	4
F-0180	Dijagonala b	Diagonal b	L=760	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1180	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1345	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=2800	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35
PVC	PVC		
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

1. Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

2. Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40 / Screw M12x40	32
432.016	Sigurnosna Matica / Security Nut M12	32
432.115	M12 Podloška U12 / Washer U12	64

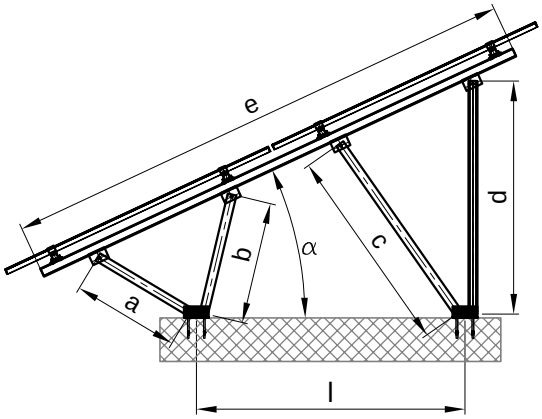
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

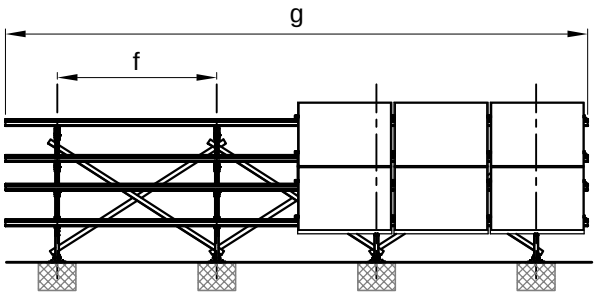
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5x1600±50x40
Nagib:	30°
Kategorija terena:	III
Brzina vjetra:	< 30 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5x1600±50x40
Slope:	30°
Ground category:	III
Wind speed:	< 30 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=570	90-90	4
F-0180	Dijagonala b	Diagonal b	L=885	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1300	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1580	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=2800	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35
PVC	PVC		
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

1. Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

2. Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

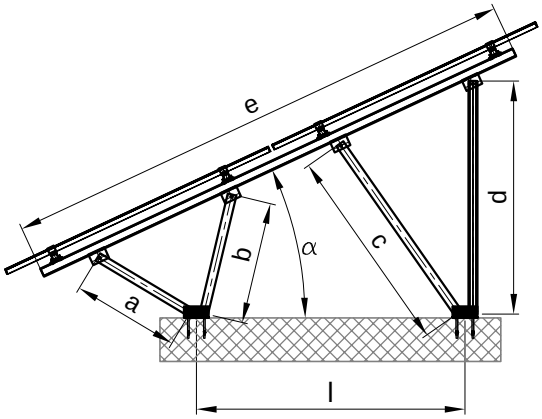
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

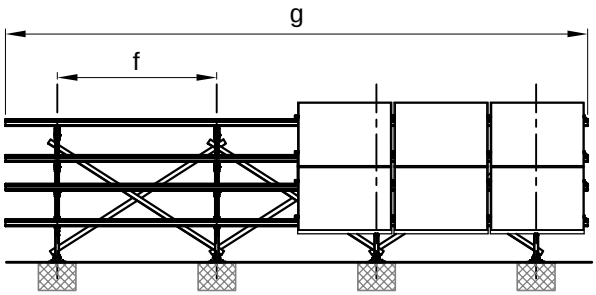
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5x1600±50x40
Nagib:	25°
Kategorija terena:	III
Brzina vjetra:	30-35 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5x1600±50x40
Slope:	25°
Ground category:	III
Wind speed:	30-35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=580	90-90	4
F-0180	Dijagonala b	Diagonal b	L=760	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1180	90-90	4
FNE-0004	Dijagonala d	Diagonal d	L=1345	90-90	4
FNE-0004	Greda u nagibu e	The beam in the slope e	L=2800	90-90	4
FNE-0004	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1766	Ojačanje grede g FNE-0004(p)	Beam reinforcement g FNE-0004(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.393	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	19
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

1. Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

2. Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

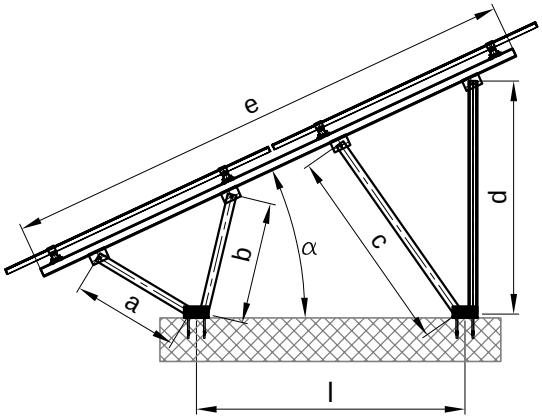
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
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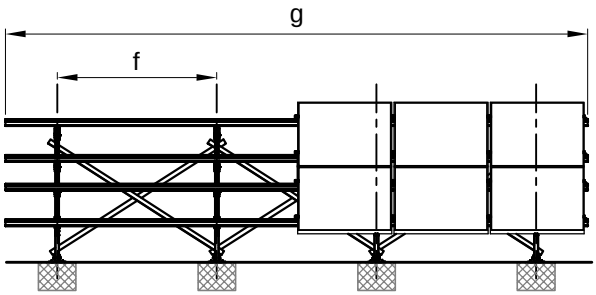
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 1600±50x40
Nagib:	30°
Kategorija terena:	III
Brzina vjetra:	30-35 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5x1600±50x40
Slope:	30°
Ground category:	III
Wind speed:	30-35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=570	90-90	4
F-0180	Dijagonala b	Diagonal b	L=885	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1300	90-90	4
FNE-0004	Dijagonala d	Diagonal d	L=1580	90-90	4
FNE-0004	Greda u nagibu e	The beam in the slope e	L=2800	90-90	4
FNE-0004	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1766	Ojačanje grede g FNE-0004(p)	Beam reinforcement g FNE-0004(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.393	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	19
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

1. Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

2. Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

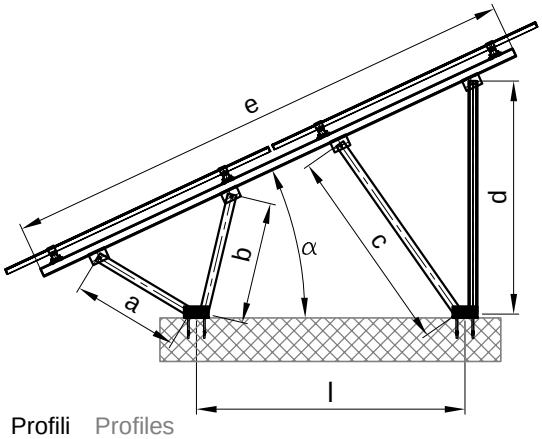
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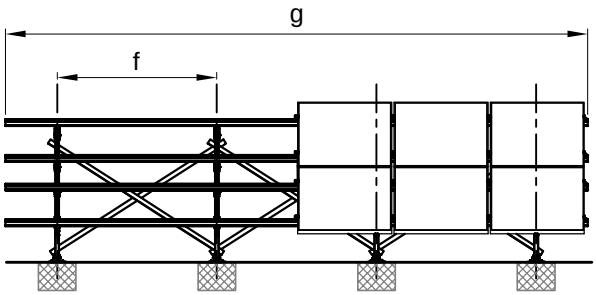
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 2000±50x40
Nagib:	20°
Kategorija terena:	III
Brzina vjetra:	< 30 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5 x 2000±50x40
Slope:	20°
Ground category:	III
Wind speed:	< 30 m/s





Profili	Profiles		mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=660	90-90	4
F-0180	Dijagonala b	Diagonal b	L=715	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1300	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1320	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=3580	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi	Connection elements		
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci	Accessories		
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35

PVC	PVC		
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

1.	Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50		32

2.	Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

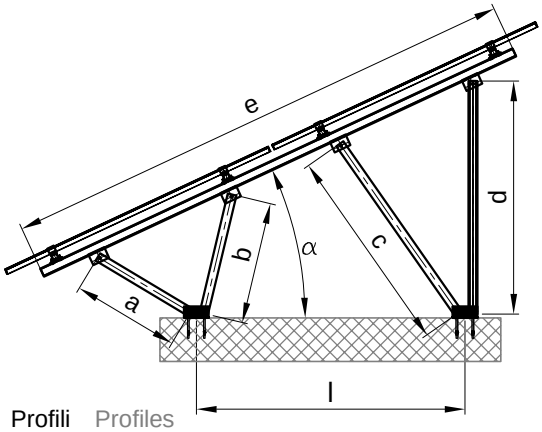
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

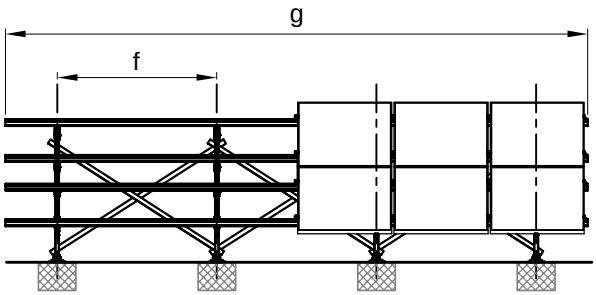
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 2000±50x40
Nagib:	25°
Kategorija terena:	III
Brzina vjetra:	< 25 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5 x 2000±50x40
Slope:	25°
Ground category:	III
Wind speed:	< 25 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=590	90-90	4
F-0180	Dijagonala b	Diagonal b	L=850	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1430	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1600	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=3580	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

1. Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

2. Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

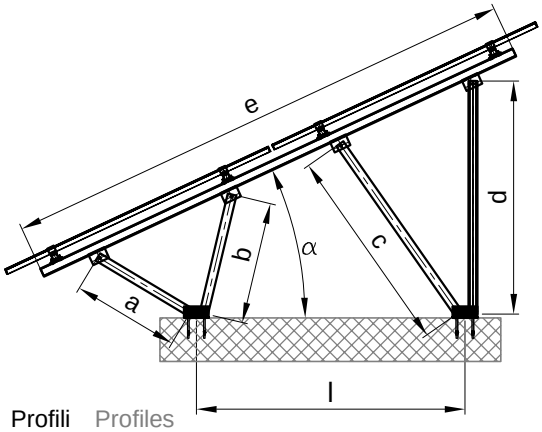
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

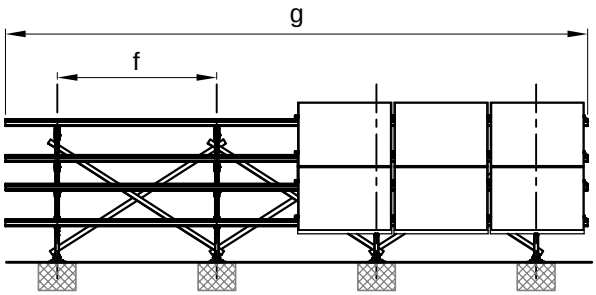
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 2000±50x40
Nagib:	30°
Kategorija terena:	III
Brzina vjetra:	< 20 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5 x 2000±50x40
Slope:	30°
Ground category:	III
Wind speed:	< 20 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=565	90-90	4
F-0180	Dijagonala b	Diagonal b	L=980	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1565	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1875	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=3580	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

1. Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

2. Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

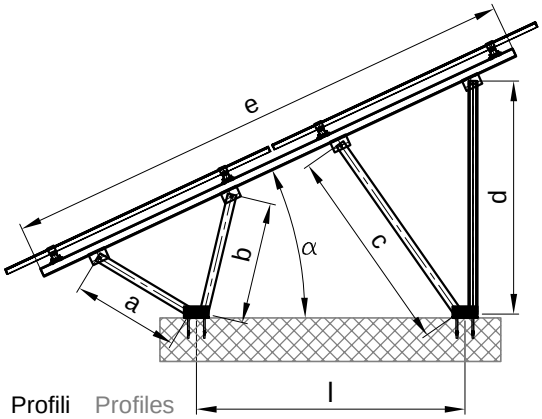
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

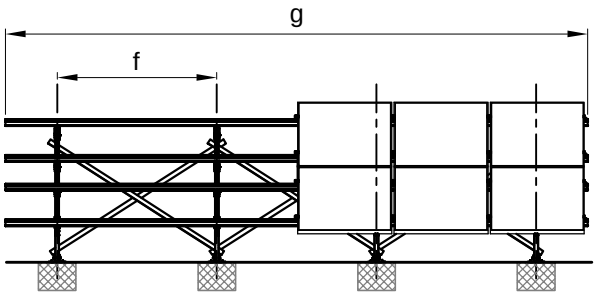
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 2000±50x40
Nagib:	20°
Kategorija terena:	III
Brzina vjetra:	35 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5 x 2000±50x40
Slope:	20°
Ground category:	III
Wind speed:	35 m/s





Profili	Profiles		mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=660	90-90	4
F-0180	Dijagonala b	Diagonal b	L=715	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1300	90-90	4
FNE-0004	Dijagonala d	Diagonal d	L=1320	90-90	4
FNE-0005	Greda u nagibu e	The beam in the slope e	L=3580	90-90	4
FNE-0005	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6

Vezni elementi	Connection elements		
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.393	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.412	Ojačanje grede (g) FNE-0005	Beam (g) reinforcement FNE-0005	8
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci	Accessories		
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	19
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35

PVC	PVC		
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw		
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

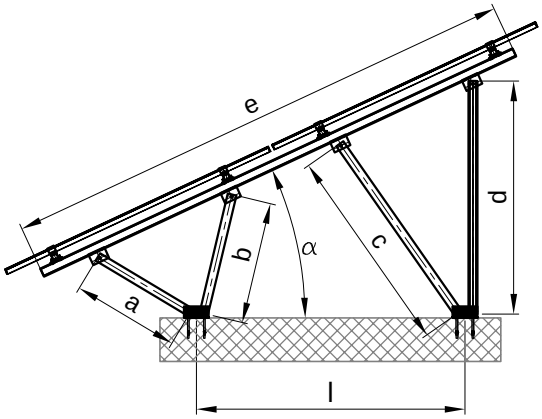
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

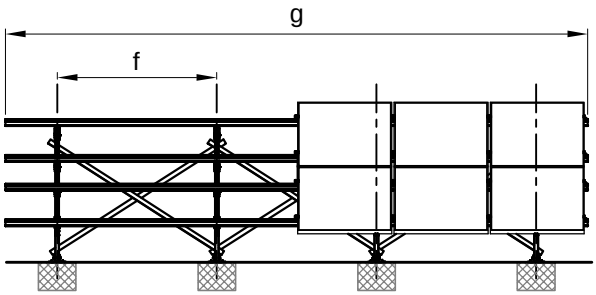
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 2000±50x40
Nagib:	25°
Kategorija terena:	III
Brzina vjetra:	30-35 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5 x 2000±50x40
Slope:	25°
Ground category:	III
Wind speed:	30-35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=590	90-90	4
F-0180	Dijagonala b	Diagonal b	L=850	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1430	90-90	4
FNE-0004	Dijagonala d	Diagonal d	L=1600	90-90	4
FNE-0005	Greda u nagibu e	The beam in the slope e	L=3580	90-90	4
FNE-0005	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.393	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.412	Ojačanje grede (g) FNE-0005	Beam (g) reinforcement FNE-0005	8
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	19
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton The connection of the foundation structure - concrete		
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju The connection of the foundation structure - ground screw			
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

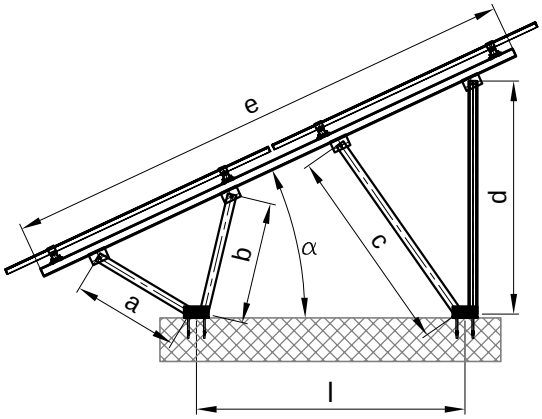
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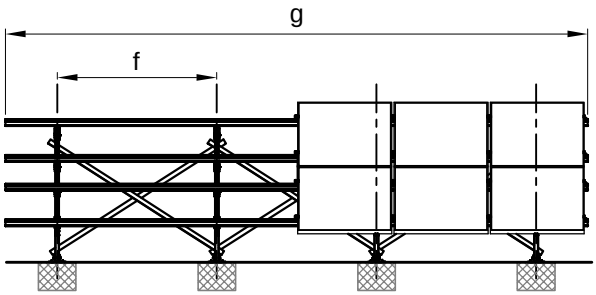
Vertikalna montaža solarnih panela

Solarni panel:	LxHxd= 1000±5 x 2000±50x40
Nagib:	30°
Kategorija terena:	III
Brzina vjetra:	25-35 m/s

Vertical mounting of solar panels

Solar panel:	LxHxd= 1000±5 x 2000±50x40
Slope:	30°
Ground category:	III
Wind speed:	25-35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=565	90-90	4
F-0180	Dijagonala b	Diagonal b	L=980	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1565	90-90	4
FNE-0004	Dijagonala d	Diagonal d	L=1875	90-90	4
FNE-0005	Greda u nagibu e	The beam in the slope e	L=3580	90-90	4
FNE-0005	Horizontalna greda g	The horizontal beam g	L=6300	90-90	4
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	8
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	20
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	32
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.393	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.412	Ojačanje grede (g) FNE-0005	Beam (g) reinforcement FNE-0005	8
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	19
431.562	T vijak M8x30	T Screw M8x30	38
431.561	Vijak M8x18	Screw M8x18	8
431.567	Vijak M8x30	Screw M8x30	20
432.014	Sigurnosna Matica M8	Security Nut M8	76
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	28
432.113	Podloška U8	Washer U8	76
432.114	Podloška U10	Washer U10	35

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton The connection of the foundation structure - concrete		
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju The connection of the foundation structure - ground screw			
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

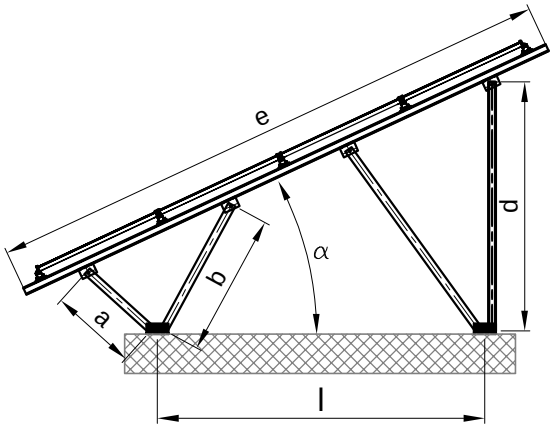
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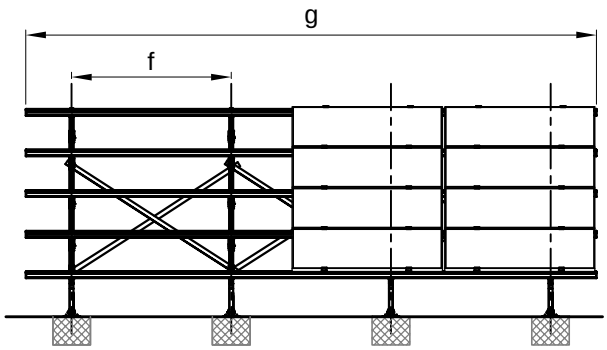
Horizontalna montaža solarnih panela

Solarni panel:	LxHxd=1600±50 x 1000±5x40
Nagib:	20°
Kategorija terena:	III
Brzina vjetra:	< 35 m/s

Horizontalal mounting of solar panels

Solar panel:	LxHxd=1600±50 x 1000±5x40
Slope:	20°
Ground category:	III
Wind speed:	< 35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=725	90-90	4
F-0180	Dijagonala b	Diagonal b	L=930	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1555	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1580	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=4400	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6500	90-90	5
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	16
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	24
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	40
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	46
431.561	Vijak M8x18	Screw M8x18	16
431.567	Vijak M8x30	Screw M8x30	24
432.014	Sigurnosna Matica M8	Security Nut M8	84
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	40
432.113	Podloška U8	Washer U8	84
432.114	Podloška U10	Washer U10	35

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	32
432.016	Sigurnosna Matica	32
432.115	M12 Podloška U12	64

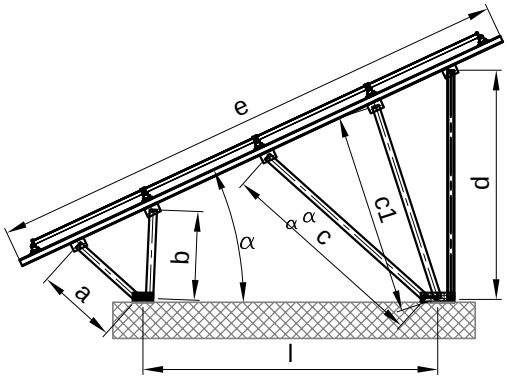
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
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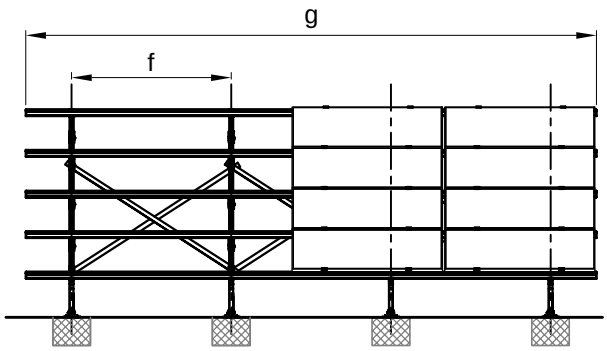
Horizontalna montaža solarnih panela

Solarni panel:	LxHxd=1600±50 x 1000±5x40
Nagib:	25°
Kategorija terena:	III
Brzina vjetra:	< 35 m/s

Horizontalal mounting of solar panels

Solar panel:	LxHxd=1600±50 x 1000±5x40
Slope:	25°
Ground category:	III
Wind speed:	< 35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=665	90-90	4
F-0180	Dijagonala b	Diagonal b	L=735	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1760	90-90	4
F-0180	Dijagonala c1	Diagonal c1	L=1680	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1900	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=4400	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6500	90-90	5
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	40
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	16
521.337	Držač solarnog panela - dvostrani	Solar panel holder-double sided	24
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	40
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	20
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4
521.389	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	46
431.087	Vijak M10x70	Screw M10x70	20
431.089	Vijak M10x80	Screw M10x80	20
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	46
431.561	Vijak M8x18	Screw M8x18	16
431.567	Vijak M8x30	Screw M8x30	24
432.014	Sigurnosna Matica M8	Security Nut M8	92
432.015	Sigurnosna Matica M10	Security Nut M10	43
432.048	Matica s oprugom M8	Nut with spring M8	40
432.113	Podloška U8	Washer U8	92
432.114	Podloška U10	Washer U10	43

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton		The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50		32

Veza temeljne konstrukcije - vijak za zemlju		The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

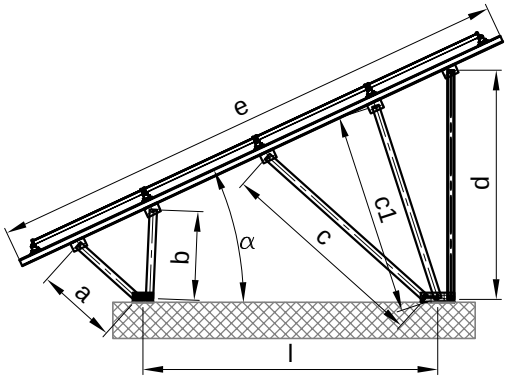
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

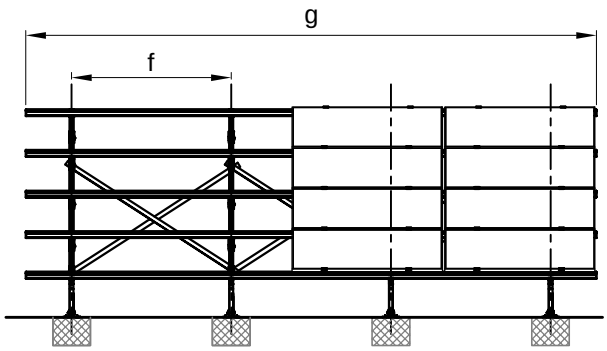
Horizontalna montaža solarnih panela

Solarni panel:	LxHxd=1600±50 x 1000±5x40
Nagib:	30°
Kategorija terena:	III
Brzina vjetra:	< 30 m/s

Horizontalal mounting of solar panels

Solar panel:	LxHxd=1600±50 x 1000±5x40
Slope:	30°
Ground category:	III
Wind speed:	< 30 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=700	90-90	4
F-0180	Dijagonala b	Diagonal b	L=810	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1840	90-90	4
F-0180	Dijagonala c1	Diagonal c1	L=1910	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=2200	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=4400	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6500	90-90	5
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	40
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	16
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	24
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	40
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	20
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4
521.389	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	46
431.561	Vijak M8x18	Screw M8x18	16
431.567	Vijak M8x30	Screw M8x30	24
432.014	Sigurnosna Matica M8	Security Nut M8	84
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	40
432.113	Podloška U8	Washer U8	84
432.114	Podloška U10	Washer U10	35
PVC	PVC		
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	32
432.016	Sigurnosna Matica	32
432.115	M12 Podloška U12	64

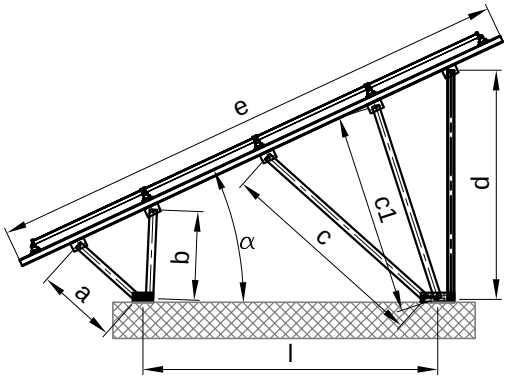
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

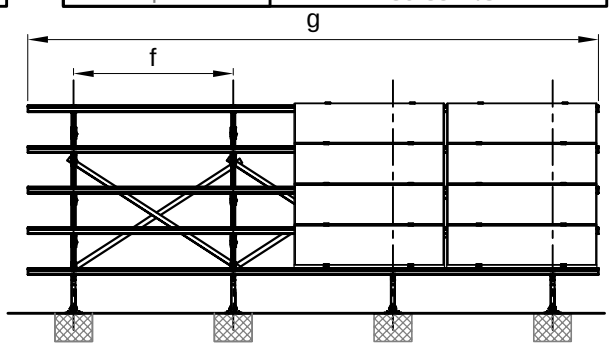
Horizontalna montaža solarnih panela

Solarni panel:	LxHxd=1600±50 x 1000±5x40
Nagib:	30°
Kategorija terena:	III
Brzina vjetra:	30-35 m/s

Horizontalal mounting of solar panels

Solar panel:	LxHxd=1600±50 x 1000±5x40
Slope:	30°
Ground category::	III
Wind speed:	30-35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=700	90-90	4
F-0180	Dijagonala b	Diagonal b	L=810	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1840	90-90	4
F-0180	Dijagonala c1	Diagonal c1	L=1910	90-90	4
FNE-0004	Dijagonala d	Diagonal d	L=2200	90-90	4
FNE-0005	Greda u nagibu e	The beam in the slope e	L=4400	90-90	4
FNE-0005	Horizontalna greda g	The horizontal beam g	L=6500	90-90	5
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	40
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	16
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	24
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	40
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	20
521.393	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.412	Ojačanje grede (g) FNE-0005	Beam (g) reinforcement FNE-0005	8
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4
521.389	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	46
431.087	Vijak M10x70	Screw M10x70	20
431.089	Vijak M10x80	Screw M10x80	23
431.562	T vijak M8x30	T Screw M8x30	46
431.561	Vijak M8x18	Screw M8x18	16
431.567	Vijak M8x30	Screw M8x30	24
432.014	Sigurnosna Matica M8	Security Nut M8	92
432.015	Sigurnosna Matica M10	Security Nut M10	43
432.048	Matica s oprugom M8	Nut with spring M8	40
432.113	Podloška U8	Washer U8	92
432.114	Podloška U10	Washer U10	43

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton The connection of the foundation structure - concrete		
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju The connection of the foundation structure - ground screw			
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

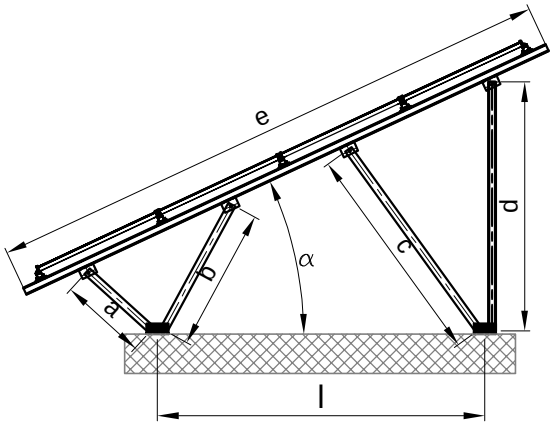
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

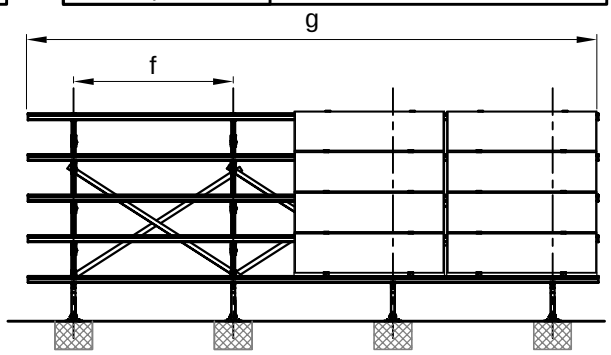
Horizontalna montaža solarnih panela

Solarni panel:	LxHxd=2000±50 x 1000±5x40
Nagib:	20°
Kategorija terena:	III
Brzina vjetra:	< 35 m/s

Horizontalal mounting of solar panels

Solar panel:	LxHxd=2000±50 x 1000±5x40
Slope:	20°
Ground category::	III
Wind speed:	< 35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=725	90-90	4
F-0180	Dijagonala b	Diagonal b	L=930	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1555	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1580	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=4400	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6070	90-90	5
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	32
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	16
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	24
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	40
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	16
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	8

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	38
431.087	Vijak M10x70	Screw M10x70	16
431.089	Vijak M10x80	Screw M10x80	16
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	46
431.561	Vijak M8x18	Screw M8x18	16
431.567	Vijak M8x30	Screw M8x30	24
432.014	Sigurnosna Matica M8	Security Nut M8	84
432.015	Sigurnosna Matica M10	Security Nut M10	35
432.048	Matica s oprugom M8	Nut with spring M8	40
432.113	Podloška U8	Washer U8	84
432.114	Podloška U10	Washer U10	35
PVC	PVC		
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton		The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50		32

Veza temeljne konstrukcije - vijak za zemlju		The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

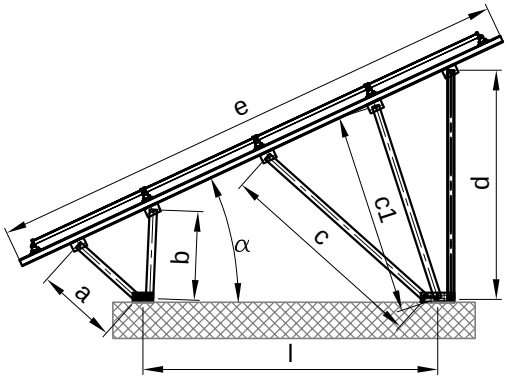
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

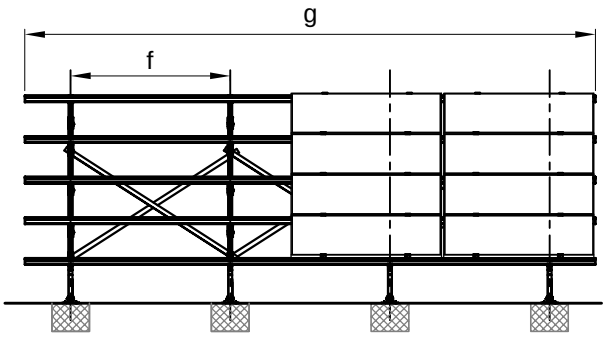
Horizontalna montaža solarnih panela

Solarni panel:	LxHxd=2000±50 x 1000±5x40
Nagib:	25°
Kategorija terena:	III
Brzina vjetra:	< 35 m/s

Horizontalal mounting of solar panels

Solar panel:	LxHxd=2000±50 x 1000±5x40
Slope:	25°
Ground category::	III
Wind speed:	< 35 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=665	90-90	4
F-0180	Dijagonala b	Diagonal b	L=735	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1760	90-90	4
F-0180	Dijagonala c1	Diagonal c1	L=1680	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=1900	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=4400	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6070	90-90	5
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	40
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	16
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	24
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	40
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	20
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4
521.389	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	46
431.087	Vijak M10x70	Screw M10x70	20
431.089	Vijak M10x80	Screw M10x80	20
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	46
431.561	Vijak M8x18	Screw M8x18	16
431.567	Vijak M8x30	Screw M8x30	24
432.014	Sigurnosna Matica M8	Security Nut M8	92
432.015	Sigurnosna Matica M10	Security Nut M10	43
432.048	Matica s oprugom M8	Nut with spring M8	40
432.113	Podloška U8	Washer U8	92
432.114	Podloška U10	Washer U10	43
PVC	PVC		
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	32
432.016	Sigurnosna Matica	32
432.115	M12 Podloška U12	64

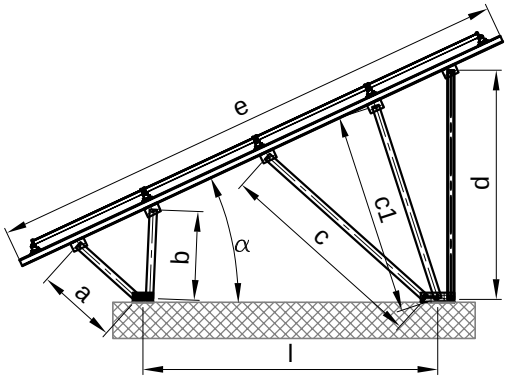
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

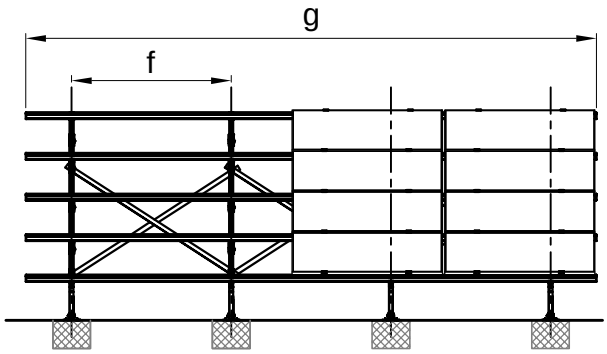
Horizontalna montaža solarnih panela

Solarni panel:	LxHxd=2000±50 x 1000±5x40
Nagib:	30°
Kategorija terena:	III
Brzina vjetra:	< 30 m/s

Horizontalal mounting of solar panels

Solar panel:	LxHxd=2000±50 x 1000±5x40
Slope:	30°
Ground category::	III
Wind speed:	< 30 m/s





Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=700	90-90	4
F-0180	Dijagonala b	Diagonal b	L=810	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1840	90-90	4
F-0180	Dijagonala c1	Diagonal c1	L=1910	90-90	4
FNE-0006	Dijagonala d	Diagonal d	L=2200	90-90	4
FNE-0006	Greda u nagibu e	The beam in the slope e	L=4400	90-90	4
FNE-0006	Horizontalna greda g	The horizontal beam g	L=6070	90-90	5
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6
F-1767	Ojačanje grede g FNE-0006(p)	Beam reinforcement g FNE-0006(p)	L=500	90-90	8

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	40
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	16
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	24
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	40
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	20
521.417	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4
521.389	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4

Dodaci Accessories		
431.051	Vijak M8x20	Screw M8x20	46
431.087	Vijak M10x70	Screw M10x70	20
431.089	Vijak M10x80	Screw M10x80	20
431.090	Vijak M10x90	Screw M10x90	3
431.562	T vijak M8x30	T Screw M8x30	46
431.561	Vijak M8x18	Screw M8x18	16
431.567	Vijak M8x30	Screw M8x30	24
432.014	Sigurnosna Matica M8	Security Nut M8	92
432.015	Sigurnosna Matica M10	Security Nut M10	43
432.048	Matica s oprugom M8	Nut with spring M8	40
432.113	Podloška U8	Washer U8	92
432.114	Podloška U10	Washer U10	43

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton	The connection of the foundation structure - concrete	
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju	The connection of the foundation structure - ground screw	
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

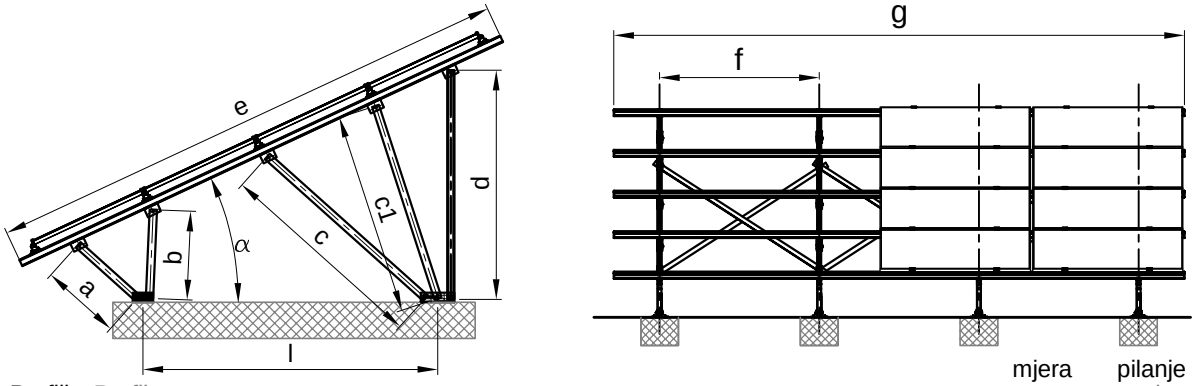
Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

Horizontalna montaža solarnih panela

Solarni panel:	LxHxd=2000±50 x 1000±5x40
Nagib:	30°
Kategorija terena:	III
Brzina vjetra:	30-35 m/s

Horizontalal mounting of solar panels

Solar panel:	LxHxd=2000±50 x 1000±5x40
Slope:	30°
Ground category:	III
Wind speed:	30-35 m/s



Profili Profiles			mjera measure	pilanje cutting	kom pcs
F-0180	Dijagonala a	Diagonal a	L=700	90-90	4
F-0180	Dijagonala b	Diagonal b	L=810	90-90	4
F-0180	Dijagonala c	Diagonal c	L=1840	90-90	4
F-0180	Dijagonala c1	Diagonal c1	L=1910	90-90	4
FNE-0004	Dijagonala d	Diagonal d	L=2200	90-90	4
FNE-0005	Greda u nagibu e	The beam in the slope e	L=4400	90-90	4
FNE-0005	Horizontalna greda g	The horizontal beam g	L=6070	90-90	5
F-1045	Dijagonalna ukruta	Diagonal stiffener	L=2200	90-90	6

Vezni elementi Connection elements			
521.479	Al. podloška 40x40	Al. washer 40x40	40
521.427	Držač solarnog panela - jednostrani	Solar panel holder-single sided	16
521.437	Držač solarnog panela - dvostrani	Solar panel holder-double sided	24
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder	40
521.378	Veza dijagonala i grede u nagibu	The connection of the diagonal and the beam in the slope	20
521.393	Distancer dijagonala Ø 15x1.5	Diagonal spacer Ø 15x1.5	3
521.412	Ojačanje grede (g) FNE-0005	Beam (g) reinforcement FNE-0005	8
521.377	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4
521.389	Stopa za montažu na betonu i vijak za zemlju	Al.footing for concrete and ground screw mounting	4

Dodaci Accessories			
431.051	Vijak M8x20	Screw M8x20	46
431.087	Vijak M10x70	Screw M10x70	20
431.089	Vijak M10x80	Screw M10x80	23
431.562	T vijak M8x30	T Screw M8x30	46
431.561	Vijak M8x18	Screw M8x18	16
431.567	Vijak M8x30	Screw M8x30	24
432.014	Sigurnosna Matica M8	Security Nut M8	92
432.015	Sigurnosna Matica M10	Security Nut M10	43
432.048	Matica s oprugom M8	Nut with spring M8	40
432.113	Podloška U8	Washer U8	92
432.114	Podloška U10	Washer U10	43

PVC PVC			
374.020	PVC podmetač 90mm	Mullion anchor shim 90mm	32

Ovisno o izboru temeljne konstrukcije odabiremo vijčanu vezu.

Depending on the choice of the foundation structure, we choose screw connection

Veza temeljne konstrukcije - beton The connection of the foundation structure - concrete		
430.052	Anker fischer FAZ II 12/50	32

Veza temeljne konstrukcije - vijak za zemlju The connection of the foundation structure - ground screw			
431.106	Vijak M12x40	Screw M12x40	32
432.016	Sigurnosna Matica	Security Nut M12	32
432.115	M12 Podloška U12	Washer U12	64

Dodatni elementi ovog sistema nalaze se na posebnoj reznoj listi na kraju kataloga.
Additional elements of this system can be found on a special cutting list at the end of the catalog.

Za sistem FNE 2000 i sve njegove opcije razvijeni su određeni elementi koji se koriste kao dodatna oprema:

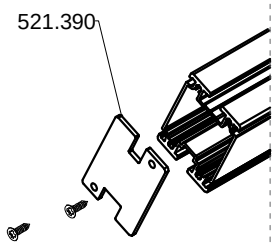
For the FNE 2000 system and all its options, certain elements have been developed that are used as accessories:

Opis: FNE Bočni poklopci na profile — Description: FNE Side covers on profiles

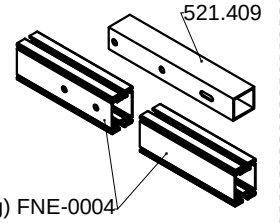
Čepovi služe kako bi se zatvorili svi bočni krajevi profila i to horizontalnih greda (g) i greda u nagibu (e), a spriječio bi se ulazak vode i stvaranje osinjaka koji mogu prouzrokovati otežan pristup konstrukciji.

The plugs serve to close all the side ends of the profile, namely the horizontal beams (g) and the beams in the slope (e), and to prevent the entry of water and the formation of wasps that can cause difficult access to the structure.

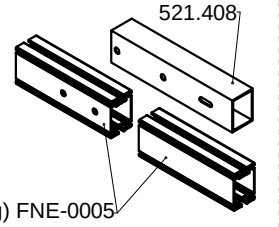
Profil	Profiles		kom pcs
521.392	FNE bočni poklopac 100 (FNE-0001)	Side cover 100 (FNE-0001)	16
521.391	FNE bočni poklopac 60 (FNE-0004)	Side cover 60 (FNE-0004)	16
521.390	FNE bočni poklopac 80 (FNE-0005)	Side cover 80 (FNE-0005)	16
521.418	FNE bočni poklopac 70 (FNE-0006)	Side cover 70 (FNE-0006)	16
433.016	Vijak 3.9x13	Screw 3.9x13	64



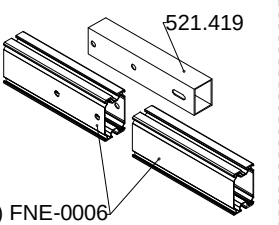
Opis: Spojni element sekundarnih nosača FNE-0004 (g)		Connecting element of secondary supports FNE-0004 (g)	kom pcs
431.060	Vijak M8x60	Screw M8x60	16
431.087	Sigurnosna Matica M8	Security Nut M8	16
431.089	Podloška U8	Washer U8	32
521.409	Spojni element sekundarnih nosača FNE-0004	Connecting element of secondary supports FNE-0004	4



Opis: Spojni element sekundarnih nosača FNE-0005 (g)		Connecting element of secondary supports FNE-0005 (g)	kom pcs
431.060	Vijak M8x60	Screw M8x60	16
431.087	Sigurnosna Matica M8	Security Nut M8	16
431.089	Podloška U8	Washer U8	32
521.408	Spojni element sekundarnih nosača FNE-0005	Connecting element of secondary supports FNE-0005	4



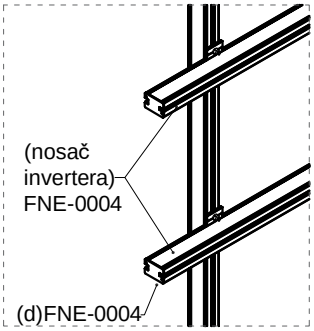
Opis: Spojni element sekundarnih nosača FNE-0006 (g)		Connecting element of secondary supports FNE-0006 (g)	kom pcs
431.060	Vijak M8x60	Screw M8x60	16
431.087	Sigurnosna Matica M8	Security Nut M8	16
431.089	Podloška U8	Washer U8	32
521.419	Spojni element sekundarnih nosača FNE-0006	Connecting element of secondary supports FNE-0006	4



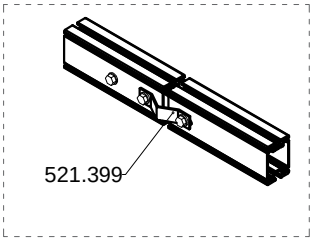
Za sistem FNE 2000 i sve njegove opcije razvijeni su određeni elementi koji se koriste kao dodatna oprema:

For the FNE 2000 system and all its options, certain elements have been developed that are used as accessories:

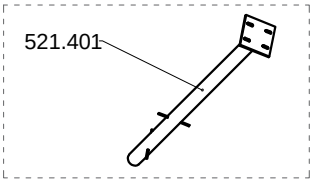
Opis: Nosači invertera		Description: Inverter brackets		kom pcs
FNE-0004	Nosač invertera	Inverter holder	L=2000	2
431.562	T vijak M8x30	T screw M8x30		8
432.014	Sigurnosna Matica M8	Security Nut M8		8
432.113	Podloška U8	Washer U8		8
433.104	Vijak 3.9x13	Screw 3.9x13		16
521.345	Držač primarnog i sekundarnog nosača	Primary and secondary support holder		8
521.387	FNE bočni poklopac 60	Side cover 60		4



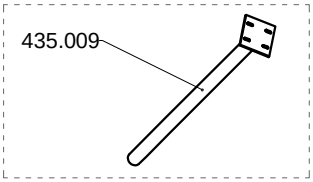
Opis: Dilatacijska premosnica horizontalnih greda (g) Description: Dilation bypas of horizontal beam (g)			kom pcs
1 kom po horizontalnoj gredi (g)		1 piece per horizontal beam (g)	
521.399	Dilatacijska premosnica 90	Dilation bypas 90	5
433.200	Vijak 6.3x25 DIN 7504-K	Screw 6.3x25 DIN 7504-K	5



Opis: Vijak za zemlju (aluminijski) Description: Ground screw (aluminium)			kom pcs
6 kom po sekciji		6 piece per section	
521.401	Vijak za zemlju	Ground screw	6



Opis: Vijak za zemlju (čelični - pocinčani) Description: Ground screw (steel - galvanized)			kom pcs
6 kom po sekciji		6 piece per section	
435.009	Vijak za zemlju	Ground screw	6



FEAL

FNE-2000

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