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TEHNIČNO POROČILO

2 – NAČRT GRADBENIH KONSTRUKCIJ

1) SPLOŠNO

Predmet obdelave je lesena-panelni montažni objekt vrtec Ruše s skupno bruto tlorisno površino cca. 860m2.

Pri tem smo upoštevali naslednje pogoje:

1. Konstrukcijske značilnosti obravnavanega objekta

Vsi konstrukcijski elementi v obravnavanem projektu so dimenzionirani v skladu s Pravilnikom o mehanski odpornosti in stabilnosti, Ur. List RS 101/2005.

Zahteve glede mehanske odpornosti in stabilnosti so izpolnjene s projektiranjem v skladu z načeli in pravili slovenskih standardov:

- SIST EN 1990 Evrokod: Osnove projektiranja konstrukcije
- SIST EN 1991 Evrokod 1: Vplivi na konstrukcije
- SIST EN 1992 Evrokod 2: Projektiranje betonskih konstrukcij
- SIST EN 1993 Evrokod 3: Projektiranje jeklenih konstrukcij
- SIST EN 1994 Evrokod 4: Projektiranje sovprežnih konstrukcij
- SIST EN 1995 Evrokod 5: Projektiranje lesenih konstrukcij
- SIST EN 1996 Evrokod 6: Projektiranje zidanih konstrukcij
- SIST EN 1997 Evrokod 7: Geotehnično projektiranje
- SIST EN 1998 Evrokod 8: Projektiranje potresnoodpornih konstrukcij

Vsi konstrukcijski elementi so dimenzionirani na maksimalne obremenitve, ki bi lahko nastopile v času uporabe objekta v skladu z njihovo kategorijo uporabnosti.

2) KONSTRUKCIJA

Elementi konstrukcije so označeni s pozicijami, ki so podani v nadaljevanju. Vsi vgrajeni leseni konstrukcijski elementi morajo imeti vlažnost pri vgrajevanju manj kot 18%.

- STREŠNA KONSTRUKCIJA

Strešno konstrukcijo tvorijo palični nosilci, ki so podprti samo na zunanjih stenah objekta. Palični nosilci so zavetrovani in med seboj povezani s prostorskim paličjem, ki zagotavlja globalno stabilnost ostrešja. V statičnem preračunu je upoštevan karakteristična oblika paličnega nosilca, ki ga je potrebno v fazi izrisa delavniških načrtov ponovno preračunat skupa s spoji. Pri spremembi smeri strehe je potrebno vgraditi več paličnih nosilcev skupaj oz. preklado, ki bo sposobna prevzet obtežbo. Spoji niso del tega projekta.

- MONTAŽNI STENSKI ELEMENTI

-ZUNANJI STENSKI ELEMENTI

So sestavljeni iz pokončnikov dimenzij 6/16 cm, trdnostnega razreda leda C24, na razmaku maksimalno 57 cm in venca (zgoraj in spodaj) dimenzij 16/8 cm.

Togost panela je dosežena z OSB3 ploščami debeline 15 mm, ki so enostransko pritrjene na okvir s sponkami KG 750,

-NOTRANJI STENSKI ELEMENTI

So sestavljeni iz pokončnikov dimenzij 6/10 cm oz. 6/16 cm, trdnostnega razreda leda C24, na razmaku maksimalno 57 cm in venca (zgoraj in spodaj) dimenzij 10/8 cm.

Togost panela je dosežena z OSB3 ploščami debeline 15 mm, ki so obojestransko pritrjene na okvir s sponkami KG 750,

- SIDRANJE STENSKIH ELEMENTOV

Sidranje pritličnih sten in sten mansarde se izvede z dvižnimi in strižnimi sidri proizvajalca Würth, kot je prikazano na pozicijskih načrtih sidranja sten, z vsemi pripadajočimi elementi, ki jih navaja proizvajalec (žeblji, podložke,…).

- JEKLENE KONSTRUKCIJE

Vsi jekleni konstrukcijski elementi so iz kvalitete S235 in so na ležiščih privijačeni s pločevino na jeklene oz. lesene stebre.

- TEMELJNA PLOŠČA

Temeljna plošča objekta je armirano betonska, debeline d=25 cm z robno poglobitvijo 50x50 cm vzdolž štirih stranic temeljne plošče, kot je prikazano na armaturnih načrtih temeljne plošče.
Kvalitete betona C25/30 in je armirana z armaturnimi mrežami in palicami kvalitete B 500 B. Zaščitni sloj armature je 3,5 cm.
Pri izračunu temeljne plošče je privzet modul reakcije tal k = 6.000 kN/m3 in upoštevana maksimalna napetost v temeljnih tleh 100 kN/m2, kar mora potrditi geomehanik ob pregledu izkopov pred izvedbo temeljne plošče. Nasip pod temeljno ploščo je potrebno izvesti do kote zmrzovanja, kot ga poda geomehanik.
Geomehanik ob pregledu poda svoje mnenje, na podlagi katerega se po potrebi izvede sprememba temeljenja.

- IZVEDBA KONSTRUKCIJE

Pri izvedbi, montaži in izdelavi vseh statičnih elementov je potrebno brezpogojno upoštevati vse statične karakteristike in zagotoviti, da imajo vsi materiali ustrezne A-teste.

Izvajalec mora:

- pri izvedbi konstrukcije v celoti upoštevati določila tega načrta, dopolnjenega z načrtom gradbene konstrukcije za izvedbo,
- zagotoviti v načrtu zahtevano kvaliteto vgrajenih materialov in opravljenih del.

Geomehanik mora:

- pred ali ob izkopu preveriti ali je dosežen modul reakcije tal 6.000 kN/m3 in nosilnost tal 100,0 kPa, kot je upoštevano v tem statičnem izračunu; ugotovljeno dejansko stanje naj se vpiše v gradbeni dnevnik s strani geomehanika;
- ob ugotovitvah odstopanj od predvidenih parametrov takoj obvestiti poleg nadzornega in odgovornega vodje projekta tudi projektanta GK.

Potrebna je kvalitetna hidroizolacija in ustrezna izvedba drenaže.
V primeru kakršnekoli nejasnosti se je izvajalec dolžan obrniti na projektanta. Pri izvedbi in montaži vseh statičnih elementov mora biti prisotna nadzorna oseba s primerno izobrazbo.

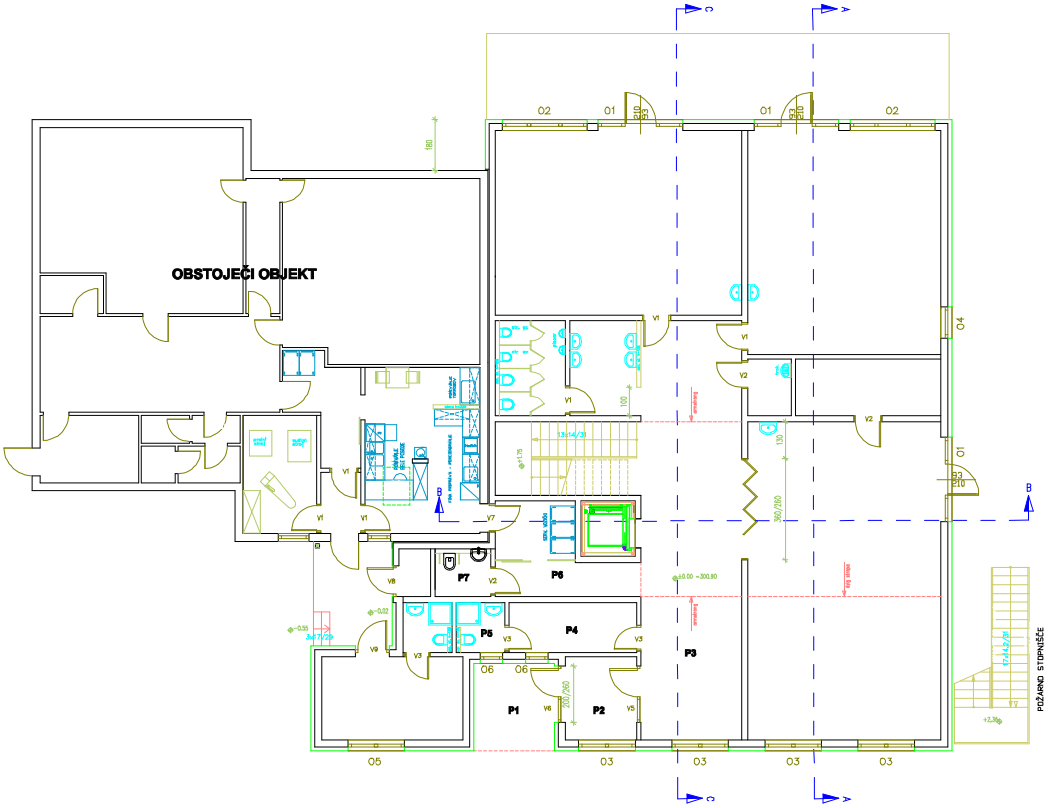
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OPOMBE

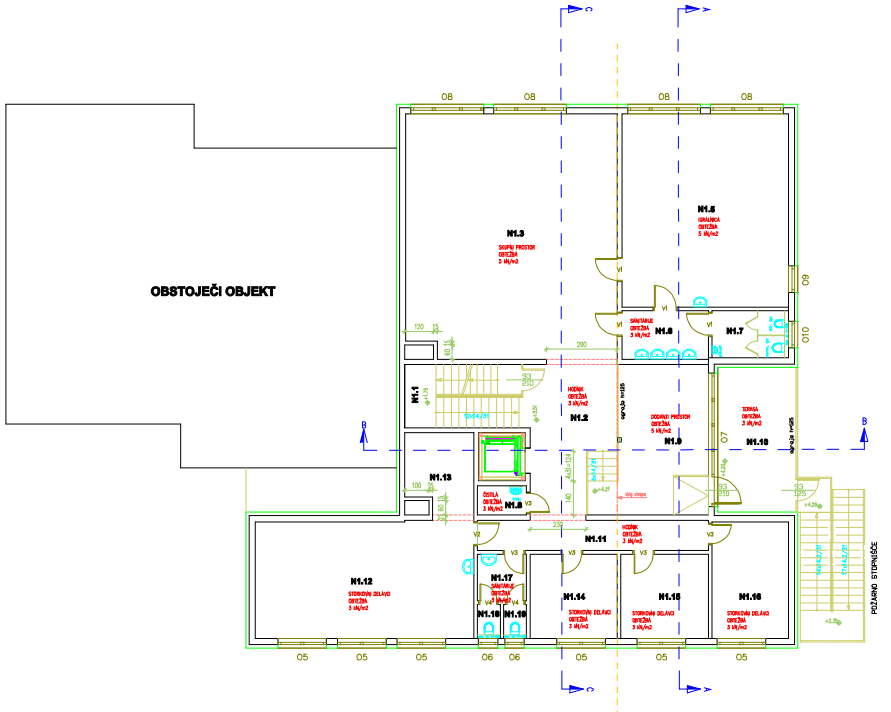
- VSE NEDEFINIRANE PREKLADE SE IZVEDEJO KOT KONSTRUKTIVNE, NA MINIMALNO DVEH POKONČNIKIH V NOTRANJIH IN ENEM POKONČNIKU NA ZUNANJIH STENAH;
- V STROPNEM ELEMENTU SE POD VSAKO STENO (ki poteka v smeri stropnikov) PREDVIDIKONSTRUKTIVNA PREKLADA, SESTAVLJENA IZ DVEH STROPNIKOV (praviloma 2x C24-8/28 cm), ČE NI PREDPISANO DRUGAČE;
- KJER JE V STENI VEČ POKONČNIKOV, MORAJO BITI VSI POSPONKANI;
- V KOLIKOR JE POTREBEN MENJALNIK V STROPU, SE TAM DODA STROPNIK;
- STRIŽNA SIDRA JE POTREBNO NAMESTITI NA VSE STENE, UPOŠTEVA SE RAZMAK PREDIPSAN V STATIKI;
- ZA USTREZNO PRITRDITEV STRIŽNIH IN DVIŽNIH SIDER V NADSTROPJU JE POD VSEMI SIDRI POTREBEN LES V STROPNIH ELEMENTIH;
- POD STEBRI V NADSTROPJU JE POTREBNO V STROPNE ELEMENTE VGRADITI ENAKO POVRŠINO LESA, DA SE OBTEŽBA USTREZNO PRENESE SKOZI STROP NA SPODNJO ETAŽO;
- VSI POKONČNIKI NA KATERE SE PRITRDIJO DVIŽNA SIDRA MORAJO BITI ŠIROKI VSAJ 80 mm (da se zadosti pogojem oddaljenosti veznih sredstev od roba – dva pokončnika debeline 60 mm torej ne ustrezata!)
- VIJAČENJE STROPNIH ELEMENTOV SE IZVEDE PO SPLOŠNIH NAVODILIH, V KOLIKOR NA NAČRTIH STEN V STATIKI NI PREDPISANO DRUGAČE;
- JEKLENE NOSILCE JE POTREBNO S STEBRI KONSTRUKTIVNO POVEZATI - LEŽIŠČE (KOVINSKA PLOŠČICA) IN VIJAK Φ10 NA VSAKI STRANI PROFILA, ČE NI PREDPISANO DRUGAČE;
- LEŽIŠČA JEKLENIH NOSILCEV, KI NALEGAJO NA ZGORNJI VENEC STENE, MORAJO IMETI VSAJ TAKŠNO POVRŠINO, KOT JO IMA PODPORA POD VENCEM.
- DELAVNIŠKA DOKUMENTACIJA ZA LESENE IN JEKLENE KONSTRUKCIJE SE POŠLJE V PREGLED IN POTRDITEV PROJEKTANTU GRADBENIH KONSTRUKCIJ

3) ZASNOVA

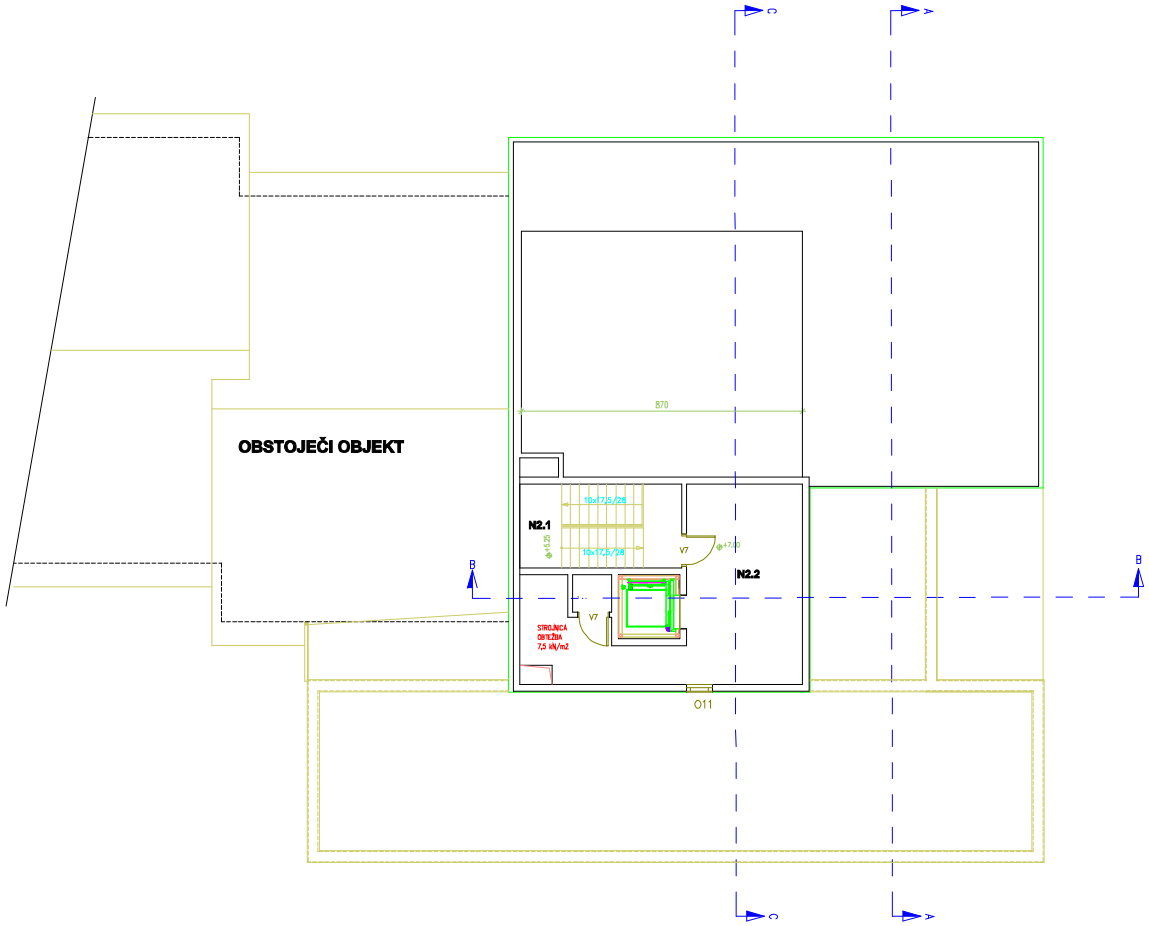
- **Tloris pritličja**



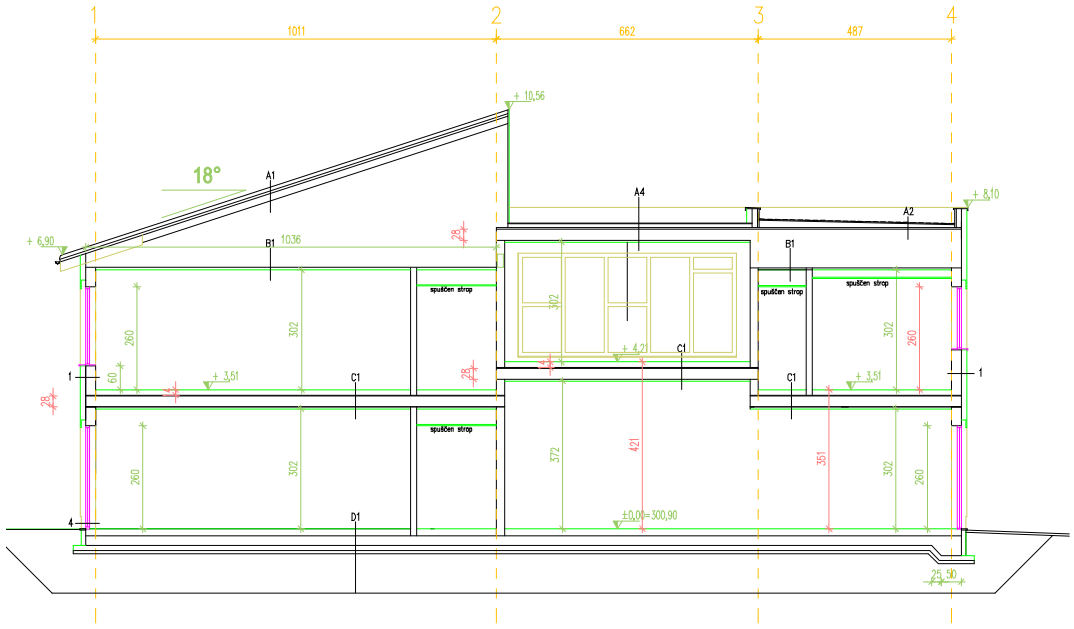
- **Tloris 1. nadstropja**



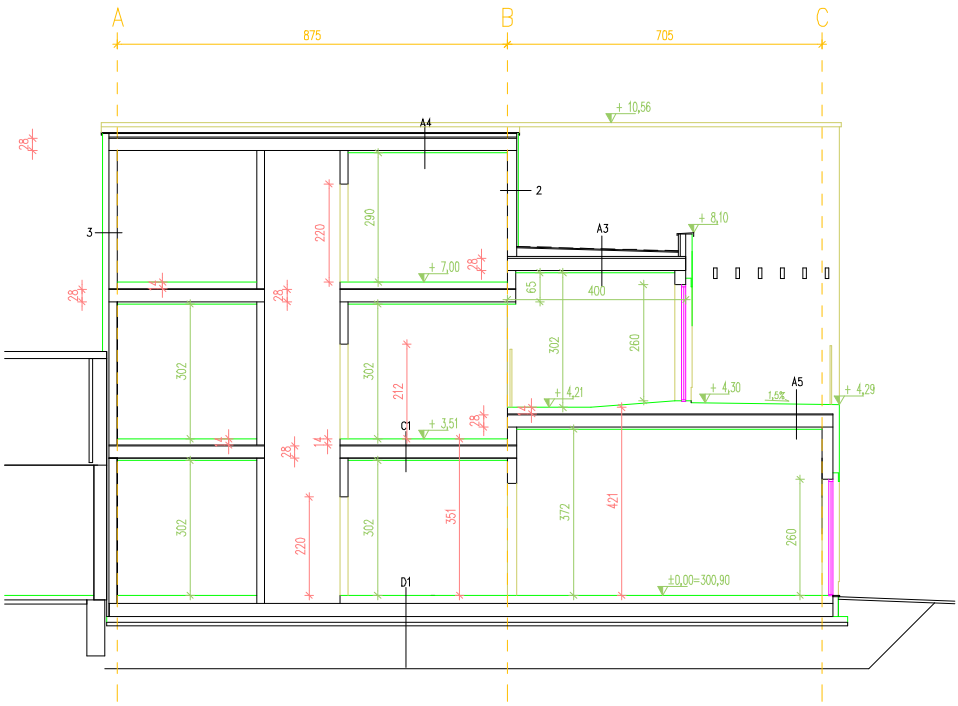
- **Tloris 2. nadstropja**



- **Prerez A-A**

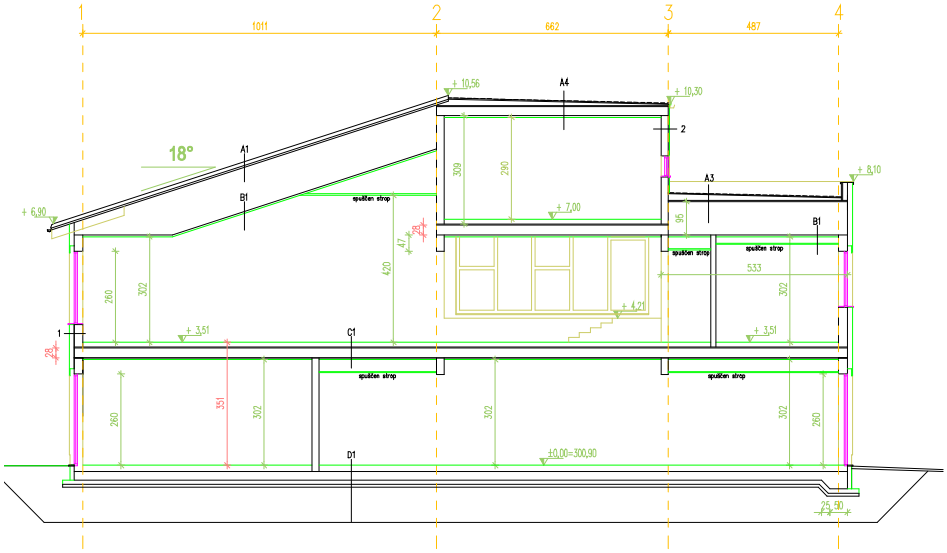


- **Prerez B-B**



-

- **- Prerez C-C**



-

4) STALNI IN ZAČASNI VPLIVI

5.1 Lastna teža konstrukcijskih elementov

Stalna obtežba strehe (ravna streha)

			kN/m²	
Pločevinasta kritina	/		0,15	kN/m²
filc	/		/	
strešna folija 0.3 mm	0.3 cm		0,021	kN/m²
deske	2 cm		0,1	kN/m²
naklonska konstrukcija	2 cm		0,033	kN/m²
OSB 3	1.8 cm		0,126	kN/m²
mineralna volna	20 cm		0,14	kN/m²
PE folja	0		0	
letve	4 cm		0,06	
mavčno-vlaknena plošča (MVP)	1.25 cm		0,15	kN/m²
mavčno-kartonska plošča (MKP)	1.25 cm		0,15	
		∑	0,94	kN/m²

Stalna obtežba strehe (paličje – enokapnica)

strešna kritina - pločevina	/		0,15	kN/m²
strešne letve 48mm	4.8 cm		0,056	kN/m²
kontra letve 48 mm	4.8 cm		0,056	kN/m²
strešna folija 0.3 mm	0.03 cm		0,021	kN/m²
deske	27.0 cm		0,10	kN/m²
palični nosilec	22.0 cm		/	kN/m²
mineralna volna	30 cm		0,21	kN/m²
spodnji pas paličnega nosilca	4.4 cm		0	kN/m²
PE folja	0		0	
letve	4		0,033	
Kontra letve	4		0,033	
mavčno-vlaknena plošča (MKP)	1.25 cm		0,15	kN/m²
mavčno-kartonska plošča (MKP)	1.25 cm		0,15	kN/m²
Od tega:				
Obtežba na streho		∑	0,383	kN/m²
Obtežba na strop nadstropja		∑	0,622	kN/m²
SKUPAJ:		∑	1,005	kN/m²

Stalna obtežba strehe (paličje – ravna streha)

prodec 13/32 – 10 – 50 mm	6,0 cm	1,2	kN/m^2
paroprepustni filc 200g/mm	/	/	kN/m^2
Termoplastična izolacija	/	/	kN/m^2
Naklonski EPS	45 cm	0,036	kN/m^2
EPS	15 cm	0,045	kN/m^2
OSB	1.8 cm	0,126	kN/m^2
palični nosilec	/		kN/m^2
mineralna volna	20 cm	0,14	kN/m^2
spodnji pas paličnega nosilca	/		kN/m^2
PE folja	0	0	
letve	4	0,056	
mavčno-vlaknena plošča (MVP)	1.25 cm	0,15	kN/m^2
mavčno-kartonska plošča (MKP)	1.25 cm	0,15	kN/m^2

Od tega:			
Obtežba na streho		∑ 1,400	kN/m^2
Obtežba na strop nadstropja		∑ 0,500	kN/m^2
SKUPAJ:		∑ 1,9	kN/m^2

Stalna obtežba etažnih plošč (notranji prostori)

		kN/m^2	
obloga	1.0 cm	0,25	kN/m^2
lepilo	0.02 cm	0	kN/m^2
mikroarmirani estrih	6 cm	1,5	kN/m^2
sistemska plošča	3.5 cm	0,03	kN/m^2
OSB3	1.8 cm	0,108	kN/m^2
stropniki	24.0 cm	0.27	kN/m^2
izolacija med stropniki	28.0 cm	0,126	kN/m^2
stropne letve	2.2 cm	0,056	kN/m^2
mavčno-kartonska plošča (MKP)	1.25 cm	0,15	kN/m^2
	∑	2,50	kN/m^2

Notranje stene:

		kN/m^2	
OSB3 plošča	1.5 cm	0,2	kN/m^2
konstrukcija	10.0 cm	0,07	kN/m^2
mineralna volna	5.0 cm	0.04	kN/m^2
OSB3 plošča	1.5 cm	0,2	kN/m^2
	∑	0,51	kN/m^2

Zunanje stene:

			kN/m^2	
dekorativni omet	0.2 cm		0	kN/m^2
armirna malta	0.25 cm		0,14	kN/m^2
izolacija neopor	14.0 cm		0,05	kN/m^2
disperzijsko lepilo	0.2 cm		0	kN/m^2
OSB 3 plošča	1.5 cm		0,18	kN/m^2
nosilna lesena konstrukcija	16.0 cm		0,10	kN/m^2
izolacija v konstrukciji	14.0 cm		0,13	kN/m^2
PE folija	0.02 cm		0	kN/m^2
mavčno-vlaknena plošča (MVP)	1.5 cm		0,2	kN/m^2
		∑	0,8	kN/m^2

5.2 Nezgodna obtežba:

Seizmična obtežba:

Lokacija: Ruše

Projektni pospešek tal: 0,10 g

Upoštevana kategorija tal: D

6.2 Koristne obtežbe

Koristna obtežba na streho:
q = 0,4 kN/m2 – Kategorija H

Koristna obtežba na strop 1. nadstropja:
q = 3,0 kN/m2 – strojnica
Ter lokalno po načrtu strojnih inštalacij

Koristna obtežba na strop pritličja:
q = 3,0 kN/m2 – Kategorija C
q = 5,0 kN/m2 – Kategorija C – v skupnih prostorih in igralnici

Koristna obtežba temeljne plošče :
q = 3,0 kN/m2 – Kategorija C

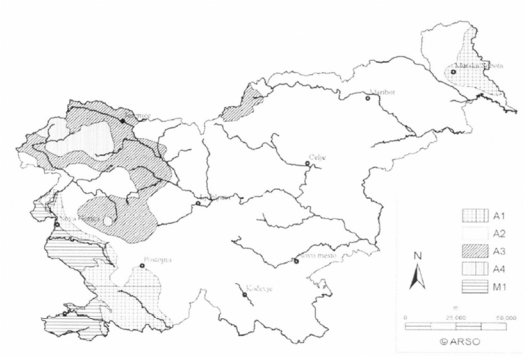
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Obtežba snega

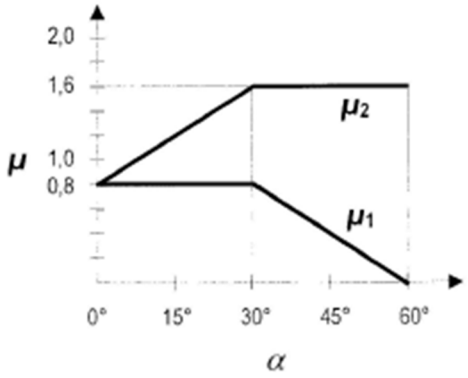
Podatki:

Kraj: Ruše
Snežna Cona: A2
N.M.V.: 295 m
Naklon α1: 15 °
Naklon α2: 15 °

Obtežba snega na tleh odvisna od snežne cone in NMV:
Sk= 1,293(1+(A/728)^2)
Sk= 1,5053146 kN/m2



Snežna karta Slovenije razdeljena na 5 snežnih con



Oblikovni koenficient obtežbe snega

Izračun obtežbe snega na strehi:

$$S = \mu \cdot Ce \cdot Ct \cdot Sk$$

μ= 0,8 μ - oblikovni koeficient obtežbe snega
Ce= 1,0 Ce - koeficient izpostavljenosti
Ct= 1,0 Ct - toplotni koeficient

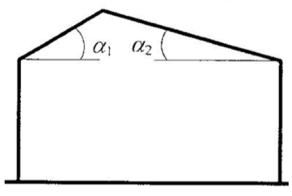
S= 1,204	**kN/m2**	α1
S= 1,204	**kN/m2**	α2

KOMBINACIJE PRI DVOKAPNICAH

S= 1,204 S= 1,204

S= 0,602 S= 1,204

S= 1,204 S= 0,602



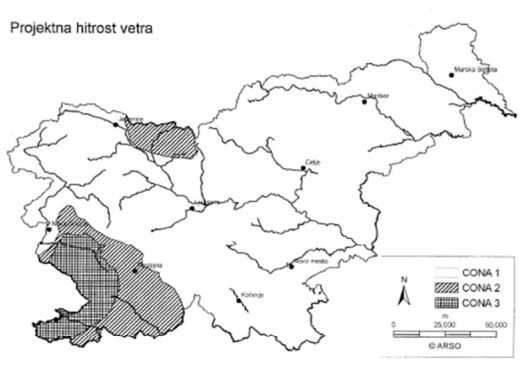
Raporeditev obtežbe snega glede na naklonski kot strehe

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Partizanska cesta 3-5
2000 Maribor

Obtežba vetra

Podatki:

Kraj:	Ruše	**Vb,0=**	**20 m/s --> Projektna hitrost**
Vetrna cona:	1	**Kategorija terena:**	3
N.M.V.:	295 m		
Višina objekta:	9,5 m		



Hitrosti vetra:

Cona 1 (večina Slovenije):
20 m/s pod 800m
25 m/s od 800 m do 1600 m
30 m/s od 1600 m do 2000 m
40 m/s nad 2000 m

Cona 2 (Trnovski gozd, Notranjska, Karavanke):
25m/s pod 1600 m
30 m/s od 1600 do 2000 m
40 m/s nad 2000 m

Cona 3 (Primorje, Kras in del Vipavske doline):
30 m/s

Vetrna karta Slovenije razdeljena na 3 vetrne cone in hitrosti vetra glede na nadmorsko višini

Osnovna hitrost vetra

Vb=Cdir*Cseason*Vb,0

Cdir=	1,0	Cdir - smerni faktor
Cseason=	1,0	Cseason - faktor letnega časa
Vb=	20	m/s

Srednji veter

Vm(z)=Cr(z)*Co(z)*Vb

Cr(Z)=	*0,7442271*	Cr(z) - faktor hrapavosti terena
Co(z)=	1,0	co(z) - faktor hribovitosti
Vm(z)=	14,88	m/s

Vetrna turbolenca

Iv(z)= 0,28941344

Tlak pri največji hitrosti ob sunku vetra

qp(z)=(1+7*Iv(z))*0,5*ρ*Vm(z)^2 ρ= 1,25 kg/m^3 --> gostota zraka

qp(z)=	**0,419**	**kN/m2**	**(največji tlak pri sunkih vetra)**

TRDNOSTNE IN TOGOSTNE KARAKTERISTIKE UPORABLJENIH MATERIALOV

Les C24

$f_{m,k}$	24,0	N/mm2
$f_{t,0,k}$	14,0	N/mm2
$f_{t,90,k}$	0,4	N/mm2
$f_{c,0,k}$	21,0	N/mm2
$f_{c,90,k}$	2,5	N/mm2
$f_{v,k}$	4,0	N/mm2
$E_{0,05}$	7400,0	N/mm2
$E_{0,mean}$	11000,0	N/mm2
$E_{90,mean}$	370,0	N/mm2
G_{mean}	690,0	N/mm2
ρ_k	350,00	kg/m3
ρ_{mean}	420,00	kg/m3

Les GL24h

$f_{m,k}$	24,0	N/mm2
$f_{t,0,k}$	16,5	N/mm2
$f_{t,90,k}$	0,4	N/mm2
$f_{c,0,k}$	24,0	N/mm2
$f_{c,90,k}$	2,7	N/mm2
$f_{v,k}$	2,7	N/mm2
$E_{0,05}$	9400,0	N/mm2
$E_{0,mean}$	11600,0	N/mm2
$E_{90,mean}$	390,0	N/mm2
G_{mean}	720,0	N/mm2
ρ_k	380,00	kg/m3
ρ_{mean}	460,00	kg/m3

OSB 3		
$f_{m,k}$	9,4	N/mm2
$f_{t,0,k}$	9,4	N/mm2
$f_{t,90,k}$	0,3	N/mm2
$f_{c,0,k}$	15,4	N/mm2
$f_{v,k}$	6,8	N/mm2
$E_{0,mean}$	3800,0	N/mm2
$E9_{0,mean}$	3000,0	N/mm2
G_{mean}	1080,0	N/mm2
ρ_{mean}	600,00	kg/m3

MAVČNO VLAKNENA PLOŠČA		
$f_{m,k}$	4,0	N/mm2
$f_{t,0,k}$	2,4	N/mm2
$f_{c,0,k}$	8,5	N/mm2
$f_{v,k}$	3,5	N/mm2
$E_{0,mean}$	3800,0	N/mm2
G_{mean}	1600,0	N/mm2
ρ_{mean}	1150,00	kg/m3

Jeklo S235		
E	2.10E+03	N/mm2
G	8.08E+02	N/mm2
f_y	235,0	N/mm2
v	0.30	
α	12.00E-06	1/K

4. Statični izračun

POVZETEK STATIKE

Item	Description	Material	Geometry
Chapter : Statični izračun / Izračun pozicij / 2. nadstropje			
Poz.100a	Streha	Softwood C24	2 Felder, 8/28
Poz.100b	Streha	Softwood C24	1 Feld, 8/28
Poz.101	Preklada nad oknom	Softwood C24	1 Feld, 2x8/16
Poz.102	Preklada nad oknom	Softwood C24	1 Feld, 2x8/16
Poz.103	Preklada v stropu	Glulam GL24h	1 Feld, 16/20
Poz.104	Preklada v stropu	Glulam GL24h	1 Feld, 16/20
Chapter : Statični izračun / Izračun pozicij / 1. nadstropje			
Poz.200a	Streha	Softwood C24	Palični nosilec
Poz.200b	Streha	Softwood C24	Palični nosilec
Poz.200c	Strop 1. nadstropja	Softwood C24	1 Feld, 8/28
Poz.200d	Strop 1. nadstropja	Softwood C24	1 Feld, 8/28
Poz.200e	Strop 1. nadstropja	Softwood C24	1 Feld, 8/28
Poz.200f	Strop 1. nadstropja	Softwood C24	1 Feld, 8/28
Poz.200g	Strop 1. nadstropja	Softwood C24	3 Felder, 8/28
Poz.200h	Streha	Softwood C24	Palični nosilec
Poz.201	Preklada nad oknom	Glulam GL24h	1 Feld, 16/36
Poz.202	Preklada pri stopnišču	S235	1 Feld, HEA 240
Poz.203	Preklada nad vrati	Glulam GL24h	1 Feld, 16/20
Poz.204	Preklada nad vrati	Glulam GL24h	1 Feld, 10/28
Poz.205	Preklana nad oknom	Glulam GL24h	1 Feld, 16/20
Poz.206	Preklana nad oknom	Glulam GL24h	1 Feld, 16/28
Poz.207	Preklana nad oknom	Glulam GL24h	2 Felder, 16/52
Poz.208	preklada nad oknom	S235	1 Feld, HEB 240
Poz.209	Preklana nad oknom	Glulam GL24h	1 Feld, 16/20
Poz.210	Preklana nad oknom	Softwood C24	1 Feld, 2x8/16
Poz.211	Preklana nad oknom	Glulam GL24h	2 Felder, 16/32
Chapter : Statični izračun / Izračun pozicij / Pritličje			
Poz.300a	Strop pritličja	BauBuche S	1 Feld, 6/28
Poz.300b	Strop pritličja	Softwood C24	2 Felder, 8/28
Poz.300c	Strop pritličja	Softwood C24	1 Feld, 8/28
Poz.300d	Strop pritličja	Softwood C24	1 Feld, 8/28
Poz.300e	Strop pritličja	Softwood C24	1 Feld, 8/28
Poz.300f	Strop pritličja	Softwood C24	1 Feld, 8/28
Poz.300g	Strop pritličja	Softwood C24	1 Feld, 8/28
Poz.300h	Strop pritličja	Softwood C24	2 Felder, 8/28
Poz.300i	Strop pritličja	Softwood C24	1 Feld, 8/28
Poz.300j	Strop pritličja	Softwood C24	3 Felder, 8/28
Poz.300k	Strop pritličja	Softwood C24	3 Felder, 8/28
Poz.300l	Strop pritličja	Softwood C24	1 Feld, 8/28
Poz.300m	Strop pritličja	BauBuche S	1 Feld, 6/28
Poz.300n	Strop pritličja	BauBuche S	1 Feld, 8/28
Poz.301	Preklana nad oknom	Glulam GL24h	2 Felder, 16/40
Poz.302	Jeklena preklada v stropu	S235	1 Feld, HEM 260
Poz.303	Preklana v stropu	Glulam GL24h	1 Feld, 20/48
Poz.304	Preklada nad vrati	Glulam GL24h	1 Feld, 16/24
Poz.305	Preklana nad oknom	Glulam GL24h	1 Feld, 16/28
Poz.306	Preklana nad oknom	Glulam GL24h	1 Feld, 16/20
Poz.307_spodaj		Glulam GL24h	1 Feld, 16/36
Poz.307_zgoraj	Jeklena preklada v stropu	S235	1 Feld, HEM 240
Poz.308	Jeklena preklada v stropu	S235	1 Feld, HEM 240
Poz.309	Preklada nad vrati	Glulam GL24h	1 Feld, 16/28
Poz.310	Preklada v stropu	Glulam GL24h	1 Feld, 16/28
Poz.311	Preklada nad vrati	Glulam GL24h	1 Feld, 10/20
Poz.312	Preklana v stropu	Glulam GL24h	1 Feld, 20/48
Poz.313	Preklana nad vrati	Glulam GL24h	1 Feld, 16/20
Poz.314_spodaj	Jeklena preklada v stropu	S235	1 Feld, HEM 240
Poz.314_zgoraj	Jeklena preklada v stropu	S235	1 Feld, HEM 280
Poz.315	Preklada nad vrati	Glulam GL24h	1 Feld, 16/28
Poz.316	Preklada nad vrati	Glulam GL24h	1 Feld, 10/24

Item	Description	Material	Geometry
Poz.317	Preklada nad vrati	Glulam GL24h	1 Feld, 16/28
Poz.318	Preklada nad vrati	Glulam GL24h	1 Feld, 16/24
Poz.319	Jeklena preklada v stropu	S235	1 Feld, HEA 240
Poz.320	Preklana v stropu	Glulam GL24h	1 Feld, 16/28
Poz.321	Preklada nad vrati	Glulam GL24h	1 Feld, 10/28
Poz.322	Preklada nad vrati	Glulam GL24h	1 Feld, 10/28
Poz.323	preklada pod stropom	S235	2 Felder, HEB 280
Poz.324	preklada pod stropom	S235	2 Felder, HEB 240

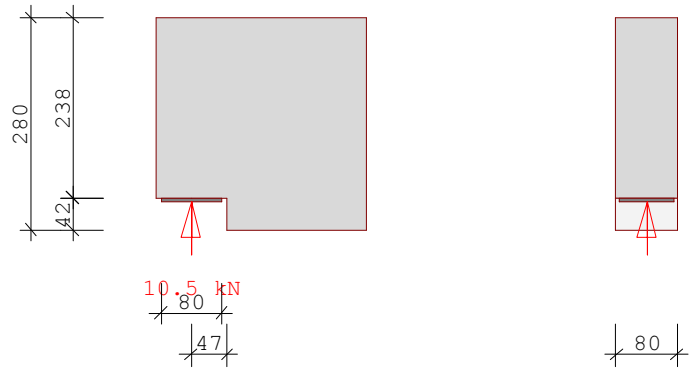
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Partizanska cesta 3-5
2000 Maribor

4.1. Detajli

Zasek - HEM 240

Timber Construction Details HO12 02/2020 (Frilo R-2022-1/P08)

Scale 1 : 10



MATERIAL: Softwood C24 (EN 338:2016), service class 2
$f_{m,k}$=24.0 MN/m2; $f_{v,k}$=4.0 MN/m2; $f_{c,90,k}$=2.5 MN/m2;
$f_{t,90,k}$=0.4 MN/m2; γ_M=1.30 ; ρ_k=350 kg/m3; k_h=1.000 ;

DIMENSIONS

beam		width	b =	80 mm	height	h =	280 mm
notching	:bottom height		a =	42 mm	residual heigth h_e=		238 mm
		distance	c =	47 mm	Alpha= h_e/h=		0.85
support		length	l_P=	80 mm	eff. L	l_A=	94 mm
			k_{c90}=	1.00			

INTERNAL FORCES

shear force V_d= 10.5 kN, LDC=medium-term k_{mod} = 0.80

VERIFICATION acc. to DIN EN 1995-1-1/NA:2013-08
based on EN 1995-1-1/A2:2014

persistent and transient situation
Nach DIN 1052:2008 geprüft werden: he/h >= 0.5, c/h <= 0.4
proof of shear stress without reinforcing
k_{cr} = 0.50 k_v = 0.67
existτ = 1.65 MN/m2 > permτ = 1.64 MN/m2 (1.01)
-> no reinforcing required

pressure support
existσ_{90d}= 1.40 MN/m2 < $f_{c,90,d}$ = 1.54 MN/m2 (0.91)
Biegespannung im Restquerschnitt
existM_{cd} = 0.49 kNm
existσ_m = 0.65 MN/m2 < $f_{m,d}$ = 14.77 MN/m2 (0.04)

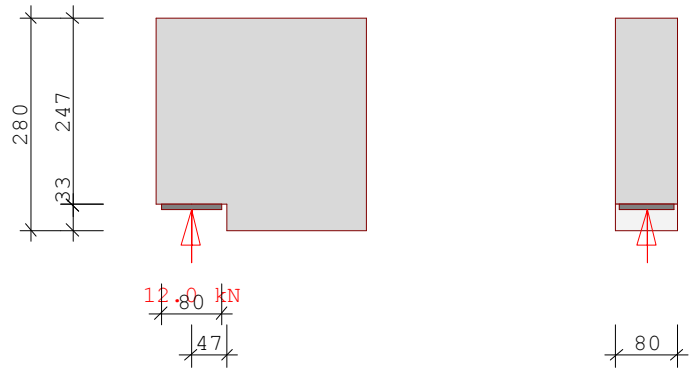
recommendation:
A rounded corner of the notching reduces the real tensile stress
perpendicular to the grain significantly.

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Zasek - HEM 260

Timber Construction Details HO12 02/2020 (Frilo R-2022-1/P08)

Scale 1 : 10



MATERIAL: Softwood C24 (EN 338:2016), service class 2
$f_{m,k}$=24.0 MN/m2; $f_{v,k}$=4.0 MN/m2; $f_{c,90,k}$=2.5 MN/m2;
$f_{t,90,k}$=0.4 MN/m2; γ_M=1.30 ; ρ_k=350 kg/m3; k_h=1.000 ;

DIMENSIONS

beam		width	b =	80 mm	height	h =	280 mm
notching	:bottom height		a =	33 mm	residual heigth	h_e=	247 mm
		distance	c =	47 mm	Alpha= h_e/h=		0.88
support		length	l_P=	80 mm	eff. L	l_A=	94 mm
			k_{c90}=	1.00			

INTERNAL FORCES

shear force V_d= 12.0 kN, LDC=medium-term k_{mod} = 0.80

VERIFICATION acc. to DIN EN 1995-1-1/NA:2013-08
based on EN 1995-1-1/A2:2014

persistent and transient situation
Nach DIN 1052:2008 geprüft werden: he/h >= 0.5, c/h <= 0.4
proof of shear stress without reinforcing

k_{cr}	=	0.50		k_v	=	0.74
existτ	=	1.82 MN/m2	<	permτ	=	1.83 MN/m2 (1.00)

-> no reinforcing required

pressure support
existσ_{90d}= 1.60 MN/m2 > $f_{c,90,d}$ = 1.54 MN/m2 (1.04)
Biegespannung im Restquerschnitt
existM_{cd} = 0.56 kNm
existσ_m = 0.69 MN/m2 < $f_{m,d}$ = 14.77 MN/m2 (0.05)

recommendation:
A rounded corner of the notching reduces the real tensile stress perpendicular to the grain significantly.

Detajl pritrjevanja s Kölnerjevim spojem

Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

IDEA StatiCa
Calculate yesterday's estimates

Project data

Project name	Vrtec Ruše
Project number	22-P035-K
Author	Probit d.o.o.
Description	Kölnerjev spoj
Date	23. 02. 2021
Design code	EN

Material

Steel	S 235

Project: **Vrtec Ruše**
Project no: **22-P035-K**
Author: **Probit d.o.o.**

IDEA StatiCa
Calculate yesterday's estimates

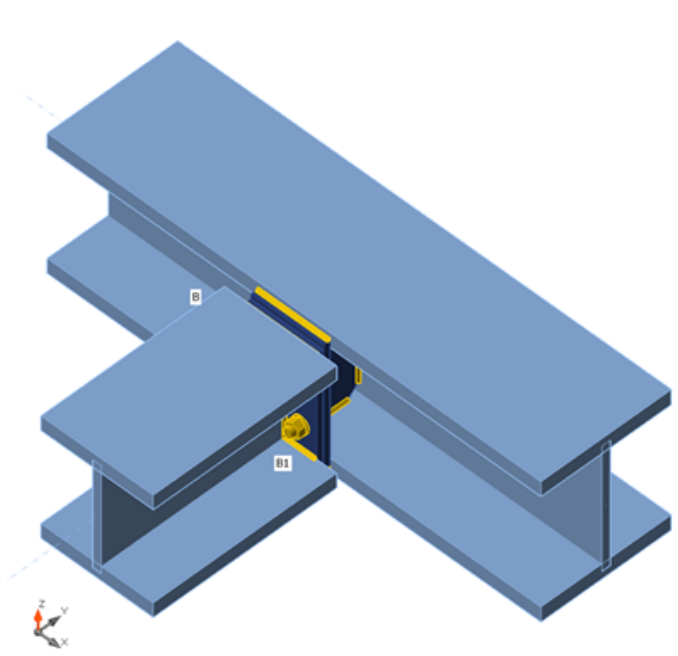
Project item Kölnerjev spoj - HEM280- HEM240

Design

Name	Kölnerjev spoj - HEM280- HEM240
Description	4x M20
Analysis	Joint design resistance

Beams and columns

Name	Cross-section	β – Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [mm]	Offset ey [mm]	Offset ez [mm]	Forces in
B	13 - HEM280	0,0	0,0	0,0	0	0	0	Node
B1	12 - HEM240	-90,0	0,0	0,0	0	0	0	Node



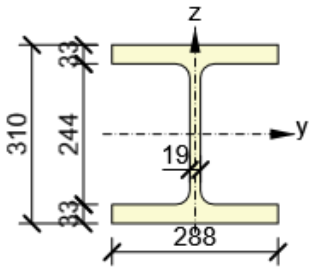
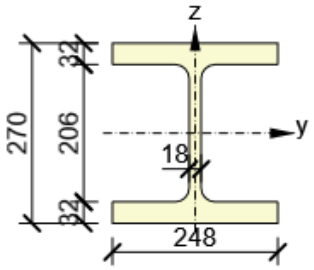
Cross-sections

Name	Material
13 - HEM280	S 235
12 - HEM240	S 235

Project: **Vrtec Ruše**
Project no: **22-P035-K**
Author: **Probit d.o.o.**

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Cross-sections

Name	Material	Drawing
13 - HEM280	S 235	
12 - HEM240	S 235	

Bolts

Name	Bolt assembly	Diameter [mm]	fu [MPa]	Gross area [mm^2]
M20 10.9	M20 10.9	20	1000,0	314

Load effects

Name	Member	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	B1	0,0	0,0	-130,0	0,0	0,0	0,0

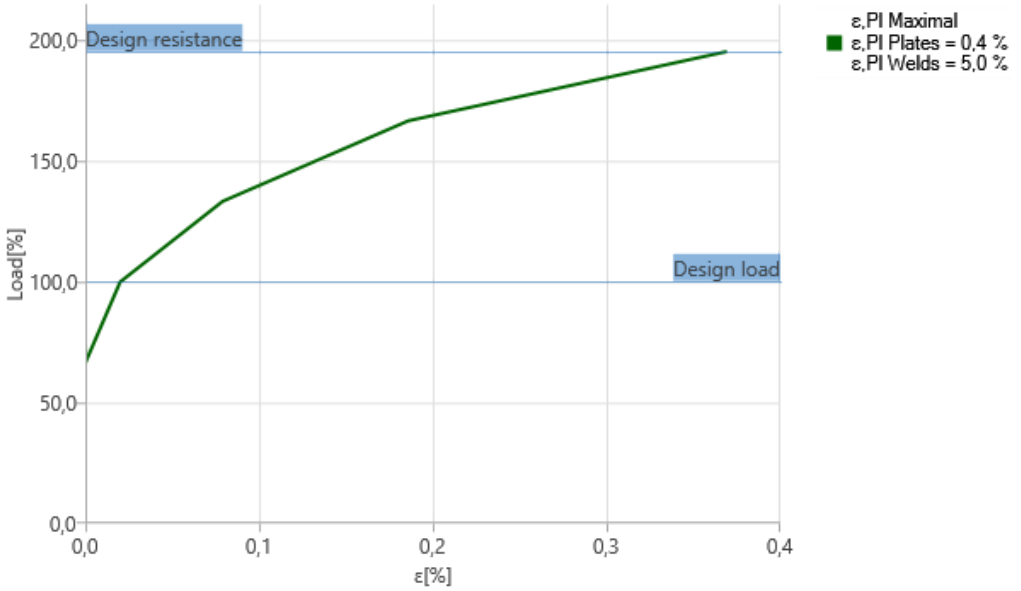
Check

Joint design resistance

Loads	Resistance [%]
LE1	195,3

Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

IDEA StatiCa
Calculate yesterday's estimates



Joint design resistance, LE1

Summary

Name	Value	Status
Plates	0,0 < 5,0%	OK
Bolts	61,2 < 100%	OK
Welds	98,0 < 100%	OK

Plates

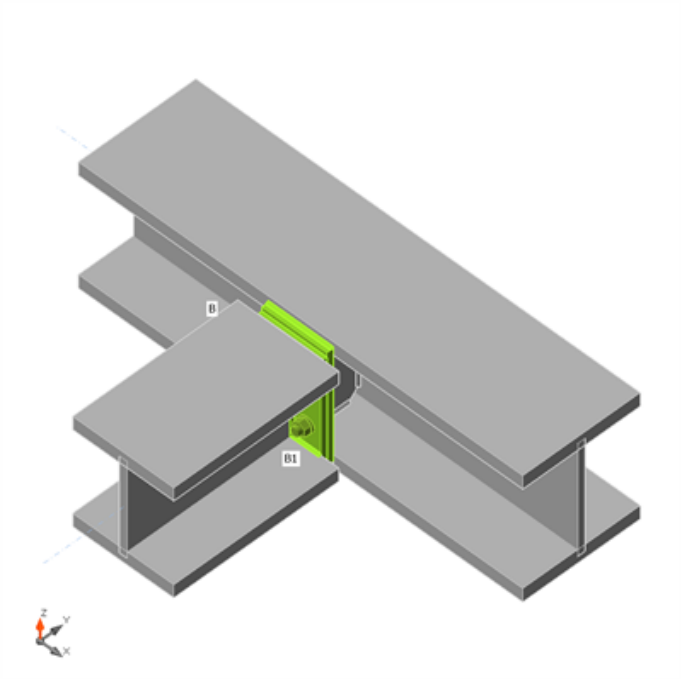
Name	Thickness [mm]	Loads	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Status
B-bfl 1	33,0	LE1	30,6	0,0	0,0	OK
B-tfl 1	33,0	LE1	36,6	0,0	0,0	OK
B-w 1	18,5	LE1	40,5	0,0	0,0	OK
B1-bfl 1	32,0	LE1	56,8	0,0	0,0	OK
B1-tfl 1	32,0	LE1	41,5	0,0	0,0	OK
B1-w 1	18,0	LE1	80,0	0,0	0,0	OK
SEP1a	15,0	LE1	222,3	0,0	28,0	OK
SEP1b	15,0	LE1	218,2	0,0	62,2	OK
STIFF	15,0	LE1	112,1	0,0	0,0	OK

Design data

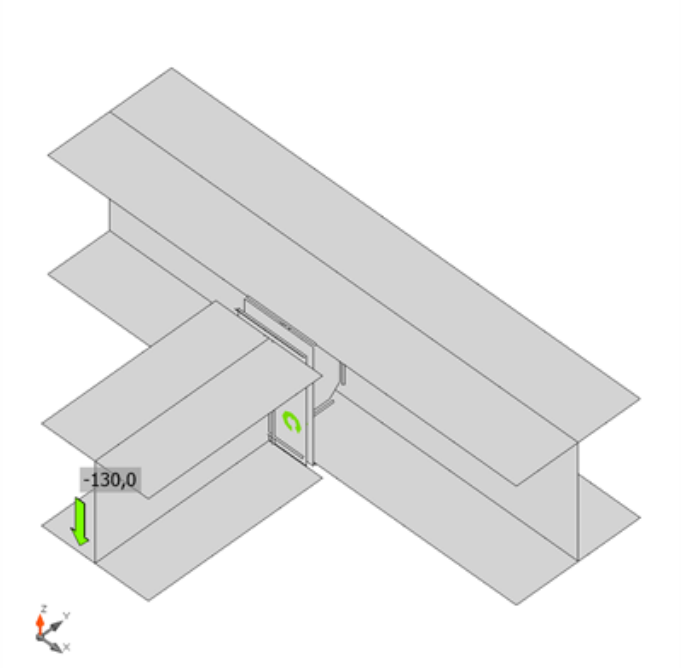
Material	f_y [MPa]	ε_{lim} [%]
S 235	235,0	5,0

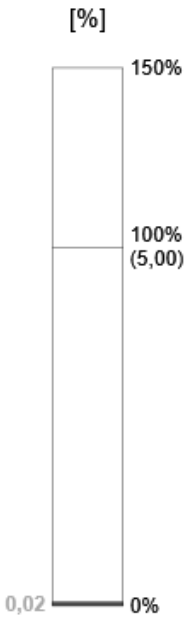
Project:	**Vrtec Ruše**
Project no:	**22-P035-K**
Author:	**Probit d.o.o.**

IDEA StatiCa
Calculate yesterday's estimates



Overall check, LE1

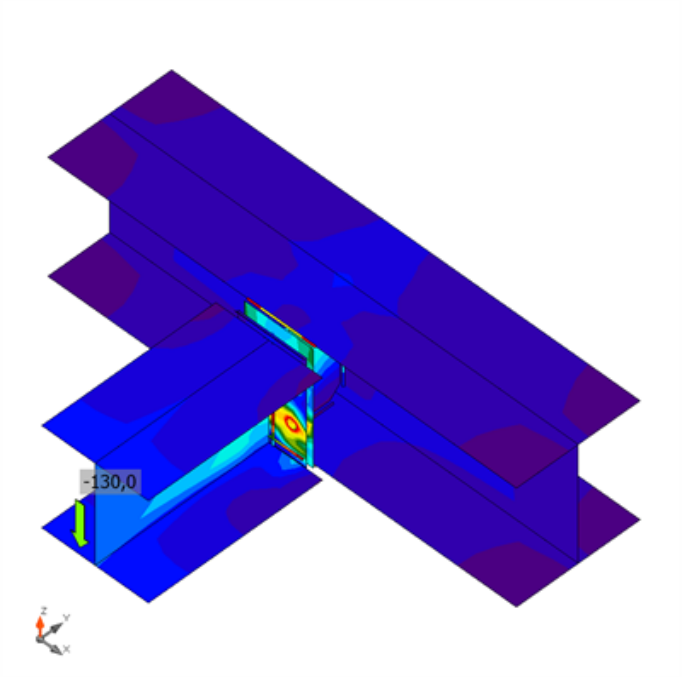




Strain check, LE1

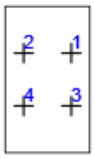
Project:	**Vrtec Ruše**
Project no:	**22-P035-K**
Author:	**Probit d.o.o.**

IDEA StatiCa
Calculate yesterday's estimates



Equivalent stress, LE1

Bolts

	Name	Loads	$F_{t,Ed}$ [kN]	V [kN]	Ut_t [%]	$F_{b,Rd}$ [kN]	Ut_s [%]	Ut_{ts} [%]	Status
	B1	LE1	17,0	32,5	9,7	216,0	33,1	40,0	OK
	B2	LE1	17,4	32,5	9,8	216,0	33,2	40,2	OK
	B3	LE1	69,2	32,5	39,2	216,0	33,2	61,2	OK
	B4	LE1	68,9	32,5	39,1	216,0	33,2	61,1	OK

Design data

Name	$F_{t,Rd}$ [kN]	$B_{p,Rd}$ [kN]	$F_{v,Rd}$ [kN]
M20 10.9 - 1	176,4	272,9	98,0

Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

IDEA StatiCa
Calculate yesterday's estimates

Welds (Plastic redistribution)

Item	Edge	Throat th. [mm]	Length [mm]	Loads	$\sigma_{w,Ed}$ [MPa]	ε_{Pl} [%]	$\sigma_{\perp}$ [MPa]	$\tau_{\parallel}$ [MPa]	$\tau_{\perp}$ [MPa]	Ut [%]	Ut_c [%]	Status
SEP1a	B-tfl 1	◢4,0	160	LE1	220,6	0,0	-75,7	-2,6	119,6	61,3	48,5	OK
SEP1a	B-bfl 1	◢4,0	160	LE1	55,8	0,0	-55,6	1,5	-2,4	21,4	12,5	OK
SEP1b	B1-bfl 1	◢4,0◣	160	LE1	248,0	0,0	155,1	-6,3	-111,6	68,9	47,4	OK
		◢4,0◣	160	LE1	127,5	0,0	-58,1	-20,6	62,2	35,4	22,8	OK
SEP1b	B1-tfl 1	◢4,0◣	160	LE1	201,2	0,0	-108,1	-15,9	-96,7	55,9	52,7	OK
		◢4,0◣	160	LE1	156,8	0,0	-95,8	11,9	-70,7	43,6	27,6	OK
SEP1b	B1-w 1	◢4,0◣	238	LE1	247,3	0,0	95,2	-93,0	93,4	68,7	37,5	OK
		◢4,0◣	238	LE1	243,2	0,0	91,6	90,6	-93,3	67,6	37,4	OK
B-bfl 1	STIFF	◢4,0◣	111	LE1	23,6	0,0	4,9	12,3	5,2	6,6	5,6	OK
		◢4,0◣	111	LE1	24,2	0,0	5,5	-12,6	-5,3	6,7	5,5	OK
B-w 1	STIFF	◢4,0◣	196	LE1	204,6	0,0	12,5	117,3	12,4	56,8	31,3	OK
		◢4,0◣	196	LE1	204,5	0,0	12,2	-117,2	-12,3	56,8	31,3	OK
B-tfl 1	STIFF	◢4,0◣	111	LE1	214,9	0,0	27,9	-119,8	27,8	59,7	34,5	OK
		◢4,0◣	111	LE1	214,5	0,0	27,6	119,6	-27,7	59,6	34,3	OK
SEP1a	STIFF	◢4,0◣	244	LE1	352,9	0,1	158,0	96,5	154,5	98,0	50,2	OK
		◢4,0◣	244	LE1	352,9	0,0	153,8	-94,3	-157,3	98,0	50,0	OK

Design data

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9 σ [MPa]
S 235	0,80	360,0	259,2

Cost estimation

Steel

Steel grade	Total weight [kg]	Unit cost [€/kg]	Cost [€]
S 235	13,85	2,00	27,69

Bolts

Bolt assembly	Total weight [kg]	Unit cost [€/kg]	Cost [€]
M20 10.9	1,45	5,00	7,26

Welds

Weld type	Throat thickness [mm]	Leg size [mm]	Total weight [kg]	Unit cost [€/kg]	Cost [€]
Fillet	4,0	5,7	0,35	40,00	13,86

Hole drilling

Bolt assembly cost [€]	Percentage of bolt assembly cost [%]	Cost [€]
7,26	30,0	2,18

Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

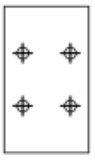
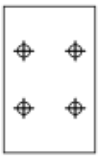
IDEA StatiCa
Calculate yesterday's estimates

Cost summary

Cost estimation summary	Cost [€]
Total estimated cost	50,98

Bill of material

Manufacturing operations

Name	Plates [mm]	Shape	Nr.	Welds [mm]	Length [mm]	Bolts	Nr.
SEP1	P15,0x160,0-277,0 (S 235)		1	Double fillet: a = 4,0 Fillet: a = 4,0 Fillet: a = 4,0	1219,5 160,0 160,0	M20 10.9	4
	P15,0x160,0-256,0 (S 235)		1				
	P15,0x134,7-244,0 (S 235)		1				

Welds

Type	Material	Throat thickness [mm]	Leg size [mm]	Length [mm]
Fillet	S 235	4,0	5,7	160,0
Fillet	S 235	4,0	5,7	160,0
Double fillet	S 235	4,0	5,7	1219,5

Bolts

Name	Grip length [mm]	Count
M20 10.9	30	4

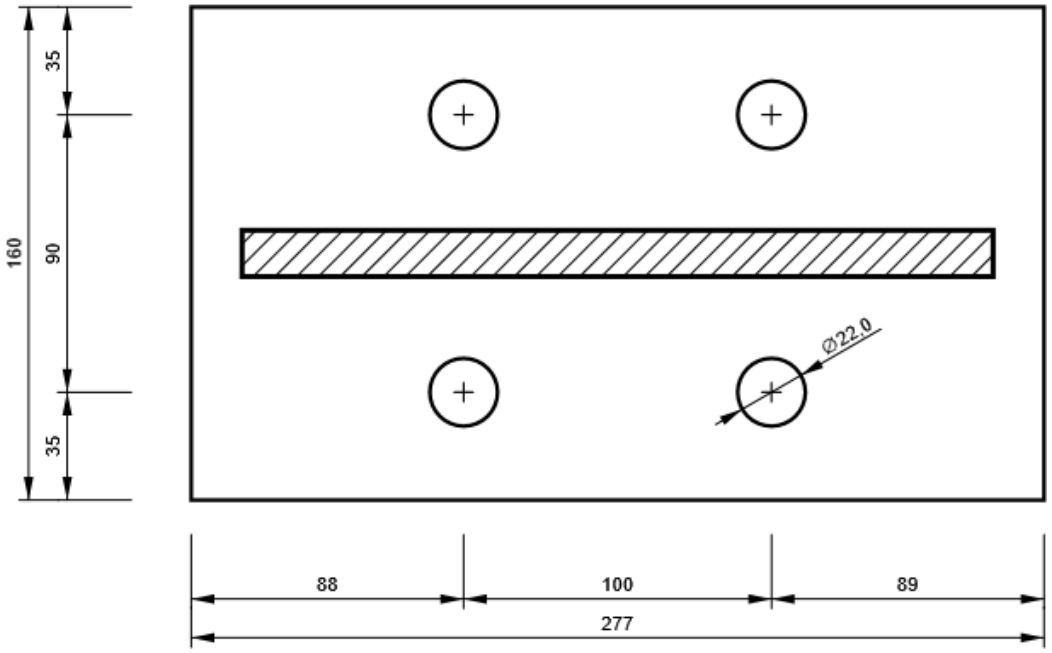
Drawing

SEP1 - SEP1a

Project:	**Vrtec Ruše**
Project no:	**22-P035-K**
Author:	**Probit d.o.o.**

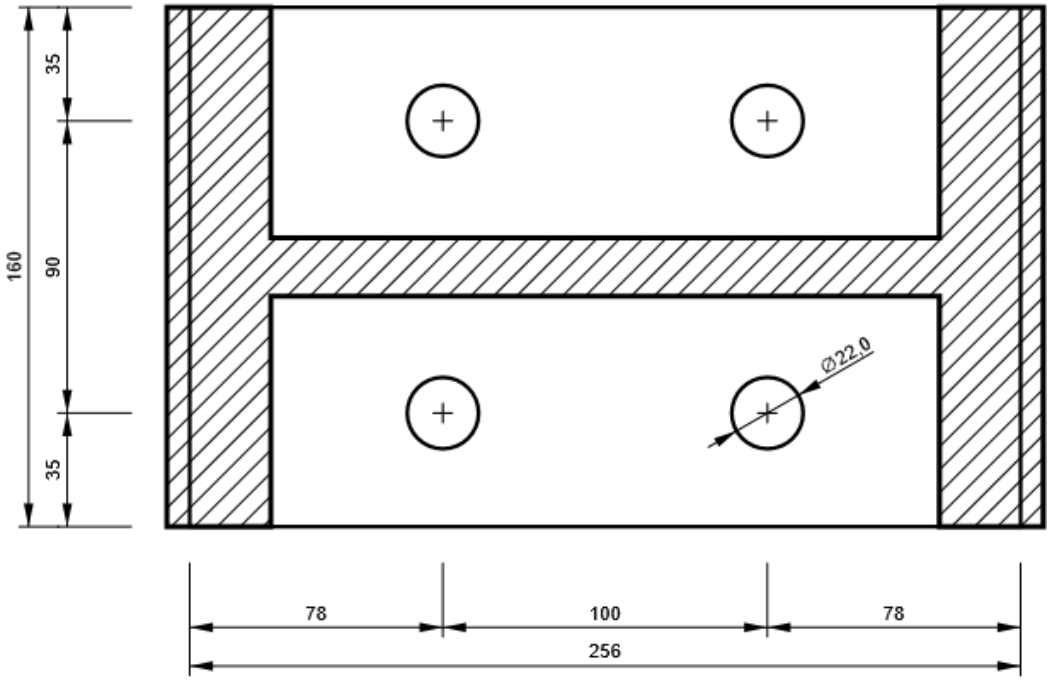
IDEA StatiCa
Calculate yesterday's estimates

P15,0x277-160 (S 235)



SEP1 - SEP1b

P15,0x256-160 (S 235)

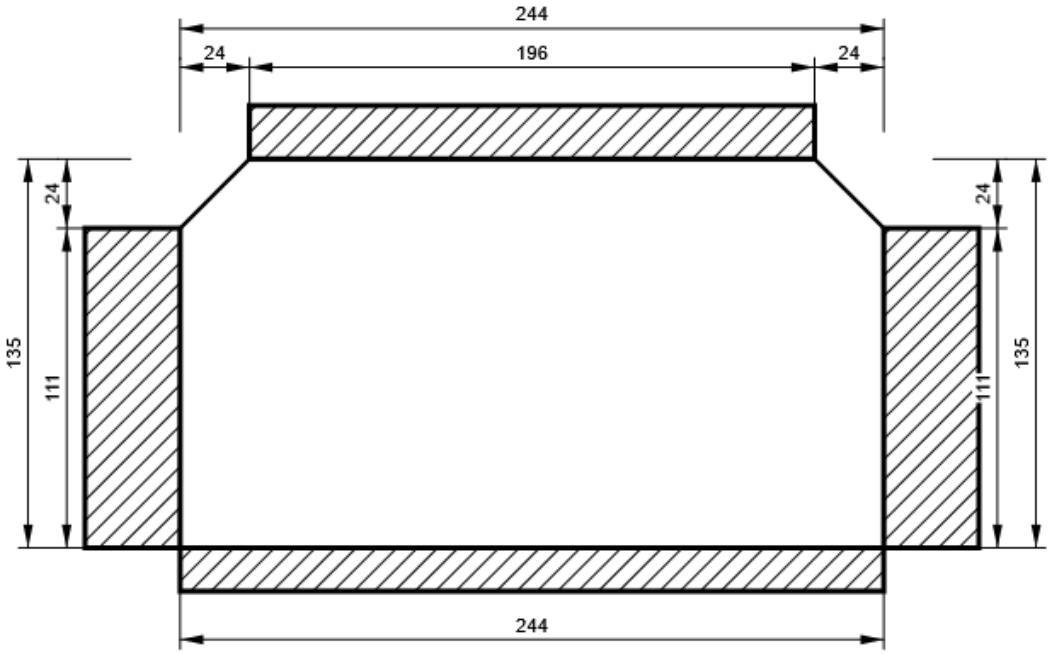


Project:	**Vrtec Ruše**
Project no:	**22-P035-K**
Author:	**Probit d.o.o.**

IDEA StatiCa
Calculate yesterday's estimates

SEP1 - STIFF

P15,0x244-135 (S 235)



Project: **Vrtec Ruše**
Project no: **22-P035-K**
Author: **Probit d.o.o.**

IDEA StatiCa
Calculate yesterday's estimates

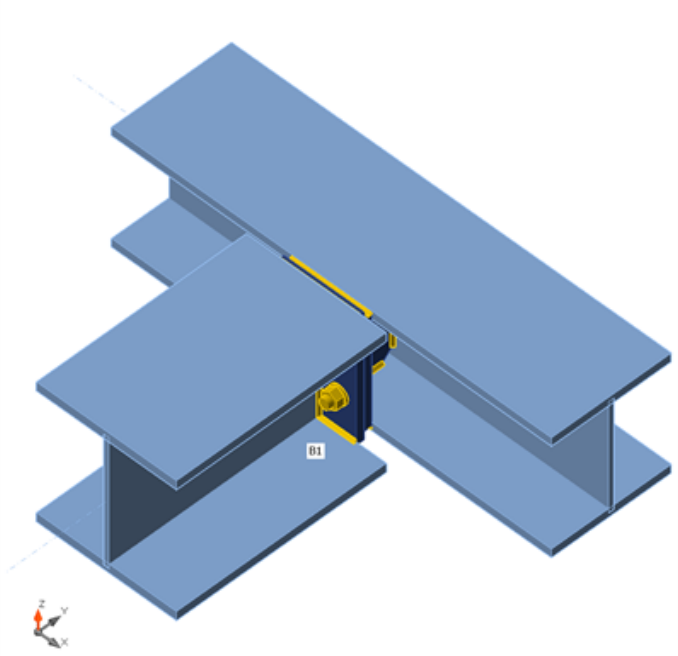
Project item Kölnerjev spoj - HEB280- HEB240

Design

Name	Kölnerjev spoj - HEB280- HEB240
Description	4x M20
Analysis	Joint design resistance

Beams and columns

Name	Cross-section	β – Direction [°]	γ - Pitch [°]	α - Rotation [°]	Offset ex [mm]	Offset ey [mm]	Offset ez [mm]	Forces in
B	6 - HEB240	0,0	0,0	0,0	0	0	0	Node
B1	14 - HEB280	-90,0	0,0	0,0	0	0	0	Node



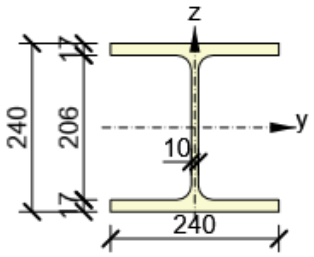
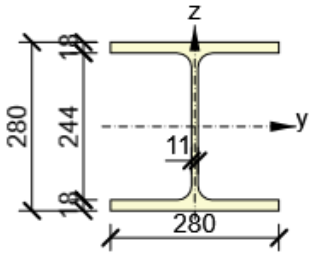
Cross-sections

Name	Material
6 - HEB240	S 235
14 - HEB280	S 235

Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

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Calculate yesterday's estimates

Cross-sections

Name	Material	Drawing
6 - HEB240	S 235	
14 - HEB280	S 235	

Bolts

Name	Bolt assembly	Diameter [mm]	fu [MPa]	Gross area [mm^2]
M20 10.9	M20 10.9	20	1000,0	314

Load effects

Name	Member	N [kN]	Vy [kN]	Vz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
LE1	B1	0,0	0,0	-150,0	0,0	0,0	0,0

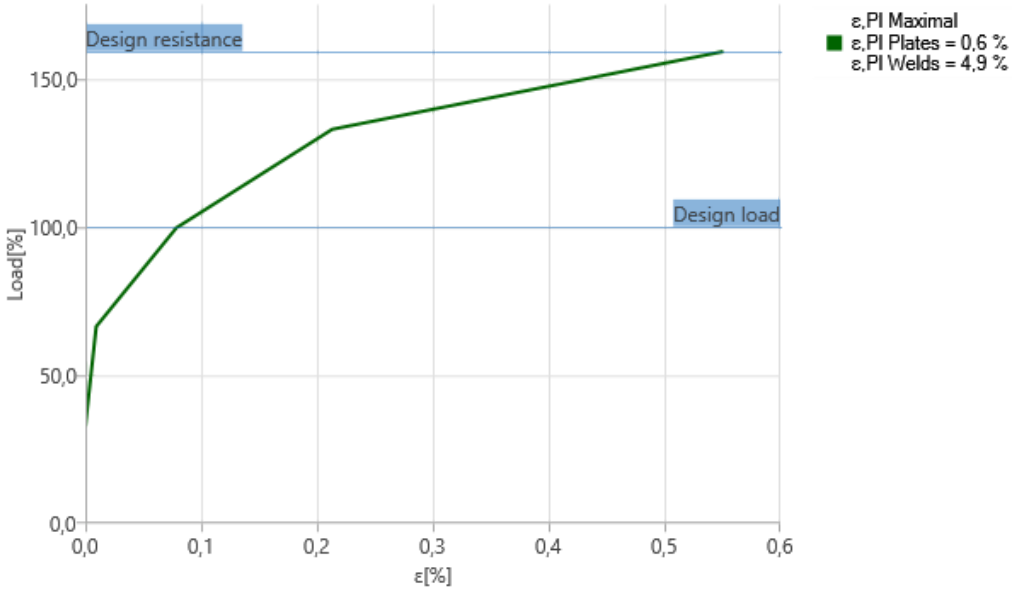
Check

Joint design resistance

Loads	Resistance [%]
LE1	159,6

Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

IDEA StatiCa
Calculate yesterday's estimates



Joint design resistance, LE1

Summary

Name	Value	Status
Plates	0,1 < 5,0%	OK
Bolts	69,4 < 100%	OK
Welds	97,5 < 100%	OK

Plates

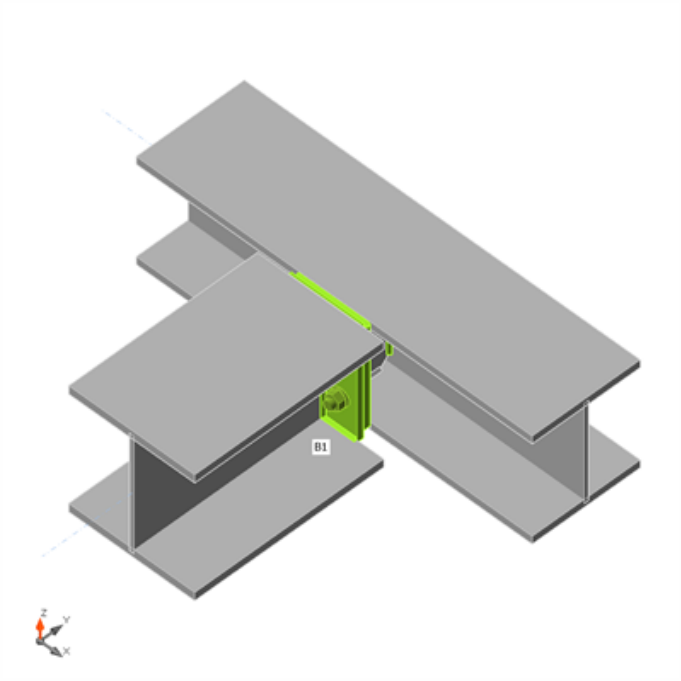
Name	Thickness [mm]	Loads	σ_{Ed} [MPa]	ε_{Pl} [%]	σc_{Ed} [MPa]	Status
B-bfl 1	17,0	LE1	78,4	0,0	0,0	OK
B-tfl 1	17,0	LE1	94,4	0,0	0,0	OK
B-w 1	10,0	LE1	95,1	0,0	0,0	OK
B1-bfl 1	18,0	LE1	82,2	0,0	0,0	OK
B1-tfl 1	18,0	LE1	93,8	0,0	0,0	OK
B1-w 1	10,5	LE1	153,1	0,0	0,0	OK
SEP1a	15,0	LE1	235,1	0,0	79,7	OK
SEP1b	15,0	LE1	235,2	0,1	67,7	OK
STIFF	15,0	LE1	122,7	0,0	0,0	OK

Design data

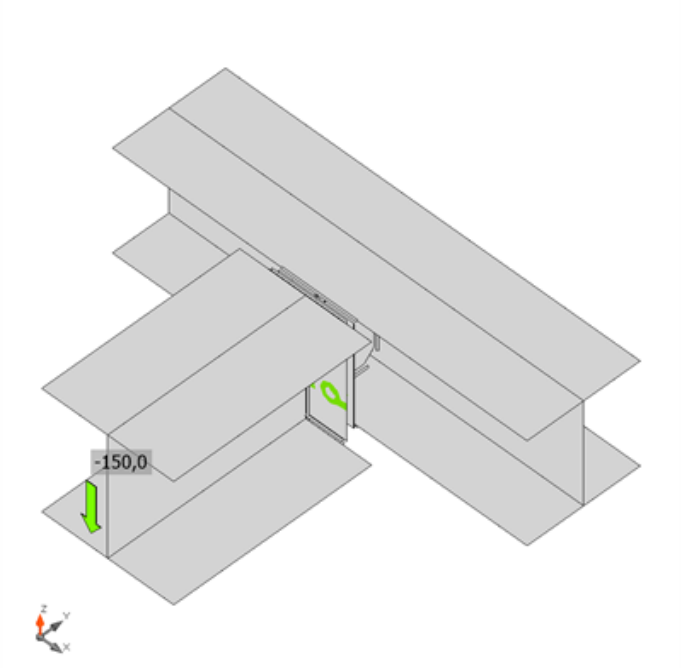
Material	f_y [MPa]	ε_{lim} [%]
S 235	235,0	5,0

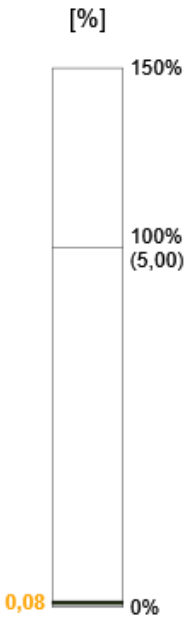
Project:	**Vrtec Ruše**
Project no:	**22-P035-K**
Author:	**Probit d.o.o.**

IDEA StatiCa
Calculate yesterday's estimates



Overall check, LE1

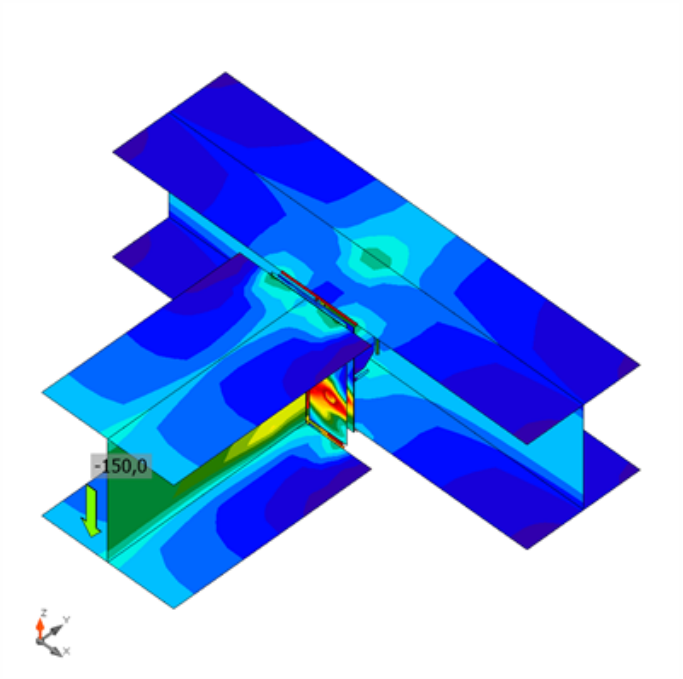


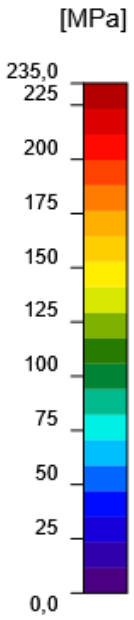


Strain check, LE1

Project:	**Vrtec Ruše**
Project no:	**22-P035-K**
Author:	**Probit d.o.o.**

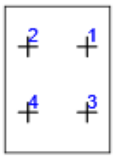
IDEA StatiCa
Calculate yesterday's estimates





Equivalent stress, LE1

Bolts

	Name	Loads	$F_{t,Ed}$ [kN]	V [kN]	Ut_t [%]	$F_{b,Rd}$ [kN]	Ut_s [%]	Ut_{ts} [%]	Status
	B1	LE1	17,6	37,7	10,0	216,0	38,4	45,5	OK
	B2	LE1	17,6	37,7	10,0	216,0	38,4	45,6	OK
	B3	LE1	77,4	37,3	43,9	201,3	38,1	69,4	OK
	B4	LE1	77,3	37,3	43,8	201,3	38,1	69,4	OK

Design data

Name	$F_{t,Rd}$ [kN]	$B_{p,Rd}$ [kN]	$F_{v,Rd}$ [kN]
M20 10.9 - 1	176,4	272,9	98,0

Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

IDEA StatiCa
Calculate yesterday's estimates

Welds (Plastic redistribution)

Item	Edge	Throat th. [mm]	Length [mm]	Loads	$\sigma_{w,Ed}$ [MPa]	ε_{Pl} [%]	$\sigma_{\perp}$ [MPa]	$\tau_{\parallel}$ [MPa]	$\tau_{\perp}$ [MPa]	Ut [%]	Ut_c [%]	Status
SEP1a	B-tfl 1	◢4,0	160	LE1	309,0	0,0	-123,1	-0,1	163,6	85,8	73,9	OK
SEP1a	B-bfl 1	◢4,0	160	LE1	116,4	0,0	61,5	22,0	52,6	32,3	21,0	OK
SEP1b	B1-bfl 1	◢4,0◣	160	LE1	322,9	0,0	237,2	34,3	121,8	91,5	54,9	OK
		◢4,0◣	160	LE1	186,9	0,0	-132,3	-33,9	-68,3	51,9	36,0	OK
SEP1b	B1-tfl 1	◢4,0◣	160	LE1	58,4	0,0	16,2	-29,0	14,4	16,2	12,5	OK
		◢4,0◣	160	LE1	284,8	0,0	-187,8	-32,7	119,2	79,1	53,8	OK
SEP1b	B1-w 1	◢4,0◣	256	LE1	299,1	0,0	115,6	-111,9	113,3	83,1	44,4	OK
		◢4,0◣	256	LE1	298,6	0,0	112,3	111,5	-114,4	82,9	44,3	OK
B-bfl 1	STIFF	◢4,0◣	94	LE1	70,1	0,0	-18,9	-34,1	-18,9	19,5	10,6	OK
		◢4,0◣	94	LE1	70,2	0,0	-18,9	34,1	18,9	19,5	10,6	OK
B-w 1	STIFF	◢4,0◣	164	LE1	308,8	0,0	9,3	178,0	9,4	85,8	47,2	OK
		◢4,0◣	164	LE1	308,9	0,0	9,4	-178,0	-9,3	85,8	47,2	OK
B-tfl 1	STIFF	◢4,0◣	94	LE1	328,6	0,0	13,4	-189,1	13,5	91,3	64,8	OK
		◢4,0◣	94	LE1	328,7	0,0	13,5	189,1	-13,4	91,3	64,8	OK
SEP1a	STIFF	◢4,0◣	206	LE1	350,4	0,0	164,7	66,9	165,6	97,3	58,5	OK
		◢4,0◣	206	LE1	350,9	0,0	166,3	-67,1	-165,3	97,5	58,5	OK

Design data

	β_w [-]	$\sigma_{w,Rd}$ [MPa]	0.9 σ [MPa]
S 235	0,80	360,0	259,2

Cost estimation

Steel

Steel grade	Total weight [kg]	Unit cost [€/kg]	Cost [€]
S 235	11,76	2,00	23,52

Bolts

Bolt assembly	Total weight [kg]	Unit cost [€/kg]	Cost [€]
M20 10.9	1,45	5,00	7,26

Welds

Weld type	Throat thickness [mm]	Leg size [mm]	Total weight [kg]	Unit cost [€/kg]	Cost [€]
Fillet	4,0	5,7	0,33	40,00	13,00

Hole drilling

Bolt assembly cost [€]	Percentage of bolt assembly cost [%]	Cost [€]
7,26	30,0	2,18

Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

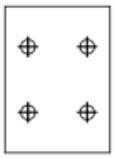
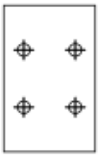
IDEA StatiCa
Calculate yesterday's estimates

Cost summary

Cost estimation summary	Cost [€]
Total estimated cost	45,96

Bill of material

Manufacturing operations

Name	Plates [mm]	Shape	Nr.	Welds [mm]	Length [mm]	Bolts	Nr.
SEP1	P15,0x160,0-223,0 (S 235)		1	Double fillet: a = 4,0 Fillet: a = 4,0 Fillet: a = 4,0	1134,0 160,0 160,0	M20 10.9	4
	P15,0x160,0-256,0 (S 235)		1				
	P15,0x115,0-206,0 (S 235)		1				

Welds

Type	Material	Throat thickness [mm]	Leg size [mm]	Length [mm]
Fillet	S 235	4,0	5,7	160,0
Fillet	S 235	4,0	5,7	160,0
Double fillet	S 235	4,0	5,7	1134,0

Bolts

Name	Grip length [mm]	Count
M20 10.9	30	4

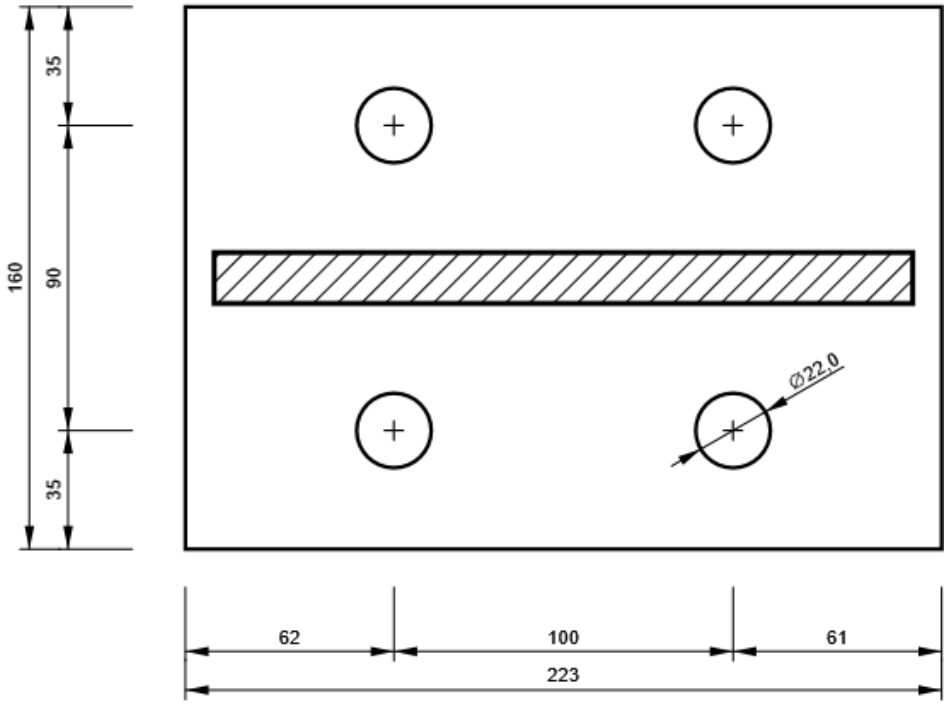
Drawing

SEP1 - SEP1a

Project:	**Vrtec Ruše**
Project no:	**22-P035-K**
Author:	**Probit d.o.o.**

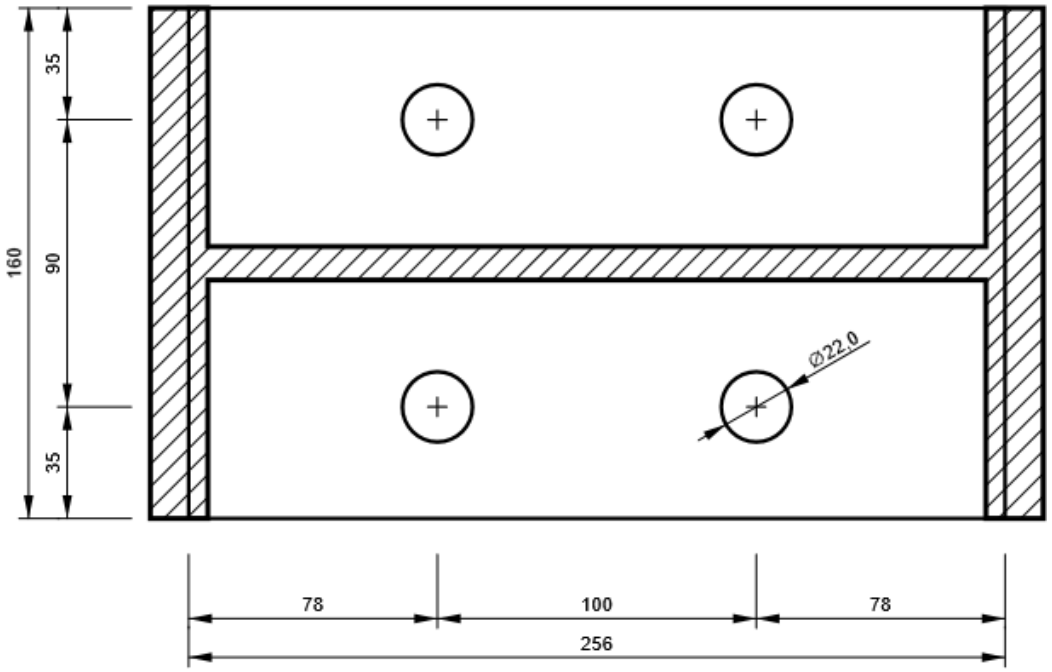
IDEA StatiCa
Calculate yesterday's estimates

P15,0x223-160 (S 235)



SEP1 - SEP1b

P15,0x256-160 (S 235)

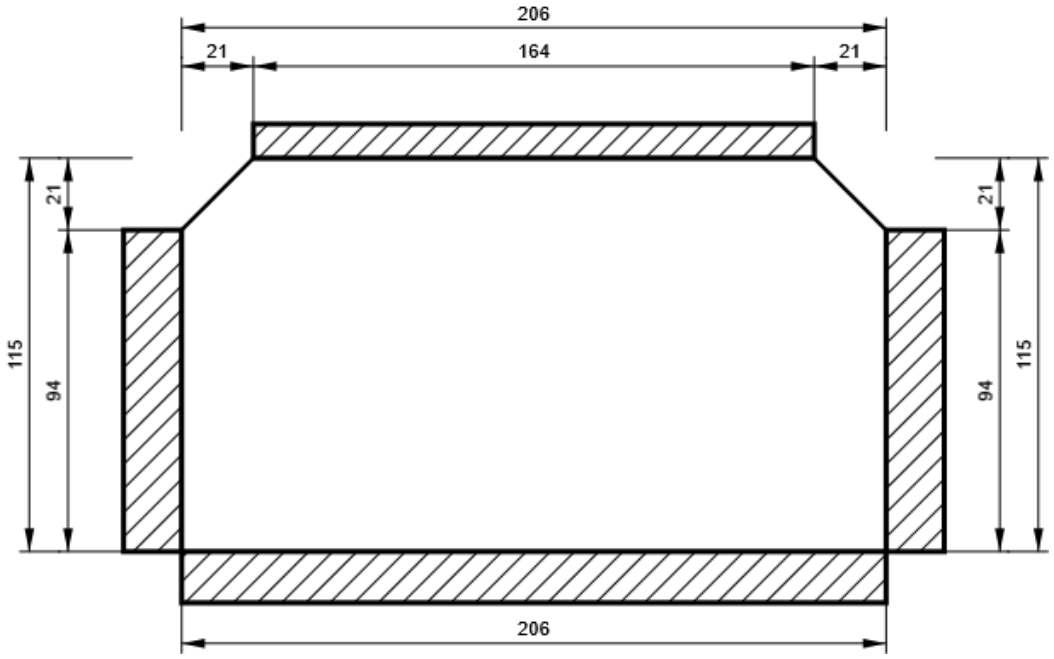


Project:	**Vrtec Ruše**
Project no:	**22-P035-K**
Author:	**Probit d.o.o.**

IDEA StatiCa
Calculate yesterday's estimates

SEP1 - STIFF

P15,0x206-115 (S 235)



Project: Vrtec Ruše
Project no: 22-P035-K
Author: Probit d.o.o.

IDEA StatiCa
Calculate yesterday's estimates

Symbol explanation

Symbol	Symbol explanation
ε_{Pl}	Strain
σ_{Ed}	Eq. stress
f_y	Yield strength
ε_{lim}	Limit of plastic strain
$F_{t,Rd}$	Bolt tension resistance EN 1993-1-8 tab. 3.4
$B_{p,Rd}$	Punching shear resistance
$F_{t,Ed}$	Tension force
V	Resultant of shear forces Vy, Vz in bolt
$F_{v,Rd}$	Bolt shear resistance EN_1993-1-8 table 3.4
$F_{b,Rd}$	Plate bearing resistance EN 1993-1-8 tab. 3.4
Ut_t	Utilization in tension
Ut_s	Utilization in shear
$\sigma_{w,Ed}$	Equivalent stress
$\sigma_{w,Rd}$	Equivalent stress resistance
$\sigma_{\perp}$	Perpendicular stress
$\tau_{\parallel}$	Shear stress parallel to weld axis
$\tau_{\perp}$	Shear stress perpendicular to weld axis
$0.9\ \sigma_{w,Rd}$	Perpendicular stress resistance - 0.9*fu/γM2
β_w	Corelation factor EN 1993-1-8 tab. 4.1
Ut	Utilization
Ut_c	Weld capacity utilization

4.2. Izračun pozicij
4.2.1. 2. nadstropje

Poz.100a Streha

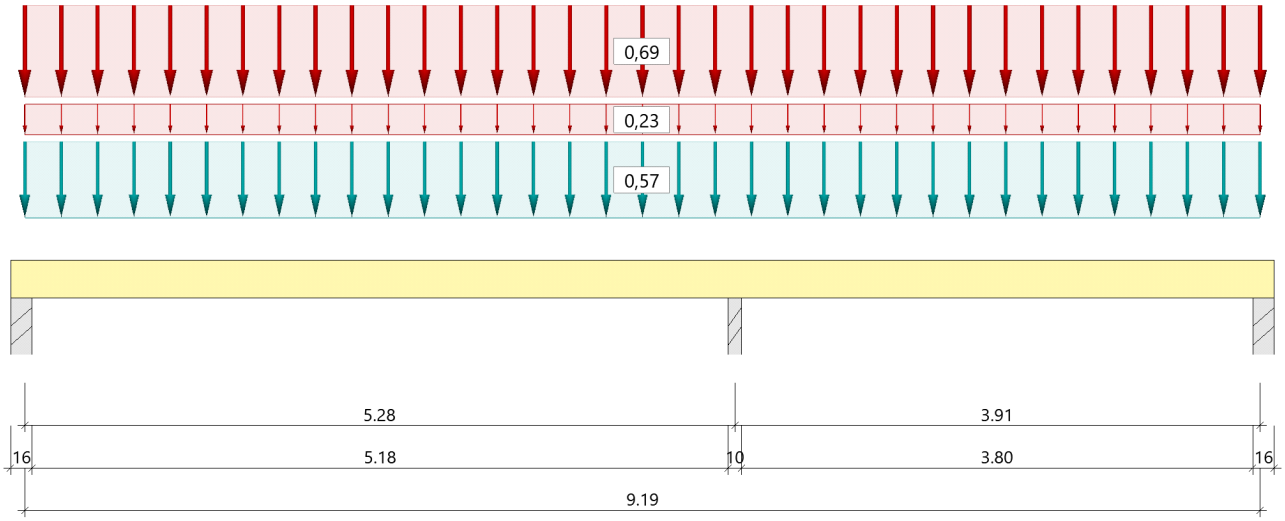
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 2 Span (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.25	-1	-1	-1	0.0	0.0
2	5.28	10.0	6.0	1.25	-1	-1	0.0	0.0	0.0
3	9.19	16.0	6.0	1.25	-1	-1	0.0	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Lateral support in y- direction: at bearings on top chord

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1	GL		9.19		1.00		Permanent		
	2	GL		9.19		0.40		Cat. H		
	3	GL		9.19		1.21		Snow		

The load no. 2 und 3 act span by span.
The load no. 1 acts simultaneously
The load values are multiplied internally by the beam spacing e = 0.57 m.

- Load 1: Stalna
- Load 2: Koristna streha
- Load 3: sneg

Self-weight

Total weight = 86 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. H: roofs					1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short

Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.31	0.20	0.54	0.38	 0.32

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-5.5	-5.43	0.20	0.31	0.38

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	5.28	2.50	inst	z	0.2	0.3	0.5	1.8	0.29	7
	5.28	2.50	net,fin	z	0.4	0.3	0.7	2.1	0.32	9
	5.28	2.50	fin	z	0.4	0.3	0.7	2.1	0.32	8
Span 2	3.91	2.26	inst	z	0.02	0.1	0.1	1.3	0.09	10
	3.91	2.26	net,fin	z	-0.03	-0.1	-0.1	1.6	0.08	11
	3.91	2.26	fin	z	-0.03	-0.1	-0.1	1.6	0.08	12

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. H: roofs Snow loads H < 1000 m	 -0.06 -0.19	2.45 0.90 2.74		
2	5.28	Permanent loads Cat. H: roofs Snow loads H < 1000 m		6.81 2.34 7.07		
3	9.19	Permanent loads Cat. H: roofs Snow loads H < 1000 m	 -0.21 -0.62	1.44 0.70 2.11		

Poz.100b Streha

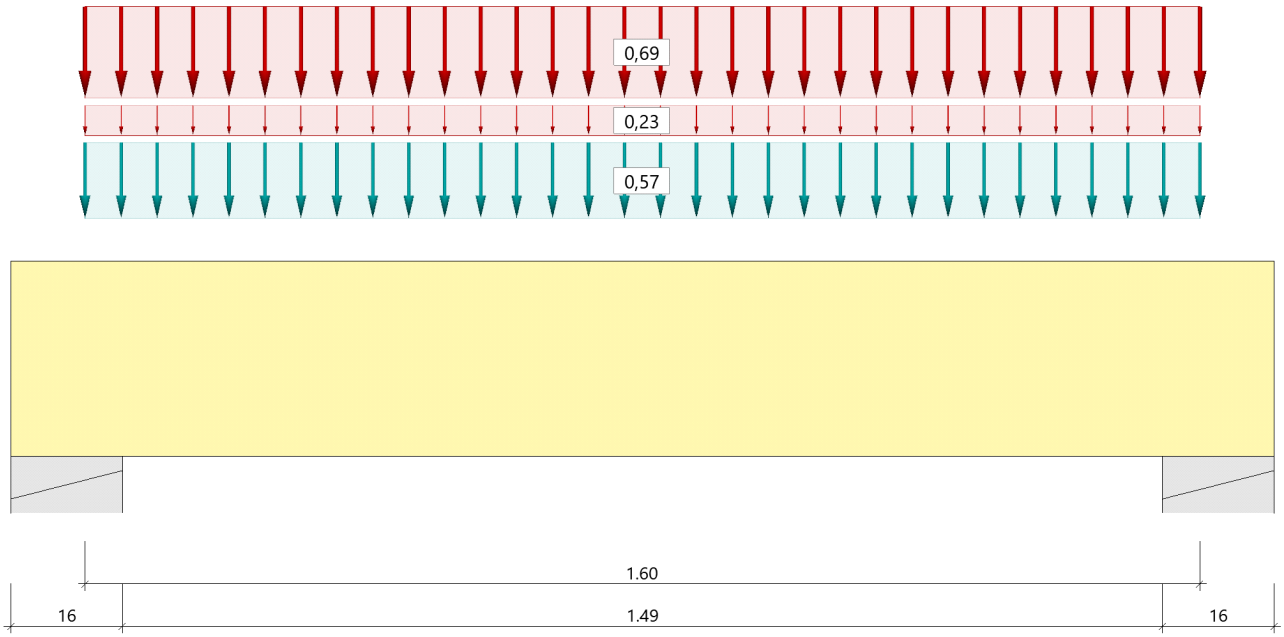
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.25	-1	-1	-1	0.0	0.0
2	1.60	16.0	6.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1	GL		1.60		1.00		Permanent		
	2	GL		1.60		0.40		Cat. H		
	3	GL		1.60		1.21		Snow		
The load values are multiplied internally by the beam spacing e = 0.57 m.										

- Load 1: Stalna
- Load 2: Koristna streha
- Load 3: sneg

Self-weight

Total weight = 15 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. H: roofs					1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.04	0.03	0.06	0.04	
Serviceability	characteristic					0.02

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-0.9	0.62	0.03	0.04	0.04

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.60	0.80	inst	z	0.0	0.0	0.01	0.5	0.01	3
	1.60	0.80	net,fin	z	0.01	0.0	0.01	0.6	0.02	5
	1.60	0.80	fin	z	0.01	0.0	0.01	0.6	0.02	4

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. H: roofs Snow loads H < 1000 m		0.93 0.32 0.97		
2	1.60	Permanent loads Cat. H: roofs Snow loads H < 1000 m		0.93 0.32 0.97		

Poz.101 Preklada nad oknom

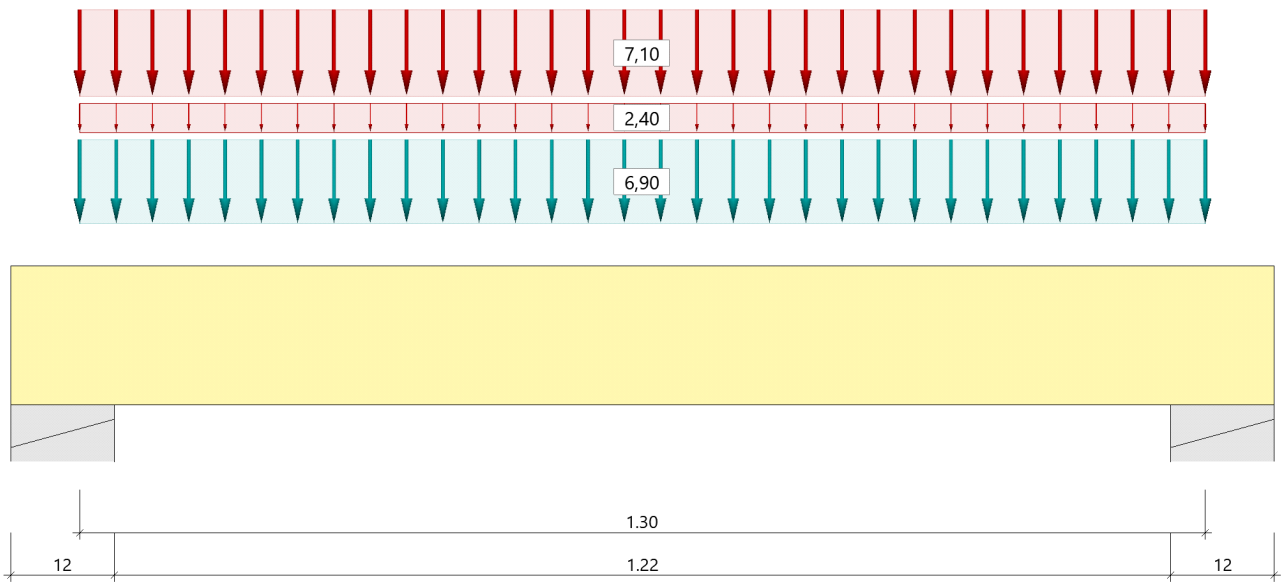
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
2x8/16	5461	5461	683	683	256.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	1.30	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		1.30		6.90		Permanent		
	2	GL		1.30		2.40		Cat. A		
	3	GL		1.30		7.10		Snow		

- Load 1: Poz.100a
- Load 2: Poz.100a
- Load 3: Poz.100a

Self-weight

Total weight = 17 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. A: domestic, residental areas	0.70	0.50	0.30		1.50	middle
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.42	0.46	0.24	0.42	
Serviceability	characteristic					0.26

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	2x8/16	14.7	4.79	0.46	0.42	0.42

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.30	0.65	inst	z	0.04	0.1	0.1	0.4	0.23	3
	1.30	0.65	net,fin	z	0.1	0.1	0.1	0.5	0.26	5
	1.30	0.65	fin	z	0.1	0.1	0.1	0.5	0.26	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. A: domestic, residental areas Snow loads H < 1000 m		4.6 1.6 4.6		
2	1.30	Permanent loads Cat. A: domestic, residental areas Snow loads H < 1000 m		4.6 1.6 4.6		

Poz.102 Preklada nad oknom

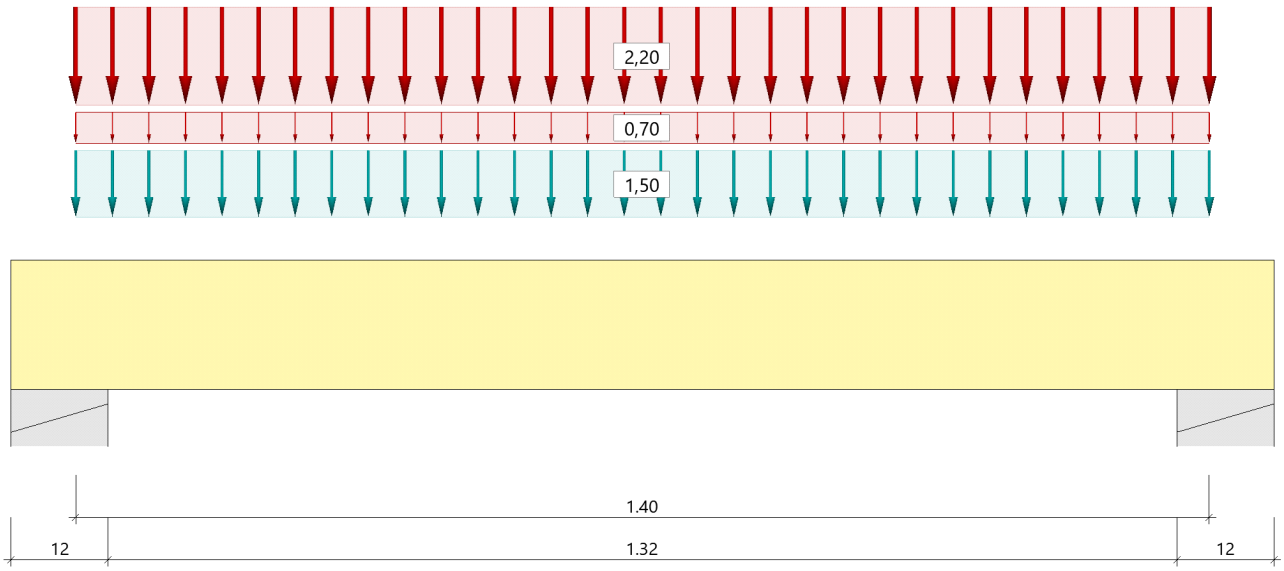
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
2x8/16	5461	5461	683	683	256.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	1.40	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		1.40		1.50		Permanent		
	2	GL		1.40		0.70		Cat. A		
	3	GL		1.40		2.20		Snow		

- Load 1: Poz.100a
- Load 2: Poz.100a
- Load 3: Poz.100a

Self-weight

Total weight = 18 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. A: domestic, residental areas	0.70	0.50	0.30		1.50	middle
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.13	0.14	0.07	0.13	
Serviceability	characteristic					0.09

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	2x8/16	-4.4	1.53	0.14	0.13	0.13

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.40	0.70	inst	z	0.01	0.02	0.04	0.5	0.08	3
	1.40	0.70	net,fin	z	0.02	0.02	0.05	0.6	0.09	5
	1.40	0.70	fin	z	0.02	0.02	0.05	0.6	0.09	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. A: domestic, residental areas Snow loads H < 1000 m		1.1 0.5 1.5		
2	1.40	Permanent loads Cat. A: domestic, residental areas Snow loads H < 1000 m		1.1 0.5 1.5		

Poz.103 Preklada v stropu

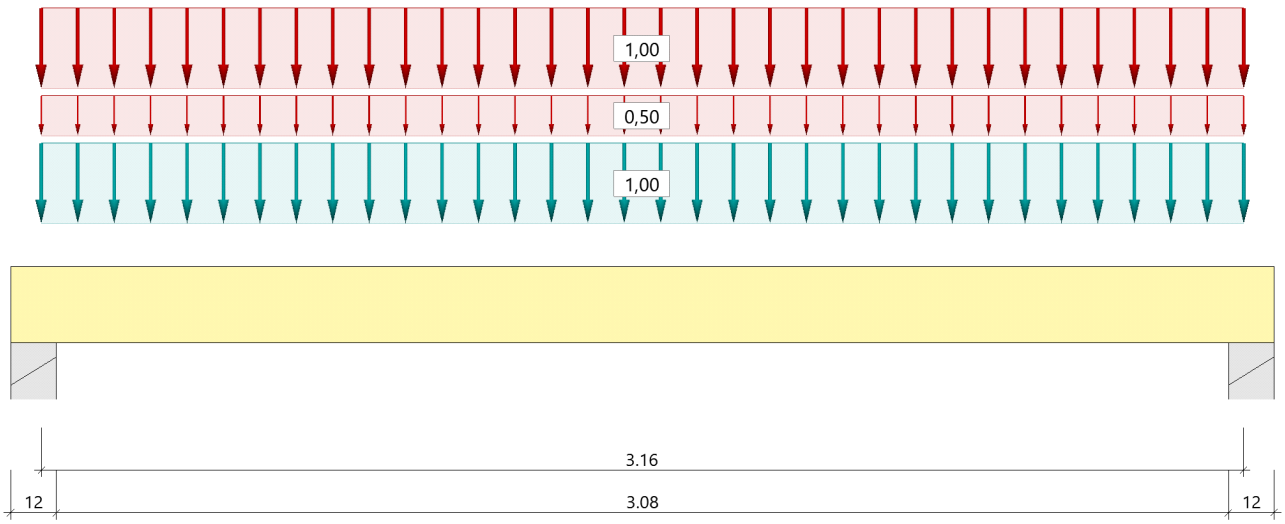
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/20	10667	6827	1067	853	320.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations*) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	3.16	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		3.16		1.00		Permanent		
	2	GL		3.16		0.50		Cat. A		
	3	GL		3.16		1.00		Snow		

- Load 1: Poz.100b
- Load 2: Poz.100b
- Load 3: Poz.100b

Self-weight

Total weight = 51 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. A: domestic, residental areas	0.70	0.50	0.30		1.50	middle
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.22	0.16	0.09	0.22	
Serviceability	characteristic					0.30

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/20	-5.7	4.48	0.16	0.22	0.22

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.16	1.58	inst	z	0.1	0.1	0.3	1.1	0.25	3
	3.16	1.58	net,fin	z	0.2	0.2	0.4	1.3	0.30	5
	3.16	1.58	fin	z	0.2	0.2	0.4	1.3	0.30	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. A: domestic, residental areas Snow loads H < 1000 m		1.8 0.8 1.6		
2	3.16	Permanent loads Cat. A: domestic, residental areas Snow loads H < 1000 m		1.8 0.8 1.6		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.104 Preklada v stropu

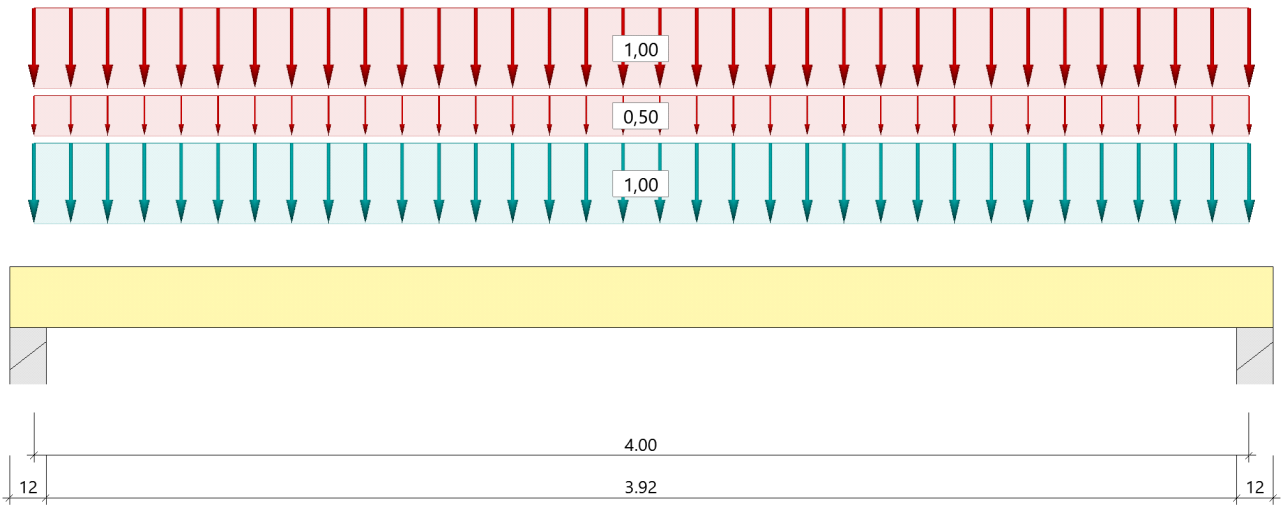
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/20	10667	6827	1067	853	320.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	4.00	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		4.00		1.00		Permanent		
	2	GL		4.00		0.50		Cat. A		
	3	GL		4.00		1.00		Snow		

- Load 1: Poz.100b
- Load 2: Poz.100b
- Load 3: Poz.100b

Self-weight

Total weight = 64 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. A: domestic, residental areas	0.70	0.50	0.30		1.50	middle
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.35	0.20	0.11	0.35	
Serviceability	characteristic					0.60

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/20	7.2	7.18	0.20	0.35	0.35

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	4.00	2.00	inst	z	0.3	0.4	0.7	1.3	0.51	3
	4.00	2.00	net,fin	z	0.6	0.4	1.0	1.6	0.60	5
	4.00	2.00	fin	z	0.6	0.4	1.0	1.6	0.60	4

Support forces

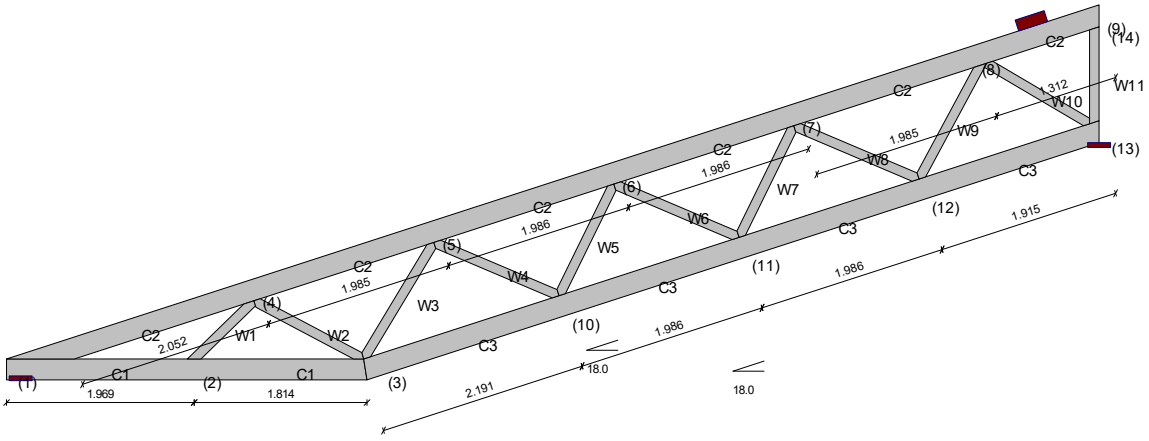
Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. A: domestic, residental areas Snow loads H < 1000 m		2.3 1.0 2.0		
2	4.00	Permanent loads Cat. A: domestic, residental areas Snow loads H < 1000 m		2.3 1.0 2.0		

4.2.2. 1. nadstropje

Poz.200a Streha

Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen **WolfWin V.8.75**
Tragen Sie hier Ihren Firmennamen ein.
Project : : 22-P035
Client: Vrtec Ruše
Contract No. :
Truss Reference : Poz.200a



REACTIONS (N)

GENERAL GEOMETRY
Span =11438 mm; Pitch = 0.0 deg.;
Raft.Restraint 800 mm

GENERAL LOADS
Note: Special loads or change loads included. See printout.
Std.loads.
Spacing = 1000 mm; Tiles: 600 N/m²; Snow[0deg]: 900 N/m²
Self Wt: 200 N/m²; C.tie: 700 N/m²
Windpressure q: 650N/m2

GENERAL SIZES
Timber width: 80 mm (1 Ply)
Rafters: C.ties: 220; 220; 220;
Webs: 100; 100; 100; 100; 100; 100; 100;
100; 100; 100; 100;

REACTIONS (for load groups)

LOAD GROUP	Node	Vert	Horiz	Node	Vert	Horiz
Ref. Description	No.	[N]	[N]	No.	[N]	[N]
1001 Dead load	1	7502	1579	13	6699	-1579
1202 Snow uniform	1	7405	2167	13	6320	-2167
1401 Man point load	1	939	64	13	61	-64
1401 Man point load(2)	1	885	-57	13	115	57
1401 Man point load(3)	1	503	-376	13	497	376

Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen **WolfWin V.8.75**

Tragen Sie hier Ihren Firmennamen ein.

Client: Vrtec Ruše

Project : : 22-P035
Contract No. :
Truss Reference : Poz.200a

MAX/MIN REACTIONS (for action classes) and average rafter Compression

		max assoc.		max	min assoc.		min		
	Supp	V	H	H	V	H	H	OG	average Axial F.
Action Class	No.	[N]	[N]		[N]	[N]		Nr.	[N]
PERMANENT	1	7502	1579	1579	7502	1579	1579		
	13	6699	-1579	-1579	6699	-1579	-1579		
SNOW	1	7405	2167	2167	7405	2167	2167		
	13	6320	-2167	-2167	6320	-2167	-2167		
MPL-BC	1	939	64	64	503	-376	-376		
	13	497	376	376	61	-64	-64		

Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen **WolfWin V.8.75**

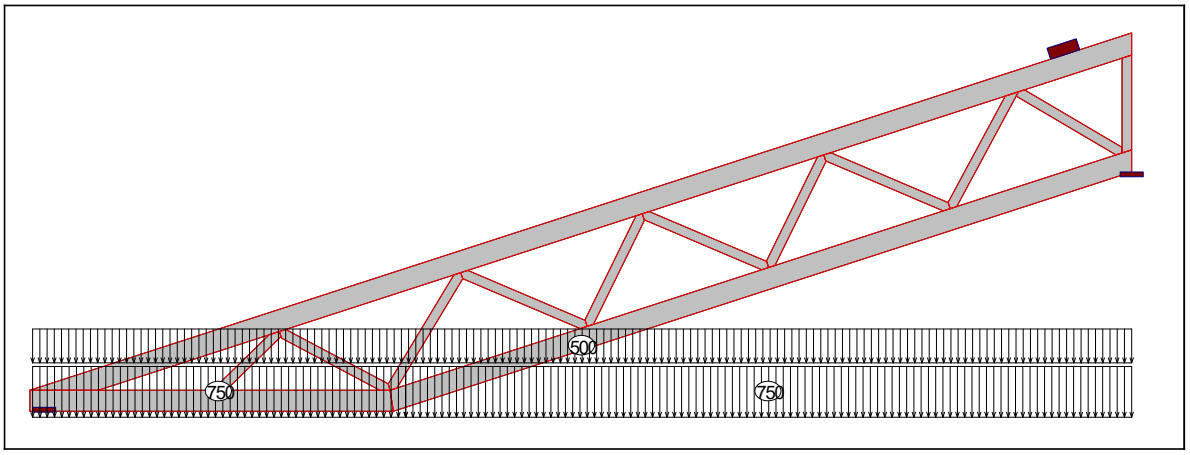
Tragen Sie hier Ihren Firmennamen ein.

Client: Vrtec Ruše

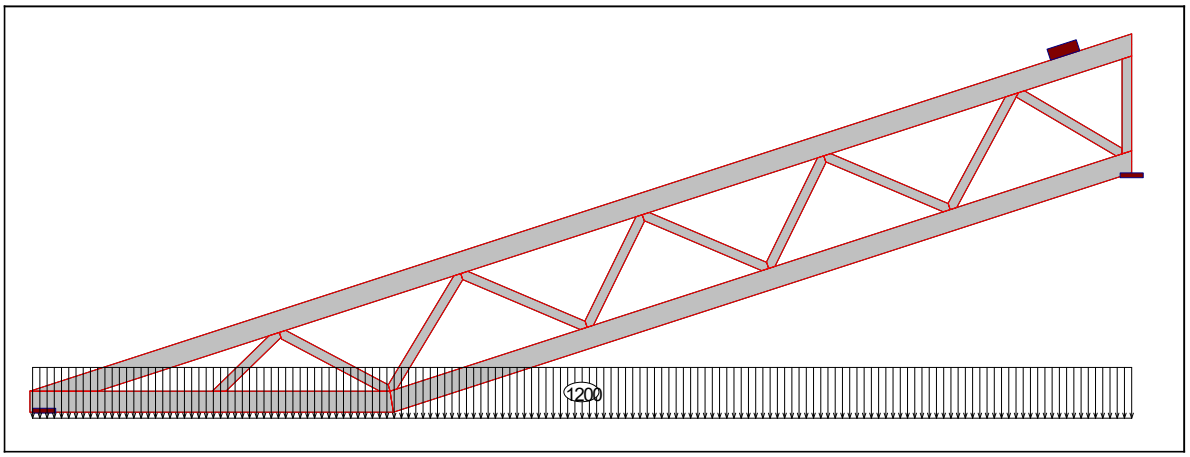
Project : : 22-P035
Contract No. :
Truss Reference : Poz.200a

LOADING SKETCHES ALL LOAD GROUPS

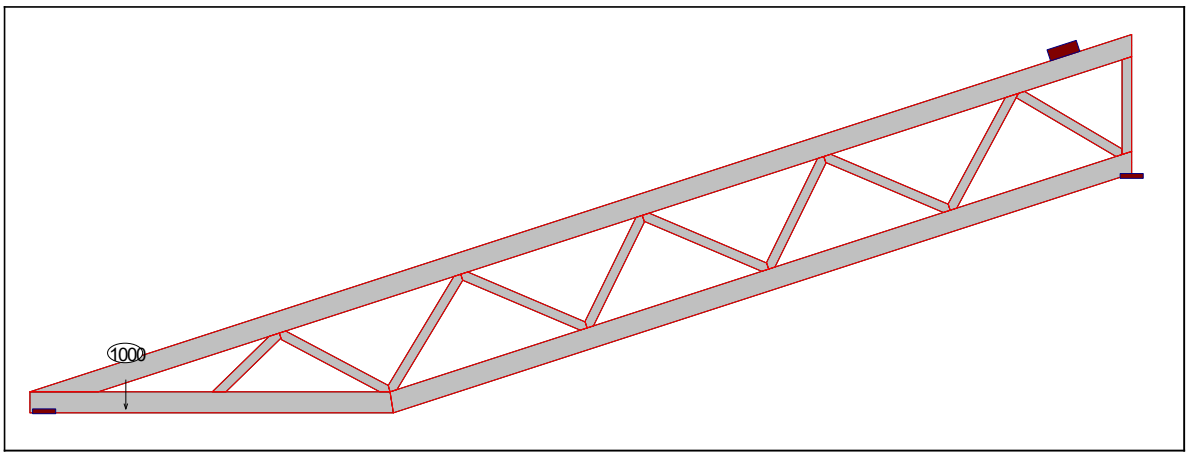
LOAD GROUP 1: Dead load



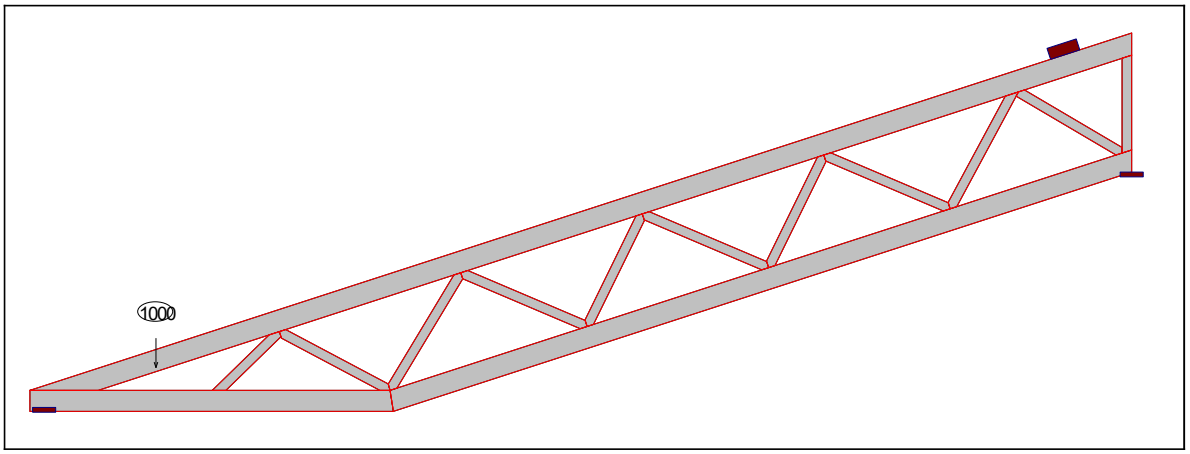
LOAD GROUP 2: Snow uniform



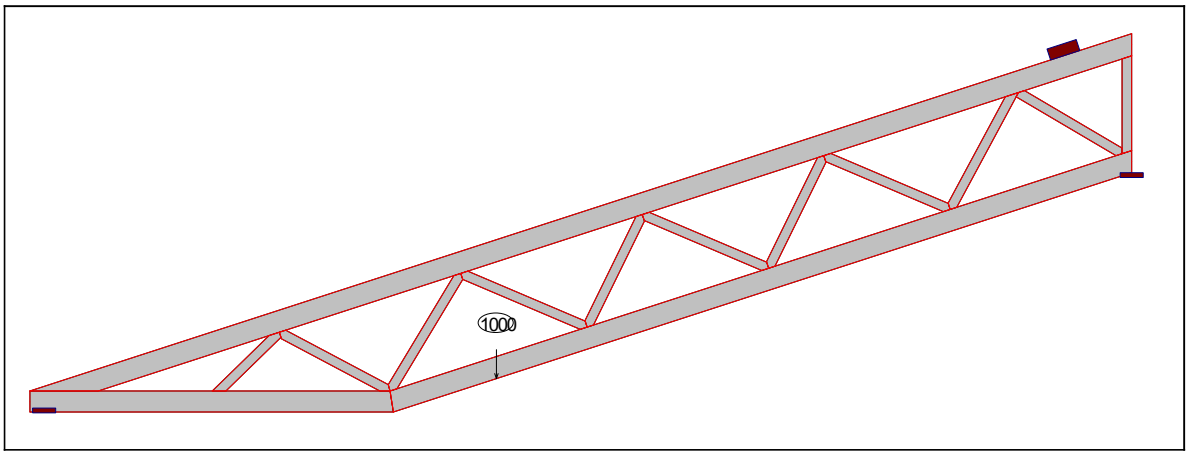
LOAD GROUP 3: Man point load



LOAD GROUP 4: Man point load(2)



LOAD GROUP 5: Man point load(3)

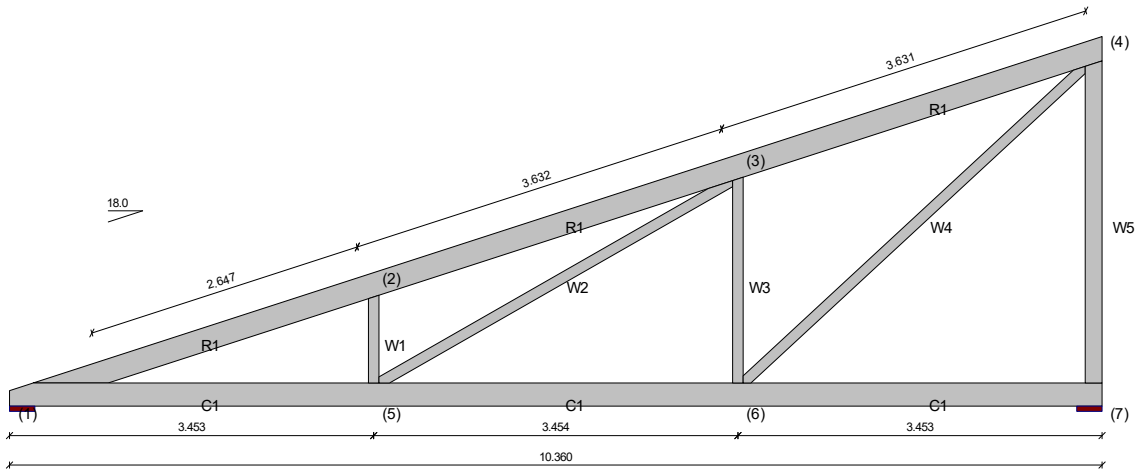


Poz.200b Streha **Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen** **WolfWin V.8.75**

Tragen Sie hier Ihren Firmennamen ein.

Client: Vrtec Ruše

Project : : 22-P035
Contract No. :
Truss Reference : Poz.200b



REACTIONS (N)

GENERAL GEOMETRY
Span =10360 mm; Pitch = 18.0 deg.;
Raft.Restraint 800 mm

GENERAL LOADS
Std.loads. +WIND
Std.loads.
Spacing = 1000 mm; Tiles: 600 N/m˛; Snow[0deg]: 1550 N/m˛
Self Wt: 200 N/m˛; C.tie: 700 N/m˛
Windpressure q: 650N/m2

GENERAL SIZES
Timber width: 80 mm (1 Ply)
Rafters: 220; C.ties: 220;
Webs: 100; 100; 100; 100; 160;

REACTIONS (for load groups)

LOAD GROUP	Node	Vert	Horiz	Node	Vert	Horiz
Ref. Description	No.	[N]	[N]	No.	[N]	[N]
1001 Dead load	1	7744	-	7	7931	-
1101 Wind from left	1	707	-519	7	904	-
1103 Wind from right	1	-2254	1741	7	-3081	-
1111 Wind from gable	1	-2374	1798	7	-3160	-
1202 Snow uniform	1	6145	-	7	6423	-
1401 Man point load	1	500	-	7	500	-

Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen **WolfWin V.8.75**

Tragen Sie hier Ihren Firmennamen ein.

Project : : 22-P035

Client: Vrtec Ruše

Contract No. :

Truss Reference : Poz.200b

MAX/MIN REACTIONS (for action classes) and average rafter Compression

		max assoc.		max	min assoc.		min		average
	Supp	V	H	H	V	H	H	OG	Axial F.
Action Class	No.	[N]	[N]		[N]	[N]		Nr.	[N]
PERMANENT	1	7744	0	0	7744	0	0	1	14631
	7	7931	0	0	7931	0	0		
WIND	1	707	-519	1798	-2374	1798	-519	1	1399
	7	904	0	0	-3160	-0	-0		
SNOW	1	6145	0	0	6145	0	0	1	11833
	7	6423	0	0	6423	0	0		
MPL-BC	1	500	0	0	500	0	0	1	1468
	7	500	0	0	500	0	0		

Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen **WolfWin V.8.75**

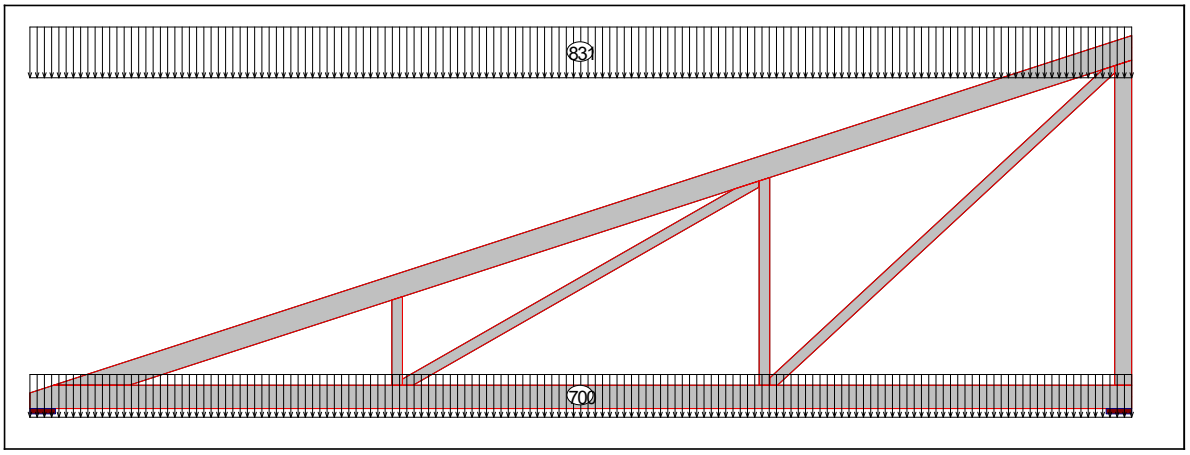
Tragen Sie hier Ihren Firmennamen ein.

Client: Vrtec Ruše

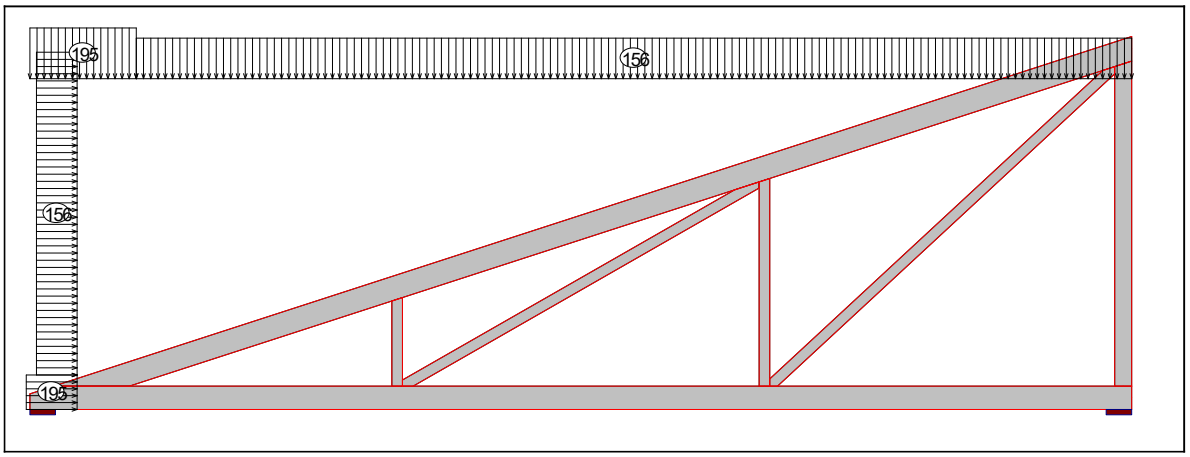
Project : : 22-P035
Contract No. :
Truss Reference : Poz.200b

LOADING SKETCHES ALL LOAD GROUPS

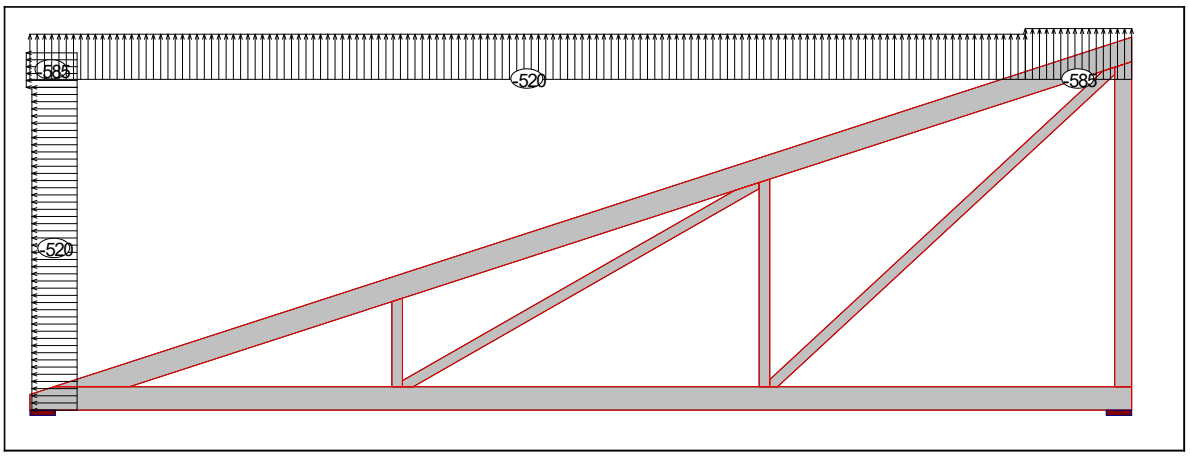
LOAD GROUP 1: Dead load



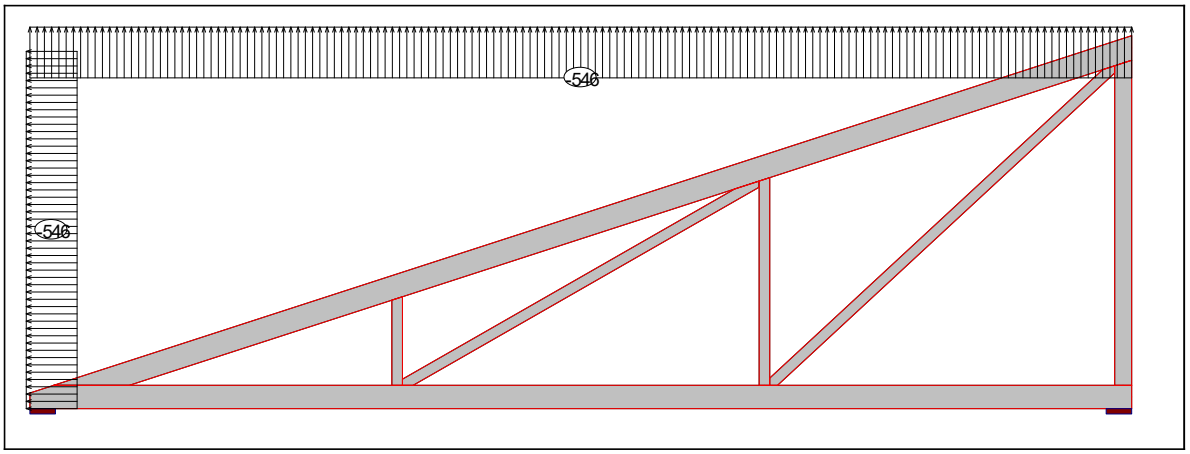
LOAD GROUP 2: Wind from left



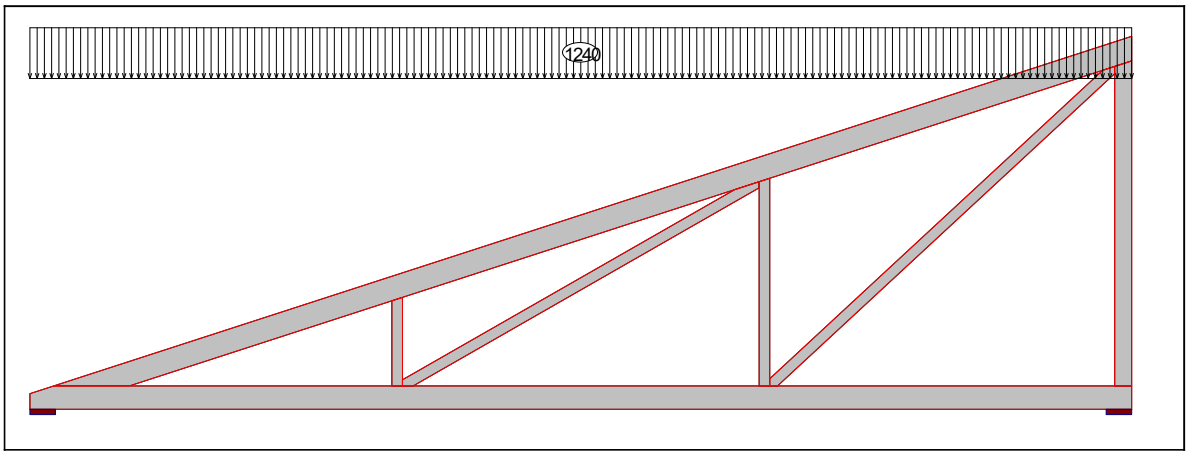
LOAD GROUP 3: Wind from right



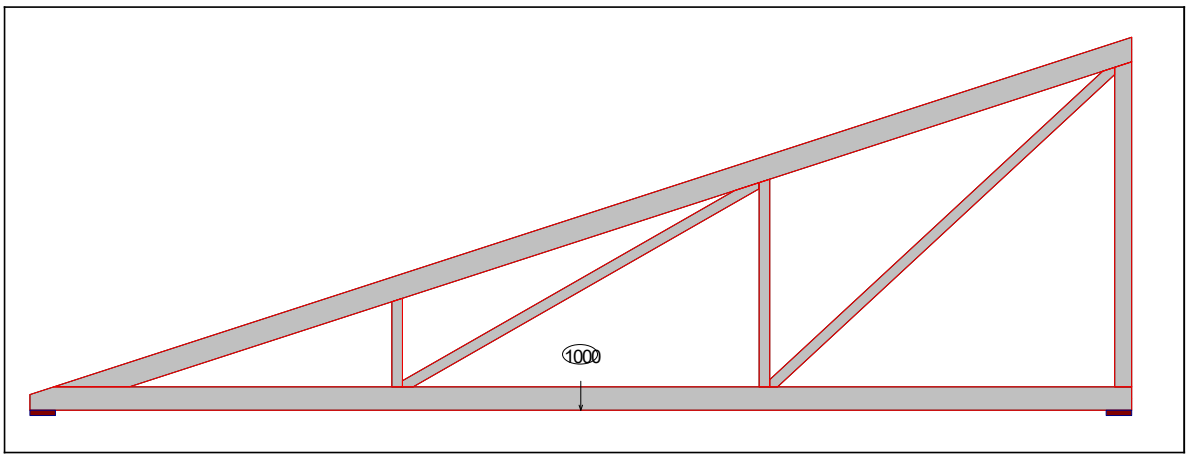
LOAD GROUP 4: Wind from gable



LOAD GROUP 5: Snow uniform



LOAD GROUP 6: Man point load



Poz.200c Strop 1. nadstropja

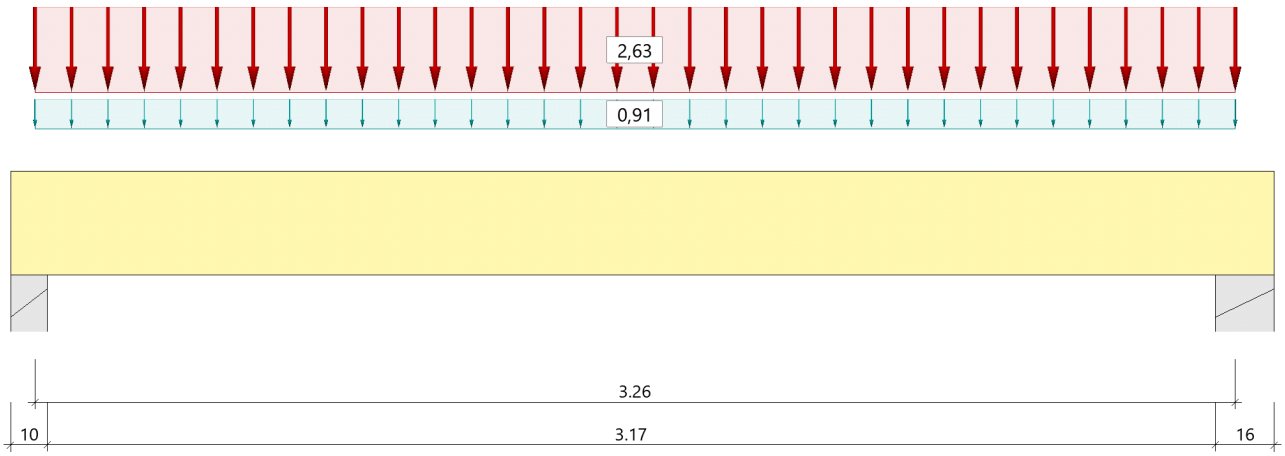
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 35.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	10.0	6.0	1.25	-1	-1	-1	0.0	0.0
2	3.26	16.0	12.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		3.26 3.26		2.60 7.50		Permanent Cat. C		
The load values are multiplied internally by the beam spacing e = 0.35 m.										

- Load 1: Stalna
- Load 2: Stojnica

Self-weight

Total weight = 31 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	 0.70	 0.70	 0.60	1.00	1.35 1.50	 short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.40	0.25	0.51	0.41	 0.40

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	7.0	7.03	0.25	0.40	0.41

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.26 3.26 3.26	1.63 1.63 1.63	inst net,fin fin	z z z	0.1 0.2 0.2	0.2 0.4 0.4	0.3 0.5 0.5	1.1 1.3 1.3	0.31 0.40 0.40	3 5 4

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas		4.68 12.23		
2	3.26	Permanent loads Cat. C: congregation areas		4.68 12.23		

Poz.200d Strop 1. nadstropja

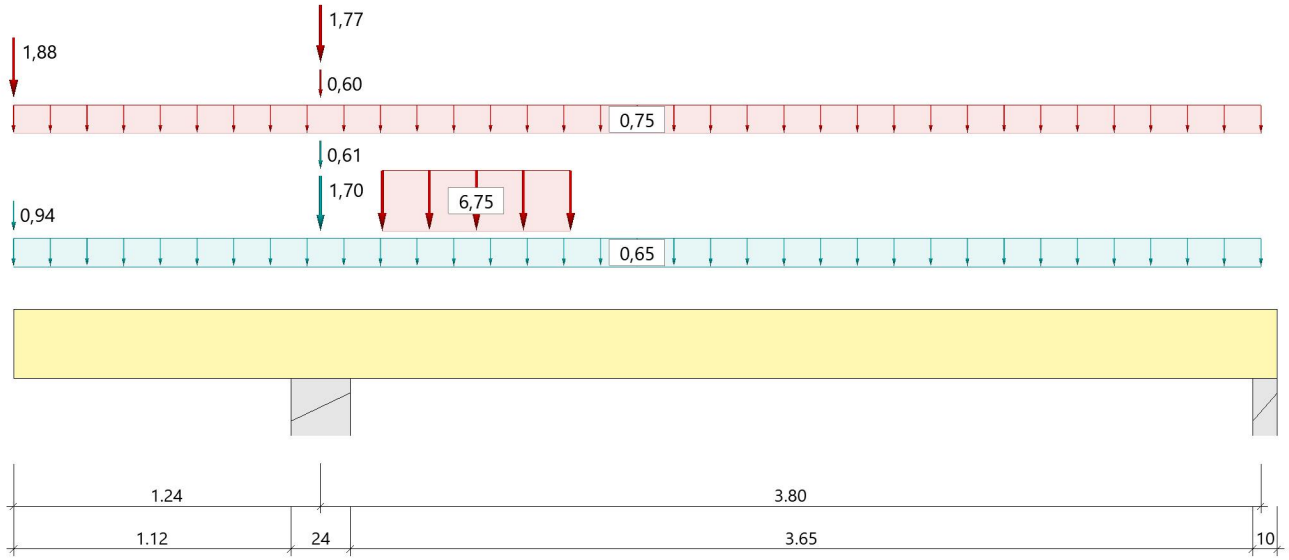
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 25.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	1.24	24.0	6.0	1.25	-1	-1	-1	0.0	0.0
2	5.04	10.0	12.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments from line loads across

Reference	No	Type	A [m]	W	[ ]	Factor	GF	Sim	Alt
System	1	force	0.00	1.50	kN/m	2.50	Permanent		
	2	force	0.00	3.00	kN/m	2.50	Cat. C		
Span 1	3	force	0.00	6.81	kN/m	1.00	Permanent		
	4	force	0.00	2.40	kN/m	1.00	Cat. C		
	5	force	0.00	7.10	kN/m	1.00	Snow		
	6	force	0.00	0.81	kN/m	3.00	Permanent		
The load values are multiplied internally by the beam spacing e = 0.25 m.									

- Load 1: stopnišèe
- Load 2: stopnišèe
- Load 3: Poz.100a
- Load 4: Poz.100a
- Load 5: Poz.100a
- Load 6: Stena

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	7	GL		5.04		2.60		Permanent		
	8	GL		5.04		3.00		Cat. C		
Span 1	9	TL	0.25	0.76		27.00	27.00	Cat. C		
Multispan load no. 8 act span by span. Multispan load no. 7 acts simultaneously The load values are multiplied internally by the beam spacing e = 0.25 m.										

- Load 7: Stalna
- Load 8: Stojnica
- Load 9: Stojnica

Self-weight

Total weight = 47 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Check of cantilever		=	completely

Initial deflection w_{inst} = l/300 $w_{inst\ Krag}$ = l/150
Final deflection $w_{net,fin}$ = l/250 $w_{net,fin\ Krag}$ = l/125
w_{fin} = l/250 $w_{fin\ Krag}$ = l/125

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.39	0.36	0.62	0.41	 0.71

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-5.9	-6.69	0.36	0.39	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Cnt le	1.24	0.00	inst	z	0.0	0.5	0.5	0.8	0.56	7
	1.24	0.00	net,fin	z	0.0	0.7	0.7	1.0	0.71	8
	1.24	0.00	fin	z	0.0	0.7	0.7	1.0	0.71	9
Span 1	3.80	1.80	inst	z	0.03	0.3	0.3	1.3	0.26	10
	3.80	1.94	net,fin	z	0.1	0.4	0.5	1.5	0.32	11
	3.80	1.94	fin	z	0.1	0.4	0.5	1.5	0.32	12
Checks on cantilever are carried out in full.										

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	1.24	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		24.16 39.49 7.10		
2	5.04	Permanent loads Cat. C: congregation areas	 -3.05	3.83 9.10		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.200e Strop 1. nadstropja

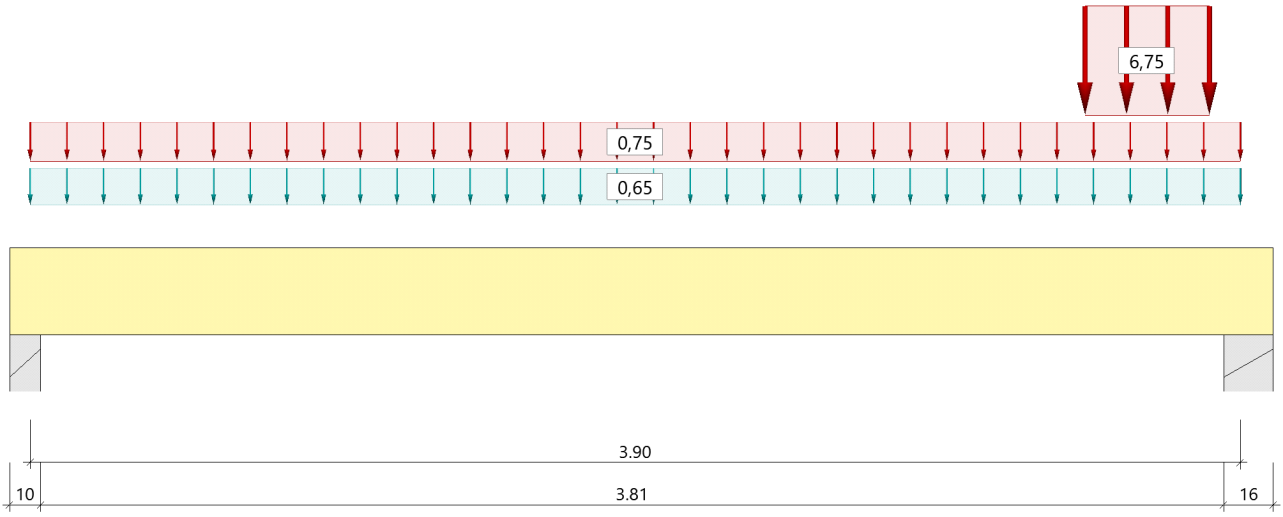
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 25.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	10.0	6.0	1.25	-1	-1	-1	0.0	0.0
2	3.90	16.0	12.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1	GL		3.90		2.60		Permanent		
	2	GL		3.90		3.00		Cat. C		
	3	TL	3.40	0.40		27.00	27.00	Cat. C		
The load values are multiplied internally by the beam spacing e = 0.25 m.										

- Load 1: Stalna
- Load 2: Stojnica
- Load 3: Stojnica

Self-weight

Total weight = 37 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.27	0.17	0.26	0.29	
Serviceability	characteristic					0.34

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-4.8	4.68	0.17	0.27	0.29

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.90	2.05	inst	z	0.1	0.2	0.3	1.3	0.25	3
	3.90	2.05	net,fin	z	0.2	0.3	0.5	1.6	0.34	5
	3.90	2.05	fin	z	0.2	0.3	0.5	1.6	0.34	4

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas		5.80 6.68		
2	3.90	Permanent loads Cat. C: congregation areas		5.80 15.82		

Poz.200f Strop 1. nadstropja

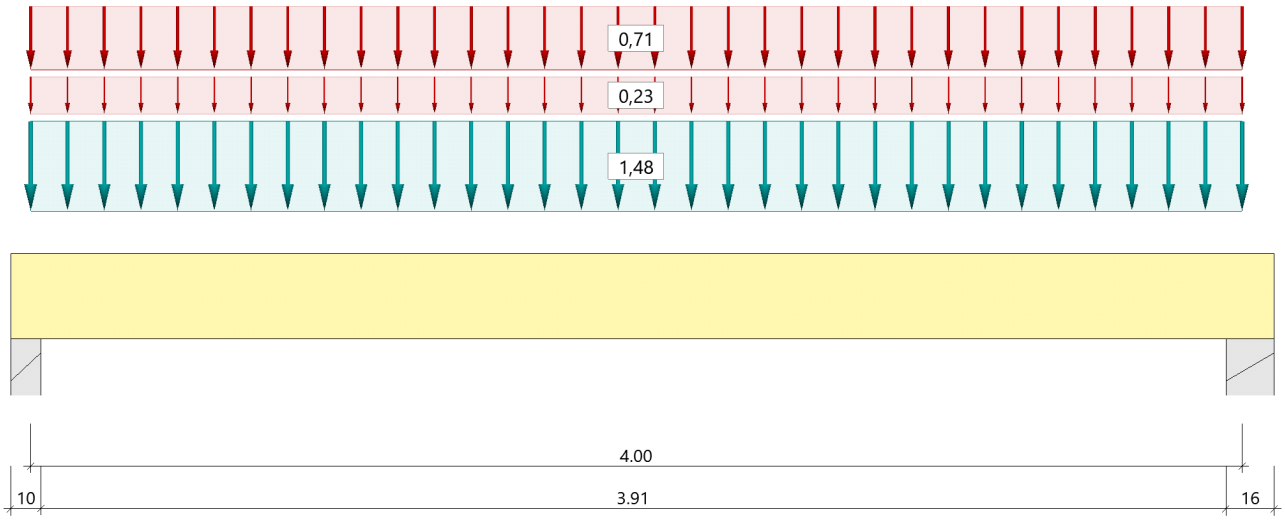
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	10.0	6.0	1.25	-1	-1	-1	0.0	0.0
2	4.00	16.0	12.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1	GL		4.00		2.60		Permanent		
	2	GL		4.00		0.40		Cat. H		
	3	GL		4.00		1.25		Snow		
The load values are multiplied internally by the beam spacing e = 0.57 m.										

- Load 1: Stalna
- Load 2: streha
- Load 3: Sneg

Self-weight

Total weight = 38 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. H: roofs					1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.37	0.19	0.38	0.40	
Serviceability	characteristic					0.46

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	5.4	6.39	0.19	0.37	0.40

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	4.00	2.00	inst	z	0.3	0.1	0.5	1.3	0.36	3
	4.00	2.00	net,fin	z	0.6	0.1	0.7	1.6	0.46	5
	4.00	2.00	fin	z	0.6	0.1	0.7	1.6	0.46	4

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. H: roofs Snow loads H < 1000 m		5.53 0.80 2.50		
2	4.00	Permanent loads Cat. H: roofs Snow loads H < 1000 m		5.53 0.80 2.50		

Poz.200g Strop 1. nadstropja

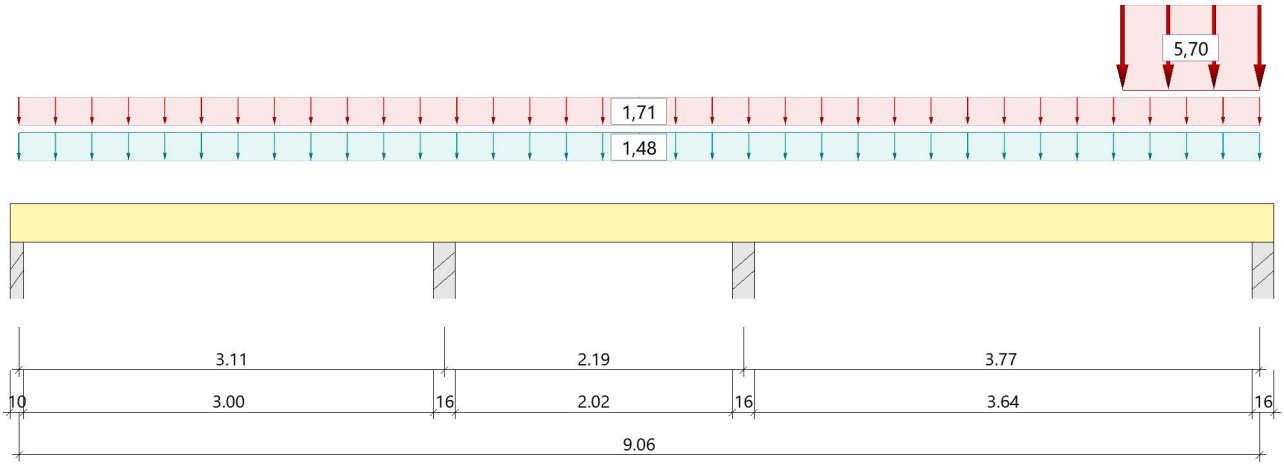
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 3 Span (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Span

Span	Length [m]	Cross-section
1 2 3	3.11 2.19 3.77	8/28(constant over entire beam length)

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	10.0	6.0	1.25	-1	-1	-1	0.0	0.0
2	3.11	16.0	12.0	1.25	-1	-1	0.0	0.0	0.0
3	5.30	16.0	12.0	1.00	-1	-1	0.0	0.0	0.0
4	9.07	16.0	12.0	1.00	-1	-1	0.0	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Lateral support in y- direction: at bearings on top chord

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1	GL		9.07		2.60		Permanent		
	2	GL		9.07		3.00		Cat. C		
Span 3	3	TL	2.77	1.00		10.00	10.00	Cat. C		

Multispan load no. 2 act span by span.
Multispan load no. 1 acts simultaneously
The load values are multiplied internally by the beam spacing e = 0.57 m.

- Load 1: Stalna
- Load 2: Stojnica
- Load 3: Stojnica

Self-weight

Total weight = 85 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short

Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.46	0.37	0.65	0.49	 0.46

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	10.3	8.06	0.37	0.46	0.49

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	3.11	1.47	inst	z	0.1	0.1	0.2	1.0	0.18	8
	3.11	1.47	net,fin	z	0.1	0.2	0.3	1.2	0.24	10
	3.11	1.47	fin	z	0.1	0.2	0.3	1.2	0.24	9
Span 2	2.19	1.15	inst	z	-0.03	-0.1	-0.1	0.7	0.12	8
	2.19	1.15	net,fin	z	-0.05	-0.1	-0.1	0.9	0.16	10
	2.19	1.15	fin	z	-0.05	-0.1	-0.1	0.9	0.16	9
Span 3	3.77	2.18	inst	z	0.1	0.3	0.4	1.3	0.35	8
	3.77	2.18	net,fin	z	0.3	0.4	0.7	1.5	0.46	10
	3.77	2.18	fin	z	0.3	0.4	0.7	1.5	0.46	9

Support forces

Support forces per [m] - characteristic of each action

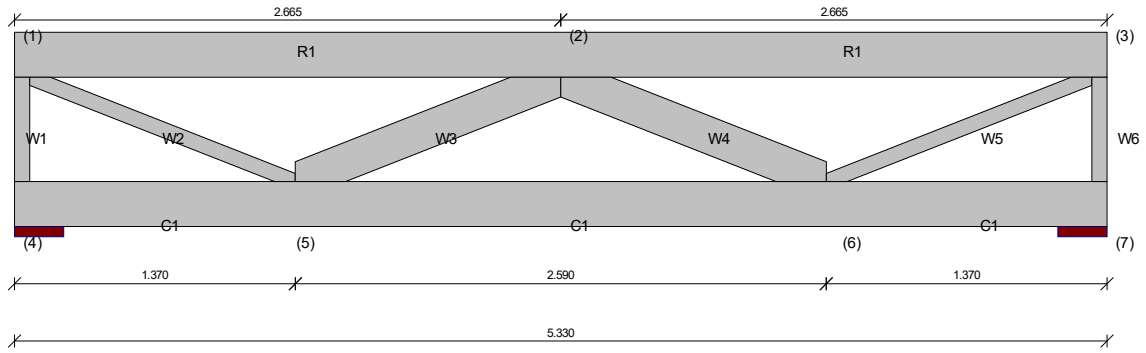
No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas	 -0.20	3.67 4.29		
2	3.11	Permanent loads Cat. C: congregation areas	 -3.15	7.30 10.09		
3	5.30	Permanent loads Cat. C: congregation areas	 -1.31	9.77 14.53		
4	9.07	Permanent loads Cat. C: congregation areas	 -0.14	4.32 13.09		

Poz.200h Streha **Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen** **WolfWin V.8.75**

Tragen Sie hier Ihren Firmennamen ein.

Client: Vrtec Ruše

Project : : 22-P035
Contract No. :
Truss Reference : Poz.200h



REACTIONS (N)

GENERAL GEOMETRY
Span = 5330 mm; Stub height = 950 mm; Pitch = 0.0 deg.;
Raft.Restraint 800 mm

GENERAL LOADS
Std.loads. +WIND
Std.loads.
Spacing = 1000 mm; Tiles: 1450 N/m˛; Snow[0deg]: 1550 N/m˛
Self Wt: 200 N/m˛; C.tie: 550 N/m˛
Windpressure q: 650N/m2

GENERAL SIZES
Timber width: 44 mm (1 Ply)
Rafters: 220; C.ties: 220;
Webs: 74; 74; 180; 180; 74; 74;

REACTIONS (for load groups)

LOAD GROUP	Node	Vert	Horiz	Node	Vert	Horiz
Ref. Description	No.	[N]	[N]	No.	[N]	[N]
1001 Dead load	4	5863	-	7	5863	-
1101 Wind from left	4	-616	-	7	269	-
1103 Wind from right	4	269	-	7	-616	-
1111 Wind from gable	4	-1213	-	7	-1213	-
1202 Snow uniform	4	3305	-	7	3305	-

Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen **WolfWin V.8.75**

Tragen Sie hier Ihren Firmennamen ein.

Client: Vrtec Ruše

Project : : 22-P035
Contract No. :
Truss Reference : Poz.200h

MAX/MIN REACTIONS (for action classes) and average rafter Compression

		max assoc.		max	min assoc.		min		average
	Supp	V	H	H	V	H	H	OG	Axial F.
Action Class	No.	[N]	[N]		[N]	[N]		Nr.	[N]
PERMANENT	4	5863	-0	-0	5863	-0	-0	1	5049
	7	5863	0	0	5863	0	0		
WIND	4	269	-0	0	-1213	0	-0	1	144
	7	269	0	0	-1213	0	0		
SNOW	4	3305	-0	-0	3305	-0	-0	1	2308
	7	3305	0	0	3305	0	0		

Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen **WolfWin V.8.75**

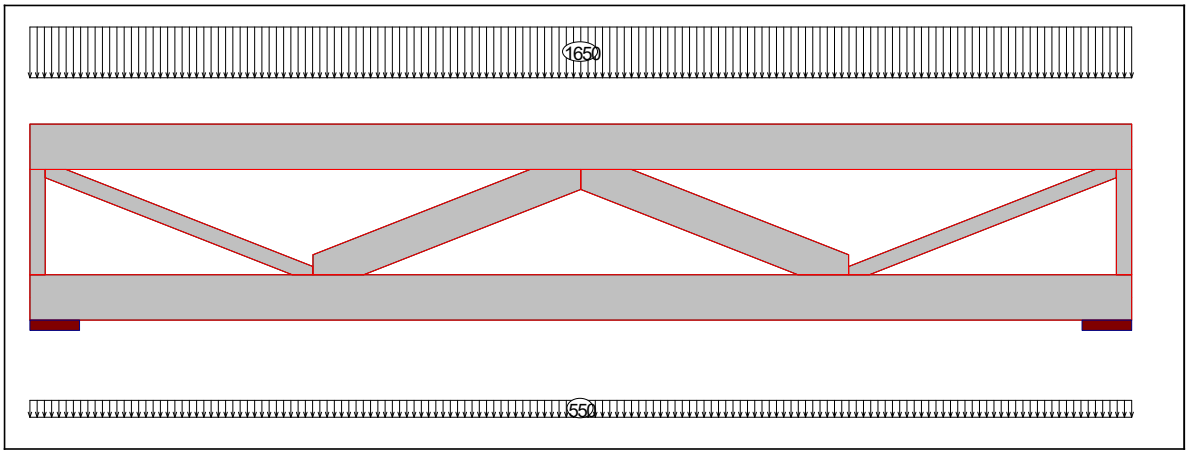
Tragen Sie hier Ihren Firmennamen ein.

Client: Vrtec Ruše

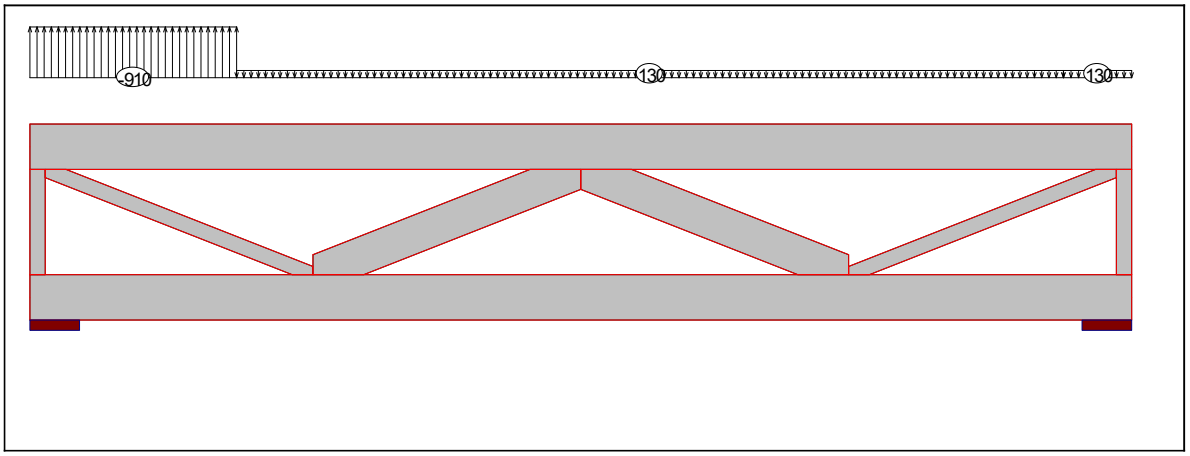
Project : : 22-P035
Contract No. :
Truss Reference : Poz.200h

LOADING SKETCHES ALL LOAD GROUPS

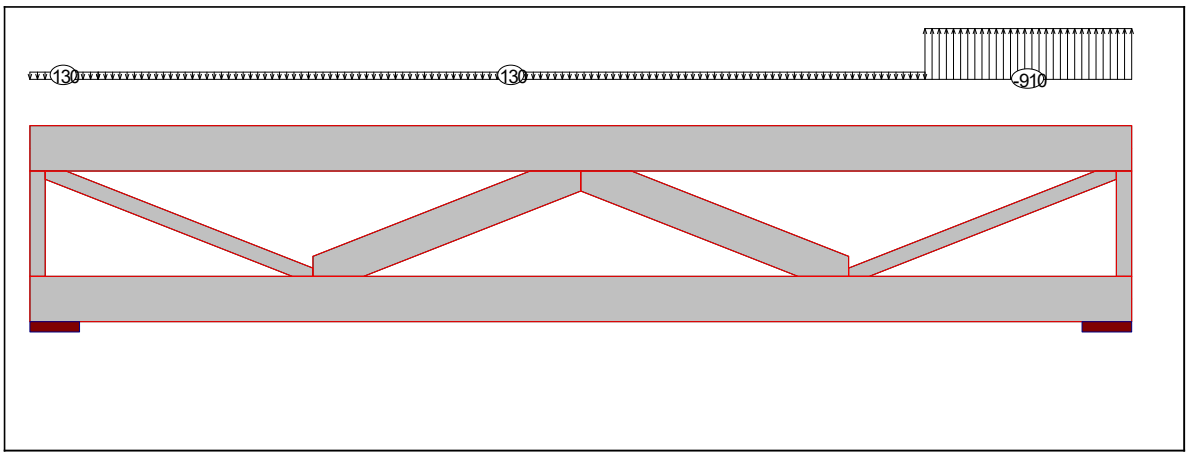
LOAD GROUP 1: Dead load



LOAD GROUP 2: Wind from left



LOAD GROUP 3: Wind from right



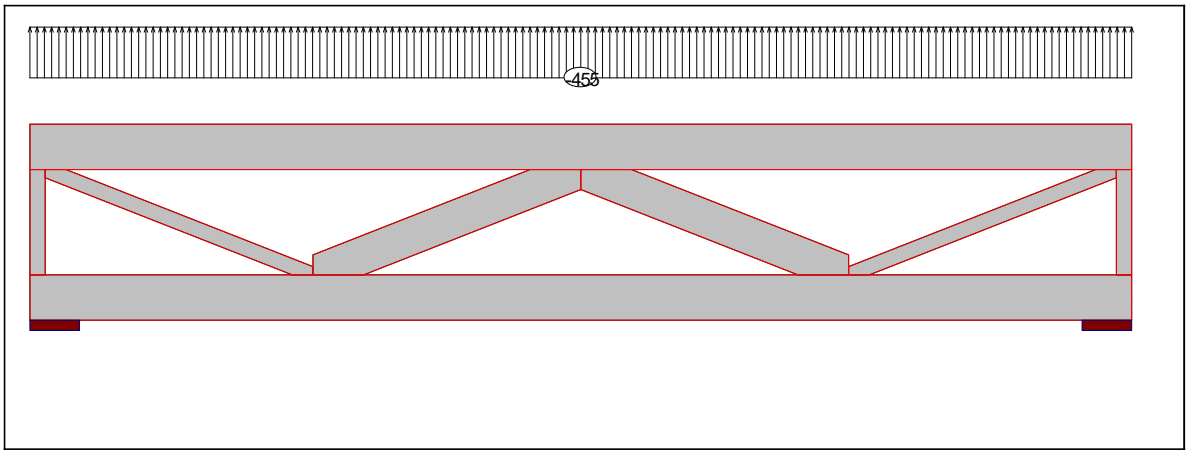
Wolf-Truss Programm zur Berechnung von Nagelplattenkonstruktionen **WolfWin V.8.75**

Tragen Sie hier Ihren Firmennamen ein.

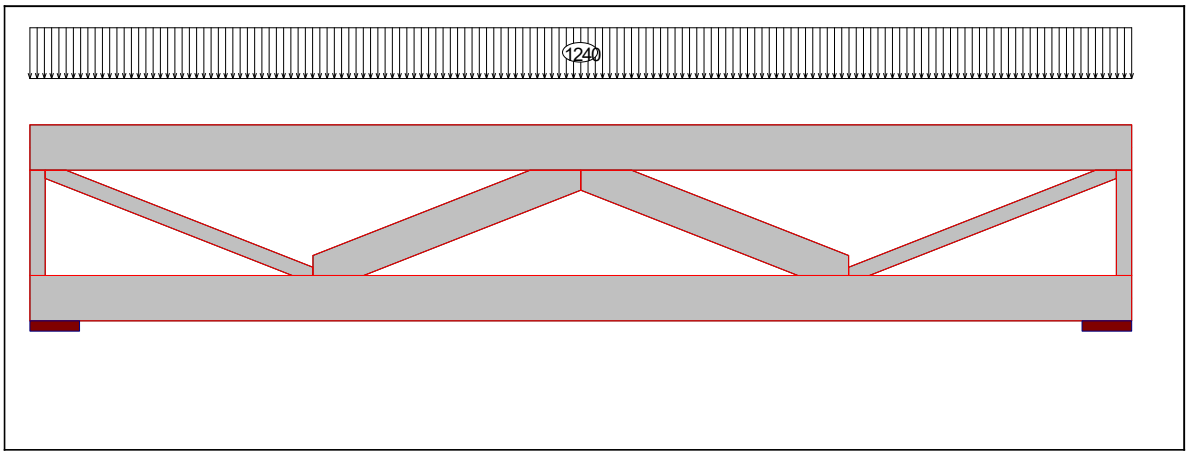
Client: Vrtec Ruše

Project : : 22-P035
Contract No. :
Truss Reference : Poz.200h

LOAD GROUP 4: Wind from gable



LOAD GROUP 5: Snow uniform



Poz.201 Preklada nad oknom

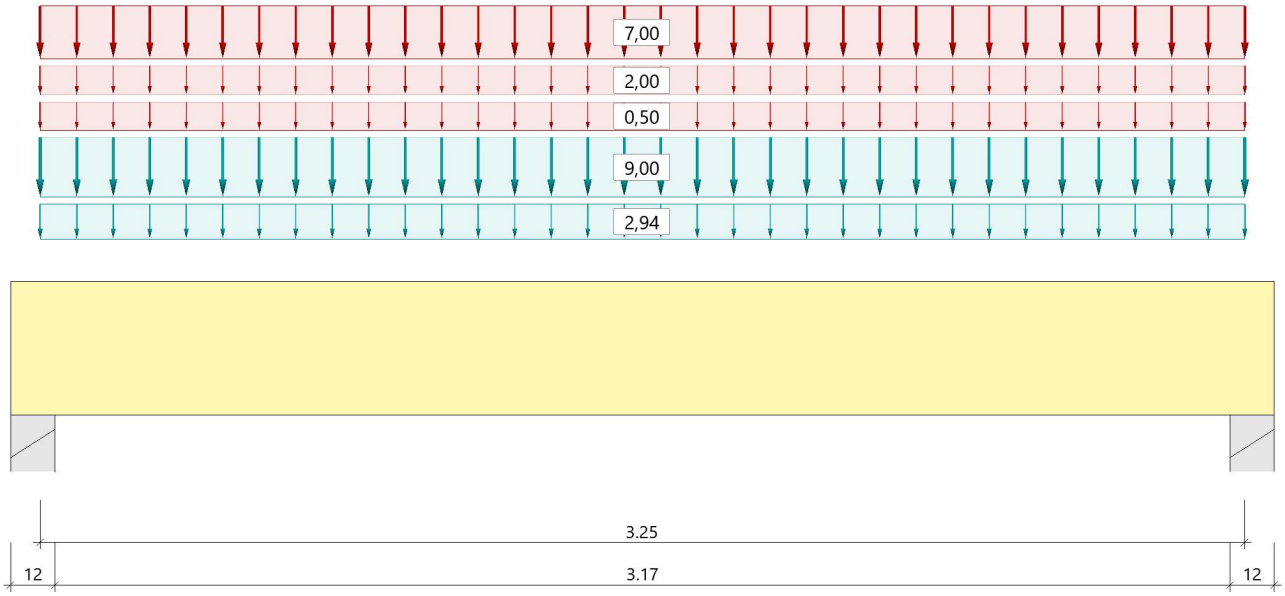
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/36	62208	12288	3456	1536	576.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	3.25	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		3.25		0.95		3.10	Permanent		
	2	GL		3.25		9.00		1.00	Permanent		
	3	GL		3.25		0.50		1.00	Cat. C		
	4	GL		3.25		2.00		1.00	Wind		
	5	GL		3.25		7.00		1.00	Snow		

- Load 1: Zunanja stena
- Load 2: Poz.200a-palièni poševni
- Load 3: Poz.200a-palièni poševni
- Load 4: Poz.200a-palièni poševni
- Load 5: Poz.200a-palièni poševni

Self-weight

Total weight = 94 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.62	0.73	0.74	0.62	 0.48

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/36	47.6	38.74	0.73	0.62	0.62

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	3.25	1.63	inst	z	0.2	0.2	0.4	1.1	0.39	3
	3.25	1.63	net,fin	z	0.4	0.2	0.6	1.3	0.48	5
	3.25	1.63	fin	z	0.4	0.2	0.6	1.3	0.48	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m		19.9 0.8 3.3 11.4		
2	3.25	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m		19.9 0.8 3.3 11.4		

Poz.202 Preklada pri stopnišču

Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

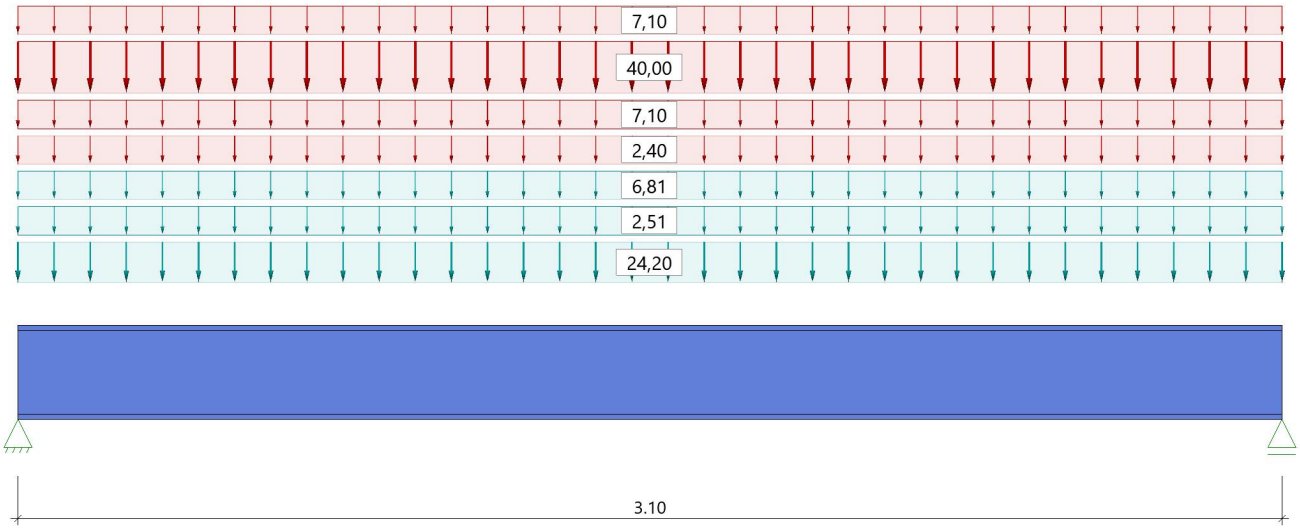
Basic Parameters

Steel girder, EN 1993-1-1:2010

Steel grade:S235

System

System Graphic



Geometry

Cross-sections

Name	I_y [cm^4]	I_z [cm^4]	W_y [cm^3]	W_z [cm^3]	A [cm^2]
HEA 240	7760.0	2770.0	675.0	231.0	76.8
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	3.10	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		3.10		0.81		3.10	Permanent		
	2	GL		3.10		6.81		1.00	Permanent		
	3	GL		3.10		2.40		1.00	Cat. C		
	4	GL		3.10		7.10		1.00	Snow		
	5	GL		3.10		24.20		1.00	Permanent		
	6	GL		3.10		40.00		1.00	Cat. C		
	7	GL		3.10		7.10		1.00	Snow		

- Load 1: Stena
- Load 2: Poz.100a
- Load 3: Poz.100a
- Load 4: Poz.100a
- Load 5: Poz.200d
- Load 6: Poz.200d
- Load 7: Poz.200d

Self-weight

Total weight = 187 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Snow loads H < 1000 m	0.50	0.20	0.00		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Results

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.3 - annex B
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.82	0.85	
Serviceability	characteristic			0.60

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEA 240	Span 1, x = 1.55	0.0	144.53	0.82	0.85

Check for maximum utilization at x = 1.55 m Lcomb 42

N_{pld}	=	0.0 kN	N_{Rd}	=	1804.8	kN
N_{Ed}	=	0.0 kN	η_N	=	0.00	
$M_{y,pld}$	=	144.53 kNm	$M_{y,Rd}$	=	175.49	kNm
$M_{y,Ed}$	=	144.53 kNm	η_{My}	=	0.82	
$V_{z,pld}$	=	0.0 kN	$V_{z,Rd}$	=	341.1	kN
$V_{z,Ed}$	=	0.0 kN	η_{Vz}	=	0.00	
			η	**=**	**0.82**	

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
1.55	3.10	0.00	3.10	0.6	1.0	0.60	3

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		52.9 65.7 22.0		
2	3.10	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		52.9 65.7 22.0		

Poz.203 Preklada nad vrati

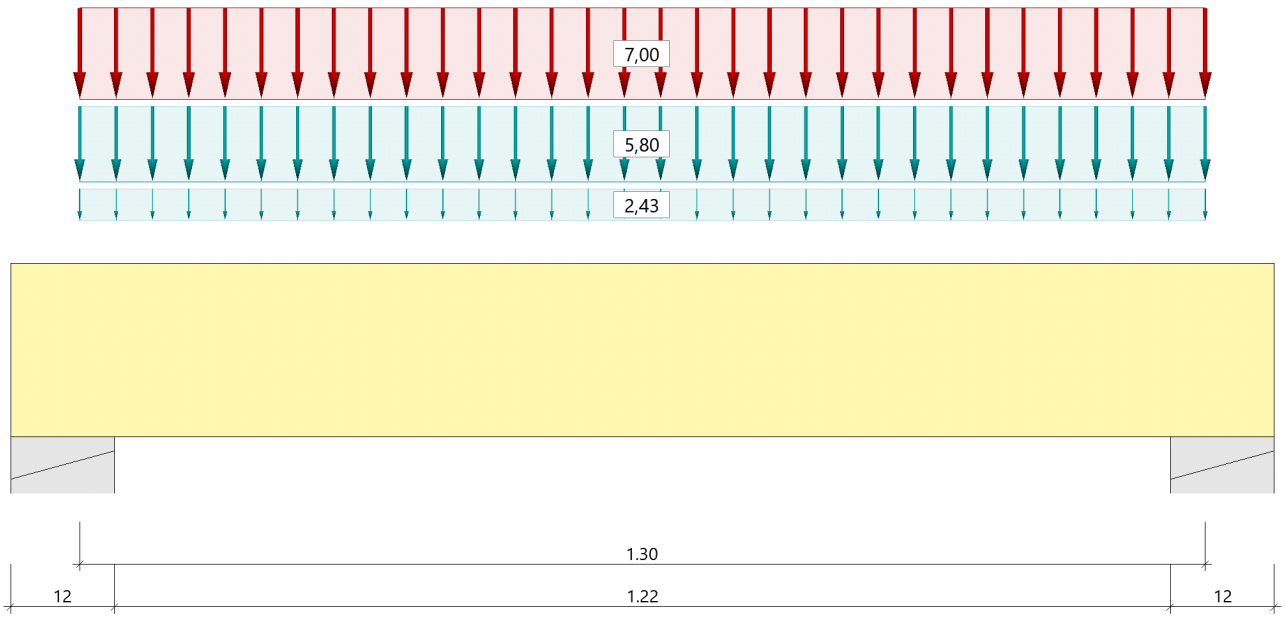
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/20	10667	6827	1067	853	320.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	10.0	1.50	-1	-1	-1	0.0	0.0
2	1.30	12.0	10.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		1.30		0.81		3.00	Permanent		
	2	GL		1.30		5.80		1.00	Permanent		
	3	GL		1.30		7.00		1.00	Cat. C		

- Load 1: stena
- Load 2: Poz.200e
- Load 3: Poz.200e

Self-weight

Total weight = 21 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.23	0.39	0.35	0.23	
Serviceability	characteristic					0.15

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/20	-14.2	4.61	0.39	0.23	0.23

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.30	0.65	inst	z	0.03	0.02	0.05	0.4	0.11	3
	1.30	0.65	net,fin	z	0.05	0.03	0.1	0.5	0.15	5
	1.30	0.65	fin	z	0.05	0.03	0.1	0.5	0.15	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		5.5		
		Cat. C: congregation areas		4.5		
2	1.30	Permanent loads		5.5		
		Cat. C: congregation areas		4.6		

Poz.204 Preklada nad vrati

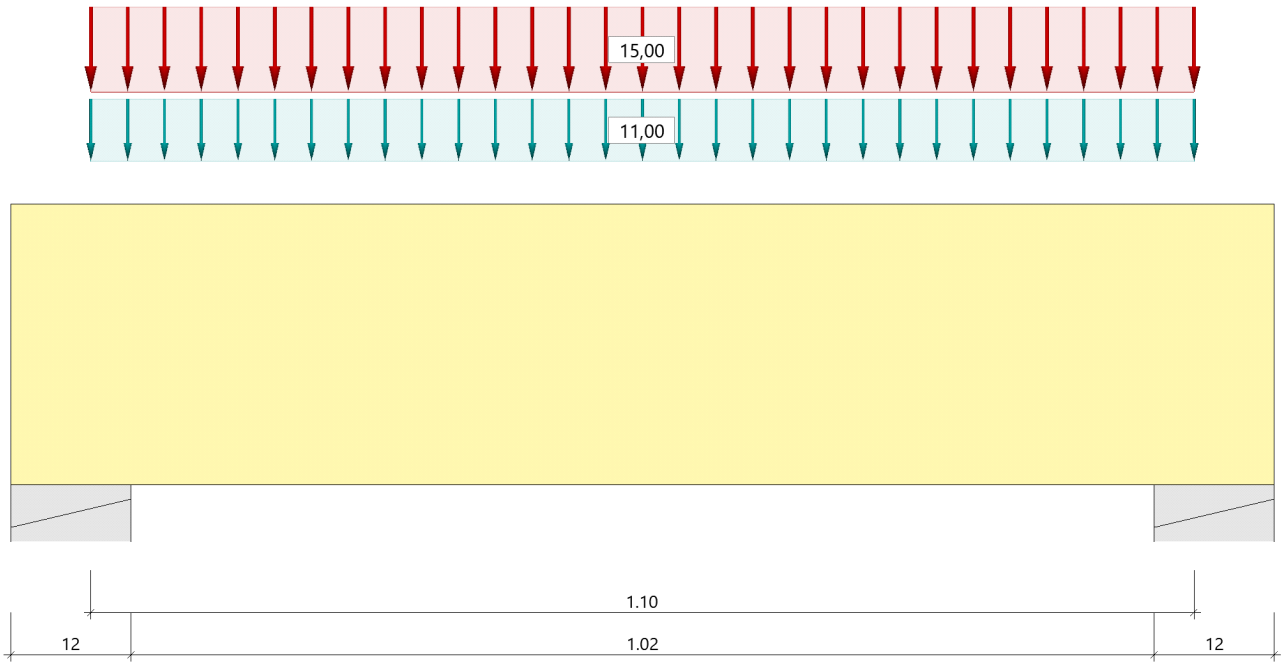
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
10/28	18293	2333	1307	467	280.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	10.0	1.50	-1	-1	-1	0.0	0.0
2	1.10	12.0	10.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		1.10		11.00		Permanent		
	2	GL		1.10		15.00		Cat. C		

- Load 1: Poz.200h
- Load 2: Poz.200h

Self-weight

Total weight = 15 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.23	0.65	0.51	0.23	
Serviceability	characteristic					0.09

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	10/28	-20.6	5.68	0.65	0.23	0.23

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	1.10	0.55	inst	z	0.01	0.01	0.02	0.4	0.06	3
	1.10	0.55	net,fin	z	0.02	0.02	0.04	0.4	0.09	5
	1.10	0.55	fin	z	0.02	0.02	0.04	0.4	0.09	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		6.1 8.2		
2	1.10	Permanent loads Cat. C: congregation areas		6.1 8.2		

Poz.205 Preklana nad oknom

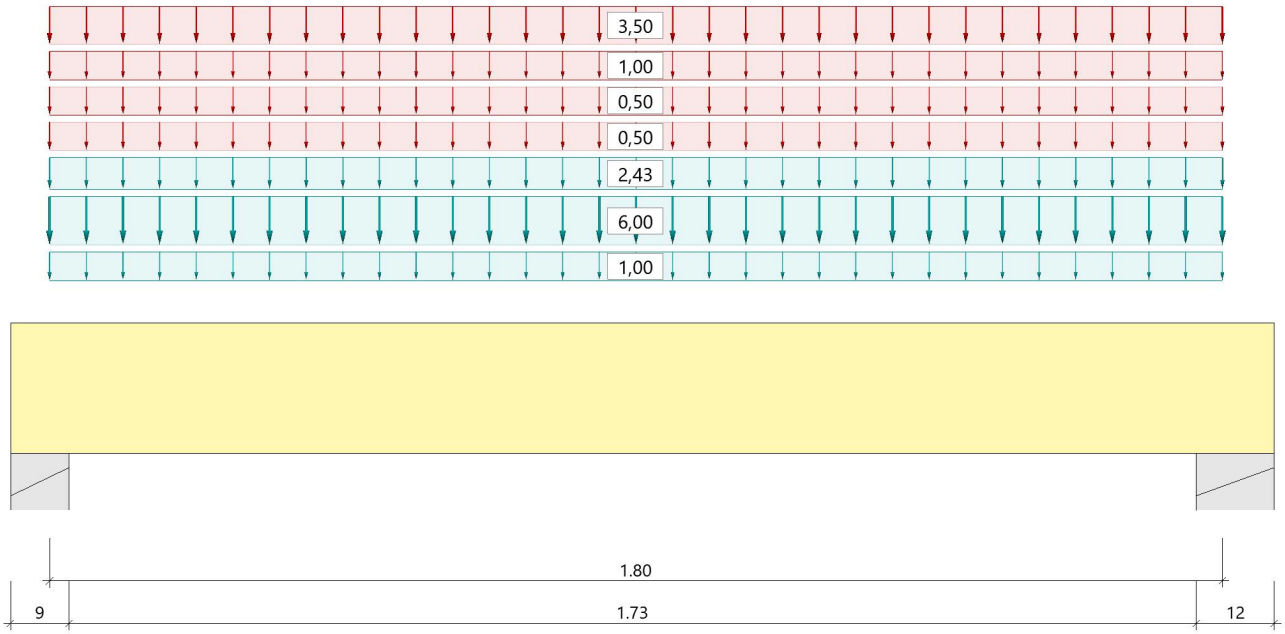
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/20	10667	6827	1067	853	320.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	9.0	16.0	1.75	-1	-1	-1	0.0	0.0
2	1.80	12.0	16.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		1.80		6.00		1.00	Permanent		
	2	GL		1.80		3.50		1.00	Snow		
	3	GL		1.80		0.50		1.00	Wind		
	4	GL		1.80		0.81		3.00	Permanent		
	5	GL		1.80		1.00		1.00	Permanent		
	6	GL		1.80		0.50		1.00	Cat. H		
	7	GL		1.80		1.00		1.00	Snow		

- Load 1: Poz.200i
- Load 2: Poz.200i
- Load 3: Poz.200i
- Load 4: stena
- Load 5: Poz.100b
- Load 6: Poz.100b
- Load 7: Poz.100b

Self-weight

Total weight = 29 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. H: roofs					1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.40	0.50	0.42	0.40	 0.34

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/20	18.1	8.16	0.50	0.40	0.40

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.80	0.90	inst	z	0.1	0.1	0.2	0.6	0.27	3
	1.80	0.90	net,fin	z	0.2	0.1	0.2	0.7	0.34	5
	1.80	0.90	fin	z	0.2	0.1	0.2	0.7	0.34	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. H: roofs Wind loads Snow loads H < 1000 m		8.6 0.5 0.5 4.1		
2	1.80	Permanent loads Cat. H: roofs Wind loads Snow loads H < 1000 m		8.6 0.5 0.5 4.0		

Poz.206 Preklana nad oknom

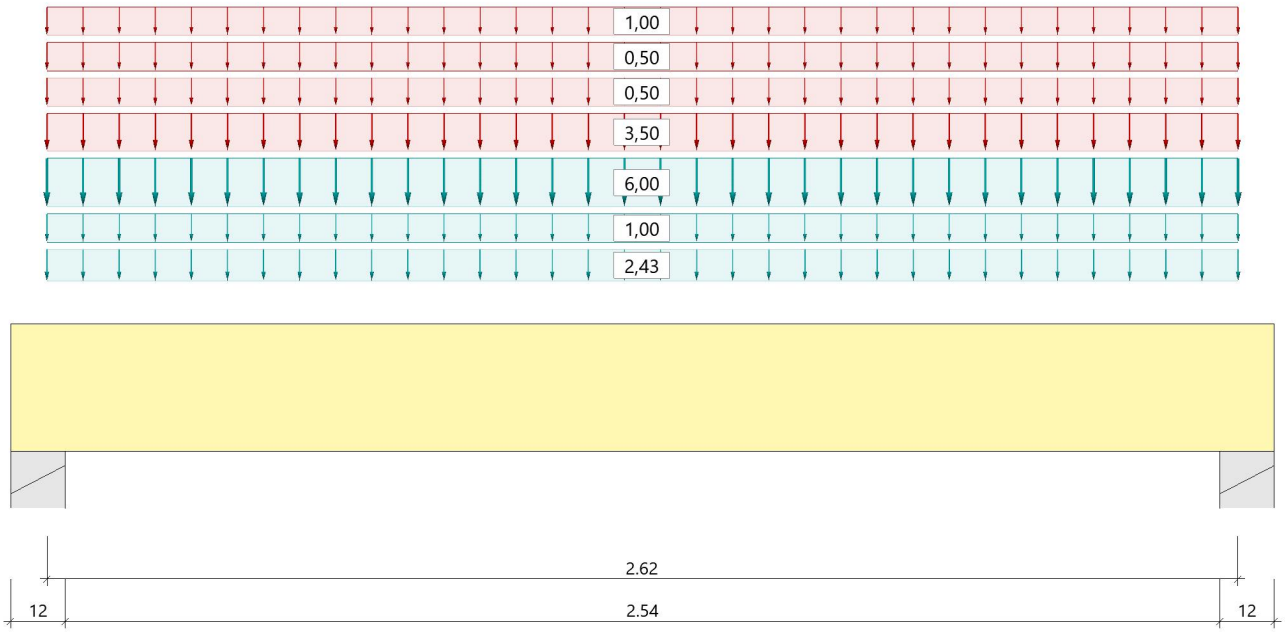
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/28	29269	9557	2091	1195	448.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	2.62	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		2.62		6.00		1.00	Permanent		
	2	GL		2.62		3.50		1.00	Snow		
	3	GL		2.62		0.50		1.00	Wind		
	4	GL		2.62		0.81		3.00	Permanent		
	5	GL		2.62		1.00		1.00	Permanent		
	6	GL		2.62		0.50		1.00	Cat. H		
	7	GL		2.62		1.00		1.00	Snow		

- Load 1: Poz.200i
- Load 2: Poz.200i
- Load 3: Poz.200i
- Load 4: stena
- Load 5: Poz.100b
- Load 6: Poz.100b
- Load 7: Poz.100b

Self-weight

Total weight = 59 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. H: roofs					1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.45	0.53	0.41	0.45	 0.39

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/28	-26.5	17.36	0.53	0.45	0.45

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	2.62	1.31	inst	z	0.2	0.1	0.3	0.9	0.30	3
	2.62	1.31	net,fin	z	0.3	0.1	0.4	1.0	0.39	5
	2.62	1.31	fin	z	0.3	0.1	0.4	1.0	0.39	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. H: roofs Wind loads Snow loads H < 1000 m		12.6 0.7 0.7 5.9		
2	2.62	Permanent loads Cat. H: roofs Wind loads Snow loads H < 1000 m		12.6 0.7 0.7 5.9		

Poz.207 Preklana nad oknom

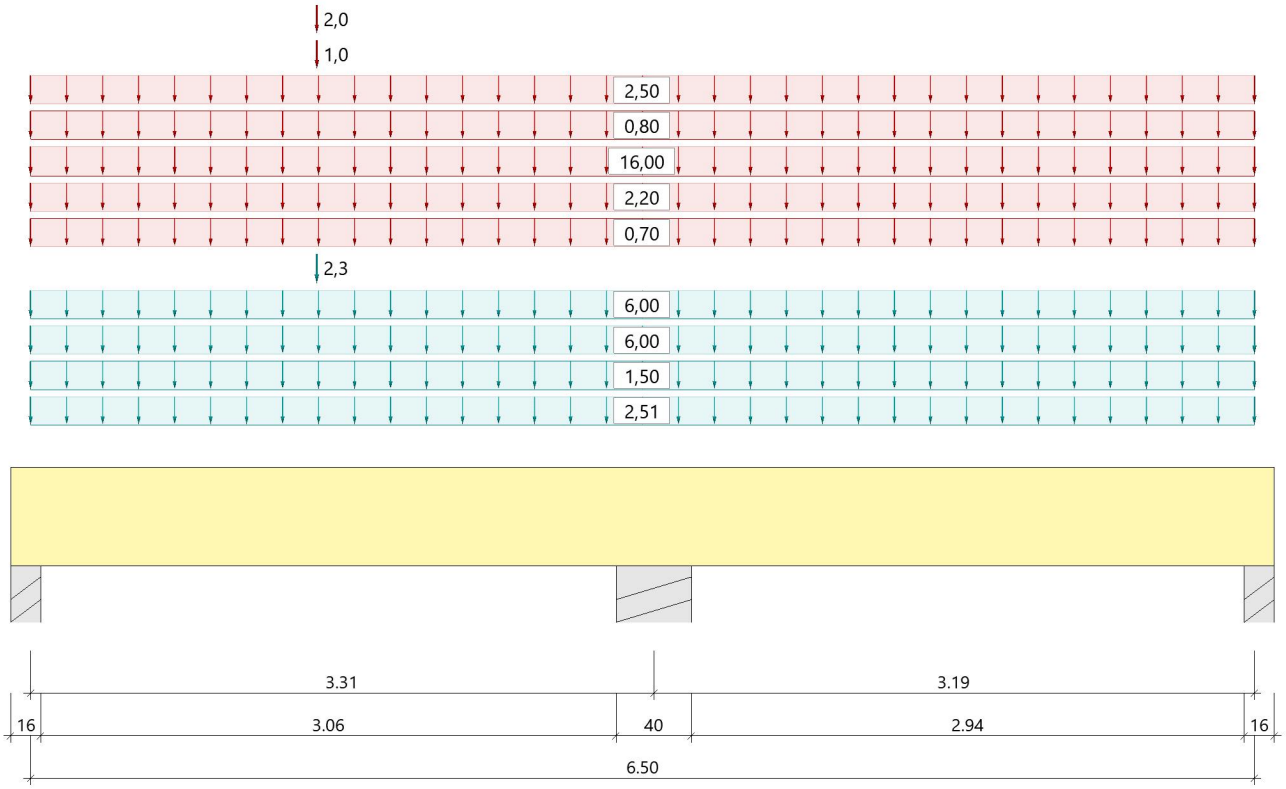
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 2 Span Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/52	187477	17749	7211	2219	832.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	3.31	40.0	16.0	1.75	-1	-1	0.0	0.0	0.0
3	6.50	16.0	16.0	1.50	-1	-1	0.0	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments

Reference	No	Type	A [m]	W	[ ]	GF	Sim	Alt
System	1	force	1.52	2.3	kN	Permanent		
	2	force	1.52	1.0	kN	Cat. C		
	3	force	1.52	2.0	kN	Snow		

- Load 1: Poz.104
- Load 2: Poz.104
- Load 3: Poz.104

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	4	GL		6.50		0.81		3.10	Permanent		
	5	GL		6.50		1.50		1.00	Permanent		
	6	GL		6.50		0.70		1.00	Cat. C		
	7	GL		6.50		2.20		1.00	Snow		
	8	GL		6.50		6.00		1.00	Permanent		
	9	GL		6.50		16.00		1.00	Cat. C		
	10	GL		6.50		6.00		1.00	Permanent		
	11	GL		6.50		0.80		1.00	Cat. C		
	12	GL		6.50		2.50		1.00	Snow		

The load no. 6, 7, 9, 11 und 12 act span by span.
The load no. 4, 5, 8 und 10 act simultaneously

- Load 4: Stena
- Load 5: Poz.100a
- Load 6: Poz.100a
- Load 7: Poz.100a
- Load 8: Poz.200e
- Load 9: Poz.200e
- Load 10: Poz.200f
- Load 11: Poz.200f
- Load 12: Poz.200f

Self-weight

Total weight = 227 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short

Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/150

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.56	0.77	0.93	0.56	
Serviceability	characteristic					0.19

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/52	-36.8	-70.41	0.77	0.56	0.56

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	3.31	1.52	inst	z	0.1	0.1	0.2	1.1	0.15	7
	3.31	1.52	net,fin	z	0.1	0.1	0.3	1.3	0.19	9
	3.31	1.52	fin	z	0.1	0.1	0.3	2.2	0.11	8
Span 2	3.19	1.68	inst	z	0.04	0.1	0.1	1.1	0.12	10
	3.19	1.68	net,fin	z	0.1	0.1	0.2	1.3	0.15	11
	3.19	1.68	fin	z	0.1	0.1	0.2	2.1	0.09	12

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		21.6		
		Cat. C: congregation areas	-3.3	25.7		
		Snow loads H < 1000 m	-0.9	7.7		
2	3.31	Permanent loads		68.0		
		Cat. C: congregation areas		71.8		
		Snow loads H < 1000 m		20.4		
3	6.50	Permanent loads		19.1		
		Cat. C: congregation areas	-3.9	24.5		
		Snow loads H < 1000 m	-1.2	6.6		

Poz.208 preklada nad oknom

Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

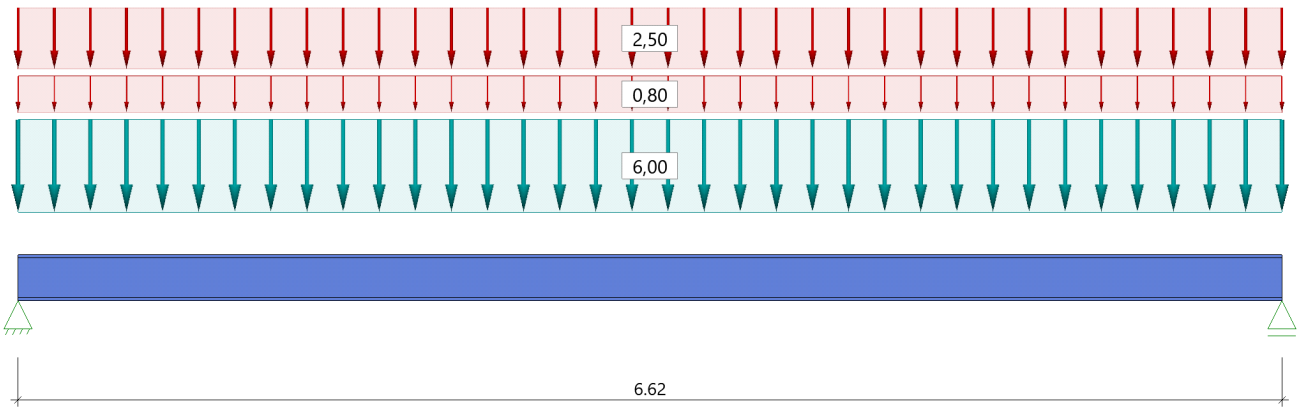
Basic Parameters

Steel girder, EN 1993-1-1:2010

Steel grade:S235

System

System Graphic



Geometry

Cross-sections

Name	I_y [cm^4]	I_z [cm^4]	W_y [cm^3]	W_z [cm^3]	A [cm^2]
HEB 240	11260.0	3923.0	938.0	327.0	106.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	6.62	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		6.62		6.00		Permanent		
	2	GL		6.62		0.80		Cat. C		
	3	GL		6.62		2.50		Snow		

- Load 1: Poz.200g
- Load 2: Poz.200g
- Load 3: Poz.200g

Self-weight

Total weight = 551 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Snow loads H < 1000 m	0.50	0.20	0.00		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Results

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.3 - annex B
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.31	0.36	
Serviceability	characteristic			0.47

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEB 240	Span 1, x = 3.31	0.0	75.67	0.31	0.36

Check for maximum utilization at x = 3.31 m Lcomb 34

N_{pld}	= 0.0	kN	N_{Rd}	= 2491.0	kN
N_{Ed}	= 0.0	kN	η_N	= 0.00	
$M_{y,pld}$	= 75.67	kNm	$M_{y,Rd}$	= 248.00	kNm
$M_{y,Ed}$	= 75.67	kNm	η_{My}	= 0.31	
$V_{z,pld}$	= 0.0	kN	$V_{z,Rd}$	= 451.0	kN
$V_{z,Ed}$	= 0.0	kN	η_{Vz}	= 0.00	
			η	= **0.31**	

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
3.31	6.62	0.00	6.62	1.0	2.2	0.47	3

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		22.6 2.6 8.3		
2	6.62	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		22.6 2.6 8.3		

Poz.209 Preklana nad oknom

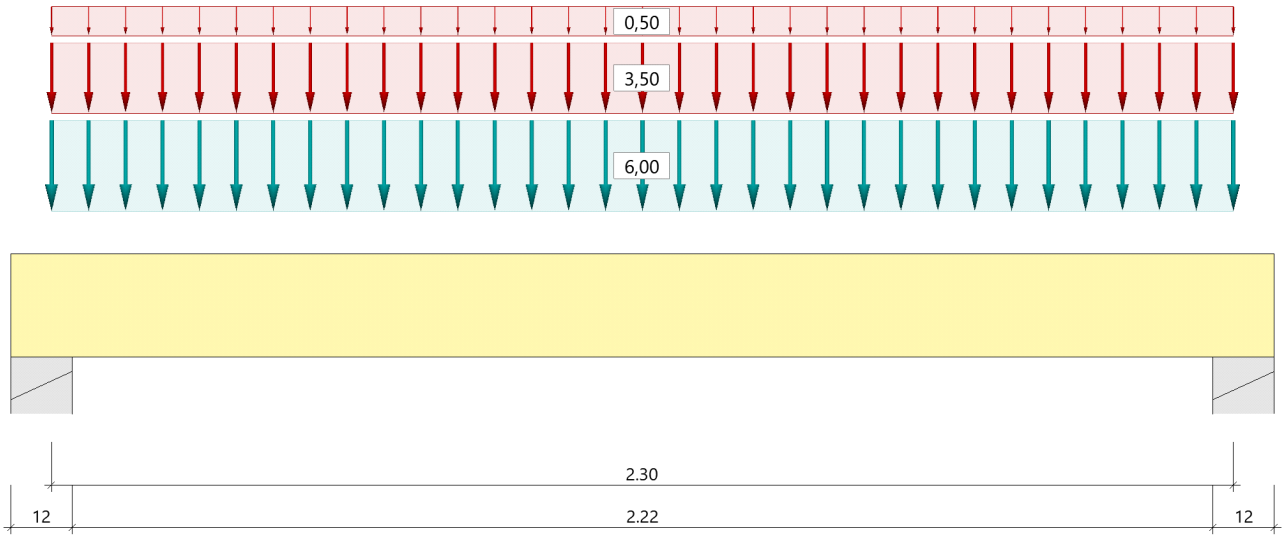
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/20	10667	6827	1067	853	320.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations*) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	2.30	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		2.30		6.00		Permanent		
	2	GL		2.30		3.50		Snow		
	3	GL		2.30		0.50		Wind		

- Load 1: Poz.200i
- Load 2: Poz.200i
- Load 3: Poz.200i

Self-weight

Total weight = 37 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.46	0.45	0.25	0.46	
Serviceability	characteristic					0.48

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/20	16.1	9.27	0.45	0.46	0.46

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	2.30	1.15	inst	z	0.2	0.1	0.3	0.8	0.39	3
	2.30	1.15	net,fin	z	0.3	0.1	0.4	0.9	0.48	5
	2.30	1.15	fin	z	0.3	0.1	0.4	0.9	0.48	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		7.1		
		Wind loads		0.6		
		Snow loads H < 1000 m		4.0		
2	2.30	Permanent loads		7.1		
		Wind loads		0.6		
		Snow loads H < 1000 m		4.0		

Poz.210 Preklana nad oknom

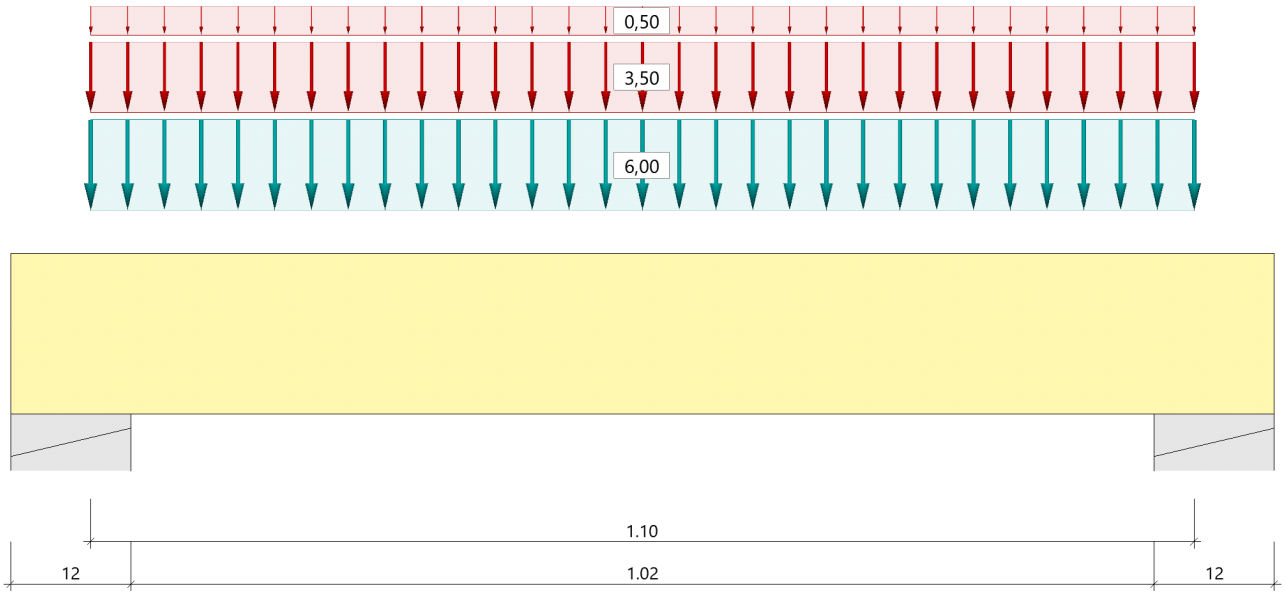
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
2x8/16	5461	5461	683	683	256.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	1.10	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		1.10		6.00		Permanent		
	2	GL		1.10		3.50		Snow		
	3	GL		1.10		0.50		Wind		

- Load 1: Poz.200i
- Load 2: Poz.200i
- Load 3: Poz.200i

Self-weight

Total weight = 14 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.19	0.24	0.12	0.19	
Serviceability	characteristic					0.11

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	2x8/16	7.7	2.11	0.24	0.19	0.19

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.10	0.55	inst	z	0.02	0.01	0.03	0.4	0.09	3
	1.10	0.55	net,fin	z	0.04	0.01	0.05	0.4	0.11	5
	1.10	0.55	fin	z	0.04	0.01	0.05	0.4	0.11	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		3.4		
		Wind loads		0.3		
		Snow loads H < 1000 m		1.9		
2	1.10	Permanent loads		3.4		
		Wind loads		0.3		
		Snow loads H < 1000 m		1.9		

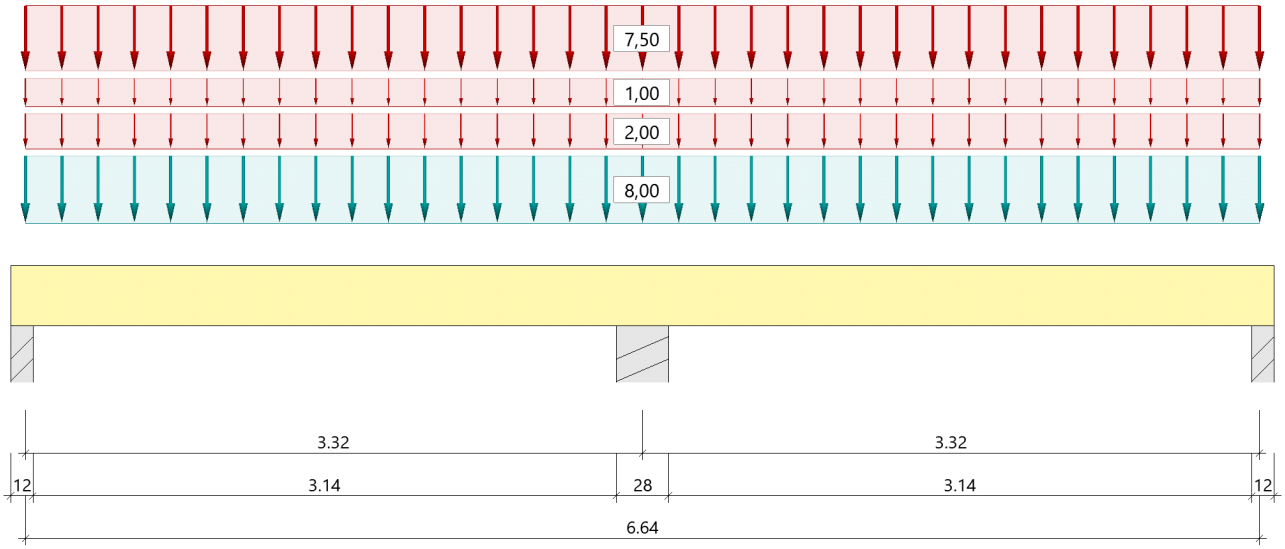
Poz.211 Preklana nad oknom

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 2 Span Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00	19.20	0.50	11500	300	650	385
3.50	24.00	2.50	9600	250	540	420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/32	43691	10923	2731	1365	512.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	3.32	28.0	16.0	1.50	-1	-1	0.0	0.0	0.0
3	6.64	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		6.64		8.00		Permanent		
	2	GL		6.64		7.50		Snow		
	3	GL		6.64		2.00		Wind		
	4	GL		6.64		1.00		Cat. H		
The load no. 2, 3 und 4 act span by span. The load no. 1 acts simultaneously										

- Load 1: Poz.200a
- Load 2: Poz.200a
- Load 3: Poz.200a
- Load 4: Poz.200a

Self-weight

Total weight = 170 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. H: roofs					1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.66	0.87	0.68	0.66	
Serviceability	characteristic					0.29

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/32	-50.2	-33.34	0.87	0.66	0.66

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.32	1.57	inst	z	0.1	0.2	0.3	1.1	0.27	10
	3.32	1.40	net,fin	z	0.2	0.2	0.4	1.3	0.29	11
	3.32	1.40	fin	z	0.2	0.2	0.4	1.3	0.29	12
Span 2	3.32	1.75	inst	z	0.1	0.2	0.3	1.1	0.27	7
	3.32	1.92	net,fin	z	0.2	0.2	0.4	1.3	0.29	9
	3.32	1.92	fin	z	0.2	0.2	0.4	1.3	0.29	8

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		10.3		
		Cat. H: roofs	-0.2	1.5		
		Wind loads	-0.4	2.9		
		Snow loads H < 1000 m	-1.6	10.9		
2	3.32	Permanent loads		34.3		
		Cat. H: roofs		4.2		
		Wind loads		8.3		
		Snow loads H < 1000 m		31.1		
3	6.64	Permanent loads		10.3		
		Cat. H: roofs	-0.2	1.5		
		Wind loads	-0.4	2.9		
		Snow loads H < 1000 m	-1.6	10.9		

4.2.3. Pritličje

Poz.300a Strop pritličja

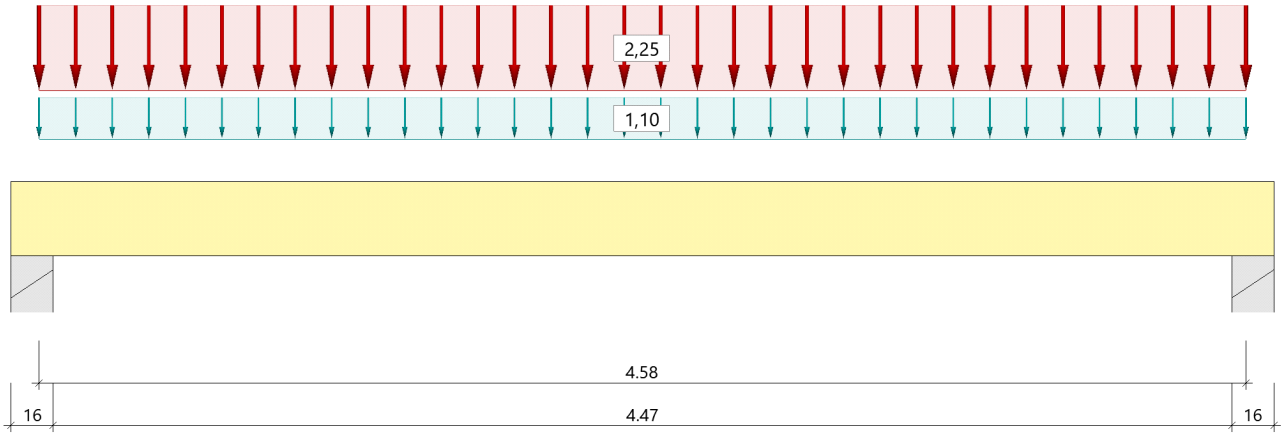
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 45.0 cm) BauBuche S (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

BauBuche S (flat), user defined material (design as GL32h)

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
80.00 8.00	60.00 57.50	1.50 14.00	16800 14900	470 350	760 620	730 800

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
6/28	10976	504	784	168	168.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations*) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.50	-1	-1	-1	0.0	0.0
2	4.58	16.0	6.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		4.58 4.58		2.45 5.00		Permanent Cat. C		
The load values are multiplied internally by the beam spacing e = 0.45 m.										

- Load 1: Stalna
- Load 2: Koristna

Self-weight

Total weight = 38 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	 0.70	 0.70	 0.60	1.00	1.35 1.50	 short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.27	0.26	0.07	1)	 0.93
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	6/28	11.4	13.05	0.26	0.27	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	4.58 4.58 4.58	2.29 2.29 2.29	inst net,fin fin	z z z	0.4 0.7 0.7	0.7 1.0 1.0	1.1 1.7 1.7	1.5 1.8 1.8	0.70 0.93 0.93	4 6 5

Vibration check

Oscillation check, span 1 ÖNorm B 1995-1-1:2015-06 / Hamm

The oscillation check is only performed for the permanent load components.
(NA ÖNorm EN 1995-1-1 7.3.3 (2) to (5)).

selected plate class		=	1	
Proof natural frequency	m	=	264	kg/m2
Beam: 6/28	EI	=	1.844	MNm2
Beam spacing	e	=	45.0	cm
	f0	=	9.34	Hz
	f1	=	9.34	Hz

Oscillation velocity due to pulse unit v <= 6*b^(f1*Ksi-1)

modal attenuation coefficient	Ksi	=	0.010	
Factor	b	=	116.58	
	adm v	=	0.0134	m / (Ns ^ 2)
	γ	=	1.00	
	v	=	0.0031	m / (Ns ^ 2)
	Eta	=	0.23	

Frequenzkriterium:

For plate class 1	f_{gr}	=	8.00	Hz
	f1	=	9.34	Hz
	Eta	=	0.86	

Stiffness criterion:
Deflection due to single load F

For plate class 1	w_{gr}	=	0.25	mm/kN
	w_{stat}	=	1.09	mm/kN
	Eta	=	4.34	

The oscillation check is not fulfilled!

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas		6.04 11.45		
2	4.58	Permanent loads Cat. C: congregation areas		6.04 11.45		

Poz.300b Strop pritličja

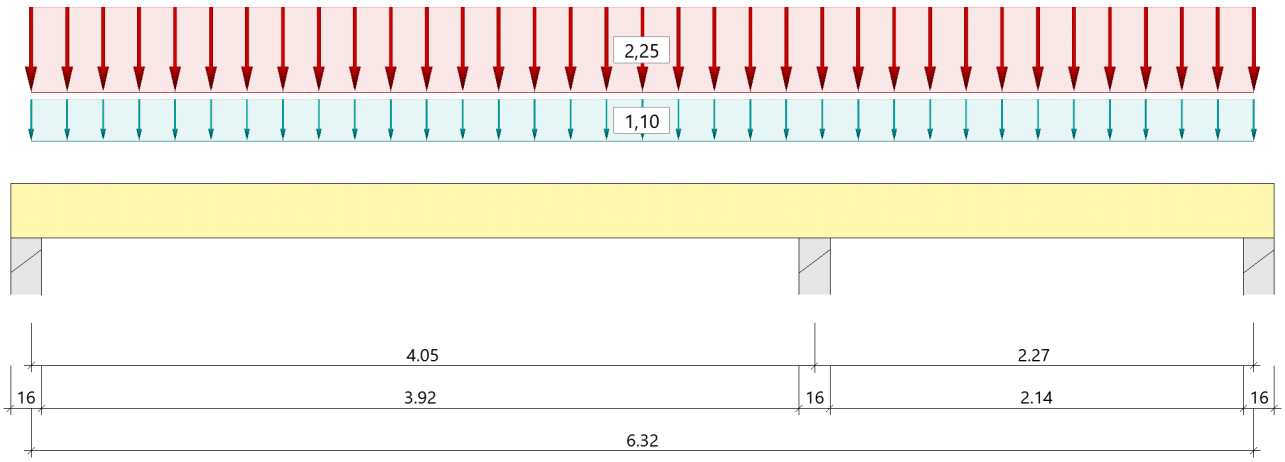
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 2 Span (e = 45.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.50	-1	-1	-1	0.0	0.0
2	4.05	16.0	6.0	1.50	-1	-1	0.0	0.0	0.0
3	6.32	16.0	6.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		6.32 6.32		2.45 5.00		Permanent Cat. C		
Load no. 2 act span by span. Load no. 1 acts simultaneously The load values are multiplied internally by the beam spacing e = 0.45 m.										

- Load 1: Stalna
- Load 2: Koristna

Self-weight

Total weight = 71 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	0.70	0.70	0.60	1.00	1.35 1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.45	0.44	0.62	1)	0.44
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-12.1	-7.75	0.44	0.45	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g	w_q	w	w_{lim}	η	Lk
					[cm]					
Span 1	4.05	1.92	inst	z	0.1	0.3	0.4	1.4	0.33	8
	4.05	1.92	net,fin	z	0.3	0.5	0.7	1.6	0.44	10
	4.05	1.92	fin	z	0.3	0.5	0.7	1.6	0.44	9
Span 2	2.27	0.84	inst	z	-0.01	-0.1	-0.1	0.8	0.10	8
	2.27	0.84	net,fin	z	-0.02	-0.1	-0.1	0.9	0.13	10
	2.27	0.84	fin	z	-0.02	-0.1	-0.1	0.9	0.13	9

Vibration check

Oscillation check, span 1 ÖNorm B 1995-1-1:2015-06 / Hamm

The oscillation check is only performed for the permanent load components.
(NA ÖNorm EN 1995-1-1 7.3.3 (2) to (5)).

selected plate class		=	1	
Proof natural frequency	m	=	270	kg/m2
Beam: 8/28	EI	=	1.610	MNm2
Beam spacing	e	=	45.0	cm
Coefficient f. continuous effect	kf	=	1.26	
	f0	=	13.89	Hz
	f1	=	13.89	Hz

Oscillation velocity due to pulse unit v <= 6*b^(f1*Ksi-1)

modal attenuation coefficient	Ksi	=	0.010	
Factor	b	=	142.40	
	adm v	=	0.0140	m / (Ns ^ 2)
	γ	=	0.99	
	v	=	0.0034	m / (Ns ^ 2)
	Eta	=	0.24	

Frequenzkriterium:

For plate class 1	f_{gr}	=	8.00	Hz
	f1	=	13.89	Hz
	Eta	=	0.58	

Stiffness criterion:
Deflection due to single load F

For plate class 1	w_{gr}	=	0.25	mm/kN
	w_{stat}	=	0.63	mm/kN
	Eta	=	2.51	

The oscillation check is not fulfilled!

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads		4.44		
		Cat. C: congregation areas	-0.29	8.50		
2	4.05	Permanent loads		11.40		
		Cat. C: congregation areas		21.11		
3	6.32	Permanent loads		1.23		
		Cat. C: congregation areas	-2.89	5.17		

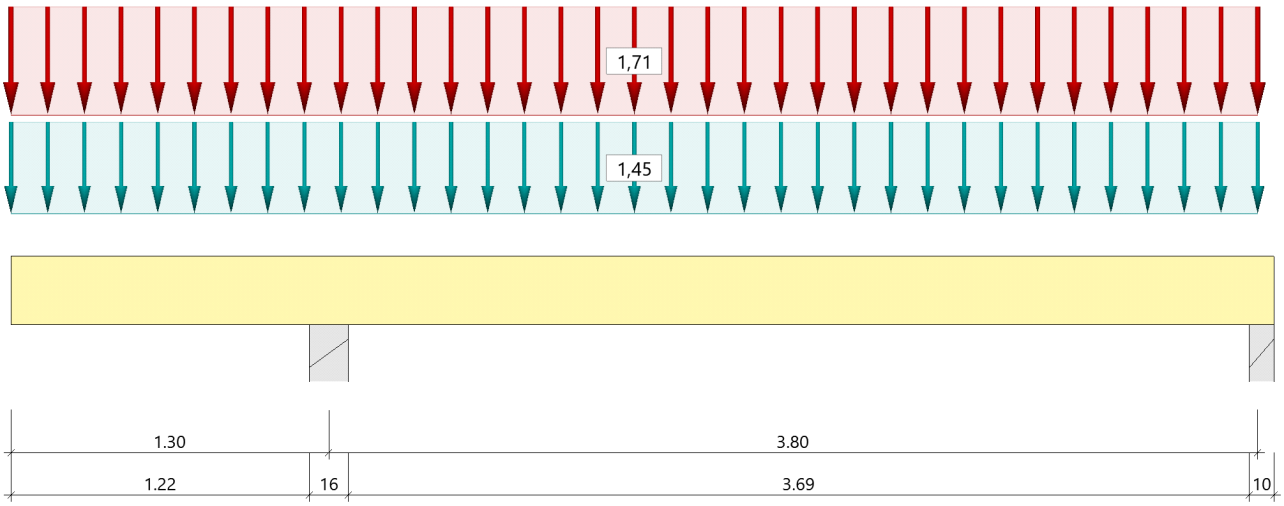
Poz.300c Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	1.30	16.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	5.10	10.0	6.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		5.10 5.10		2.55 3.00		Permanent Cat. C		
Load no. 2 act span by span. Load no. 1 acts simultaneously The load values are multiplied internally by the beam spacing e = 0.57 m.										

- Load 1: Stalna
- Load 2: Koristna

Self-weight

Total weight = 57 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	0.70	0.70	0.60	1.00	1.35 1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Check of cantilever		=	no check if sucking

Initial deflection	w_{inst}	=	l/300	$w_{inst\ Krag}$	=	l/150
Final deflection	$w_{net,fin}$	=	l/250	$w_{net,fin\ Krag}$	=	l/125
	w_{fin}	=	l/250	$w_{fin\ Krag}$	=	l/75

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.44	0.36	0.62	1) 	 0.51
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	5.1	7.58	0.36	0.44	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Cnt le	1.30	0.00	inst	z	0.0	0.1	0.1	0.9	0.08	9
	1.30	0.00	net,fin	z	0.0	0.1	0.1	1.0	0.06	10
	1.30	0.00	fin	z	0.0	0.1	0.1	1.7	0.03	11
Span 1	3.80	1.90	inst	z	0.2	0.3	0.5	1.3	0.38	6
	3.80	1.90	net,fin	z	0.3	0.4	0.8	1.5	0.51	8
	3.80	1.90	fin	z	0.3	0.4	0.8	1.5	0.51	7

Checks on cantilever are not carried out for upward deflections.

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	1.30	Permanent loads		9.40		
		Cat. C: congregation areas		10.27		
2	5.10	Permanent loads		4.61		
		Cat. C: congregation areas	-0.67	5.70		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

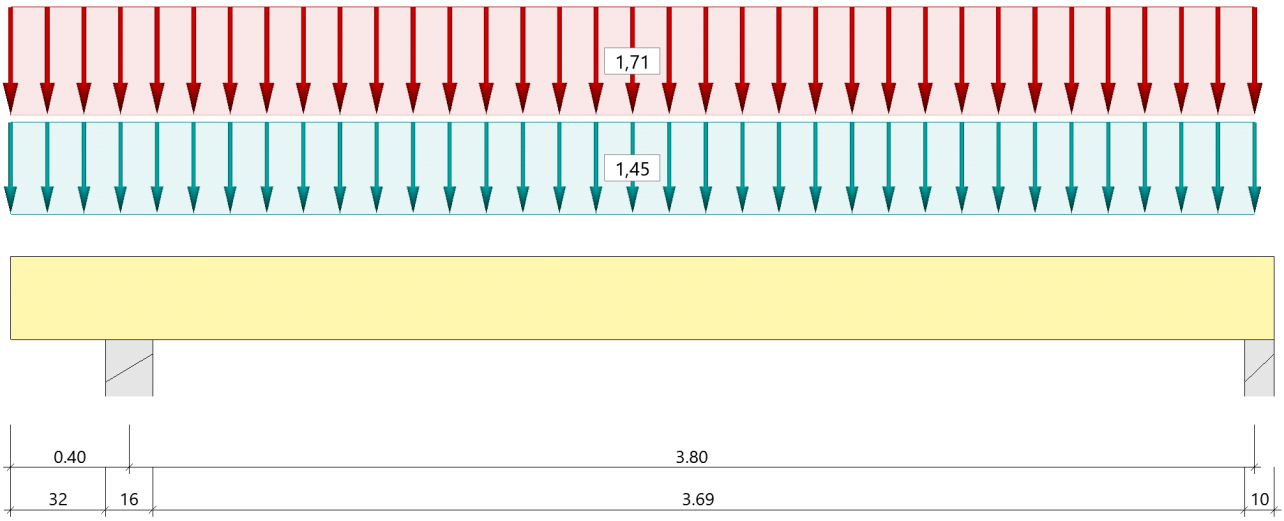
Poz.300d Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.40	16.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	4.20	10.0	6.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		4.20 4.20		2.55 3.00		Permanent Cat. C		
Load no. 2 act span by span. Load no. 1 acts simultaneously The load values are multiplied internally by the beam spacing e = 0.57 m.										

- Load 1: Stalna
- Load 2: Koristna

Self-weight

Total weight = 47 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	0.70	0.70	0.60	1.00	1.35 1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Check of cantilever		=	no check if sucking

Initial deflection	w_{inst}	=	l/300	$w_{inst\ Krag}$	=	l/150
Final deflection	$w_{net,fin}$	=	l/250	$w_{net,fin\ Krag}$	=	l/125
	w_{fin}	=	l/250	$w_{fin\ Krag}$	=	l/75

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.48	0.32	0.66	1) 	 0.59
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	4.1	8.36	0.32	0.48	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.80	1.90	inst	z	0.3	0.3	0.5	1.3	0.43	6
	3.80	1.90	net,fin	z	0.5	0.4	0.9	1.5	0.59	8
	3.80	1.90	fin	z	0.5	0.4	0.9	1.5	0.59	7
Checks on cantilever are not carried out for upward deflections.										

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.40	Permanent loads		6.37		
		Cat. C: congregation areas		6.96		
2	4.20	Permanent loads		5.16		
		Cat. C: congregation areas	-0.06	5.70		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

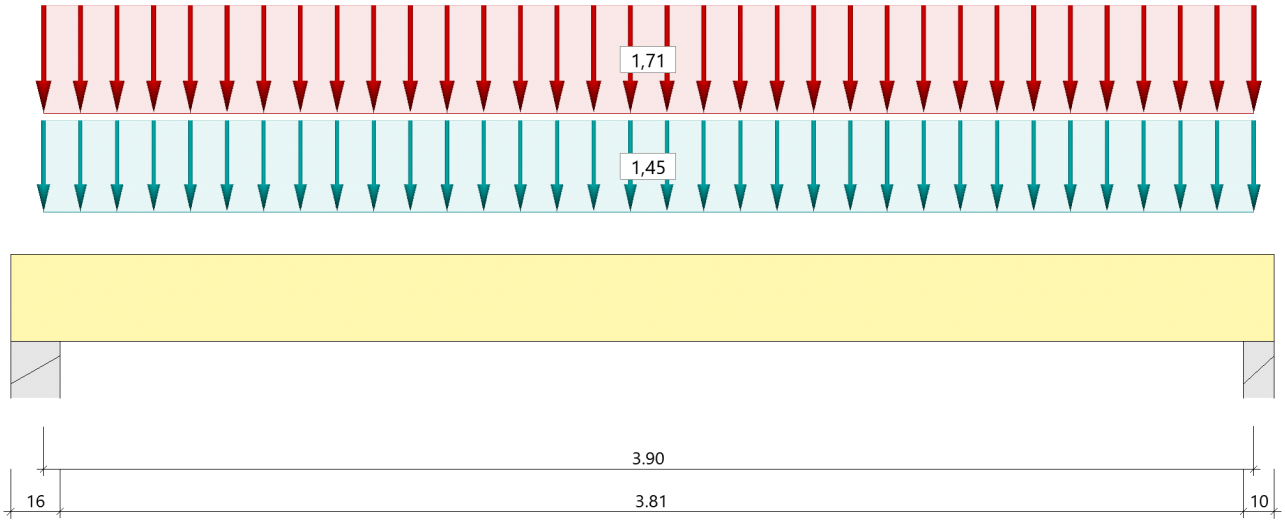
Poz.300e Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1 2	0.00 3.90	16.0 10.0	6.0 6.0	1.75 1.00	-1 -1	-1 -1	-1 0.0	0.0 0.0	0.0 0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		3.90 3.90		2.55 3.00		Permanent Cat. C		
The load values are multiplied internally by the beam spacing e = 0.57 m.										

- Load 1: Stalna
- Load 2: Koristna

Self-weight

Total weight = 44 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	 0.70	 0.70	 0.60	1.00	1.35 1.50	 short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.51	0.33	0.68	[1] 	 0.64
[1] Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	9.1	8.89	0.33	0.51	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.90 3.90 3.90	1.95 1.95 1.95	inst net,fin fin	z z z	0.3 0.5 0.5	0.3 0.5 0.5	0.6 1.0 1.0	1.3 1.6 1.6	0.47 0.64 0.64	4 6 5

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas		5.36 5.85		
2	3.90	Permanent loads Cat. C: congregation areas		5.36 5.85		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

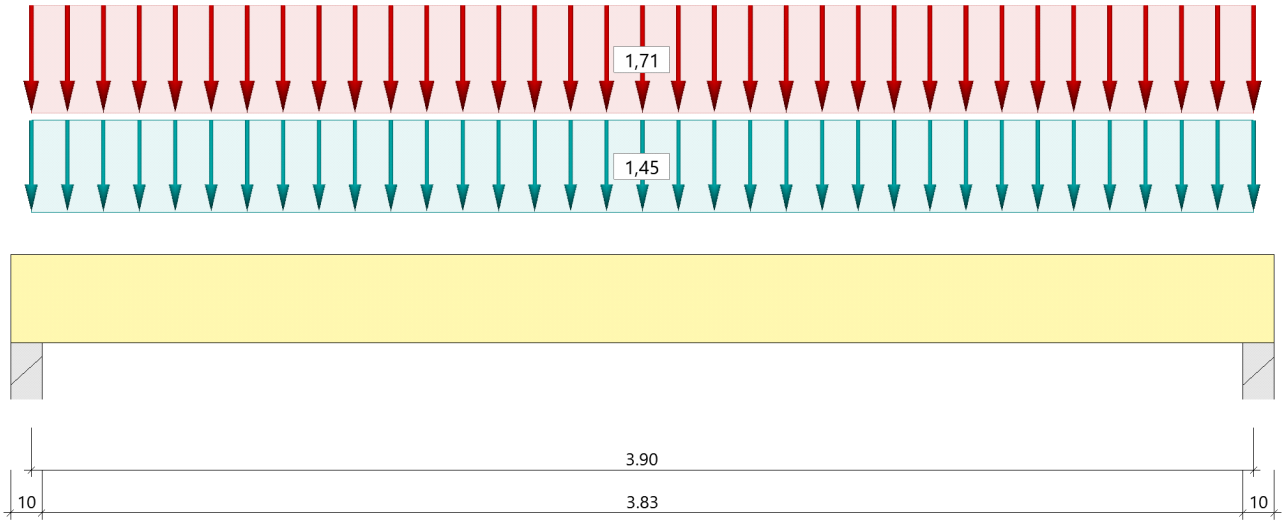
Poz.300f Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1 2	0.00 3.90	10.0 10.0	6.0 6.0	1.75 1.00	-1 -1	-1 -1	-1 0.0	0.0 0.0	0.0 0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		3.90 3.90		2.55 3.00		Permanent Cat. C		
The load values are multiplied internally by the beam spacing e = 0.57 m.										

- Load 1: Stalna
- Load 2: Koristna

Self-weight

Total weight = 44 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	 0.70	 0.70	 0.60	1.00	1.35 1.50	 short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.51	0.33	0.68	[1] 	 0.64
[1] Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	9.1	8.89	0.33	0.51	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.90 3.90 3.90	1.95 1.95 1.95	inst net,fin fin	z z z	0.3 0.5 0.5	0.3 0.5 0.5	0.6 1.0 1.0	1.3 1.6 1.6	0.47 0.64 0.64	4 6 5

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas		5.36 5.85		
2	3.90	Permanent loads Cat. C: congregation areas		5.36 5.85		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

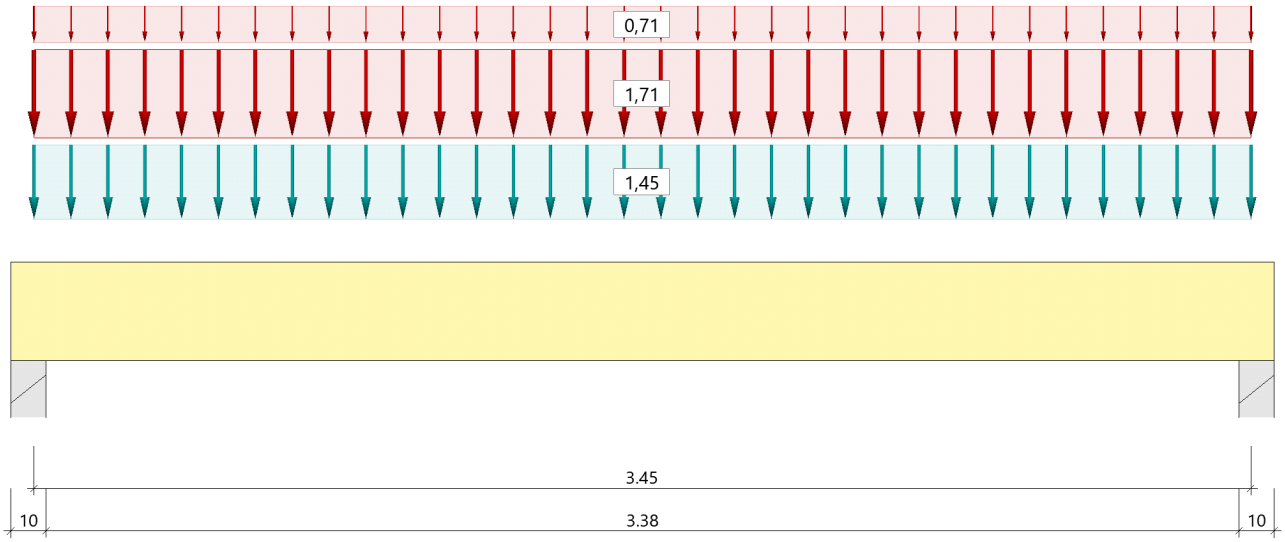
Poz.300g Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	10.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	3.45	10.0	6.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1	GL		3.45		2.55		Permanent		
	2	GL		3.45		3.00		Cat. C		
	3	GL		3.45		1.25		Snow		
The load values are multiplied internally by the beam spacing e = 0.57 m.										

- Load 1: Stalna
- Load 2: Koristna
- Load 3: sneg

Self-weight

Total weight = 39 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.45	0.32	0.67	1)	
Serviceability	characteristic					0.47
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-9.0	7.76	0.32	0.45	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.45	1.73	inst	z	0.2	0.2	0.4	1.2	0.36	4
	3.45	1.73	net,fin	z	0.3	0.3	0.7	1.4	0.47	6
	3.45	1.73	fin	z	0.3	0.3	0.7	1.4	0.47	5

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		4.74 5.18 2.16		
2	3.45	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		4.74 5.17 2.16		

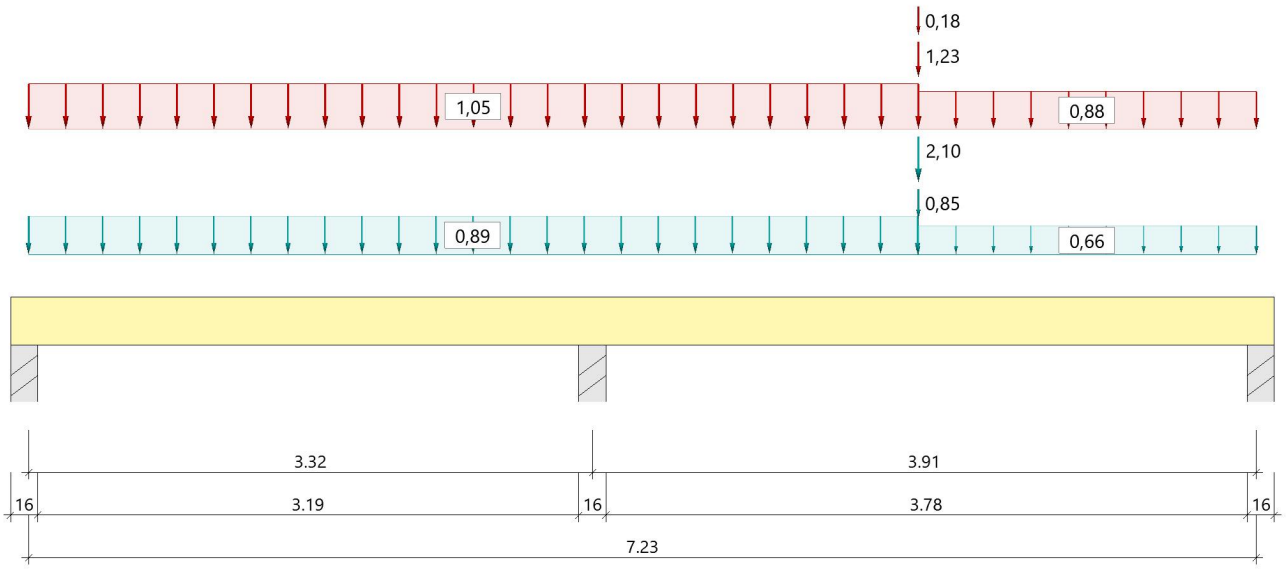
Poz.300h Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 2 Span (e = 35.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 1995-1-1:2014

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	3.32	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0
3	7.23	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Concentrated loads and moments from line loads across

Reference	No	Type	A [m]	W	[ ]	Factor	GF	Sim	Alt
System	1	force	5.24	0.81	kN/m	3.00	Permanent		
	2	force	5.24	6.00	kN/m	1.00	Permanent		
	3	force	5.24	3.50	kN/m	1.00	Snow		
	4	force	5.24	0.50	kN/m	1.00	Wind		
The load values are multiplied internally by the beam spacing e = 0.35 m.									

- Load 1: stena
- Load 2: Lastna plaièje
- Load 3: Lastna plaièje
- Load 4: Lastna plaièje

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m^2]	W2 [kN/m^2]	GF	Sim	Alt
System	5	TL		5.24		2.55	2.55	Permanent		
	6	TL		5.24		3.00	3.00	Cat. C		
	7	TL	5.24	1.99		1.90	1.90	Permanent		
	8	TL	5.24	1.99		2.50	2.50	Snow		
The load no. 6 und 8 act span by span. The load no. 5 und 7 act simultaneously The load values are multiplied internally by the beam spacing e = 0.35 m.										

- Load 5: Stalna notranji prostori
- Load 6: Koristna
- Load 7: stalna ravna streha
- Load 8: Sneg - kopièenje

Self-weight

Total weight = 81 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.43	0.34	0.70	1) 	 0.40
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	9.4	7.52	0.34	0.43	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.32	2.27	inst	z	-0.03	-0.1	-0.1	1.1	0.08	9
	3.32	2.27	net,fin	z	-0.1	-0.1	-0.1	1.3	0.09	11
	3.32	2.27	fin	z	-0.1	-0.1	-0.1	1.3	0.09	10
Span 2	3.91	2.06	inst	z	0.2	0.2	0.4	1.3	0.31	9
	3.91	2.06	net,fin	z	0.4	0.2	0.6	1.6	0.40	11
	3.91	2.06	fin	z	0.4	0.2	0.6	1.6	0.40	10

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads		2.40		
		Cat. C: congregation areas	-0.51	4.41		
		Wind loads	-0.06			
		Snow loads H < 1000 m	-0.77			
2	3.32	Permanent loads		18.70		
		Cat. C: congregation areas		11.33		
		Wind loads		0.37		
		Snow loads H < 1000 m		4.47		
3	7.23	Permanent loads		6.78		
		Cat. C: congregation areas	-0.49	0.98		
		Wind loads		0.19		
		Snow loads H < 1000 m		4.77		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

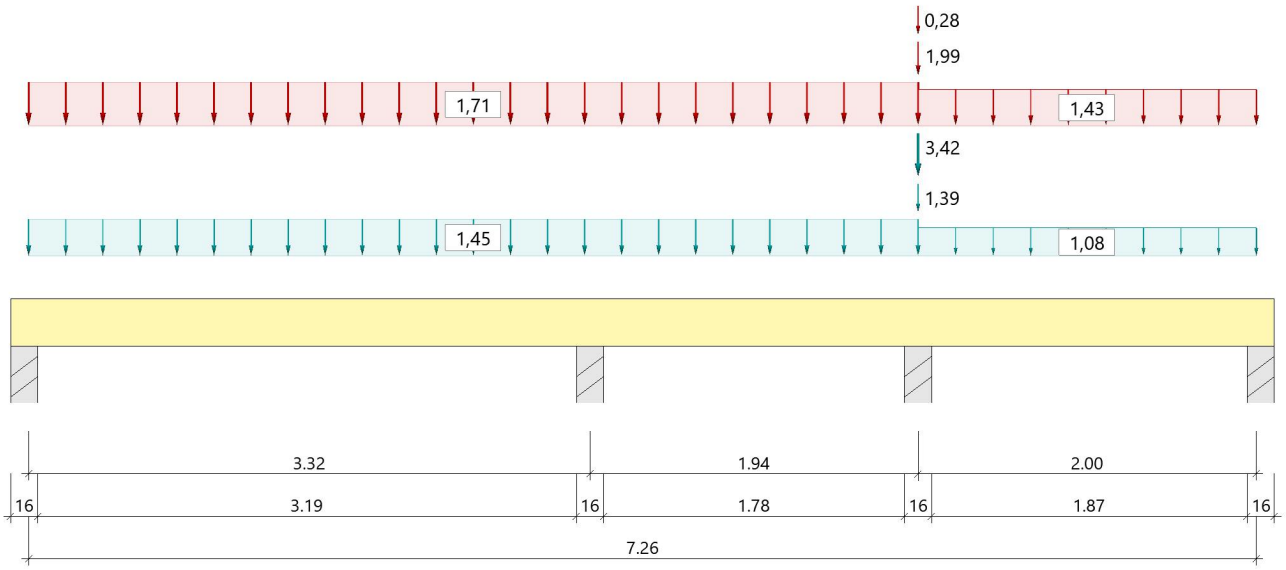
Poz.300i Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 3 Span (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Span

Span	Length [m]	Cross-section
1 2 3	3.32 1.94 2.00	8/28(constant over entire beam length)

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	3.32	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0
3	5.26	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0
4	7.26	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Loads

Concentrated loads and moments from line loads across

Reference	No	Type	A [m]	W	[ ]	Factor	GF	Sim	Alt
System	1	force	5.26	0.81	kN/m	3.00	Permanent		
	2	force	5.26	6.00	kN/m	1.00	Permanent		
	3	force	5.26	3.50	kN/m	1.00	Snow		
	4	force	5.26	0.50	kN/m	1.00	Wind		

The load values are multiplied internally by the beam spacing e = 0.57 m.

- Load 1: stena
- Load 2: Lastna plaièje
- Load 3: Lastna plaièje
- Load 4: Lastna plaièje

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	5	TL		5.26		2.55	2.55	Permanent		
	6	TL		5.26		3.00	3.00	Cat. C		
	7	TL	5.26	2.00		1.90	1.90	Permanent		
	8	TL	5.26	2.00		2.50	2.50	Snow		

The load no. 6 und 8 act span by span.
The load no. 5 und 7 act simultaneously
The load values are multiplied internally by the beam spacing e = 0.57 m.

- Load 5: Stalna notranji prostori
- Load 6: Koristna
- Load 7: stalna ravna streha
- Load 8: Sneg - kopièenje

Self-weight

Total weight = 81 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short

Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.28	0.33	0.76	1)	
Serviceability	characteristic					0.23

1) Stability check was not carried out because the upper chord is held continuously.

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-9.2	-4.82	0.33	0.28	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	3.32	1.57	inst	z	0.1	0.1	0.2	1.1	0.17	10
	3.32	1.57	net,fin	z	0.2	0.2	0.3	1.3	0.23	12
	3.32	1.57	fin	z	0.2	0.2	0.3	1.3	0.23	11
Span 2	1.94	0.71	inst	z	-0.01	-0.02	-0.03	0.6	0.05	10
	1.94	0.71	net,fin	z	-0.02	-0.03	-0.05	0.8	0.06	12
	1.94	0.71	fin	z	-0.02	-0.03	-0.05	0.8	0.06	11
Span 3	2.00	1.05	inst	z	0.01	0.02	0.03	0.7	0.04	13
	2.00	1.00	net,fin	z	0.02	0.02	0.04	0.8	0.05	14
	2.00	1.00	fin	z	0.02	0.02	0.04	0.8	0.05	15

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m	-0.12	3.72 4.16 0.04		
2	3.32	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m	-0.44	9.24 10.50		
3	5.26	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m	-2.09	12.25 3.30 0.50 6.74		
4	7.26	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m	-0.30	1.85 0.34 2.17		

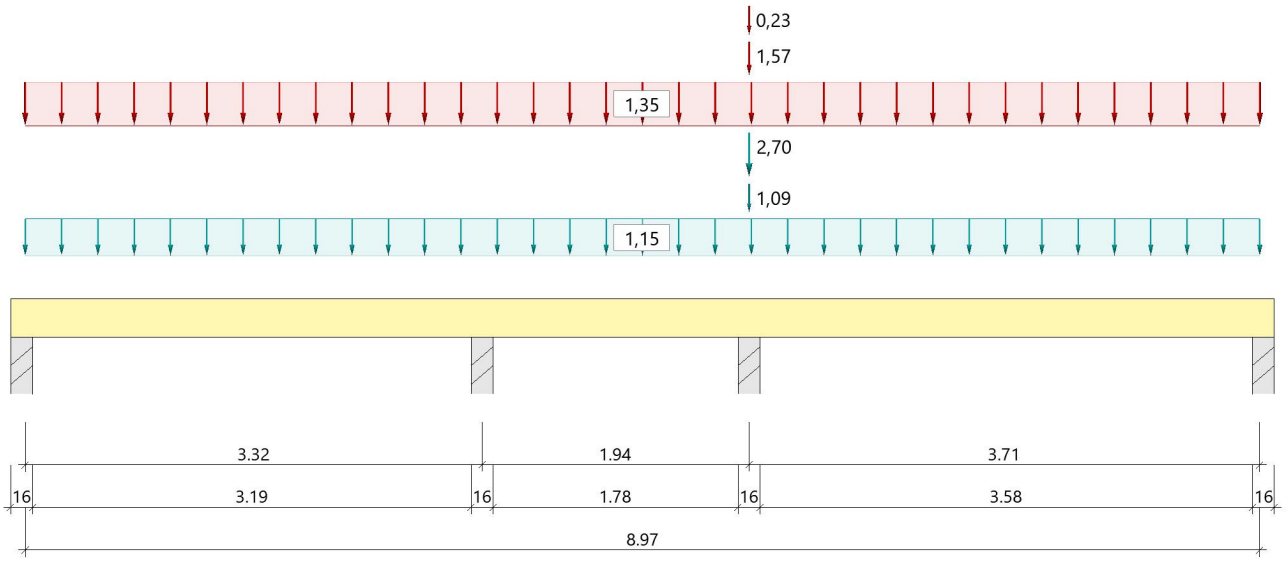
Poz.300j Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 3 Span (e = 45.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Span

Span	Length [m]	Cross-section
1 2 3	3.32 1.94 3.71	8/28(constant over entire beam length)

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kNm/rad]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	3.32	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0
3	5.26	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0
4	8.97	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Loads

Concentrated loads and moments from line loads across

Reference	No	Type	A [m]	W	[ ]	Factor	GF	Sim	Alt
System	1	force	5.26	0.81	kN/m	3.00	Permanent		
	2	force	5.26	6.00	kN/m	1.00	Permanent		
	3	force	5.26	3.50	kN/m	1.00	Snow		
	4	force	5.26	0.50	kN/m	1.00	Wind		

The load values are multiplied internally by the beam spacing e = 0.45 m.

- Load 1: stena
- Load 2: Poz.200h - paliè je
- Load 3: Poz.200h - paliè je
- Load 4: Poz.200h - paliè je

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	5	GL		8.97		2.55		Permanent		
	6	GL		8.97		3.00		Cat. C		

Load no. 6 act span by span.
Load no. 5 acts simultaneously
The load values are multiplied internally by the beam spacing e = 0.45 m.

- Load 5: Stalna
- Load 6: Koristna

Self-weight

Total weight = 100 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short

Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.26	0.29	0.87	1) 	 0.28
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	8.1	-4.59	0.29	0.26	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	3.32	1.57	inst	z	0.1	0.1	0.2	1.1	0.16	9
	3.32	1.57	net,fin	z	0.1	0.1	0.3	1.3	0.21	11
	3.32	1.57	fin	z	0.1	0.1	0.3	1.3	0.21	10
Span 2	1.94	1.02	inst	z	-0.02	-0.03	-0.1	0.6	0.09	9
	1.94	1.02	net,fin	z	-0.04	-0.1	-0.1	0.8	0.11	11
	1.94	1.02	fin	z	-0.04	-0.1	-0.1	0.8	0.11	10
Span 3	3.71	1.95	inst	z	0.1	0.1	0.3	1.2	0.20	9
	3.71	1.95	net,fin	z	0.2	0.2	0.4	1.5	0.28	11
	3.71	1.95	fin	z	0.2	0.2	0.4	1.5	0.28	10

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas	 -0.13	3.95 4.36		
2	3.32	Permanent loads Cat. C: congregation areas	 -2.33	7.60 10.48		
3	5.26	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m	 -1.75	17.66 11.65 0.50 3.50		
4	8.97	Permanent loads Cat. C: congregation areas	 -0.11	4.33 4.75		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

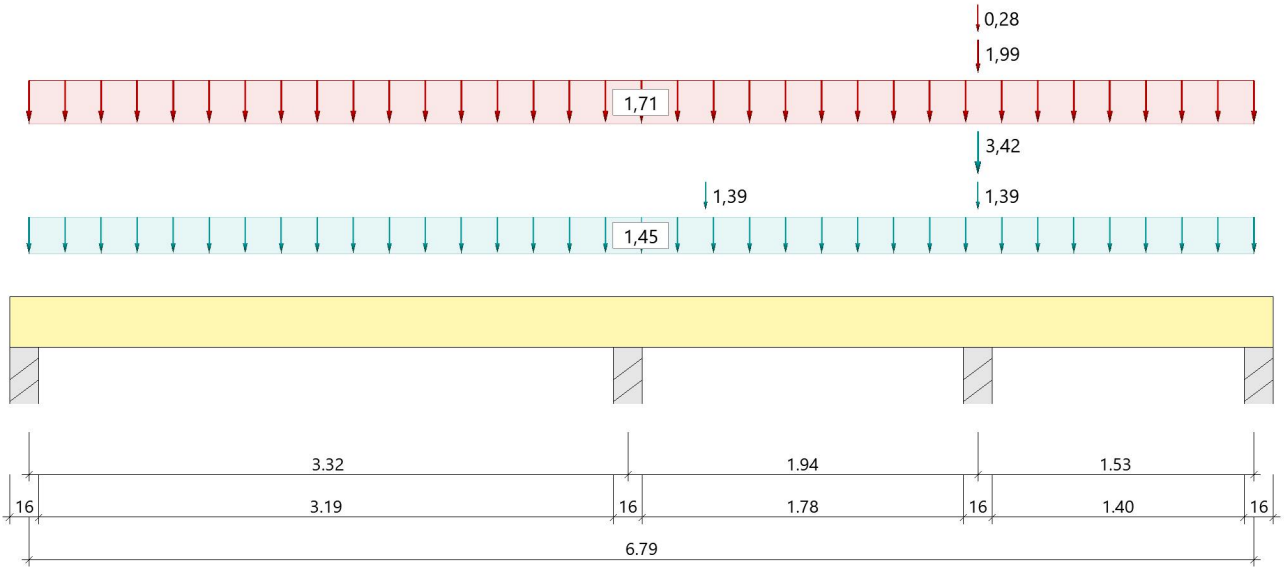
Poz.300k Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 3 Span (e = 57.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Span

Span	Length [m]	Cross-section
1 2 3	3.32 1.94 1.53	8/28(constant over entire beam length)

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	3.32	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0
3	5.26	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0
4	6.79	16.0	6.0	1.00	-1	-1	0.0	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Loads

Concentrated loads and moments from line loads across

Reference	No	Type	A [m]	W	[ ]	Factor	GF	Sim	Alt
System	1	force	5.26	0.81	kN/m	3.00	Permanent		
	2	force	5.26	6.00	kN/m	1.00	Permanent		
	3	force	5.26	3.50	kN/m	1.00	Snow		
	4	force	5.26	0.50	kN/m	1.00	Wind		
	5	force	3.75	0.81	kN/m	3.00	Permanent		

The load values are multiplied internally by the beam spacing e = 0.57 m.

- Load 1: stena
- Load 2: Poz.200h - palièje
- Load 3: Poz.200h - palièje
- Load 4: Poz.200h - palièje
- Load 5: stena

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	6	GL		6.79		2.55		Permanent		
	7	GL		6.79		3.00		Cat. C		

Load no. 7 act span by span.
Load no. 6 acts simultaneously
The load values are multiplied internally by the beam spacing e = 0.57 m.

- Load 6: Stalna
- Load 7: Koristna

Self-weight

Total weight = 76 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short

Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.29	0.33	0.77	1)	
Serviceability	characteristic					0.22

1) Stability check was not carried out because the upper chord is held continuously.

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-9.3	-5.03	0.33	0.29	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.32	1.57	inst	z	0.1	0.1	0.2	1.1	0.17	9
	3.32	1.57	net,fin	z	0.1	0.2	0.3	1.3	0.22	11
	3.32	1.57	fin	z	0.1	0.2	0.3	1.3	0.22	10
Span 2	1.94	0.71	inst	z	0.0	-0.02	-0.02	0.6	0.04	9
	1.94	0.71	net,fin	z	-0.01	-0.03	-0.04	0.8	0.05	11
	1.94	0.71	fin	z	-0.01	-0.03	-0.04	0.8	0.05	10
Span 3	1.53	0.77	inst	z	0.0	0.01	0.01	0.5	0.03	9
	1.53	0.77	net,fin	z	0.01	0.01	0.02	0.6	0.04	11
	1.53	0.77	fin	z	0.01	0.01	0.02	0.6	0.04	10

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads		3.64		
		Cat. C: congregation areas	-0.12	4.17		
2	3.32	Permanent loads		11.34		
		Cat. C: congregation areas	-0.27	10.51		
3	5.26	Permanent loads		12.76		
		Cat. C: congregation areas	-2.32	6.31		
		Wind loads		0.50		
		Snow loads H < 1000 m		3.50		
4	6.79	Permanent loads		1.77		
		Cat. C: congregation areas	-0.44	2.53		

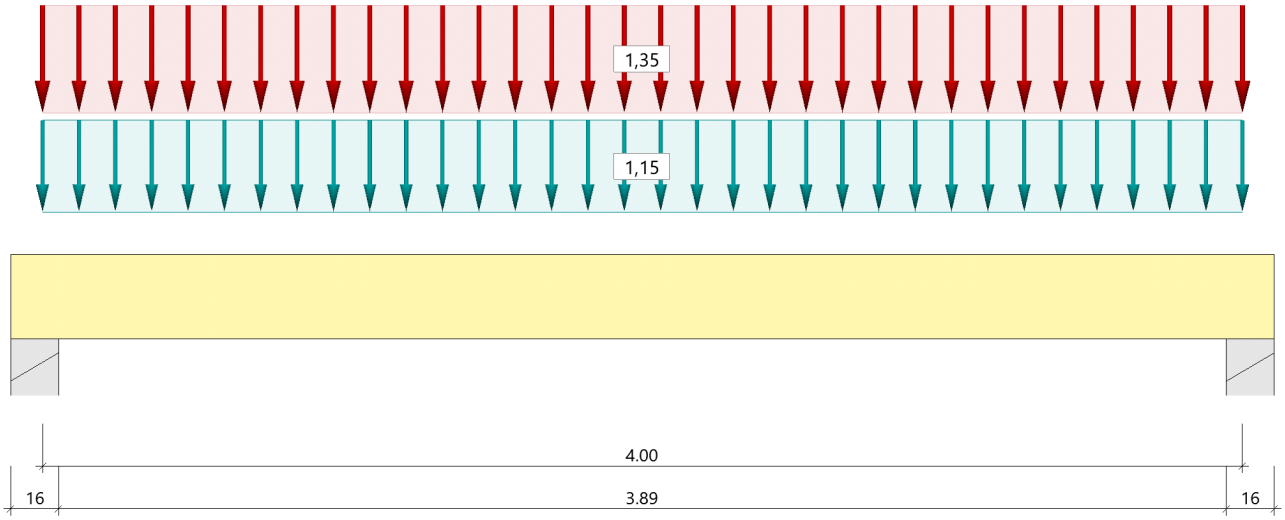
Poz.300l Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 45.0 cm) Softwood C24 EN 1995-1-1/A2:2014

System Graphic



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations*) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1 2	0.00 4.00	16.0 16.0	6.0 6.0	1.75 1.00	-1 -1	-1 -1	-1 0.0	0.0 0.0	0.0 0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		4.00 4.00		2.55 3.00		Permanent Cat. C		
The load values are multiplied internally by the beam spacing e = 0.45 m.										

- Load 1: Stalna
- Load 2: Koristna

Self-weight

Total weight = 45 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	 0.70	 0.70	 0.60	1.00	1.35 1.50	 short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.43	0.27	0.38	[1] 	 0.55
[1] Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-7.4	7.45	0.27	0.43	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	4.00 4.00 4.00	2.00 2.00 2.00	inst net,fin fin	z z z	0.3 0.5 0.5	0.3 0.4 0.4	0.5 0.9 0.9	1.3 1.6 1.6	0.41 0.55 0.55	4 6 5

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas		5.60 6.00		
2	4.00	Permanent loads Cat. C: congregation areas		5.60 6.00		

Poz.300m Strop pritličja

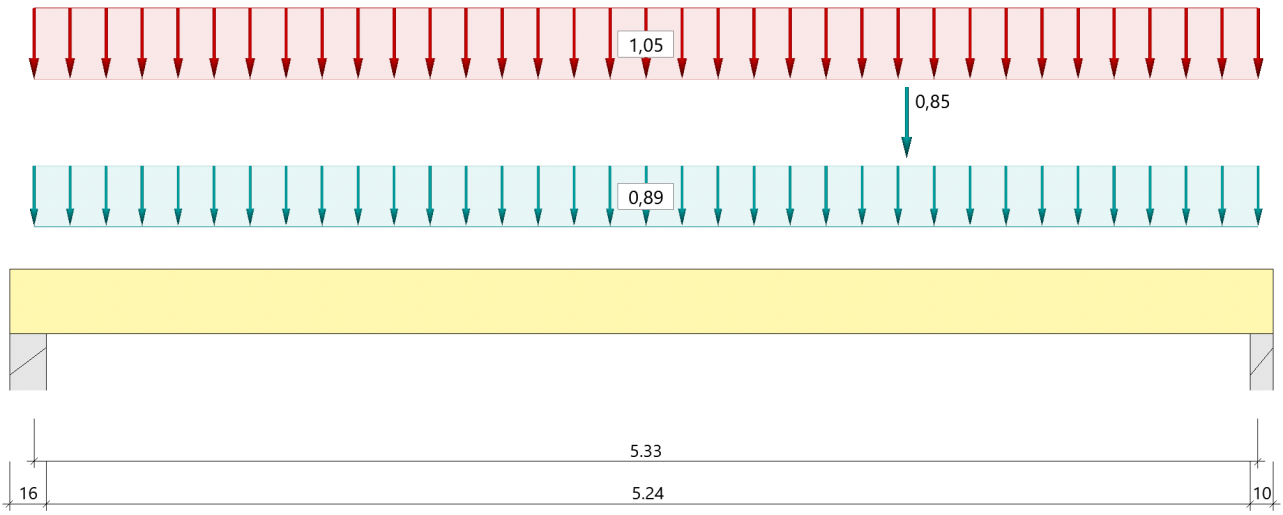
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 35.0 cm) BauBuche S (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

BauBuche S (flat), user defined material (design as GL32h)

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
80.00 8.00	60.00 57.50	1.50 14.00	16800 14900	470 350	760 620	730 800

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
6/28	10976	504	784	168	168.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	5.33	10.0	6.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Concentrated loads and moments from line loads across

Reference	No	Type	A [m]	W	[ ]	Factor	GF	Sim	Alt
System	1	force	3.80	0.81	kN/m	3.00	Permanent		
The load values are multiplied internally by the beam spacing e = 0.35 m.									

- Load 1: Koristna

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	2 3	GL GL		5.33 5.33		2.55 3.00		Permanent Cat. C		
The load values are multiplied internally by the beam spacing e = 0.35 m.										

- Load 2: Stalna
- Load 3: Koristna

Self-weight

Total weight = 45 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	0.70	0.70	0.60	1.00	1.35 1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.23	0.20	0.11	1) 	 0.98
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	6/28	-8.5	11.17	0.20	0.23	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	5.33	2.79	inst	z	0.7	0.6	1.3	1.8	0.71	4
	5.33	2.80	net,fin	z	1.2	0.9	2.1	2.1	0.98	6
	5.33	2.80	fin	z	1.2	0.9	2.1	2.1	0.98	5

Support forces

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads		8.13		
		Cat. C: congregation areas		8.00		
2	5.33	Permanent loads		9.17		
		Cat. C: congregation areas		7.99		

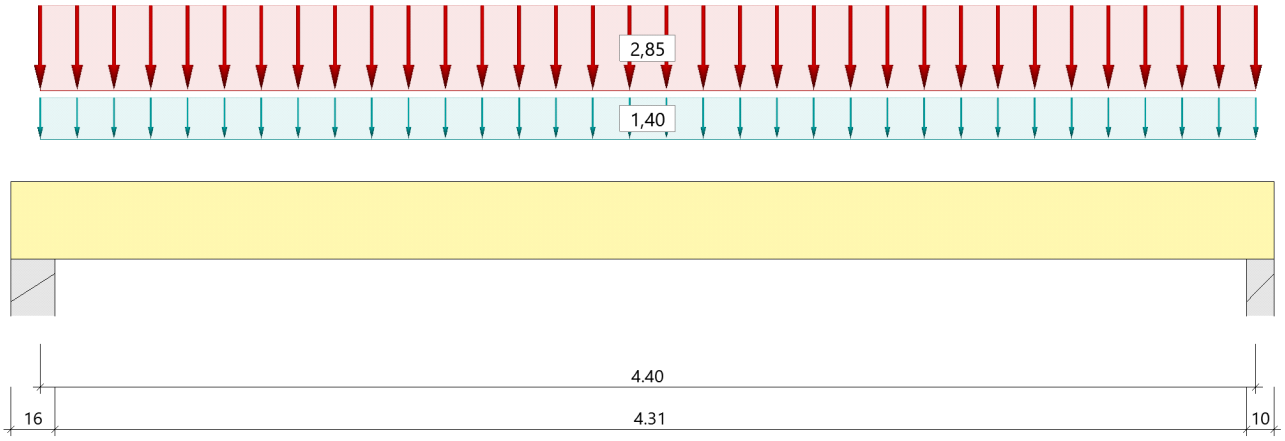
Poz.300n Strop pritličja

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam (e = 57.0 cm) BauBuche S (flat) EN 1995-1-1/A2:2014

System Graphic



Material

BauBuche S (flat), user defined material (design as GL32h)

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
80.00 8.00	60.00 57.50	1.50 14.00	16800 14900	470 350	760 620	730 800

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
8/28	14635	1195	1045	299	224.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations*) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1	0.00	16.0	6.0	1.75	-1	-1	-1	0.0	0.0
2	4.40	10.0	6.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Loads

Line loads from area loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m²]	W2 [kN/m²]	GF	Sim	Alt
System	1 2	GL GL		4.40 4.40		2.45 5.00		Permanent Cat. C		
The load values are multiplied internally by the beam spacing e = 0.57 m.										

- Load 1: Stalna
- Load 2: Koristna

Self-weight

Total weight = 49 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	 0.70	 0.70	 0.60	1.00	1.35 1.50	 short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.24	0.24	0.18	1) 	 0.78
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	8/28	-13.9	15.27	0.24	0.24	

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	4.40	2.20	inst	z	0.3	0.6	0.9	1.5	0.59	4
	4.40	2.20	net,fin	z	0.5	0.8	1.4	1.8	0.78	6
	4.40	2.20	fin	z	0.5	0.8	1.4	1.8	0.78	5

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Support forces per [m] - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. C: congregation areas		5.82 11.00		
2	4.40	Permanent loads Cat. C: congregation areas		5.82 11.00		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

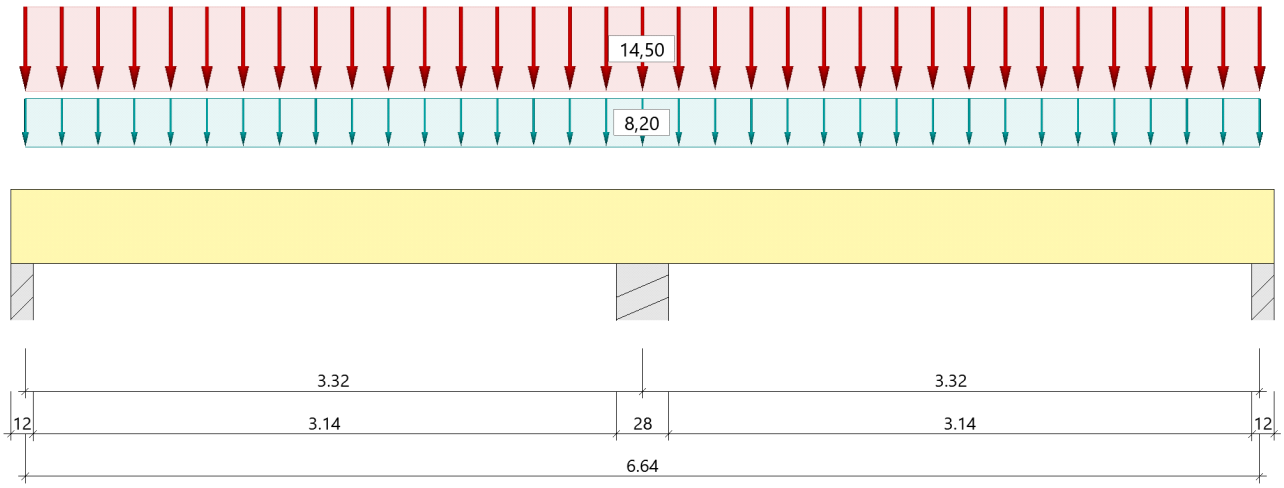
Poz.301 Preklana nad oknom

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam by 2 Span Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/40	85333	13653	4267	1707	640.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	3.32	28.0	16.0	1.50	-1	-1	0.0	0.0	0.0
3	6.64	12.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		6.64		8.20		Permanent		
	2	GL		6.64		14.50		Cat. C		
Load no. 2 act span by span. Load no. 1 acts simultaneously										

- Load 1: Poz.200a
- Load 2: Poz.200a

Self-weight

Total weight = 212 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.60	0.96	0.94	0.60	
Serviceability	characteristic					0.26

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/40	-69.0	-45.81	0.96	0.60	0.60

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.32	1.57	inst	z	0.1	0.2	0.2	1.1	0.20	7
	3.32	1.57	net,fin	z	0.1	0.2	0.3	1.3	0.26	9
	3.32	1.57	fin	z	0.1	0.2	0.3	1.3	0.26	8
Span 2	3.32	1.75	inst	z	0.1	0.2	0.2	1.1	0.20	10
	3.32	1.75	net,fin	z	0.1	0.2	0.3	1.3	0.26	11
	3.32	1.75	fin	z	0.1	0.2	0.3	1.3	0.26	12

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas	 -3.0	10.6 21.1		
2	3.32	Permanent loads Cat. C: congregation areas		35.4 60.2		
3	6.64	Permanent loads Cat. C: congregation areas	 -3.0	10.6 21.1		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.302 Jeklena preklada v stropu

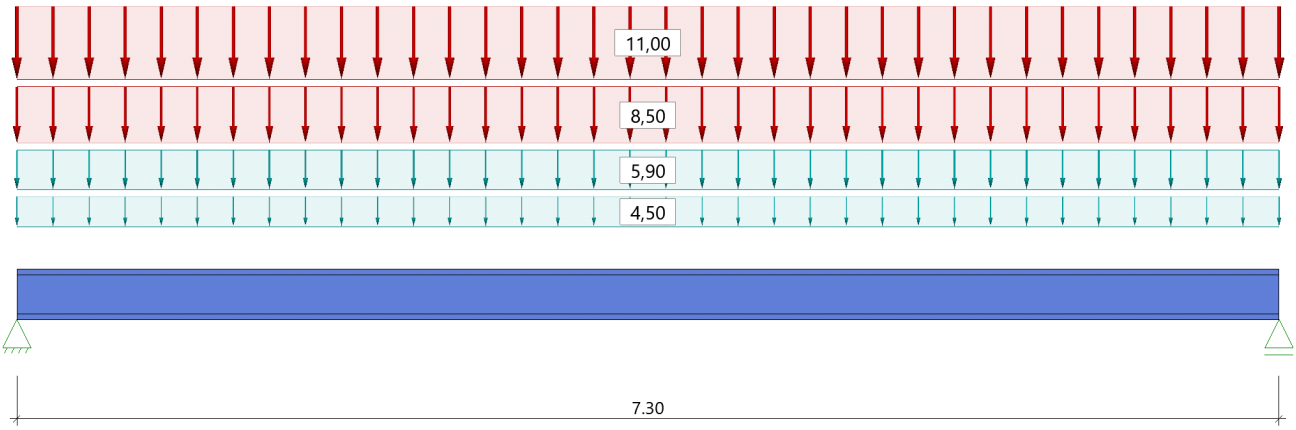
Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Steel girder, EN 1993-1-1:2010

Steel grade:S235

System Graphic



Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
HEM 260	31310.0	10450.0	2159.0	780.0	219.6
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	7.30	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		7.30		4.50		Permanent		
	2	GL		7.30		5.90		Permanent		
	3	GL		7.30		8.50		Cat. C		
	4	GL		7.30		11.00		Cat. C		

- Load 1: Poz.300b
- Load 2: Poz.300n
- Load 3: Poz.300b
- Load 4: Poz.300n

Self-weight

Total weight = 1258 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.4
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.51	0.66	
Serviceability	characteristic			0.73

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEM 260	Span 1, x = 3.65	0.0	303.87	0.51	0.66

Check for maximum utilization at x = 3.65 m Lcomb 35

N_{pld}	= 0.0 kN	N_{Rd}	= 5160.6 kN		
N_{Ed}	= 0.0 kN	η_N	= 0.00		
$M_{y,pld}$	= 303.87 kNm	$M_{y,Rd}$	= 593.77 kNm		
$M_{y,Ed}$	= 303.87 kNm	η_{My}	= 0.51		
$V_{z,pld}$	= 0.0 kN	$V_{z,Rd}$	= 907.0 kN		
$V_{z,Ed}$	= 0.0 kN	η_{Vz}	= 0.00		
		η	**= 0.51**		

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
3.65	7.30	0.00	7.30	1.8	2.4	0.73	3

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		44.3 71.2		
2	7.30	Permanent loads Cat. C: congregation areas		44.3 71.2		

Poz.303 Preklana v stropu

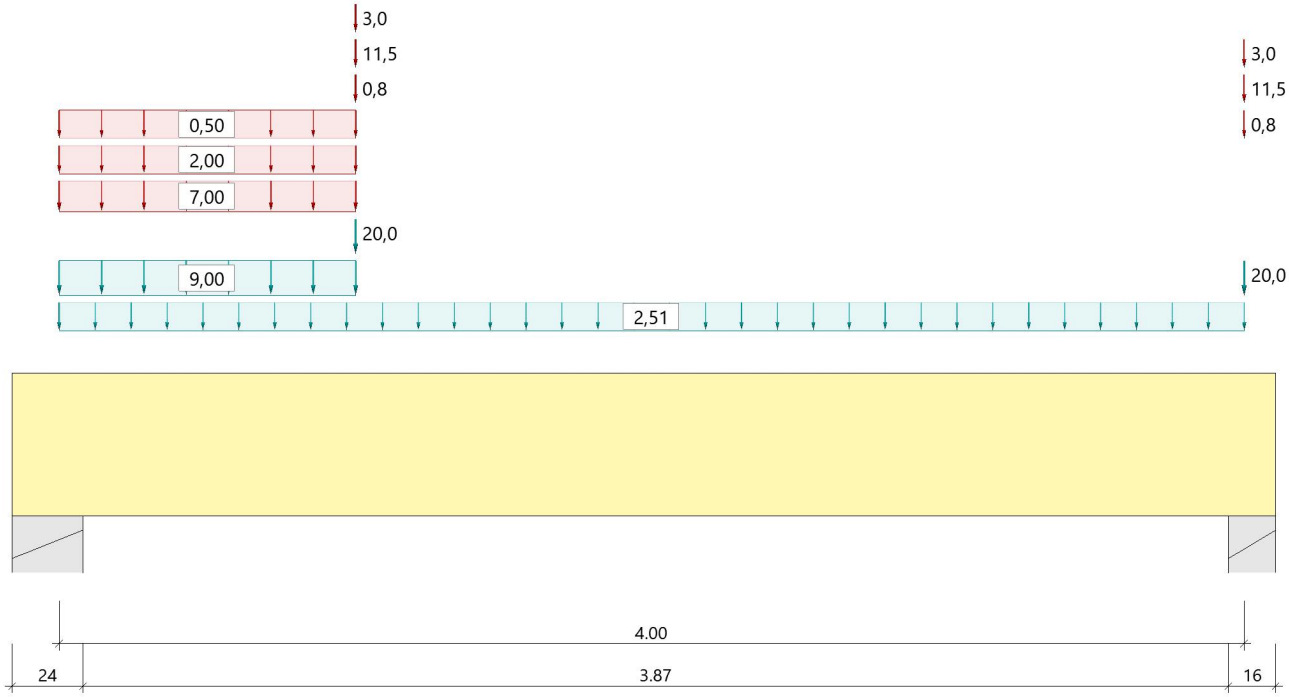
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
20/48	184320	32000	7680	3200	960.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	24.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	4.00	16.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments

Reference	No	Type	A [m]	W	[ ]	GF	Sim	Alt
System	1	force	1.00	20.0	kN	Permanent		
	2	force	4.00	20.0	kN	Permanent		
	3	force	1.00	0.8	kN	Cat. H		
	4	force	4.00	0.8	kN	Cat. H		
	5	force	1.00	11.5	kN	Snow		
	6	force	4.00	11.5	kN	Snow		
	7	force	1.00	3.0	kN	Wind		
	8	force	4.00	3.0	kN	Wind		

- Load 1: Poz.201
- Load 2: Poz.201
- Load 3: Poz.201
- Load 4: Poz.201
- Load 5: Poz.201
- Load 6: Poz.201
- Load 7: Poz.201
- Load 8: Poz.201

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	9	TL		1.00		9.00	9.00	1.00	Permanent		
	10	TL		1.00		7.00	7.00	1.00	Snow		
	11	TL		1.00		2.00	2.00	1.00	Wind		
	12	TL		1.00		0.50	0.50	1.00	Cat. H		
	13	GL		4.00		0.81		3.10	Permanent		

- Load 9: Poz.200a
- Load 10: Poz.200a
- Load 11: Poz.200a
- Load 12: Poz.200a
- Load 13: stena

Self-weight

Total weight = 192 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. H: roofs					1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.37	0.60	0.85	0.37	
Serviceability	characteristic					0.22

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	20/48	64.7	50.44	0.60	0.37	0.37

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	4.00	1.89	inst	z	0.2	0.1	0.2	1.3	0.17	4
	4.00	1.89	net,fin	z	0.3	0.1	0.4	1.6	0.22	6
	4.00	1.89	fin	z	0.3	0.1	0.4	1.6	0.22	5

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		28.9		
		Cat. H: roofs		1.0		
		Wind loads		4.0		
		Snow loads H < 1000 m		14.8		
2	4.00	Permanent loads		32.1		
		Cat. H: roofs		1.1		
		Wind loads		4.0		
		Snow loads H < 1000 m		15.3		

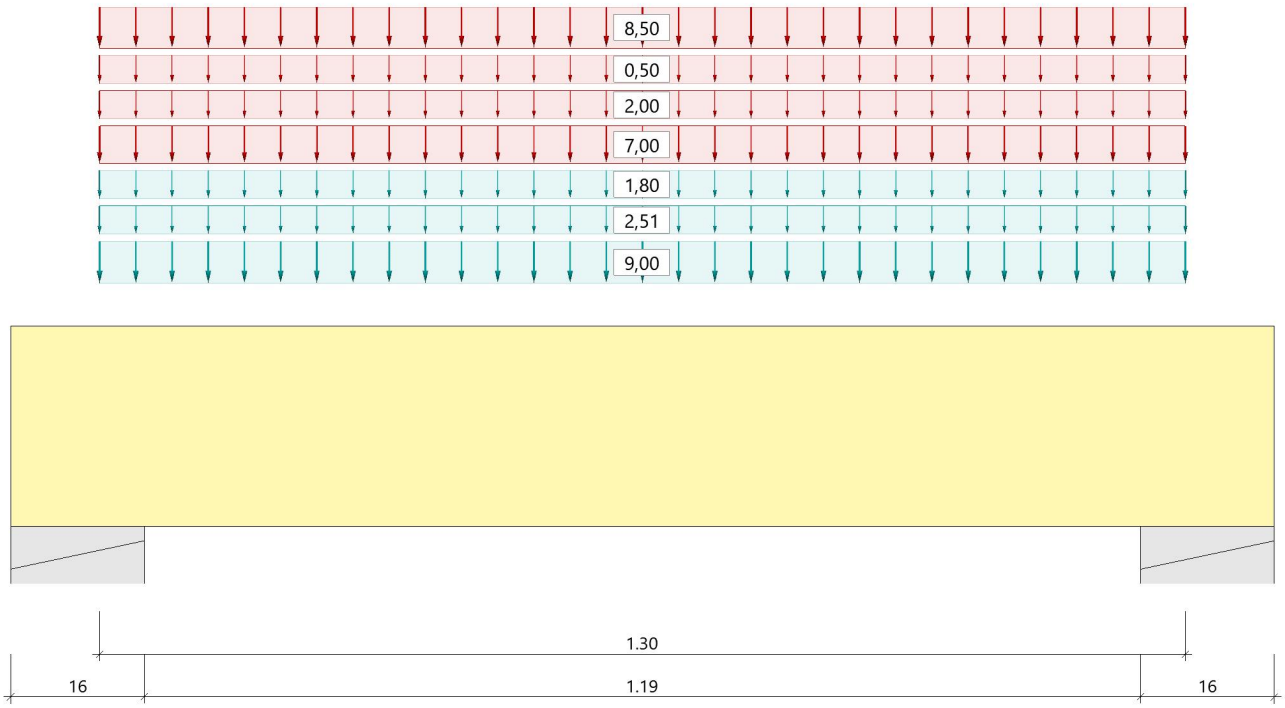
Poz.304 Preklada nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/24	18432	8192	1536	1024	384.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	16.0	1.25	-1	-1	-1	0.0	0.0
2	1.30	16.0	16.0	1.25	-1	-1	0.0	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		1.30		9.00		1.00	Permanent		
	2	GL		1.30		7.00		1.00	Snow		
	3	GL		1.30		2.00		1.00	Wind		
	4	GL		1.30		0.50		1.00	Cat. H		
	5	GL		1.30		0.81		3.10	Permanent		
	6	GL		1.30		1.80		1.00	Permanent		
	7	GL		1.30		8.50		1.00	Cat. C		

- Load 1: Poz.200a
- Load 2: Poz.200a
- Load 3: Poz.200a
- Load 4: Poz.200a
- Load 5: stena
- Load 6: Poz.300b
- Load 7: Poz.300b

Self-weight

Total weight = 25 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Cat. H: roofs					1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.29	0.59	0.37	0.29	 0.14

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/24	-25.6	8.33	0.59	0.29	0.29

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.30 1.30 1.30	0.65 0.65 0.65	inst net,fin fin	z z z	0.02 0.04 0.04	0.02 0.03 0.03	0.05 0.1 0.1	0.4 0.5 0.5	0.11 0.14 0.14	3 5 4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Cat. H: roofs Wind loads Snow loads H < 1000 m		8.8 5.5 0.3 1.3 4.6		
2	1.30	Permanent loads Cat. C: congregation areas Cat. H: roofs Wind loads Snow loads H < 1000 m		8.8 5.5 0.3 1.3 4.6		

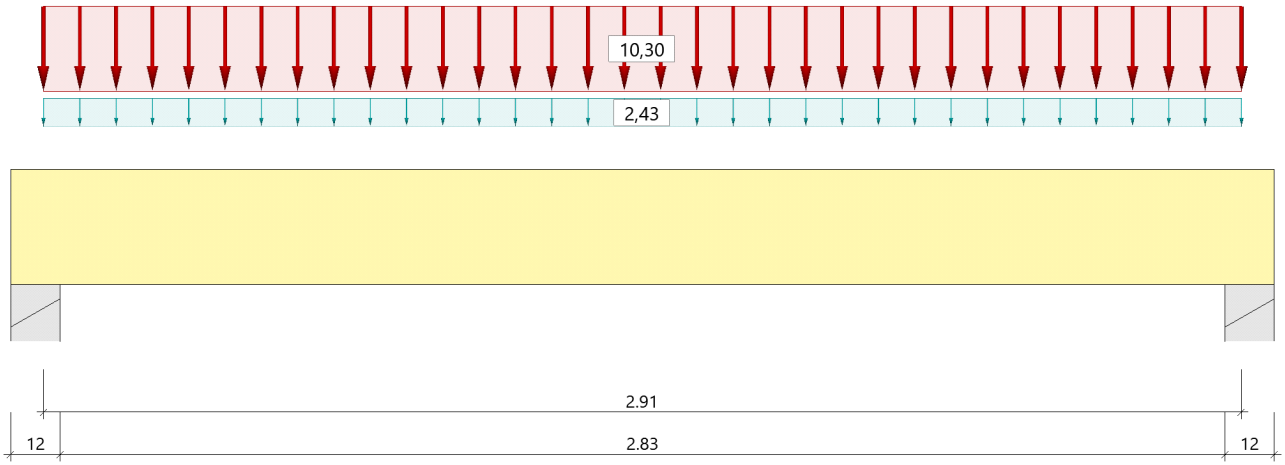
Poz.305 Preklana nad oknom

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/28	29269	9557	2091	1195	448.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.75	-1	-1	-1	0.0	0.0
2	2.91	12.0	16.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		2.91		10.00		0.00	Permanent		
	2	GL		2.91		10.30		1.00	Cat. C		
	3	GL		2.91		0.81		3.00	Permanent		

- Load 1: Poz.300c
- Load 2: Poz.300c
- Load 3: stena

Self-weight

Total weight = 65 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.52	0.55	0.64	0.52	
Serviceability	characteristic					0.48

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/28	27.7	20.15	0.55	0.52	0.52

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	2.91	1.46	inst	z	0.1	0.3	0.4	1.0	0.37	3
	2.91	1.46	net,fin	z	0.1	0.4	0.6	1.2	0.48	5
	2.91	1.46	fin	z	0.1	0.4	0.6	1.2	0.48	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		3.9 15.0		
2	2.91	Permanent loads Cat. C: congregation areas		3.9 15.0		

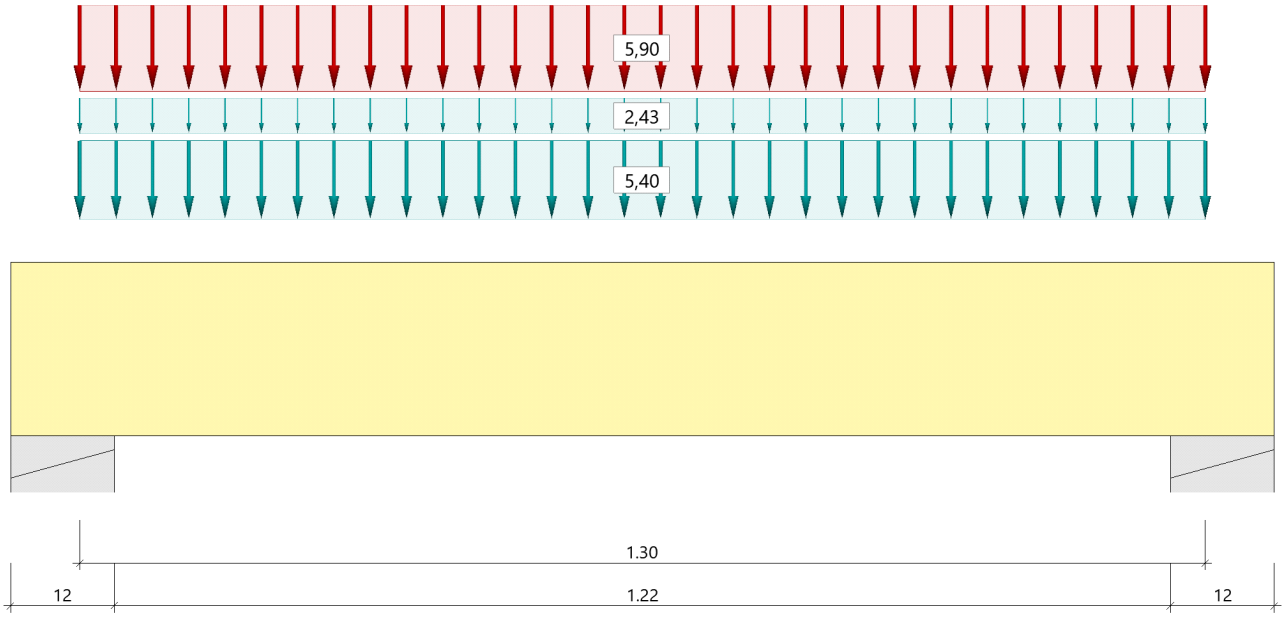
Poz.306 Preklana nad oknom

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/20	10667	6827	1067	853	320.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.75	-1	-1	-1	0.0	0.0
2	1.30	12.0	16.0	1.00	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		1.30		5.40		1.00	Permanent		
	2	GL		1.30		5.90		1.00	Cat. C		
	3	GL		1.30		0.81		3.00	Permanent		

- Load 1: Poz.200e
- Load 2: Poz200e
- Load 3: stena

Self-weight

Total weight = 21 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.20	0.35	0.30	0.20	
Serviceability	characteristic					0.13

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/20	-12.7	4.15	0.35	0.20	0.20

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	1.30	0.65	inst	z	0.02	0.02	0.04	0.4	0.10	3
	1.30	0.65	net,fin	z	0.04	0.03	0.1	0.5	0.13	5
	1.30	0.65	fin	z	0.04	0.03	0.1	0.5	0.13	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		5.2 3.8		
2	1.30	Permanent loads Cat. C: congregation areas		5.2 3.8		

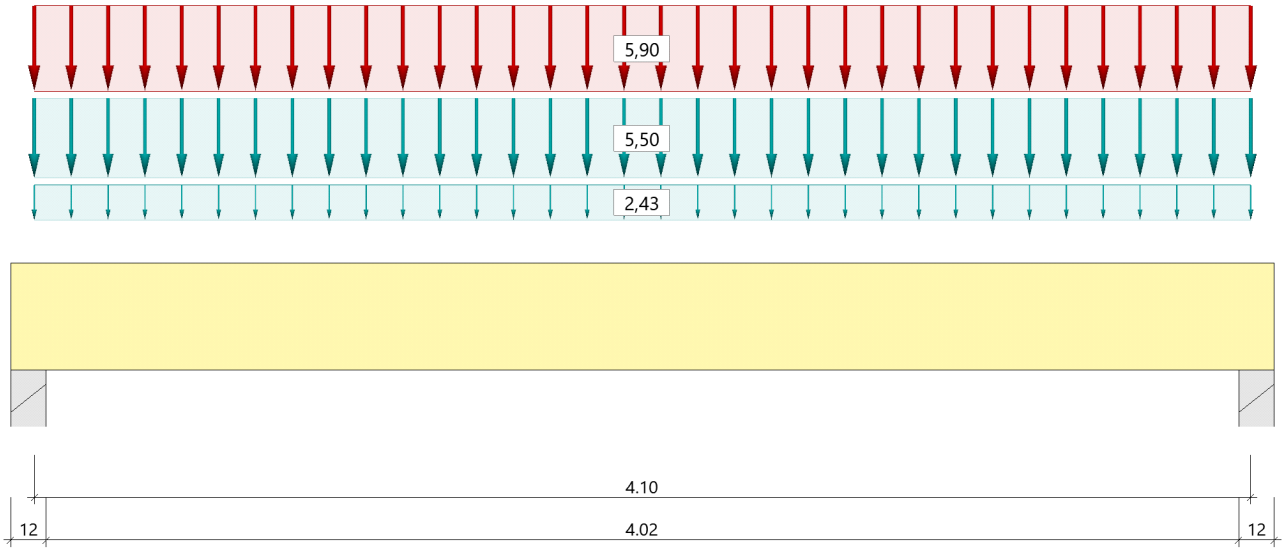
Poz.307_spodaj

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/36	62208	12288	3456	1536	576.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	16.0	1.75	-1	-1	-1	0.0	0.0
2	4.10	12.0	16.0	1.75	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		4.10		5.50		1.00	Permanent		
	2	GL		4.10		5.90		1.00	Cat. C		
	3	GL		4.10		0.81		3.00	Permanent		

- Load 1: Poz.300e
- Load 2: Poz.300e
- Load 3: stena notranja

Self-weight

Total weight = 99 kg taken into account with gamma = 4.20 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with red. Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/150

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.66	0.51	0.54	0.66	
Serviceability	characteristic					0.74

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/36	32.8	41.78	0.51	0.66	0.66

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	4.10	2.05	inst	z	0.4	0.3	0.7	1.4	0.53	3
	4.10	2.05	net,fin	z	0.8	0.4	1.2	1.6	0.74	5
	4.10	2.05	fin	z	0.8	0.4	1.2	2.7	0.44	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		16.8 12.1		
2	4.10	Permanent loads Cat. C: congregation areas		16.8 12.1		

Poz.307_zgoraj Jeklena preklada v stropu

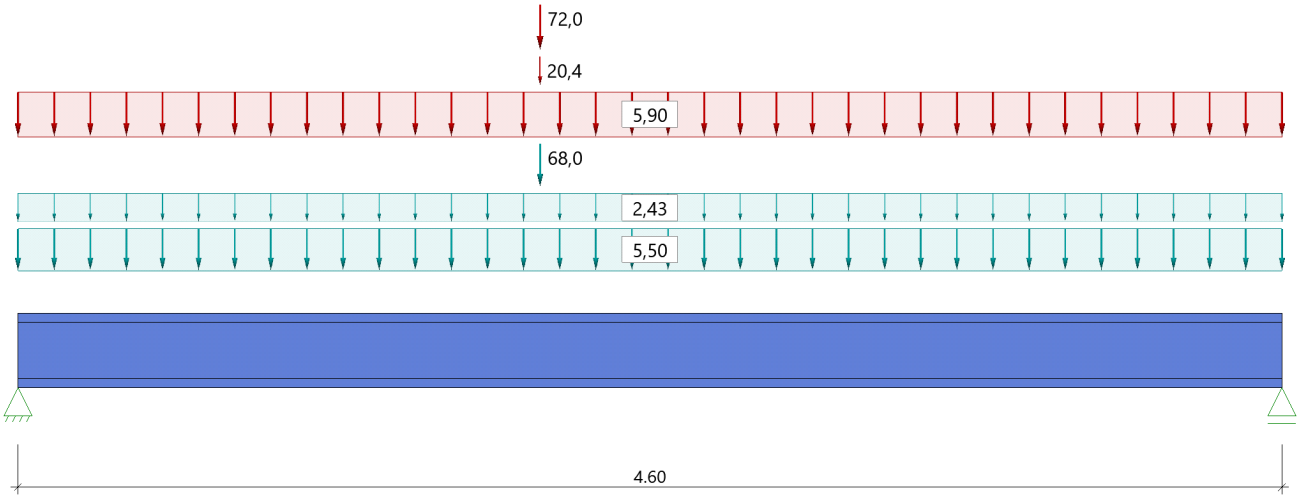
Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Steel girder, EN 1993-1-1:2010

Steel grade:S235

System Graphic



Geometry

Cross-sections

Name	I_y [cm^4]	I_z [cm^4]	W_y [cm^3]	W_z [cm^3]	A [cm^2]
HEM 240	24290.0	8153.0	1799.0	657.0	199.6
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	4.60	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments

Reference	No	Type	A [m]	W	[ ]	GF	Sim	Alt
System	1	force	1.90	68.0	kN	Permanent		
	2	force	1.90	20.4	kN	Snow		
	3	force	1.90	72.0	kN	Cat. C		

- Load 1: Poz.207
- Load 2: Poz.207
- Load 3: Poz.207

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	4	GL		4.60		5.50		1.00	Permanent		
	5	GL		4.60		5.90		1.00	Cat. C		
	6	GL		4.60		0.81		3.00	Permanent		

- Load 4: Poz.300f
- Load 5: Poz.300f
- Load 6: stena notranja

Self-weight

Total weight = 721 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Snow loads H < 1000 m	0.50	0.20	0.00		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.4
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.59	0.69	
Serviceability	characteristic			0.49

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEM 240	Span 1, x = 1.90	-80.2	295.47	0.59	0.69

Check for maximum utilization at x = 1.90 m Lcomb 44

N_{pld} =	0.0	kN	N_{Rd} =	4690.6	kN
N_{Ed} =	0.0	kN	η_N =	0.00	
$M_{y,pld}$ =	295.47	kNm	$M_{y,Rd}$ =	497.99	kNm
$M_{y,Ed}$ =	295.47	kNm	η_{My} =	0.59	
$V_{z,pld}$ =	-80.2	kN	$V_{z,Rd}$ =	815.1	kN
$V_{z,Ed}$ =	-80.2	kN	η_{Vz} =	0.10	
			η =	**0.59**	

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
2.18	4.60	0.00	4.60	0.7	1.5	0.49	3

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		61.8 55.8 12.0		
2	4.60	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		49.9 43.3 8.4		

Poz.308 Jeklena preklada v stropu

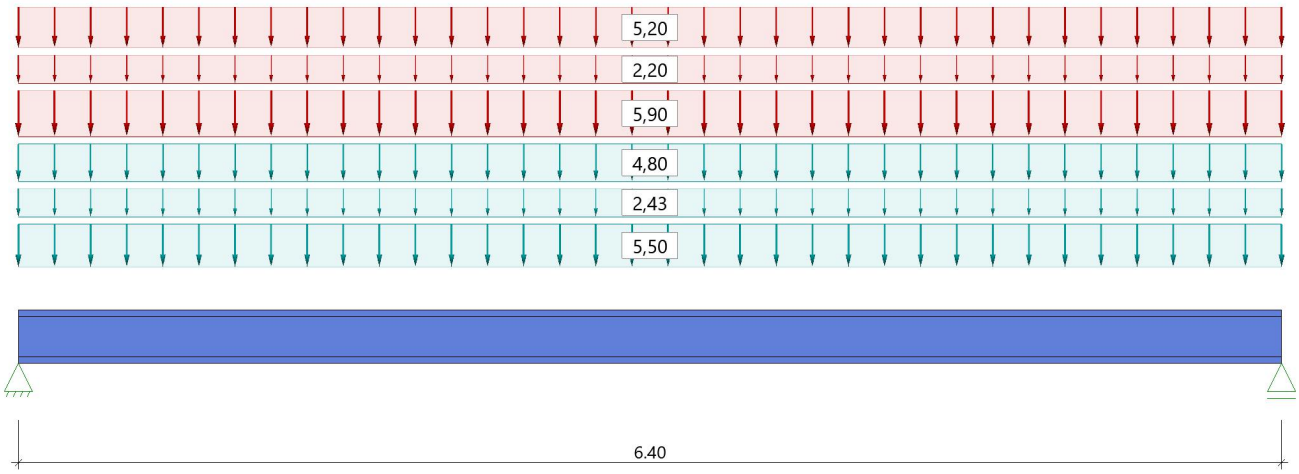
Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Steel girder, EN 1993-1-1:2010

Steel grade:S235

System Graphic



Geometry

Cross-sections

Name	I_y [cm^4]	I_z [cm^4]	W_y [cm^3]	W_z [cm^3]	A [cm^2]
HEM 240	24290.0	8153.0	1799.0	657.0	199.6
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	6.40	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		6.40		5.50		1.00	Permanent		
	2	GL		6.40		4.80		1.00	Permanent		
	3	GL		6.40		5.90		1.00	Cat. C		
	4	GL		6.40		5.20		1.00	Cat. C		
	5	GL		6.40		0.81		3.00	Permanent		
	6	GL		6.40		2.20		1.00	Snow		

- Load 1: Poz.300f
- Load 2: Poz.300g
- Load 3: Poz.300f
- Load 4: Poz.300g
- Load 5: stena notranja
- Load 6: Poz.300g

Self-weight

Total weight = 1003 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Snow loads H < 1000 m	0.50	0.20	0.00		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.4
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.39	0.49	
Serviceability	characteristic			0.53

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEM 240	Span 1, x = 3.20	0.0	192.52	0.39	0.49

Check for maximum utilization at x = 3.20 m Lcomb 41

N_{pld} =	0.0	kN	N_{Rd} =	4690.6	kN
N_{Ed} =	0.0	kN	η_N =	0.00	
$M_{y,pld}$ =	192.52	kNm	$M_{y,Rd}$ =	497.99	kNm
$M_{y,Ed}$ =	192.52	kNm	η_{My} =	0.39	
$V_{z,pld}$ =	0.0	kN	$V_{z,Rd}$ =	815.1	kN
$V_{z,Ed}$ =	0.0	kN	η_{Vz} =	0.00	
			η =	**0.39**	

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
3.20	6.40	0.00	6.40	1.1	2.1	0.53	3

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		45.7 35.5 7.0		
2	6.40	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		45.7 35.5 7.0		

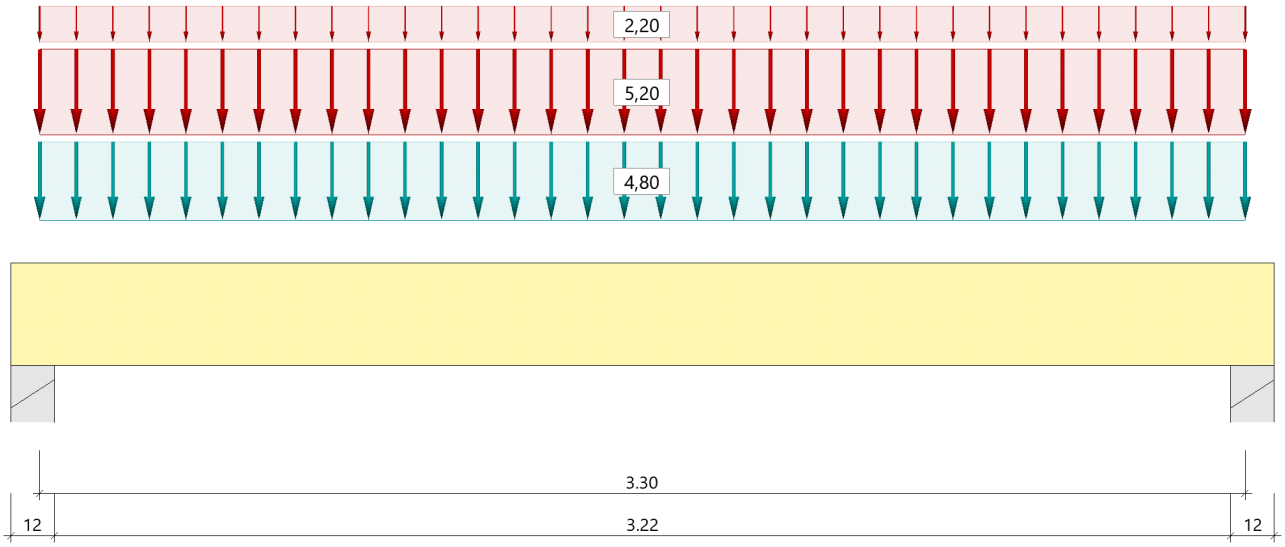
Poz.309 Preklada nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/28	29269	9557	2091	1195	448.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	3.30	12.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		3.30		4.80		Permanent		
	2	GL		3.30		5.20		Cat. C		
	3	GL		3.30		2.20		Snow		

- Load 1: Poz.300g
- Load 2: Poz.300g
- Load 3: Poz.300g

Self-weight

Total weight = 74 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.57	0.53	0.79	0.57	
Serviceability	characteristic					0.62

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/28	-26.8	22.10	0.53	0.57	0.57

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.30	1.65	inst	z	0.2	0.3	0.5	1.1	0.47	3
	3.30	1.65	net,fin	z	0.4	0.4	0.8	1.3	0.62	5
	3.30	1.65	fin	z	0.4	0.4	0.8	1.3	0.62	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		8.3 8.6 3.6		
2	3.30	Permanent loads Cat. C: congregation areas Snow loads H < 1000 m		8.3 8.6 3.6		

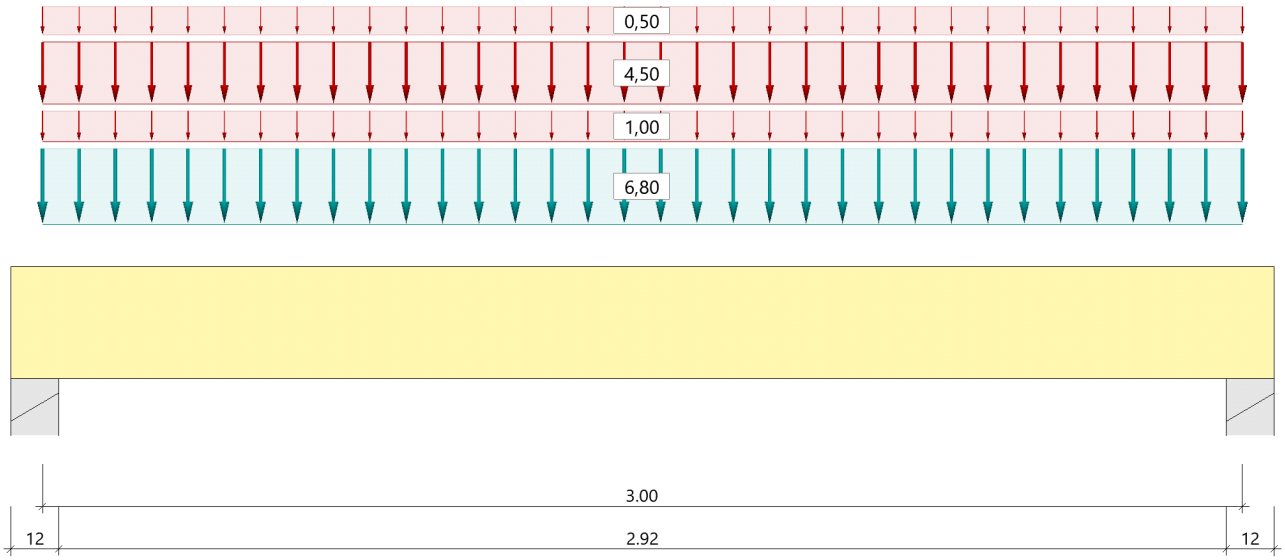
Poz.310 Preklada v stropu

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/28	29269	9557	2091	1195	448.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	3.00	12.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		3.00		6.80		Permanent		
	2	GL		3.00		1.00		Cat. C		
	3	GL		3.00		4.50		Snow		
	4	GL		3.00		0.50		Wind		

- Load 1: Poz.300h
- Load 2: Poz.300h
- Load 3: Po.300h
- Load 4: Po.300h

Self-weight

Total weight = 67 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.51	0.53	0.79	0.51	
Serviceability	characteristic					0.49

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/28	-26.6	19.95	0.53	0.51	0.51

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	3.00	1.50	inst	z	0.2	0.2	0.4	1.0	0.39	3
	3.00	1.50	net,fin	z	0.4	0.2	0.6	1.2	0.49	5
	3.00	1.50	fin	z	0.4	0.2	0.6	1.2	0.49	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m		10.5 1.5 0.8 6.7		
2	3.00	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m		10.5 1.5 0.8 6.7		

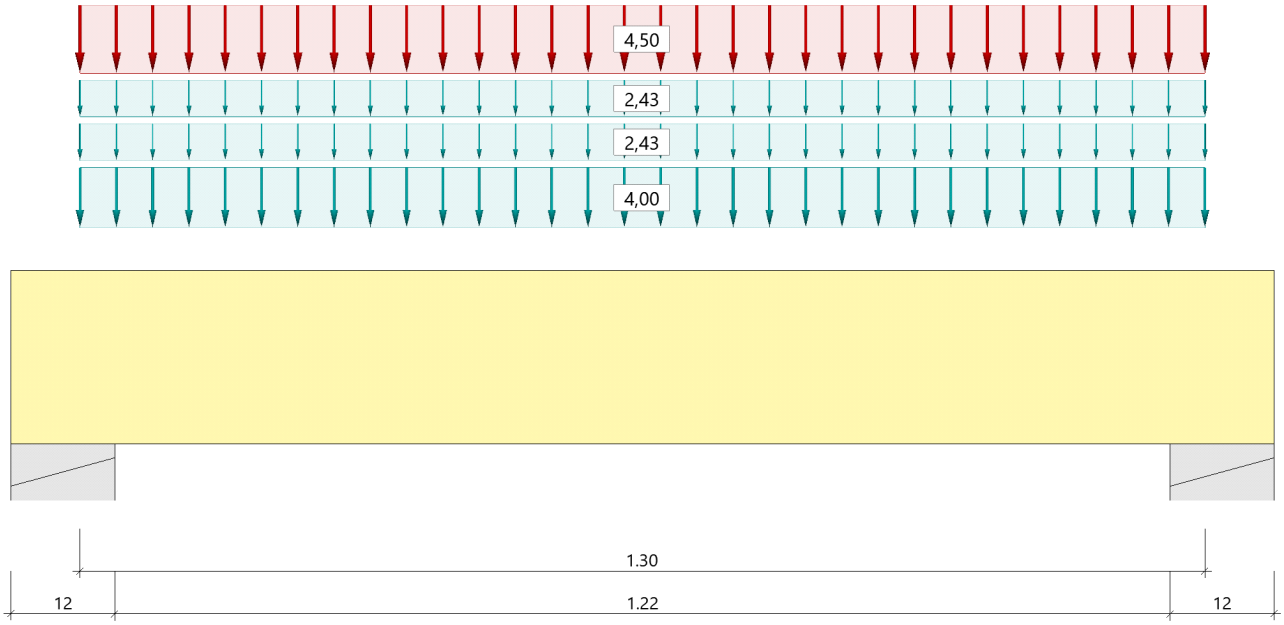
Poz.311 Preklada nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
10/20	6667	1667	667	333	200.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	1.30	12.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		1.30		4.00		1.00	Permanent		
	2	GL		1.30		4.50		1.00	Cat. C		
	3	GL		1.30		0.81		3.00	Permanent		
	4	GL		1.30		0.81		3.00	Permanent		

- Load 1: Poz.200g
- Load 2: Poz.200g
- Load 3: stena
- Load 4: stena

Self-weight

Total weight = 13 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.31	0.54	0.36	0.31	
Serviceability	characteristic					0.21

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	10/20	12.2	3.98	0.54	0.31	0.31

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.30	0.65	inst	z	0.04	0.02	0.1	0.4	0.15	3
	1.30	0.65	net,fin	z	0.1	0.03	0.1	0.5	0.21	5
	1.30	0.65	fin	z	0.1	0.03	0.1	0.5	0.21	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		5.8 2.9		
2	1.30	Permanent loads Cat. C: congregation areas		5.8 2.9		

Poz.312 Preklana v stropu

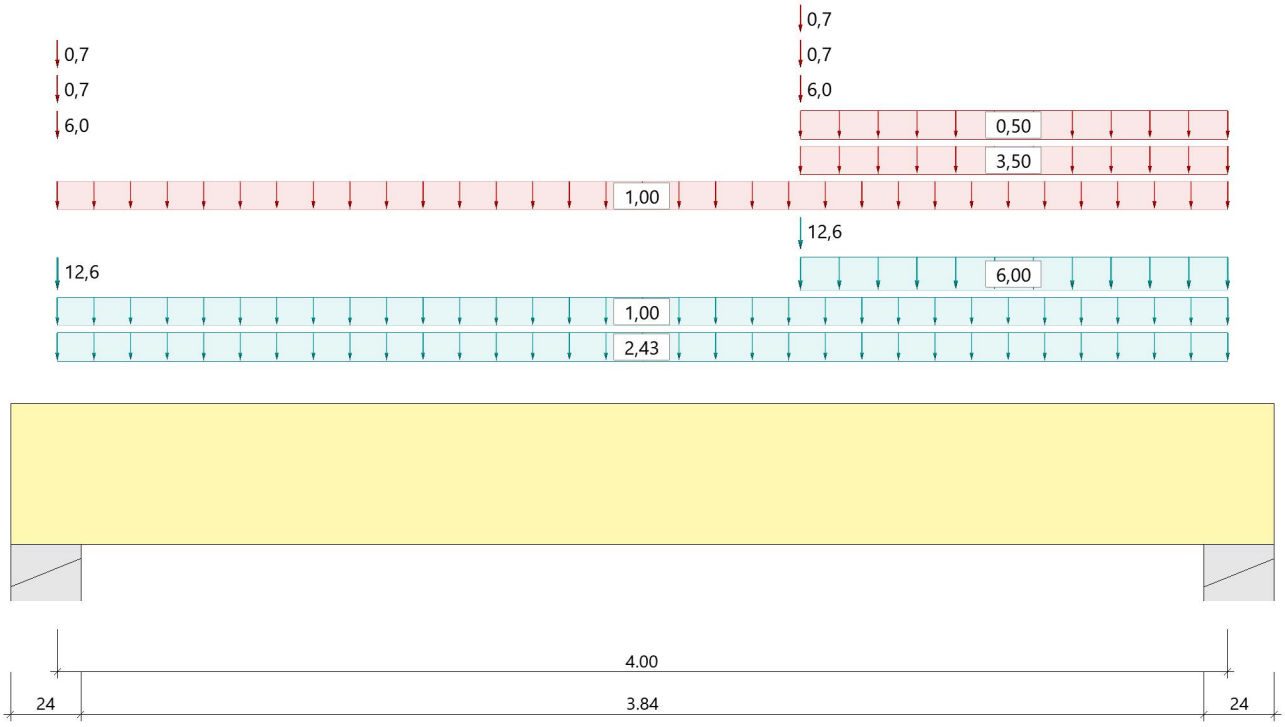
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
20/48	184320	32000	7680	3200	960.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	24.0	16.0	1.50	-1	-1	-1	0.0	0.0
2	4.00	24.0	16.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments

Reference	No	Type	A [m]	W	[ ]	GF	Sim	Alt
System	1	force	0.00	12.6	kN	Permanent		
	2	force	2.54	12.6	kN	Permanent		
	3	force	0.00	6.0	kN	Snow		
	4	force	2.54	6.0	kN	Snow		
	5	force	0.00	0.7	kN	Cat. C		
	6	force	2.54	0.7	kN	Cat. C		
	7	force	0.00	0.7	kN	Wind		
	8	force	2.54	0.7	kN	Wind		

- Load 1: Poz.206
- Load 2: Poz.206
- Load 3: Poz.206
- Load 4: Poz.206
- Load 5: Poz.206
- Load 6: Poz.206
- Load 7: Poz.206
- Load 8: Poz.206

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	9	GL		4.00		0.81		3.00	Permanent		
	10	GL		4.00		1.00		1.00	Permanent		
	11	GL		4.00		1.00		1.00	Snow		
	12	TL	2.54	1.46		6.00	6.00	1.00	Permanent		
	13	TL	2.54	1.46		3.50	3.50	1.00	Snow		
	14	TL	2.54	1.46		0.50	0.50	1.00	Wind		

- Load 9: stena
- Load 10: Poz.100b
- Load 11: Poz.100b
- Load 12: Poz.200h
- Load 13: Poz.200h
- Load 14: Poz.200h

Self-weight

Total weight = 192 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

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Partizanska cesta 3-5
2000 Maribor

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.35	0.44	0.47	0.35	
Serviceability	characteristic					0.23

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	20/48	-47.4	47.29	0.44	0.35	0.35

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	4.00	2.11	inst	z	0.2	0.1	0.2	1.3	0.18	4
	4.00	2.11	net,fin	z	0.3	0.1	0.4	1.6	0.23	6
	4.00	2.11	fin	z	0.3	0.1	0.4	1.6	0.23	5

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		26.6		
		Cat. C: congregation areas		1.0		
		Wind loads		1.1		
		Snow loads H < 1000 m		11.1		
2	4.00	Permanent loads		23.0		
		Cat. C: congregation areas		0.4		
		Wind loads		1.0		
		Snow loads H < 1000 m		10.0		

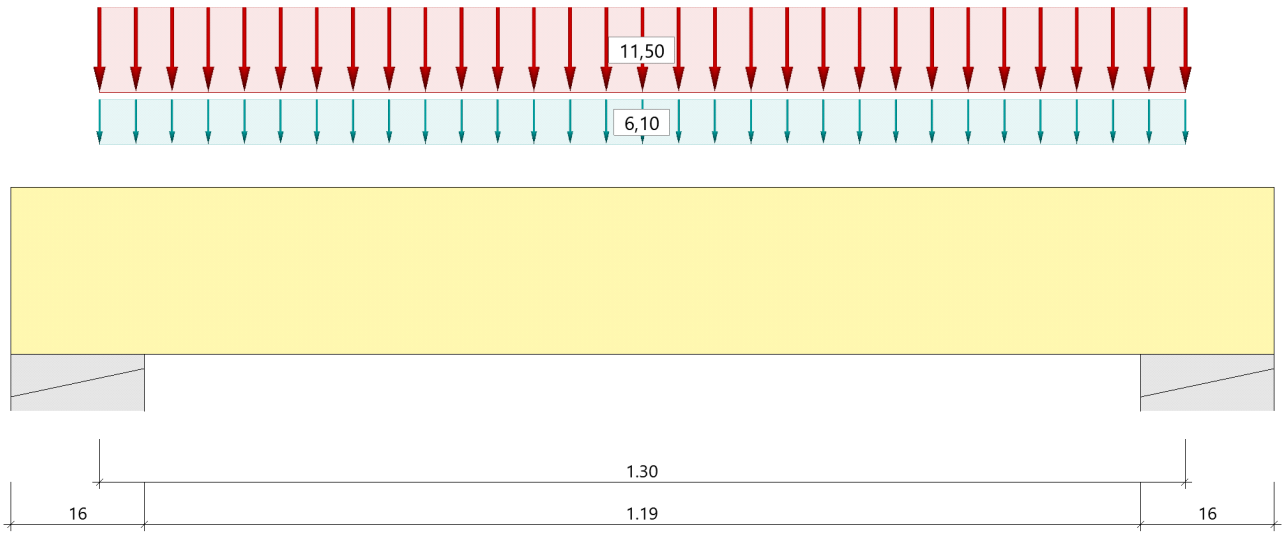
Poz.313 Preklana nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/20	10667	6827	1067	853	320.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	 Φ_y [kNm/rad]	 Φ_z [kNm/rad]
1	0.00	16.0	12.0	1.50	-1	-1	-1	0.0	0.0
2	1.30	16.0	12.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
Span 1	1 2	GL GL		1.30 1.30		6.10 11.50		Permanent Cat. C		

- Load 1: Poz.300a
- Load 2: Poz300a

Self-weight

Total weight = 21 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	 0.70	 0.70	 0.60	1.00	1.35 1.50	 short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.27	0.46	0.27	0.27	 0.16

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/20	-16.7	5.43	0.46	0.27	0.27

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.30 1.30 1.30	0.65 0.65 0.65	inst net,fin fin	z z z	0.02 0.03 0.03	0.03 0.1 0.1	0.1 0.1 0.1	0.4 0.5 0.5	0.12 0.16 0.16	3 5 4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		4.1 7.5		
2	1.30	Permanent loads Cat. C: congregation areas		4.1 7.5		

Poz.314_spodaj Jeklena preklada v stropu

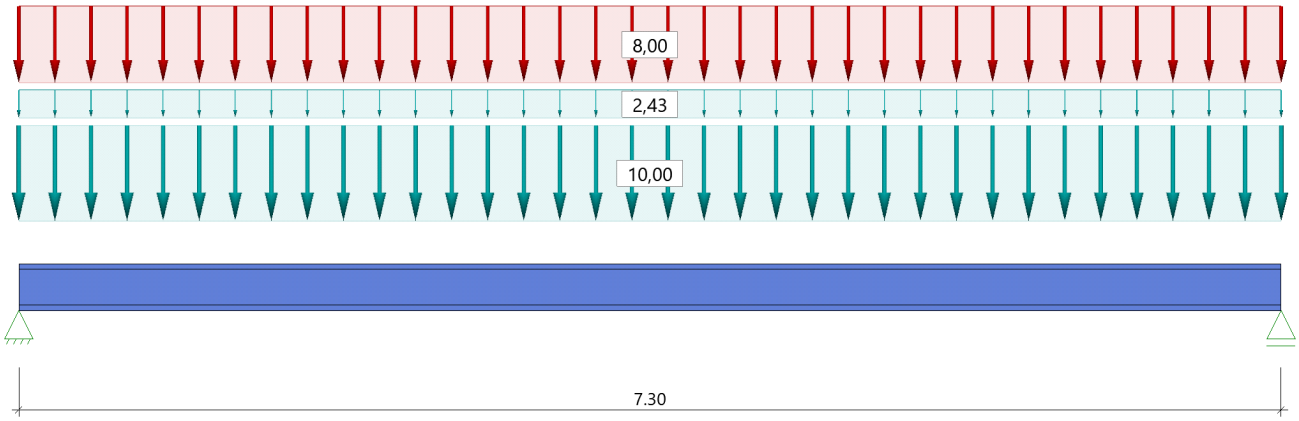
Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Steel girder, EN 1993-1-1:2010

Steel grade:S235

System Graphic



Geometry

Cross-sections

Name	I_y [cm^4]	I_z [cm^4]	W_y [cm^3]	W_z [cm^3]	A [cm^2]
HEM 240	24290.0	8153.0	1799.0	657.0	199.6
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	7.30	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		7.30		10.00		1.00	Permanent		
	2	GL		7.30		8.00		1.00	Cat. C		
	3	GL		7.30		0.81		3.00	Permanent		

- Load 1: Poz.200h
- Load 2: Poz.200h
- Load 3: stena notranja

Self-weight

Total weight = 1144 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.4
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.41	0.53	
Serviceability	characteristic			0.66

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEM 240	Span 1, x = 3.65	0.0	205.80	0.41	0.53

Check for maximum utilization at x = 3.65 m Lcomb 34

N_{pld} =	0.0	kN	N_{Rd} =	4690.6	kN
N_{Ed} =	0.0	kN	η_N =	0.00	
$M_{y,pld}$ =	205.80	kNm	$M_{y,Rd}$ =	497.99	kNm
$M_{y,Ed}$ =	205.80	kNm	η_{My} =	0.41	
$V_{z,pld}$ =	0.0	kN	$V_{z,Rd}$ =	815.1	kN
$V_{z,Ed}$ =	0.0	kN	η_{Vz} =	0.00	
			η =	**0.41**	

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
3.65	7.30	0.00	7.30	1.6	2.4	0.66	3

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		51.1		
		Cat. C: congregation areas		29.2		
2	7.30	Permanent loads		51.1		
		Cat. C: congregation areas		29.2		

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2000 Maribor

Poz.314_zgoraj Jeklena preklada v stropu

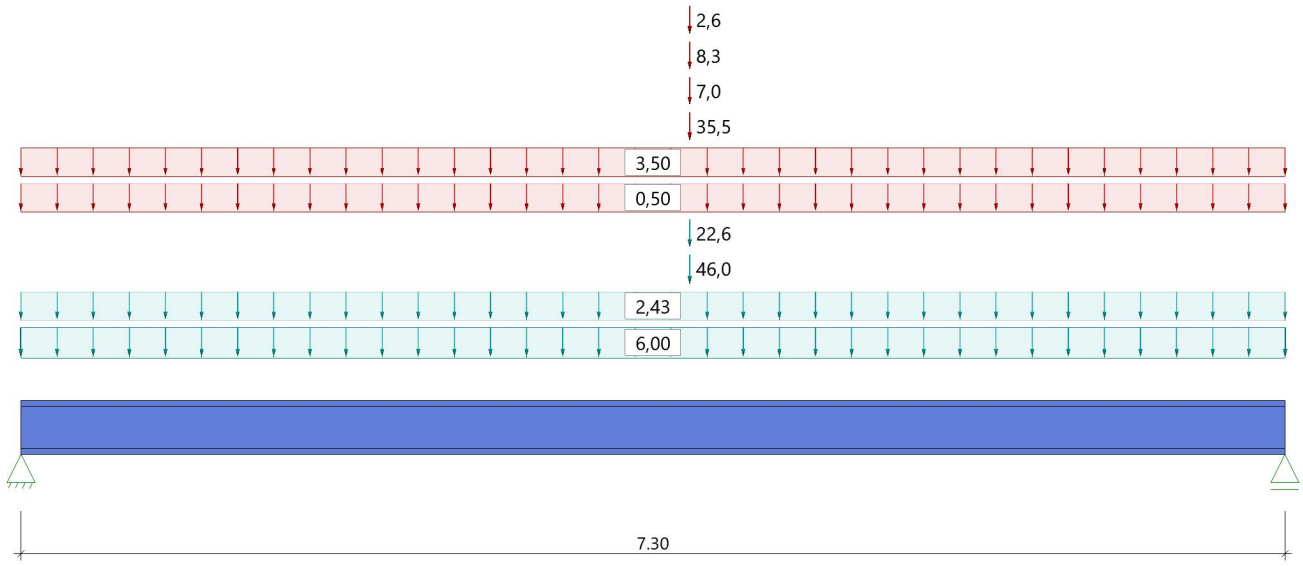
Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Steel girder, EN 1993-1-1:2010

Steel grade:S235

System Graphic



Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
HEM 280	39550.0	13160.0	2551.0	914.0	240.2
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	7.30	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments

Reference	No	Type	A [m]	W	[ ]	GF	Sim	Alt
System	1	force	3.86	46.0	kN	Permanent		
	2	force	3.86	35.5	kN	Cat. C		
	3	force	3.86	7.0	kN	Snow		
	4	force	3.86	22.6	kN	Permanent		
	5	force	3.86	8.3	kN	Snow		
	6	force	3.86	2.6	kN	Cat. C		

- Load 1: Poz.308
- Load 2: Poz.308
- Load 3: Poz.308
- Load 4: Poz.208
- Load 5: Poz.208
- Load 6: Poz.208

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	7	GL		7.30		6.00		1.00	Permanent		
	8	GL		7.30		0.50		1.00	Wind		
	9	GL		7.30		3.50		1.00	Snow		
	10	GL		7.30		0.81		3.00	Permanent		

- Load 7: Poz.200h
- Load 8: Poz.200h
- Load 9: Poz.200h
- Load 10: stena notranja

Self-weight

Total weight = 1376 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Wind loads	0.60	0.20	0.00		1.50
Snow loads H < 1000 m	0.50	0.20	0.00		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.4
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.59	0.75	
Serviceability	characteristic			0.70

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEM 280	Span 1, x = 3.86	69.1	413.24	0.59	0.75

Check for maximum utilization at x = 3.86 m Lcomb 53

N_{pld}	=	0.0 kN	N_{Rd}	=	5644.7 kN
N_{Ed}	=	0.0 kN	η_N	=	0.00
$M_{y,pld}$	=	413.24 kNm	$M_{y,Rd}$	=	697.71 kNm
$M_{y,Ed}$	=	413.24 kNm	η_{My}	=	0.59
$V_{z,pld}$	=	69.1 kN	$V_{z,Rd}$	=	977.8 kN
$V_{z,Ed}$	=	69.1 kN	η_{Vz}	=	0.07
			η	**=**	**0.59**

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
3.84	7.30	0.00	7.30	1.7	2.4	0.70	3

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m		70.0 17.9 1.8 20.0		
2	7.30	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m		73.9 20.2 1.8 20.9		

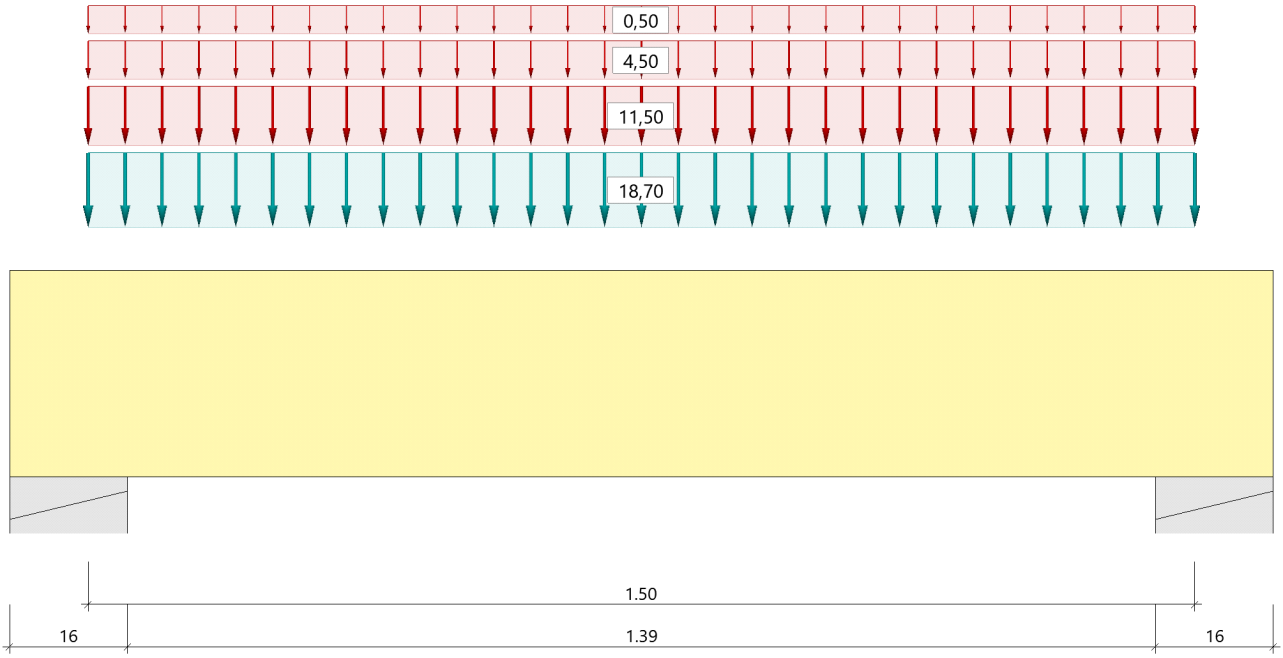
Poz.315 Preklada nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/28	29269	9557	2091	1195	448.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	1.50	16.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		1.50		18.70		Permanent		
	2	GL		1.50		11.50		Cat. C		
	3	GL		1.50		4.50		Snow		
	4	GL		1.50		0.50		Wind		

- Load 1: Poz.300h
- Load 2: Poz.300h
- Load 3: Po.300h
- Load 4: Po.300h

Self-weight

Total weight = 34 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Wind loads	0.60	0.20	0.00		1.50	short
Snow loads H < 1000 m	0.50	0.20	0.00		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.34	0.69	0.82	0.34	
Serviceability	characteristic					0.18

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/28	-34.9	13.11	0.69	0.34	0.34

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.50	0.75	inst	z	0.04	0.03	0.1	0.5	0.13	3
	1.50	0.75	net,fin	z	0.1	0.04	0.1	0.6	0.18	5
	1.50	0.75	fin	z	0.1	0.04	0.1	0.6	0.18	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		14.2		
		Cat. C: congregation areas		8.6		
		Wind loads		0.4		
		Snow loads H < 1000 m		3.4		
2	1.50	Permanent loads		14.2		
		Cat. C: congregation areas		8.6		
		Wind loads		0.4		
		Snow loads H < 1000 m		3.4		

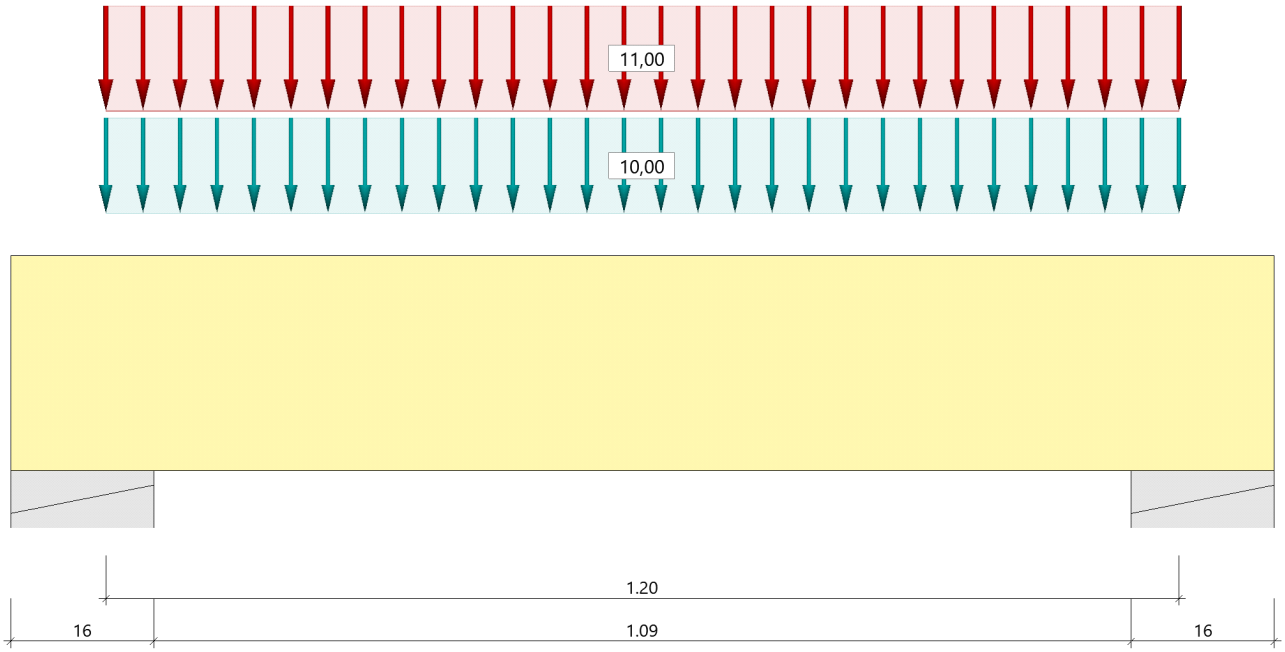
Poz.316 Preklada nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
10/24	11520	2000	960	400	240.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	1.20	16.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		1.20		10.00		Permanent		
	2	GL		1.20		11.00		Cat. C		

- Load 1: Poz.300i
- Load 2: Poz.300i

Self-weight

Total weight = 14 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.30	0.67	0.42	0.30	
Serviceability	characteristic					0.15

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	10/24	18.1	5.43	0.67	0.30	0.30

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.20	0.60	inst	z	0.02	0.02	0.04	0.4	0.11	3
	1.20	0.60	net,fin	z	0.04	0.03	0.1	0.5	0.15	5
	1.20	0.60	fin	z	0.04	0.03	0.1	0.5	0.15	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		6.1		
		Cat. C: congregation areas		6.6		
2	1.20	Permanent loads		6.1		
		Cat. C: congregation areas		6.6		

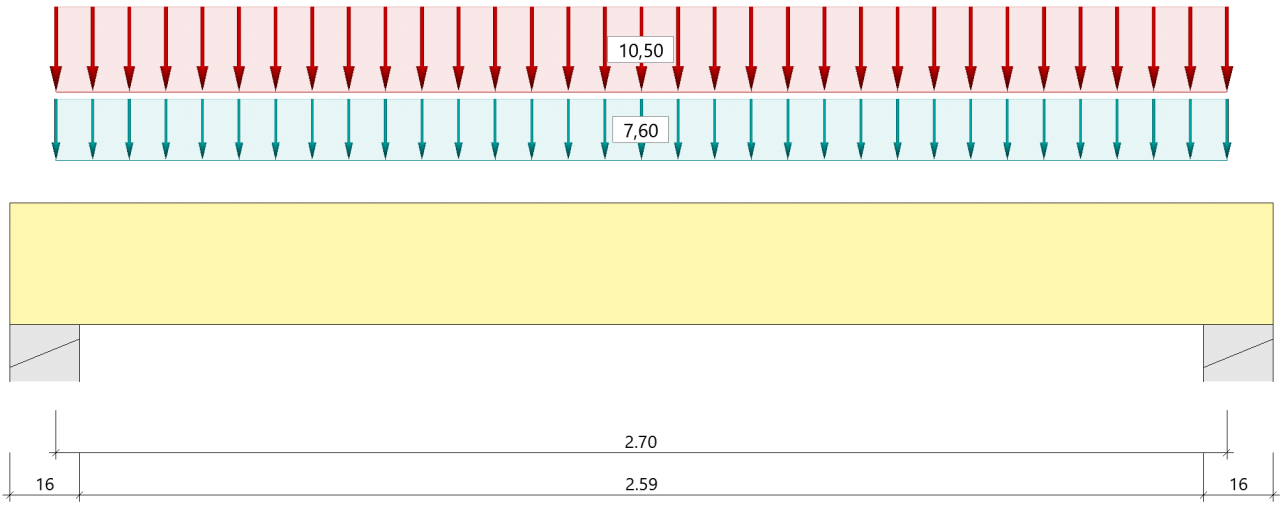
Poz.317 Preklada nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/28	29269	9557	2091	1195	448.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	2.70	16.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1 2	GL GL		2.70 2.70		7.60 10.50		Permanent Cat. C		

- Load 1: Poz.300j
- Load 2: Poz.300j

Self-weight

Total weight = 60 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. C: congregation areas	 0.70	 0.70	 0.60	1.00	1.35 1.50	 short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.61	0.70	0.83	0.61	 0.56

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/28	35.5	23.98	0.70	0.61	0.61

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim}	η	Lk
Span 1	2.70	1.35	inst	z	0.2	0.2	0.4	0.9	0.42	3
	2.70	1.35	net,fin	z	0.3	0.3	0.6	1.1	0.56	5
	2.70	1.35	fin	z	0.3	0.3	0.6	1.1	0.56	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		10.6 14.2		
2	2.70	Permanent loads Cat. C: congregation areas		10.6 14.2		

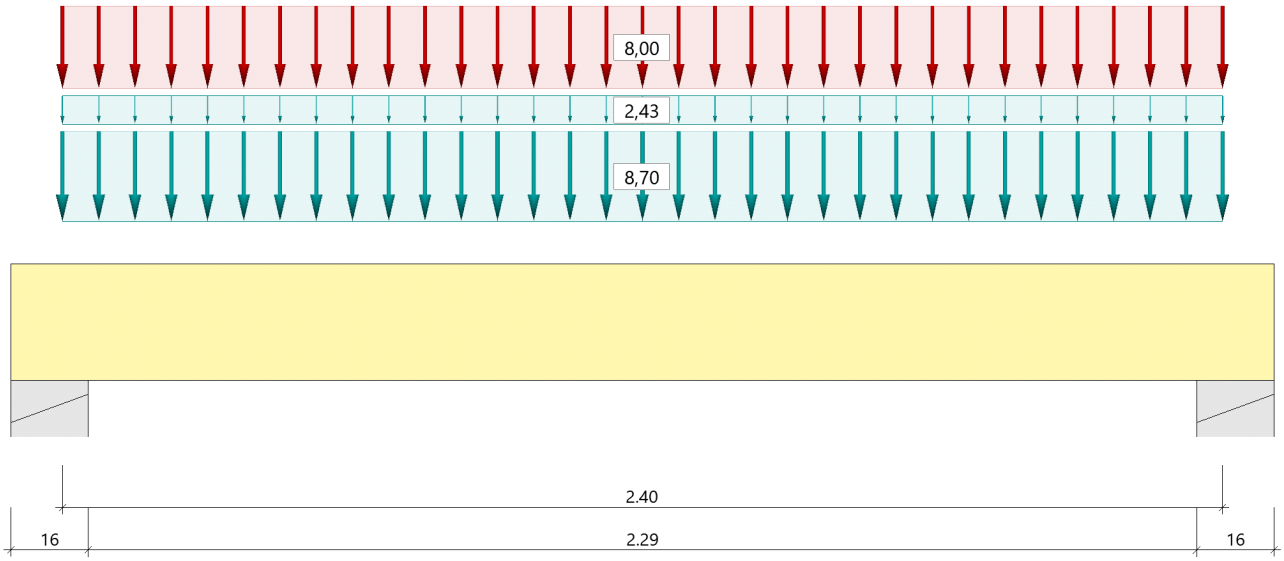
Poz.318 Preklada nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/24	18432	8192	1536	1024	384.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	2.40	16.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		2.40		8.70		1.00	Permanent		
	2	GL		2.40		8.00		1.00	Cat. C		
	3	GL		2.40		0.81		3.00	Permanent		

- Load 1: Poz.300m
- Load 2: Poz.300m
- Load 3: stena

Self-weight

Total weight = 46 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.68	0.76	0.77	0.68	
Serviceability	characteristic					0.68

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/24	-32.7	19.64	0.76	0.68	0.68

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	2.40	1.20	inst	z	0.2	0.2	0.4	0.8	0.49	3
	2.40	1.20	net,fin	z	0.4	0.2	0.7	1.0	0.68	5
	2.40	1.20	fin	z	0.4	0.2	0.7	1.0	0.68	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		13.6 9.6		
2	2.40	Permanent loads Cat. C: congregation areas		13.6 9.6		

Poz.319 Jeklena preklada v stropu

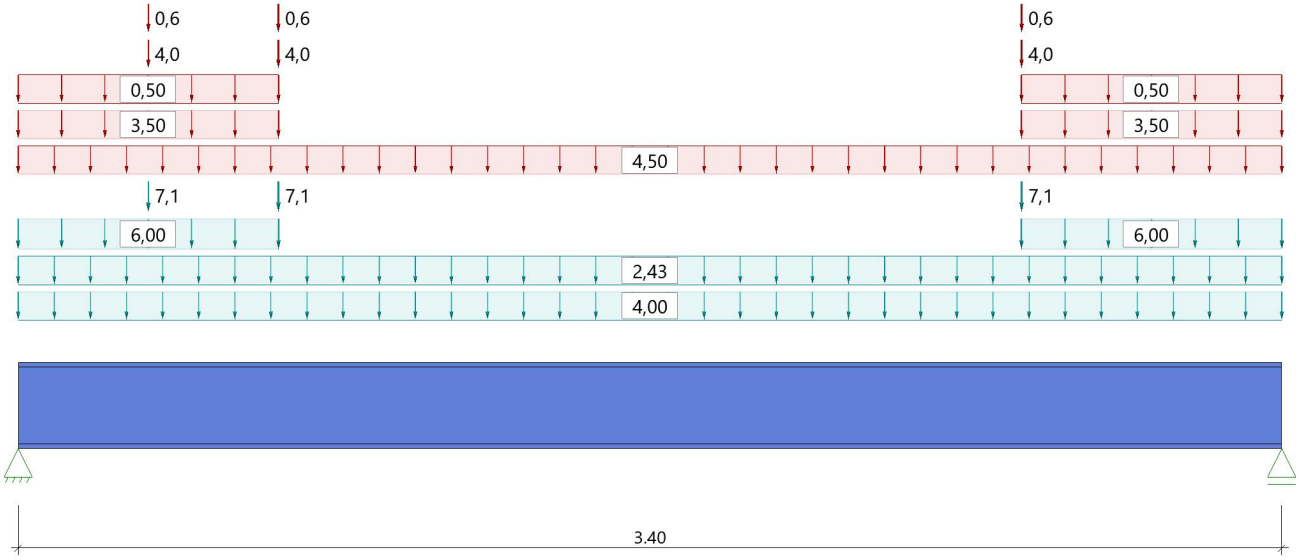
Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Steel girder, EN 1993-1-1:2010

Steel grade:S235

System Graphic



Geometry

Cross-sections

Name	I_y [cm^4]	I_z [cm^4]	W_y [cm^3]	W_z [cm^3]	A [cm^2]
HEA 240	7760.0	2770.0	675.0	231.0	76.8
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	3.40	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments

Reference	No	Type	A [m]	W	[ ]	GF	Sim	Alt
System	1	force	0.70	7.1	kN	Permanent		
	2	force	0.35	7.1	kN	Permanent		
	3	force	2.70	7.1	kN	Permanent		
	4	force	0.70	4.0	kN	Snow		
	5	force	0.35	4.0	kN	Snow		
	6	force	2.70	4.0	kN	Snow		
	7	force	0.70	0.6	kN	Wind		
	8	force	0.35	0.6	kN	Wind		
	9	force	2.70	0.6	kN	Wind		

- Load 1: Poz.209
- Load 2: Poz.209
- Load 3: Poz.209
- Load 4: Poz.209
- Load 5: Poz.209
- Load 6: Poz.209
- Load 7: Poz.209
- Load 8: Poz.209
- Load 9: Poz.209

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	10	GL		3.40		4.00		1.00	Permanent		
	11	GL		3.40		4.50		1.00	Cat. C		
	12	GL		3.40		0.81		3.00	Permanent		
	13	TL		0.70		6.00	6.00	1.00	Permanent		
	14	TL	2.70	0.70		6.00	6.00	1.00	Permanent		
	15	TL		0.70		3.50	3.50	1.00	Snow		
	16	TL	2.70	0.70		3.50	3.50	1.00	Snow		
	17	TL		0.70		0.50	0.50	1.00	Wind		
	18	TL	2.70	0.70		0.50	0.50	1.00	Wind		

- Load 10: Poz.300j
- Load 11: Poz.300j
- Load 12: stena
- Load 13: Poz.200h
- Load 14: Poz.200h
- Load 15: Poz.200h
- Load 16: Poz.200h
- Load 17: Poz.200h
- Load 18: Poz.200h

Self-weight

Total weight = 205 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Wind loads	0.60	0.20	0.00		1.50
Snow loads H < 1000 m	0.50	0.20	0.00		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.3 - annex B
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.22	0.23	 0.19

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEA 240	Span 1, x = 1.58	0.0	38.13	0.22	0.23

Check for maximum utilization at x = 1.58 m Lcomb 68

N_{pld}	=	0.0 kN	N_{Rd}	=	1804.8 kN
N_{Ed}	=	0.0 kN	η_N	=	0.00
$M_{y,pld}$	=	38.13 kNm	$M_{y,Rd}$	=	175.49 kNm
$M_{y,Ed}$	=	38.13 kNm	η_{My}	=	0.22
$V_{z,pld}$	=	0.0 kN	$V_{z,Rd}$	=	341.1 kN
$V_{z,Ed}$	=	0.0 kN	η_{Vz}	=	0.00
			η	**=**	**0.22**

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
1.61	3.40	0.00	3.40	0.2	1.1	0.19	3

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m		29.6 7.6 1.5 10.0		
2	3.40	Permanent loads Cat. C: congregation areas Wind loads Snow loads H < 1000 m		24.0 7.6 1.0 6.9		

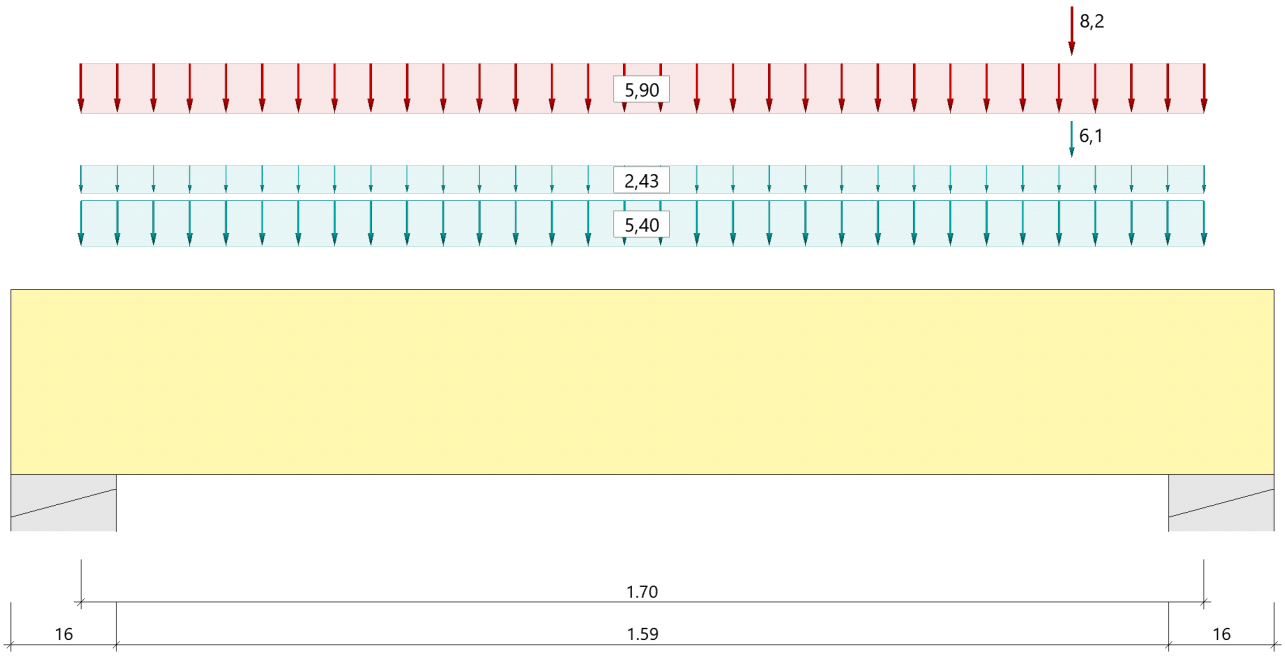
Poz.320 Preklana v stropu

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
16/28	29269	9557	2091	1195	448.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	16.0	12.0	1.50	-1	-1	-1	0.0	0.0
2	1.70	16.0	12.0	1.50	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments

Reference	No	Type	A [m]	W	[ ]	GF	Sim	Alt
Span 1	1	force	1.50	6.1	kN	Permanent		
	2	force	1.50	8.2	kN	Cat. C		

- Load 1: Poz.204
- Load 2: Poz.204

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	3	GL		1.70		0.81		3.00	Permanent		
Span 1	4	GL		1.70		5.40		1.00	Permanent		
	5	GL		1.70		5.90		1.00	Cat. C		

- Load 3: stena
- Load 4: Poz.300e
- Load 5: Poz300e

Self-weight

Total weight = 38 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity Serviceability	persistent/transient characteristic	0.24	0.69	0.57	0.24	 0.15

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	16/28	-34.9	9.33	0.69	0.24	0.24

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.70 1.70 1.70	0.89 0.89 0.89	inst net,fin fin	z z z	0.03 0.1 0.1	0.03 0.04 0.04	0.1 0.1 0.1	0.6 0.7 0.7	0.11 0.15 0.15	3 5 4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		7.6 6.0		
2	1.70	Permanent loads Cat. C: congregation areas		12.2 12.3		

Poz.321 Preklada nad vrati

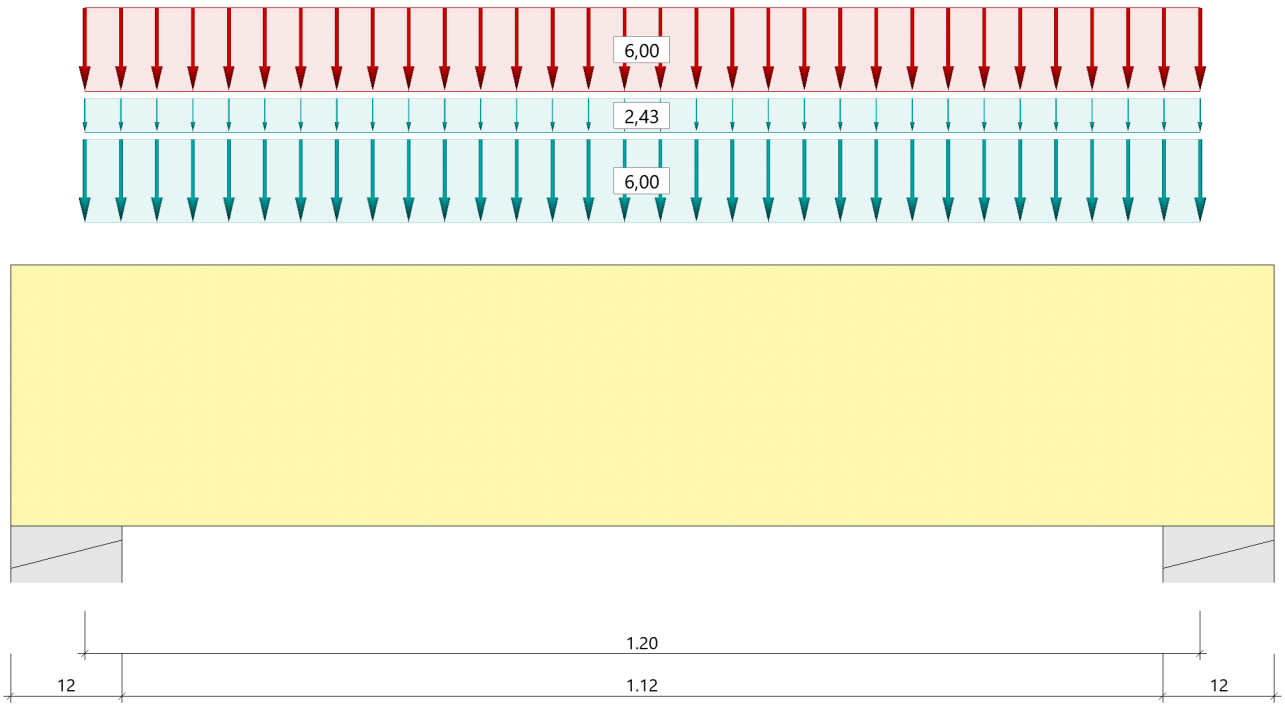
Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
10/28	18293	2333	1307	467	280.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	1.20	12.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		1.20		6.00		1.00	Permanent		
	2	GL		1.20		6.00		1.00	Cat. C		
	3	GL		1.20		0.81		3.00	Permanent		

- Load 1: Poz.300l
- Load 2: Poz.300l
- Load 3: stena

Self-weight

Total weight = 17 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Results

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.15	0.39	0.37	0.15	
Serviceability	characteristic					0.06

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	10/28	-12.3	3.70	0.39	0.15	0.15

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	1.20	0.60	inst	z	0.01	0.01	0.02	0.4	0.05	3
	1.20	0.60	net,fin	z	0.02	0.01	0.03	0.5	0.06	5
	1.20	0.60	fin	z	0.02	0.01	0.03	0.5	0.06	4

Support forces

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		5.1		
		Cat. C: congregation areas		3.6		
2	1.20	Permanent loads		5.1		
		Cat. C: congregation areas		3.6		

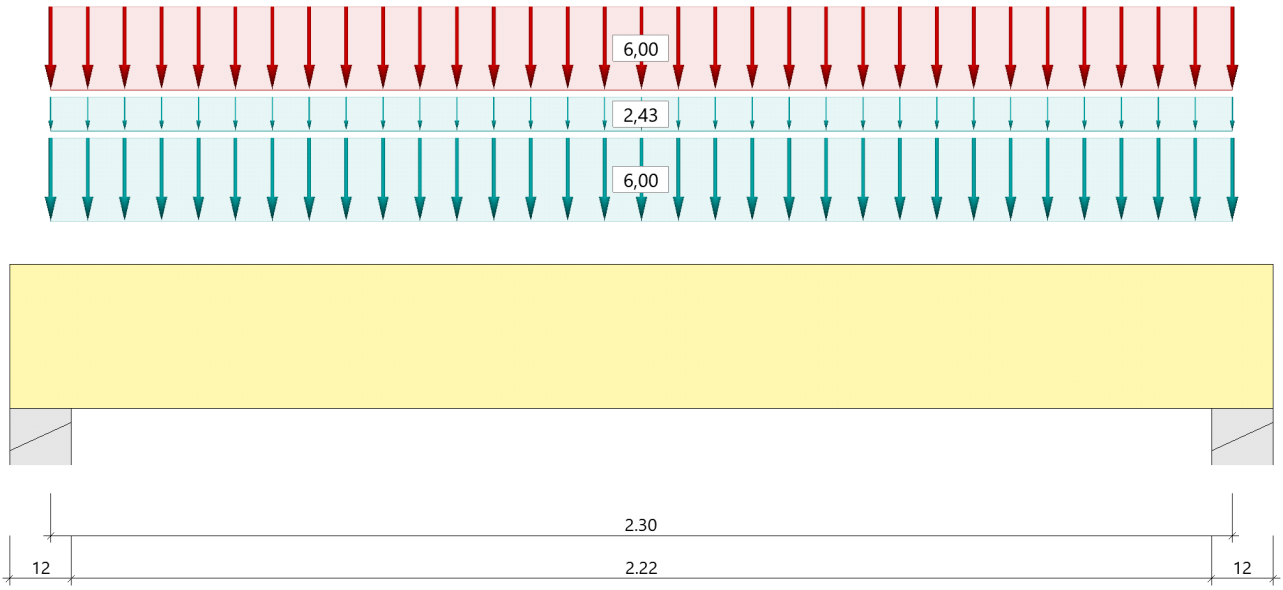
Poz.322 Preklada nad vrati

Continuous Beam Timber HTM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Timber beam Glulam GL24h (flat) EN 1995-1-1/A2:2014

System Graphic



Material

Glulam GL24h (flat), acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ [N/mm²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm²]	$E_{0,mean}$ $E_{0,05}$ [N/mm²]	$E_{90,mean}$ $E_{90,05}$ [N/mm²]	G_{mean} G_{05} [N/mm²]	ρ_k ρ_m [kg/m³]
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420

Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
10/28	18293	2333	1307	467	280.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	10.0	1.25	-1	-1	-1	0.0	0.0
2	2.30	12.0	10.0	1.25	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint									

Lateral support in y- direction: at bearings on top chord

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	1	GL		2.30		6.00		1.00	Permanent		
	2	GL		2.30		6.00		1.00	Cat. C		
	3	GL		2.30		0.81		3.00	Permanent		

- Load 1: Poz.300l
- Load 2: Poz.300l
- Load 3: stena

Self-weight

Total weight = 32 kg taken into account with gamma = 5.00 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads				1.00	1.35	
Cat. C: congregation areas	0.70	0.70	0.60		1.50	short
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3						

Design parameter

Design code	:	EN 1995-1-1/A2:2014
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED ati wind	:	very short

Service class	2	:	roofed, open
Design situation serviceability		:	characteristic
Shear stresses		=	Tau with full Q
Initial deflection	w_{inst}	=	l/300
Final deflection	$w_{net,fin}$	=	l/250
	w_{fin}	=	l/250

Summary

Check	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.56	0.75	0.70	0.56	
Serviceability	characteristic					0.46

Structural safety per cross-section (compact)

Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	10/28	23.6	13.60	0.75	0.56	0.56

Check of SLS

	l_{eff} [m]	Position [m]	typ		w_g [cm]	w_q [cm]	w [cm]	w_{lim} [cm]	η	Lk
Span 1	2.30	1.15	inst	z	0.1	0.1	0.3	0.8	0.33	3
	2.30	1.15	net,fin	z	0.3	0.2	0.4	0.9	0.46	5
	2.30	1.15	fin	z	0.3	0.2	0.4	0.9	0.46	4

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas		9.9 6.9		
2	2.30	Permanent loads Cat. C: congregation areas		9.9 6.9		

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.323 preklada pod stropom

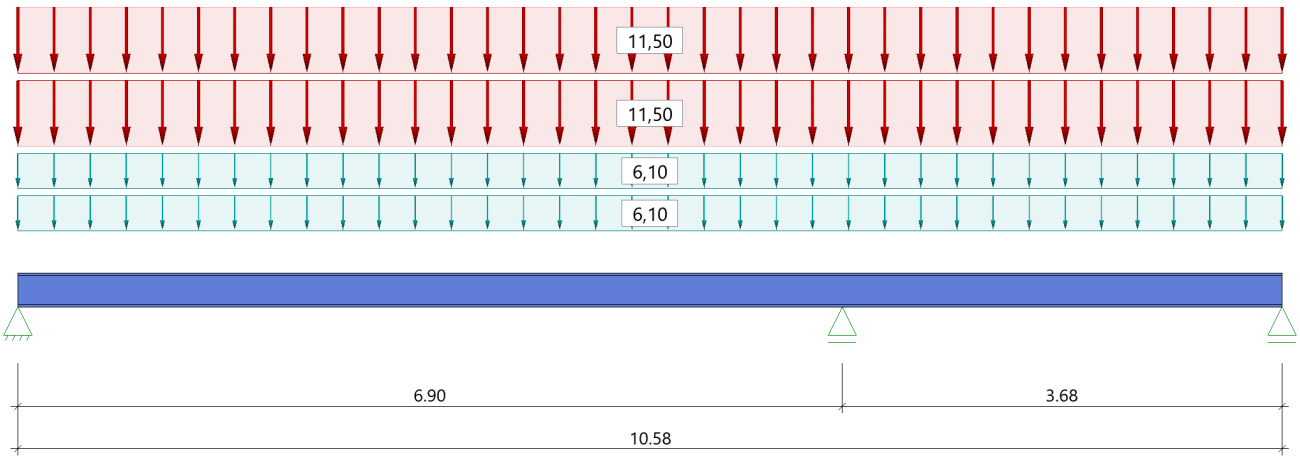
Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Steel girder by 2 Span, EN 1993-1-1:2010

Steel grade:S235

System Graphic



Geometry

Cross-sections

Name	I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]
HEB 280	19270.0	6595.0	1376.0	471.0	131.4
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	6.90	-1	-1	0.0	0.0	0.0
3	10.58	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Loads

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	GF	Sim	Alt
System	1	GL		10.58		6.10		Permanent		
	2	GL		10.58		6.10		Permanent		
	3	GL		10.58		11.50		Cat. C		
	4	GL		10.58		11.50		Cat. C		
The load no. 3 und 4 act span by span. The load no. 1 und 2 act simultaneously										

- Load 1: Poz.300a
- Load 2: Poz.300a
- Load 3: Poz.300a
- Load 4: Poz.300a

Self-weight

Total weight = 1091 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Design parameter

Design code	:	EN 1993-1-1:2010
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	EN 1990:2002/AC:2010
Consequence class	:	CC 2
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.3 - annex B
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.65	0.72	
Serviceability	characteristic			0.68

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEB 280	Span 1, x = 6.90	-214.6	-234.06	0.65	0.72

Check for maximum utilization at x = 6.90 m Lcomb 47

N_{pld} =	0.0	kN	N_{Rd} =	3087.9	kN
N_{Ed} =	0.0	kN	η_N =	0.00	
$M_{y,pld}$ =	-234.06	kNm	$M_{y,Rd}$ =	361.38	kNm
$M_{y,Ed}$ =	-234.06	kNm	η_{My} =	0.65	
$V_{z,pld}$ =	-214.6	kN	$V_{z,Rd}$ =	558.0	kN
$V_{z,Ed}$ =	-214.6	kN	η_{Vz} =	0.38	
			η =	**0.65**	

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
3.27	6.90	0.00	6.90	1.6	2.3	0.68	7
8.45	3.68	6.90	10.58	0.2	1.2	0.20	7

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads		37.1		
		Cat. C: congregation areas	-2.0	66.4		
2	6.90	Permanent loads		94.6		
		Cat. C: congregation areas		164.5		
3	10.58	Permanent loads		8.3		
		Cat. C: congregation areas	-24.3	38.6		

Poz.324 preklada pod stropom

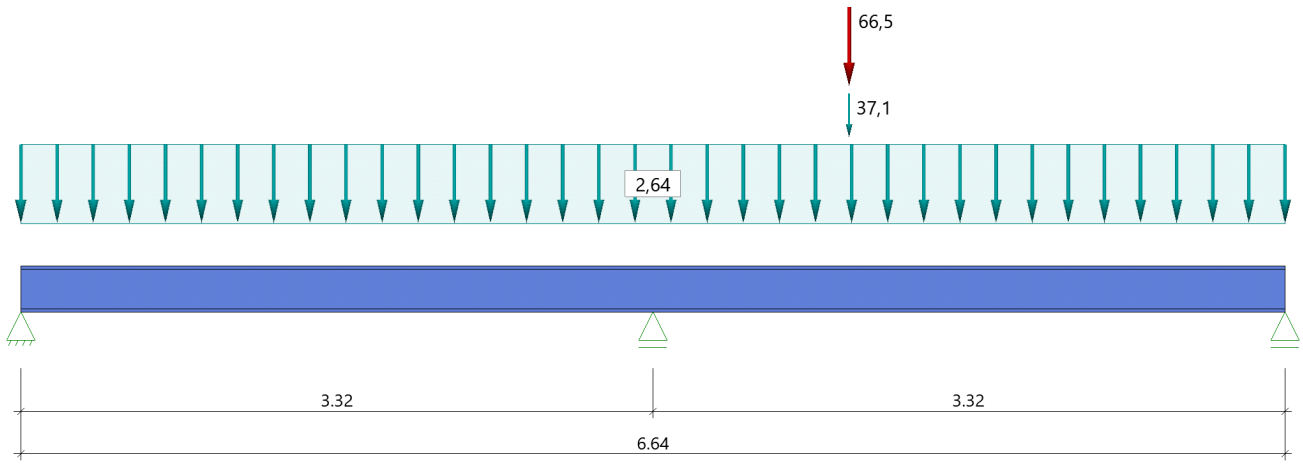
Continuous Beam Steel STM+ 01/22A (FRILO R-2022-1/P08)

Basic Parameters

Steel girder by 2 Span, DIN EN 1993-1-1/NA:2015-08

Steel grade:S235

System Graphic



Geometry

Cross-sections

Name	I_y [cm^4]	I_z [cm^4]	W_y [cm^3]	W_z [cm^3]	A [cm^2]
HEB 240	11260.0	3923.0	938.0	327.0	106.0
Cross-section is constant over the entire length of the beam.					

Support (Bearing conditions)

No	x [m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	0.0	0.0
2	3.32	-1	-1	0.0	0.0	0.0
3	6.64	-1	-1	0.0	0.0	0.0
*) -1 = fixed, 0 = free, > 0 = elastically restraint						

Lateral support in y- direction: at bearings on top chord

Loads

Concentrated loads and moments

Reference	No	Type	A [m]	W	[ ]	GF	Sim	Alt
System	1	force	4.35	37.1	kN	Permanent		
	2	force	4.35	66.5	kN	Cat. C		

- Load 1: Poz.323
- Load 2: Poz.323

Line loads

Reference	No	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	Factor	GF	Sim	Alt
System	3	GL		6.64		0.88		3.00	Permanent		
All loads act simultaneously.											

- Load 3: stena

Self-weight

Total weight = 553 kg taken into account with gamma = 78.50 kN/m ^{3}.

Overview of the actions used

Actions

Designation	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$
Permanent loads				1.00	1.35
Cat. C: congregation areas	0.70	0.70	0.60		1.50
Consequences class CC 2 according to EN 1990 Tab. B1 -> K_{Fi} = 1.0 Tab. B3					

Design parameter

Design code	:	DIN EN 1993-1-1/NA:2015-08
Basis	:	EN 1993-1-1:2010
Safety concept / load combinatorics	:	DIN EN 1990/NA:2010-12
Consequence class	:	CC 2
Ψ_2 = 0.5 for snow (AE)	:	not considered
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
Check of cross-section	:	plastic
Stability	:	6.3.3 - annex B
Design situation serviceability	:	characteristic
Check of relative deformation	δ_{lim} =	Cantilever l_{eff}/ 150
	δ_{lim} =	Spans l_{eff}/ 300

Summary

Check	Design situation	η_{Qs}	η_{Stabi}	$\eta_{Deformation}$
Load capacity	persistent/transient	0.31	0.34	
Serviceability	characteristic			0.17

Structural safety per cross-section (compact)

Design situation	Cross-section	Stelle	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Qs}	η_{Stabi}
persistent/transient	HEB 240	Span 2, x = 4.35	121.8	76.51	0.31	

Check for maximum utilization at x = 1.03 m Lcomb 44

N_{pld}	= 0.0 kN	N_{Rd}	= 2491.0	kN
N_{Ed}	= 0.0 kN	η_N	= 0.00	
$M_{y,pld}$	= 76.51 kNm	$M_{y,Rd}$	= 248.00	kNm
$M_{y,Ed}$	= 76.51 kNm	η_{My}	= 0.31	
$V_{z,pld}$	= 121.8 kN	$V_{z,Rd}$	= 451.0	kN
$V_{z,Ed}$	= 121.8 kN	η_{Vz}	= 0.27	
		η	**= 0.31**	

Serviceability - Load combination characteristic

Deformation analysis - Relative deflection in z $f_{Cd} = l_{eff}/300$

x [m]	l_{eff} [m]	$l_{eff,x0}$ [m]	$l_{eff,x1}$ [m]	$f_{z,Ed}$ [cm]	$f_{z,Cd}$ [cm]	η	Comb
1.92	3.32	0.00	3.32	0.1	1.1	0.08	5
4.89	3.32	3.32	6.64	0.2	1.1	0.17	5

Support forces - characteristic of each action

No	x [m]	Action	$R_{z,min}$ [kN]	$R_{z,max}$ [kN]	$M_{y,min}$ [kNm]	$M_{y,max}$ [kNm]
1	0.00	Permanent loads Cat. C: congregation areas	 -6.0	1.0		
2	3.32	Permanent loads Cat. C: congregation areas		46.7 57.9		
3	6.64	Permanent loads Cat. C: congregation areas		12.5 14.6		

4.2.4. Pokončniki

Poz.S201, S301-Steber16/16 na venec 16x8

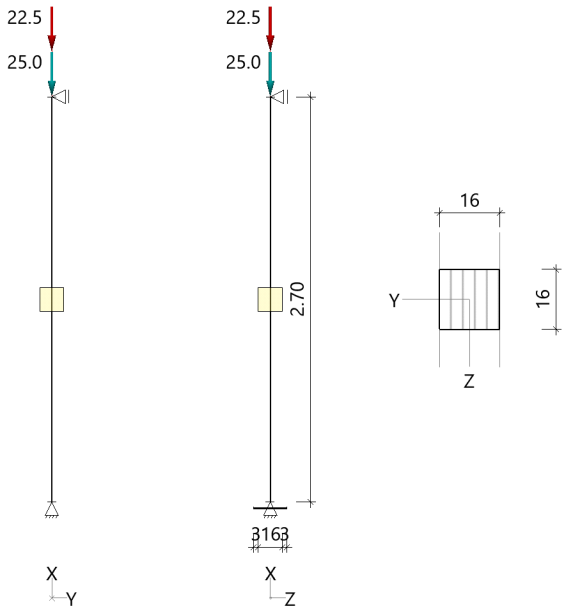
Timber Column HO1+ 01/2022A (FRILO R-2022-1/P05)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 50



System

Simply supported, H=2.70m, b/h=16.0/16.0cm
GL24h, SC 2, γ=5.00 kN/m³, EN 14080:2013 Lamellae/layers parallel h(z)

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	16.0	8.0	3.0	3.0	2 C24	2

Material Design code

Material	Design code
GL24h C24	acc.to EN 14080:2013 acc.to EN 338:2016

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

List of Loads

No.	Type	ACT	Q1	a1	Q2	L2	fac	grp	About
1	2 X	99	0.3	2.70			1.00		AUTO_G_Mat
2	2 X	99	25.0	2.70			1.00		
3	2 X	1	22.5	2.70			1.00		
4	2 X	1	0.0	2.70			1.00		

Type: 2 = Concentrated load: Q1[kN] at a1[m]; a1 = Distance from base point
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Special rules

Same γG for permanent loads	Yes

Buckling a. tilting lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System lengths

(E) Eigenvalue , See check for lengths because load depending.
(S) Calculation using spacing of the rigid bearing

Design Results Decisive Combination (Brief ouput)

Co 1: Load capacity, permanent/transient

Cross-secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross-section Check x=2.03m b/h=16.0/16.0cm						
Nx	-68.0	K_{mod}=0.80	γ_M=1.25	-2.65	15.36	0.17
N,M						**0.17**
Stability Check x=2.03m b/h=16.0/16.0cm						
Nx	-68.0	K_{mod}=0.80 $k_{c,y}$=0.82	γ_M=1.25 $k_{c,z}$=0.82	-2.65	15.36	0.21
N,M						**0.21**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || h
Buckling length: s_{ky}=2.70m s_{kz}=2.70m Tilting length: s_b=2.70m
Slenderness: λ_y=58.4 λ_z=58.4
Share N(g)/N(g+q) = 65%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Co 1: Load capacity, permanent/transient

Foot Binder: Comp.p.Grain

Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-68.0	22.0	16.0	352.0	1.25	0.80	1.30	-1.93	-1.54	**1.00**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Pressure without consideration of eccentricities

Decisive Deformations

w=0 => η=0

Poz.S202 - Steber 16/24 na venec BB

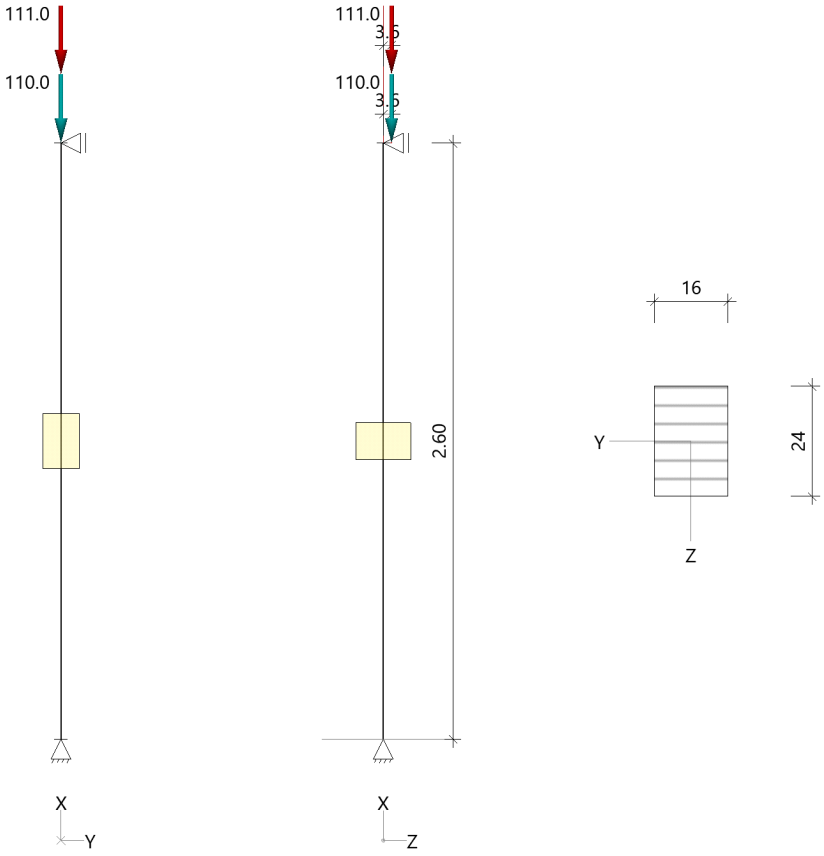
Timber Column HO1+ 01/2021B (FRILO R-2021-1/P06)

Design code

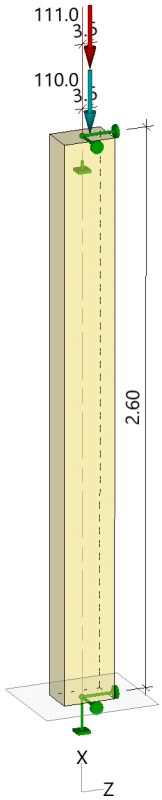
Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 33



System Graphic (isometric)



System

Simply supported, H=2.60m, b/h=16.0/24.0cm
GL24h, SC 2, EN 14080:2013 Lamellas/layers parallel b(y)

Material Values Timber

Glulam GL24h, Service class 2, acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ N/mm²	$f_{t,0,k}$ $f_{c,0,k}$ N/mm²	$f_{t,90,k}$ $f_{c,90,k}$ N/mm²	$E_{0,mean}$ $E_{0,05}$ N/mm²	$E_{90,mean}$ $E_{90,05}$ N/mm²	G_{mean} G_{05} N/mm²	ρ_k ρ_m kg/m³	γ kN/m³	γ_M K_{def}
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420	5.00	1.25 0.80

Section Properties

Rectangle

Modulus of section	$W_{y,ef}$	=	1536	cm³
1st moment of area	$S_{y,ef}$	=	1152	cm³
2nd moment of area	$I_{y,ef}$	=	18432	cm⁴
Modulus of section	$W_{z,ef}$	=	1024	cm³
1st moment of area	$S_{z,ef}$	=	768	cm³
2nd moment of area	$I_{z,ef}$	=	8192	cm⁴
torsional section modulus	W_t	=	1419	cm³
torsional constant	I_t	=	19268	cm⁴
CS Area	A_{tot}	=	384.0	cm²

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Partial Factors

ACT	LDC	Limit State	P/T γ_{sup}	P/T γ_{inf}	A γ_{sup}	A γ_{inf}
99	1	Permanent loads				
		Bearing capacity	1.35	1.00	1.00	1.00
		Safety against displacement	1.10	0.90	1.00	1.00
		Serviceability	1.00	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas				
		Bearing capacity	1.50	0.00	1.00	0.00
		Safety against displacement	1.50	0.00	1.00	0.00
		Serviceability	1.00	0.00	1.00	0.00
STR=Bearing capacity EQU=Safety against displacement SLS=Serviceability						

Combination Factors

ACT	LDC	action	ψ0	ψ1	ψ2
99	1	Permanent loads	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas	0.70	0.50	0.30

List of Loads

No.	Type	ACT	Q1	a1	Q2, ez	L2, ey	fac	grp	About
1	2 X	99	0.5	2.60			1.00		AUTO_G_Mat
2	2 X	99	110.0	2.60	e= 3.6	e= 0.0	1.00		
3	2 X	1	111.0	2.60	e= 3.6	e= 0.0	1.00		
4	2 X	1	0.0	2.60			1.00		
Type: 2 = concentrated load: Q1[kN] at a1[m]; a1 = Distance to Foot-point Eccentricities ez, ey[cm] ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas									

Load Cases: Assignment Loads and Actions

Lc	ACT	Alt	About	Involved Loads No
1	99	0	Sup	1, 2
2	1	0	Sup	3
3	1	0	Sup	4

Load Cases: Support Reactions (1.0-fold, TH 1.O)

Lc	x [m]	R_x [kN]	R_y [kN]	R_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
1	2.60	-	-	1.5	-	-	-
	0.00	-110.5	-	-1.5	-	-	-
2	2.60	-	-	1.5	-	-	-
	0.00	-111.0	-	-1.5	-	-	-
3	2.60	-	-	-	-	-	-
	0.00	-	-	-	-	-	-

Special Rules

Same γG for permanent loads	Yes

Combinations: Decisive Support Reactions (Design, Anchorage)

EL	Co	Direction	Condition	R_{xd} [kN]	K_{mod}	γ_M
1	10	upward	F_d	-110.5	0.80	1.25
1	10	upward	$F_d * \gamma_M$	-110.5	0.80	1.25
1	10	upward	$F_d * \gamma_M / K_{mod}$	-110.5	0.80	1.25
1	1	upward	F_d	-315.7	0.80	1.25
1	1	upward	$F_d * \gamma_M$	-315.7	0.80	1.25
1	1	upward	$F_d * \gamma_M / K_{mod}$	-315.7	0.80	1.25
R_{xd} -> Combinations: Support Reactions (Design, TH 1.O)						

Special Rules

Stability (G- portion): Depending on permanent and quasi-permanent loads	Yes

Buckling Lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System length

(E) Eigenvalue , See check for lengths as load depending.
(S) Calculation using spacing of the rigid bearing

x1 m	x2 m	s_{ky} m	s_{kz} m	s_{by} m	s_{bz} m	λ_y	λ_z
0.00	2.60	2.60	2.60	2.60	2.60	37.5	56.3

Decisive Combination Design Results (Detailed output)

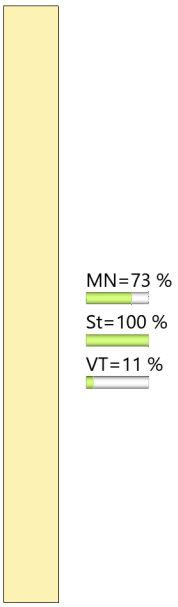
Co 1: Bearing capacity, permanent/temporary

Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=2.60m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-315.7			-8.22	15.36	0.54
My	-11.34	$k_{m,y}$=1.00		-7.38	16.83	0.44
N,M						**0.73**
Stability Check x=2.60m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-315.7	$k_{c,y}$=0.96	$k_{c,z}$=0.84	-8.22	15.36	0.56
My	-11.34	$k_{crit,y}$=1.00		-7.38	16.83	0.44
N,M						**1.00**
Shear and Torsion Check x=0.00m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vz	-4.4	k_{cr}=0.67		-0.17	2.24	0.11
V,Mt						**0.11**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=37.5 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Utilizations (Design)

Scale 1 : 33



Decisive Combination Design Results (Brief ouput)

Co 1: Bearing capacity, permanent/temporary

Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross Section Check x=2.60m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-315.7			-8.22	15.36	0.54
My	-11.34	$k_{m,y}$=1.00		-7.38	16.83	0.44
N,M						**0.73**
Stability Check x=2.60m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-315.7	$k_{c,y}$=0.96	$k_{c,z}$=0.84	-8.22	15.36	0.56
My	-11.34	$k_{crit,y}$=1.00		-7.38	16.83	0.44
N,M						**1.00**
Shear and Torsion Check x=0.00m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vz	-4.4	k_{cr}=0.67		-0.17	2.24	0.11
V,Mt						**0.11**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=37.5 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Deformations

Co	ls	Situation	Analysis	x [m]	L [m]	w [cm]	w_{lim} [h/]	w_{lim} [cm]	η
Direction Z									
9	SLS	rare/cha.	FI, inst	1.30	2.60	-0.2	300	0.9	0.18
9	SLS	rare/cha.	FI, netfin	1.30	2.60	-0.2	250	1.0	0.23
9	SLS	rare/cha.	FI, fin	1.30	2.60	-0.2	150	1.7	0.14
1	STR	permanen.	FI, fin	1.30	2.60	-0.4			

ls(Limit State): SLS(Serviceability) STR(Bearing capacity)
Analysis(System): FI(span)
inst: Elastic; fin: Elastic and creep

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.S203 - Steber10/20 na venec 10x8

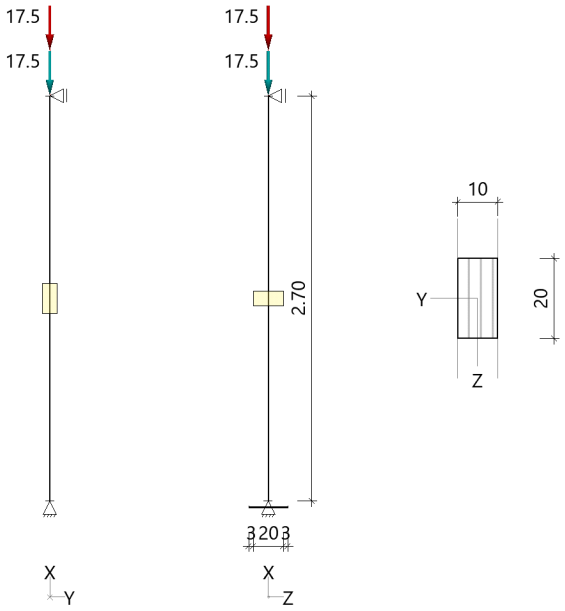
Timber Column HO1+ 01/2022A (FRILO R-2022-1/P07)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 50



System

Simply supported, H=2.70m, b/h=10.0/20.0cm
GL24h, SC 2, γ=5.00 kN/m³, EN 14080:2013 Lamellae/layers parallel h(z)

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	10.0	8.0	3.0	3.0	2 C24	2

Material Design code

Material	Design code
GL24h C24	acc.to EN 14080:2013 acc.to EN 338:2016

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

List of Loads

No.	Type	ACT	Q1	a1	Q2	L2	fac	grp	About
1	2 X	99	0.3	2.70			1.00		AUTO_G_Mat
2	2 X	99	17.5	2.70			1.00		
3	2 X	1	17.5	2.70			1.00		
4	2 X	1	0.0	2.70			1.00		

Type: 2 = Concentrated load: Q1[kN] at a1[m]; a1 = Distance from base point
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Special rules

Same γG for permanent loads	Yes

Buckling a. tilting lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System lengths

(E) Eigenvalue , See check for lengths because load depending.
(S) Calculation using spacing of the rigid bearing

Design Results Decisive Combination (Brief ouput)

Co 1: Load capacity, permanent/transient

Cross-secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross-section Check x=2.70m b/h=10.0/20.0cm						
Nx	-50.2	K_{mod}=0.80	γ_M=1.25	-2.51	15.36	0.16
N,M						**0.16**
Stability Check x=2.70m b/h=10.0/20.0cm						
Nx	-50.2	K_{mod}=0.80 $k_{c,y}$=0.92	γ_M=1.25 $k_{c,z}$=0.41	-2.51	15.36	0.40
N,M						**0.40**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || h
Buckling length: s_{ky}=2.70m s_{kz}=2.70m Tilting length: s_b=2.70m
Slenderness: λ_y=46.8 λ_z=93.5
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Co 1: Load capacity, permanent/transient

Foot Binder: Comp.p.Grain

Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-50.2	26.0	10.0	260.0	1.25	0.80	1.30	-1.93	-1.54	**1.00**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Pressure without consideration of eccentricities

Decisive Deformations

w=0 => η=0

Poz.S204 - Steber 16/40 Na jekleno preklado

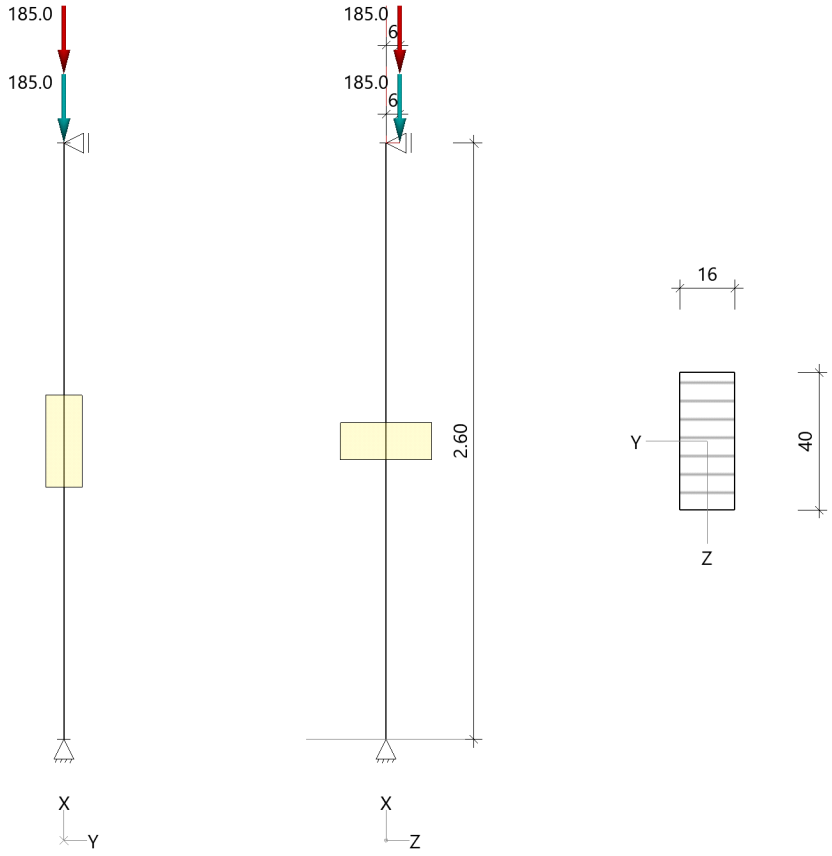
Timber Column HO1+ 01/2022A (FRILO R-2022-1/P08)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

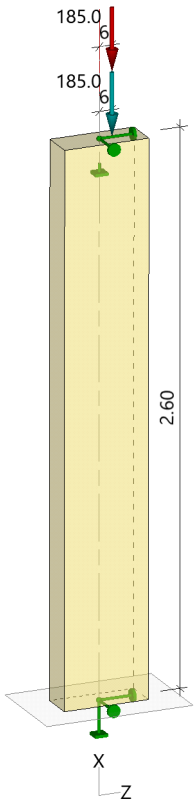
System Graphics 2D

Scale 1 : 33



Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

System Graphic (isometric)



System

Simply supported, H=2.60m, b/h=16.0/40.0cm
GL24h, SC 2, γ=5.00 kN/m³, EN 14080:2013 Lamellae/layers parallel b(y)

Material Values Timber

Glulam GL24h, Service class 2, acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ N/mm²	$f_{t,0,k}$ $f_{c,0,k}$ N/mm²	$f_{t,90,k}$ $f_{c,90,k}$ N/mm²	$E_{0,mean}$ $E_{0,05}$ N/mm²	$E_{90,mean}$ $E_{90,05}$ N/mm²	G_{mean} G_{05} N/mm²	ρ_k ρ_m kg/m³	γ kN/m³	γ_M K_{def}
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420	5.00	1.25 0.80

Section Properties

Rectangle

Moment of resistance	$W_{y,ef}$	=	4267	cm³
1st moment of area	$S_{y,ef}$	=	3200	cm³
2nd moment of area	$I_{y,ef}$	=	85333	cm⁴
Moment of resistance	$W_{z,ef}$	=	1707	cm³
1st moment of area	$S_{z,ef}$	=	1280	cm³
2nd moment of area	$I_{z,ef}$	=	13653	cm⁴
Torsional moment of resistance	W_t	=	2627	cm³
Torsional moment of inertia	I_t	=	40305	cm⁴
CS Area	A_{tot}	=	640.0	cm²

Partial safety factors

ACT	LDC	Limit State	P/T γ_{sup}	P/T γ_{inf}	A γ_{sup}	A γ_{inf}
99	1	Permanent loads				
		Load capacity	1.35	1.00	1.00	1.00
		Equilibrity	1.10	0.90	1.00	1.00
		Usability	1.00	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas				
		Load capacity	1.50	0.00	1.00	0.00
		Equilibrity	1.50	0.00	1.00	0.00
		Usability	1.00	0.00	1.00	0.00
STR=Load capacity EQU=Equilibrity SLS=Usability						

Combination Factors

ACT	LDC	Action	ψ0	ψ1	ψ2
99	1	Permanent loads	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas	0.70	0.50	0.30

List of Loads

No.	Type	ACT	Q1	a1	Q2, ez	L2, ey	fac	grp	About
1	2 X	99	0.8	2.60			1.00		AUTO_G_Mat
2	2 X	99	185.0	2.60	e= 6.0	e= 0.0	1.00		
3	2 X	1	185.0	2.60	e= 6.0	e= 0.0	1.00		
4	2 X	1	0.0	2.60			1.00		

Type: 2 = Concentrated load: Q1[kN] at a1[m]; a1 = Distance from base point
Eccentricities ez, ey[cm]
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Load Cases: Assignment Loads and Actions

Lc	ACT	Alt	About	Involved Loads No
1	99	0	Sup	1, 2
2	1	0	Sup	3
3	1	0	Sup	4

Load Cases: Support Reactions (1.0 times, TH 1.O)

Lc	x [m]	R_x [kN]	R_y [kN]	R_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
1	2.60	-	-	4.3	-	-	-
	0.00	-185.8	-	-4.3	-	-	-
2	2.60	-	-	4.3	-	-	-
	0.00	-185.0	-	-4.3	-	-	-
3	2.60	-	-	-	-	-	-
	0.00	-	-	-	-	-	-

Special rules

Same γG for permanent loads	Yes

Combinations: Decisive Support Reactions (Design, Anchoring)

EL	Co	Direction	Condition	R_{xd} [kN]	K_{mod}	γ_M
1	10	upward	F_d	-185.8	0.80	1.25
1	10	upward	$F_d * \gamma_M$	-185.8	0.80	1.25
1	10	upward	$F_d * \gamma_M / K_{mod}$	-185.8	0.80	1.25
1	1	upward	F_d	-528.4	0.80	1.25
1	1	upward	$F_d * \gamma_M$	-528.4	0.80	1.25
1	1	upward	$F_d * \gamma_M / K_{mod}$	-528.4	0.80	1.25
R_{xd} -> Combinations: Support Reactions (Design, TH 1.O)						

Special rules

Stability (G-part): Depending on permanent and quasi-permanent loads	Yes

Buckling a. tilting lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System lengths

(E) Eigenvalue , See check for lengths because load depending.
(S) Calculation using spacing of the rigid bearing

x1 m	x2 m	s_{ky} m	s_{kz} m	s_{by} m	s_{bz} m	λ_y	λ_z
0.00	2.60	2.60	2.60	2.60	2.60	22.5	56.3

Design Results Decisive Combination (Detailed output)

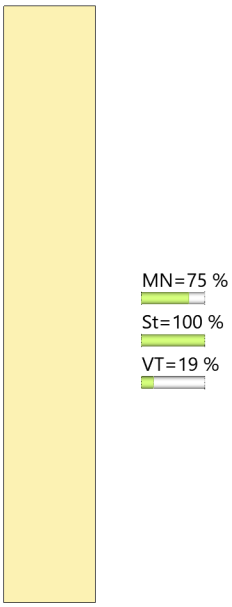
Co 1: Load capacity, permanent/transient

Cross-secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross-section Check x=2.60m b/h=16.0/40.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-528.4			-8.26	15.36	0.54
My	-31.64	$k_{m,y}$=1.00		-7.41	16.00	0.46
N,M						**0.75**
Stability Check x=2.60m b/h=16.0/40.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-528.4	$k_{c,y}$=0.99	$k_{c,z}$=0.84	-8.26	15.36	0.54
My	-31.64	$k_{crit,y}$=1.00		-7.41	16.00	0.46
N,M						**1.00**
Shear and Torsion Check x=1.30m b/h=16.0/40.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vz	-12.2	k_{cr}=0.67		-0.29	2.24	0.19
V,Mt						**0.19**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=22.5 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Utilizations (Design)

Scale 1 : 33



Design Results Decisive Combination (Brief ouput)

Co 1: Load capacity, permanent/transient

Cross-secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross-section Check x=2.60m b/h=16.0/40.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-528.4			-8.26	15.36	0.54
My	-31.64	$k_{m,y}$=1.00		-7.41	16.00	0.46
N,M						**0.75**
Stability Check x=2.60m b/h=16.0/40.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-528.4	$k_{c,y}$=0.99	$k_{c,z}$=0.84	-8.26	15.36	0.54
My	-31.64	$k_{crit,y}$=1.00		-7.41	16.00	0.46
N,M						**1.00**
Shear and Torsion Check x=1.30m b/h=16.0/40.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vz	-12.2	k_{cr}=0.67		-0.29	2.24	0.19
V,Mt						**0.19**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=22.5 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Deformations

Co	ls	Situation	Analysis	x [m]	L [m]	w [cm]	wlim [h/]	wlim [cm]	η
Direction Z									
9	SLS	rare/characteristic	VF, inst	1.30	2.60	-0.1	300	0.9	0.11
9	SLS	rare/characteristic	VF, netfin	1.30	2.60	-0.1	250	1.0	**0.14**
9	SLS	rare/characteristic	VF, fin	1.30	2.60	-0.1	150	1.7	0.08
1	STR	permanent/transient	VF, fin	1.30	2.60	-0.3			

ls(Limit State): SLS(Usability) STR(Load capacity)
Analysis(System): VF(Span)
inst: Elastic; fin: Elastic with creep

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.S205 - Steber16/28 na venec 16x8

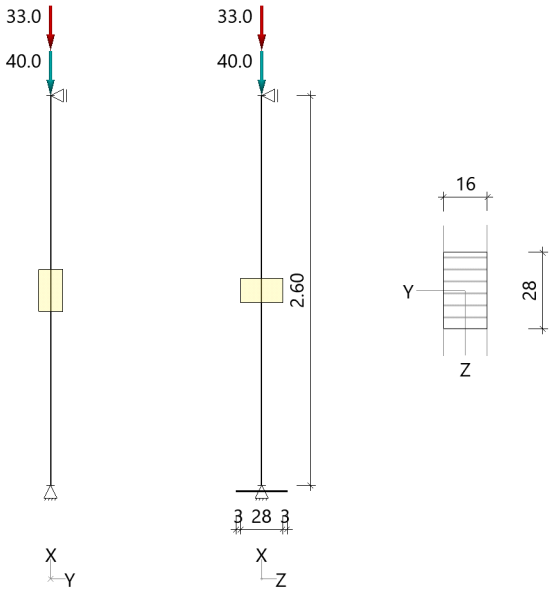
Timber Column HO1+ 01/2021B (FRILO R-2021-1/P06)

Design code

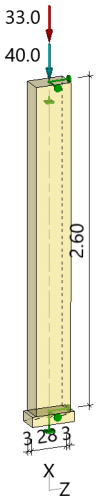
Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 50



System Graphic (isometric)



System

Simply supported, H=2.60m, b/h=16.0/28.0cm
GL24h, SC 2, EN 14080:2013 Lamellas/layers parallel b(y)

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	16.0	8.0	3.0	3.0	2 C24	2

Material Values Timber

$f_{m,k}$ $f_{v,k}$ N/mm²	$f_{t,0,k}$ $f_{c,0,k}$ N/mm²	$f_{t,90,k}$ $f_{c,90,k}$ N/mm²	$E_{0,mean}$ $E_{0,05}$ N/mm²	$E_{90,mean}$ $E_{90,05}$ N/mm²	G_{mean} G_{05} N/mm²	ρ_k ρ_m kg/m³	γ kN/m³	γ_M K_{def}
Glulam GL24h, Service class 2, acc.to EN 14080:2013								
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420	5.00	1.25 0.80
Softwood C24, Service class 2, acc.to EN 338:2016								
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420	6.00	1.30 0.80

Section Properties

Rectangle

Modulus of section	$W_{y,ef}$	=	2091	cm³
1st moment of area	$S_{y,ef}$	=	1568	cm³
2nd moment of area	$I_{y,ef}$	=	29269	cm⁴
Modulus of section	$W_{z,ef}$	=	1195	cm³
1st moment of area	$S_{z,ef}$	=	896	cm³
2nd moment of area	$I_{z,ef}$	=	9557	cm⁴
torsional section modulus	W_t	=	1710	cm³
torsional constant	I_t	=	24371	cm⁴
CS Area	A_{tot}	=	448.0	cm²

Partial Factors

ACT	LDC	Limit State	P/T γ_{sup}	P/T γ_{inf}	A γ_{sup}	A γ_{inf}
99	1	Permanent loads				
		Bearing capacity	1.35	1.00	1.00	1.00
		Safety against displacement	1.10	0.90	1.00	1.00
		Serviceability	1.00	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas				
		Bearing capacity	1.50	0.00	1.00	0.00
		Safety against displacement	1.50	0.00	1.00	0.00
		Serviceability	1.00	0.00	1.00	0.00
STR=Bearing capacity EQU=Safety against displacement SLS=Serviceability						

Combination Factors

ACT	LDC	action	$\psi 0$	$\psi 1$	$\psi 2$
99	1	Permanent loads	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas	0.70	0.50	0.30

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

List of Loads

No.	Type	ACT	Q1	a1	Q2	L2	fac	grp	About
1	2 X	99	0.6	2.60			1.00		AUTO_G_Mat
2	2 X	99	40.0	2.60			1.00		
3	2 X	1	33.0	2.60			1.00		
4	2 X	1	0.0	2.60			1.00		

Type: 2 = concentrated load: Q1[kN] at a1[m]; a1 = Distance to Foot-point
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Load Cases: Assignment Loads and Actions

Lc	ACT	Alt	About	Involved Loads No
1	99	0	Sup	1, 2
2	1	0	Sup	3
3	1	0	Sup	4

Load Cases: Support Reactions (1.0-fold, TH 1.O)

Lc	x [m]	R_x [kN]	R_y [kN]	R_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
1	2.60	-	-	-	-	-	-
	0.00	-40.6	-	-	-	-	-
2	2.60	-	-	-	-	-	-
	0.00	-33.0	-	-	-	-	-
3	2.60	-	-	-	-	-	-
	0.00	-	-	-	-	-	-

Special Rules

Same γG for permanent loads	Yes

Combinations: Decisive Support Reactions (Design, Anchorage)

EL	Co	Direction	Condition	R_{xd} [kN]	K_{mod}	γ_M
1	12	upward	F_d	-40.6	0.60	1.25
1	12	upward	$F_d * \gamma_M$	-40.6	0.60	1.25
1	10	upward	$F_d * \gamma_M / K_{mod}$	-40.6	0.80	1.25
1	1	upward	F_d	-104.3	0.80	1.25
1	1	upward	$F_d * \gamma_M$	-104.3	0.80	1.25
1	1	upward	$F_d * \gamma_M / K_{mod}$	-104.3	0.80	1.25

R_{xd} -> Combinations: Support Reactions (Design, TH 1.O)

Special Rules

Stability (G- portion): Depending on permanent and quasi-permanent loads	Yes

Buckling Lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System length

(E) Eigenvalue , See check for lengths as load depending.
(S) Calculation using spacing of the rigid bearing

x1 m	x2 m	s_{ky} m	s_{kz} m	s_{by} m	s_{bz} m	λ_y	λ_z
0.00	2.60	2.60	2.60	2.60	2.60	32.2	56.3

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Decisive Combination Design Results (Detailed output)

Co 1: Bearing capacity, permanent/temporary

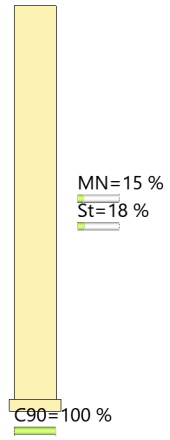
Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross Section Check x=0.00m b/h=16.0/28.0cm						
Nx	-104.3	K_{mod}=0.80	γ_M=1.25	-2.33	15.36	0.15
N,M						**0.15**
Stability Check x=0.00m b/h=16.0/28.0cm						
Nx	-104.3	K_{mod}=0.80 $k_{c,y}$=0.97	γ_M=1.25 $k_{c,z}$=0.84	-2.33	15.36	0.18
N,M						**0.18**
Co1: 1.35*G1+1.50*Q2+1.50*Q3 Lamella direction || b Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m Slenderness: λ_y=32.2 λ_z=56.3 Share N(g)/N(g+q) = 67%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80						

Co 1: Bearing capacity, permanent/temporary

Foot Binder: Comp.p.Grain										
Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-104.3	34.0	16.0	544.0	1.25	0.80	1.30	-1.92	-1.54	**1.00**
Co1: 1.35*G1+1.50*Q2+1.50*Q3 Pressure without consideration of eccentricities										

Decisive Utilizations (Design)

Scale 1 : 50



Decisive Combination Design Results (Brief ouput)

Co 1: Bearing capacity, permanent/temporary

Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross Section Check x=0.00m b/h=16.0/28.0cm						
Nx	-104.3	K_{mod}=0.80	γ_M=1.25	-2.33	15.36	0.15
N,M						**0.15**
Stability Check x=0.00m b/h=16.0/28.0cm						
		K_{mod}=0.80	γ_M=1.25			

Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Nx N,M	-104.3	$k_{c,y}$=0.97	$k_{c,z}$=0.84	-2.33	15.36	0.18 **0.18**
Co1: 1.35*G1+1.50*Q2+1.50*Q3 Lamella direction || b Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m Slenderness: λ_y=32.2 λ_z=56.3 Share N(g)/N(g+q) = 67%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80						

Co 1: Bearing capacity, permanent/temporary

Foot Binder: Comp.p.Grain										
Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-104.3	34.0	16.0	544.0	1.25	0.80	1.30	-1.92	-1.54	**1.00**
Co1: 1.35*G1+1.50*Q2+1.50*Q3 Pressure without consideration of eccentricities										

Decisive Deformations

w=0 => η=0

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.S302 - Steber 16/24 na venec 16x8

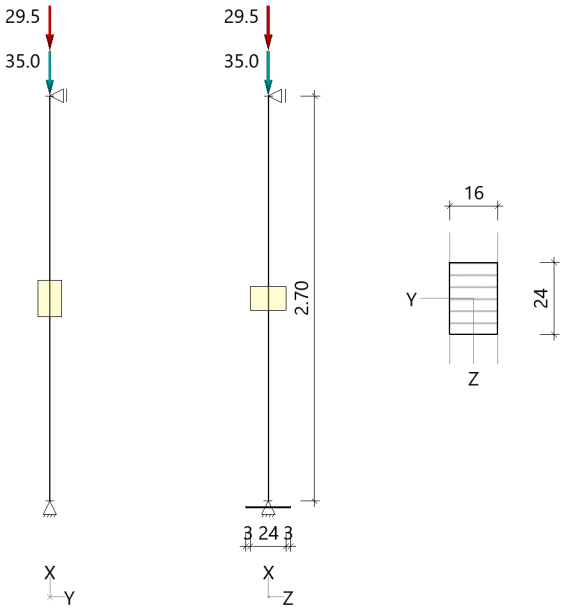
Timber Column HO1+ 01/2022A (FRILO R-2022-1/P07)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 50



System

Simply supported, H=2.70m, b/h=16.0/24.0cm
GL24h, SC 2, γ=5.00 kN/m³, EN 14080:2013 Lamellae/layers parallel b(y)

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	16.0	8.0	3.0	3.0	2 C24	2

Material Design code

Material	Design code
GL24h C24	acc.to EN 14080:2013 acc.to EN 338:2016

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

List of Loads

No.	Type	ACT	Q1	a1	Q2	L2	fac	grp	About
1	2 X	99	0.5	2.70			1.00		AUTO_G_Mat
2	2 X	99	35.0	2.70			1.00		
3	2 X	1	29.5	2.70			1.00		
4	2 X	1	0.0	2.70			1.00		

Type: 2 = Concentrated load: Q1[kN] at a1[m]; a1 = Distance from base point
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Special rules

Same γG for permanent loads	Yes

Buckling a. tilting lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System lengths

(E) Eigenvalue , See check for lengths because load depending.
(S) Calculation using spacing of the rigid bearing

Design Results Decisive Combination (Brief ouput)

Co 1: Load capacity, permanent/transient

Cross-secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross-section Check x=2.70m b/h=16.0/24.0cm						
Nx	-92.2	K_{mod}=0.80	γ_M=1.25	-2.40	15.36	0.16
N,M						**0.16**
Stability Check x=2.70m b/h=16.0/24.0cm						
Nx	-92.2	K_{mod}=0.80 $k_{c,y}$=0.95	γ_M=1.25 $k_{c,z}$=0.82	-2.40	15.36	0.19
N,M						**0.19**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.70m s_{kz}=2.70m Tilting length: s_b=2.70m
Slenderness: λ_y=39.0 λ_z=58.4
Share N(g)/N(g+q) = 66%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Co 1: Load capacity, permanent/transient

Foot Binder: Comp.p.Grain

Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-92.2	30.0	16.0	480.0	1.25	0.80	1.30	-1.92	-1.54	**1.00**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Pressure without consideration of eccentricities

Decisive Deformations

w=0 => η=0

Poz.S302 - Steber 16/24 - BB na venec BB

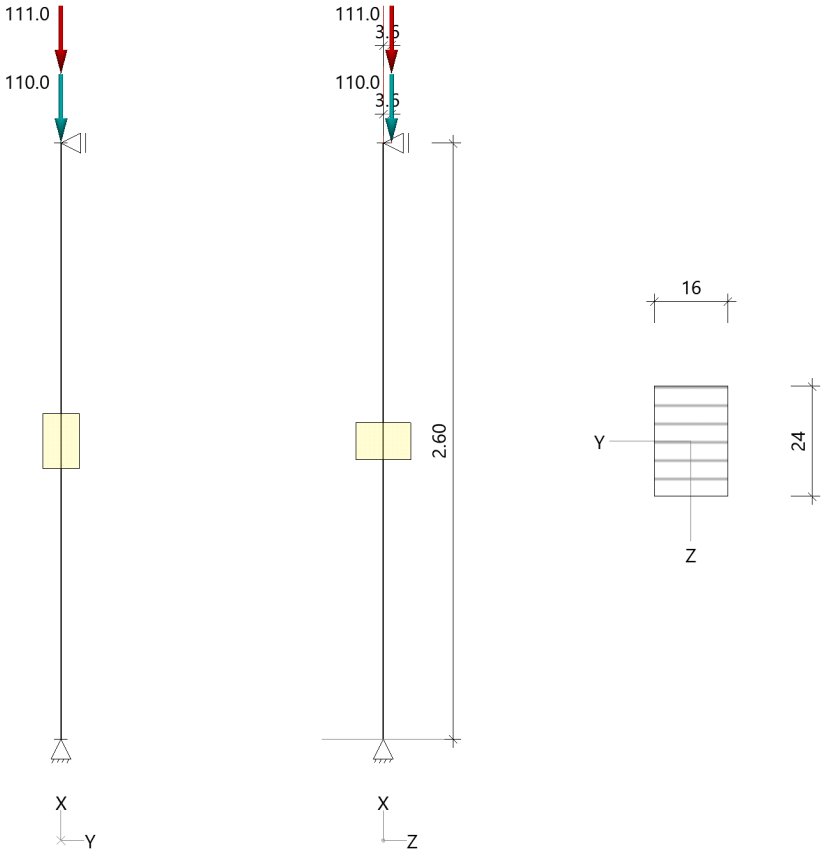
Timber Column HO1+ 01/2021B (FRILO R-2021-1/P06)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

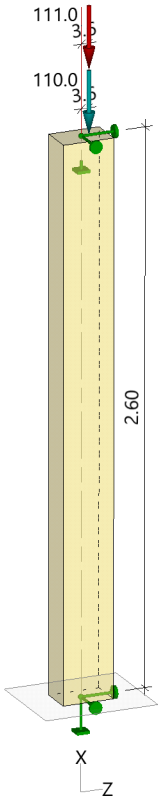
System Graphics 2D

Scale 1 : 33



Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

System Graphic (isometric)



System

Simply supported, H=2.60m, b/h=16.0/24.0cm
GL24h, SC 2, EN 14080:2013 Lamellas/layers parallel b(y)

Material Values Timber

Glulam GL24h, Service class 2, acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ N/mm²	$f_{t,0,k}$ $f_{c,0,k}$ N/mm²	$f_{t,90,k}$ $f_{c,90,k}$ N/mm²	$E_{0,mean}$ $E_{0,05}$ N/mm²	$E_{90,mean}$ $E_{90,05}$ N/mm²	G_{mean} G_{05} N/mm²	ρ_k ρ_m kg/m³	γ kN/m³	γ_M K_{def}
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420	5.00	1.25 0.80

Section Properties

Rectangle

Modulus of section	$W_{y,ef}$	=	1536	cm³
1st moment of area	$S_{y,ef}$	=	1152	cm³
2nd moment of area	$I_{y,ef}$	=	18432	cm⁴
Modulus of section	$W_{z,ef}$	=	1024	cm³
1st moment of area	$S_{z,ef}$	=	768	cm³
2nd moment of area	$I_{z,ef}$	=	8192	cm⁴
torsional section modulus	W_t	=	1419	cm³
torsional constant	I_t	=	19268	cm⁴
CS Area	A_{tot}	=	384.0	cm²

Partial Factors

ACT	LDC	Limit State	P/T γ_{sup}	P/T γ_{inf}	A γ_{sup}	A γ_{inf}
99	1	Permanent loads				
		Bearing capacity	1.35	1.00	1.00	1.00
		Safety against displacement	1.10	0.90	1.00	1.00
		Serviceability	1.00	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas				
		Bearing capacity	1.50	0.00	1.00	0.00
		Safety against displacement	1.50	0.00	1.00	0.00
		Serviceability	1.00	0.00	1.00	0.00
STR=Bearing capacity EQU=Safety against displacement SLS=Serviceability						

Combination Factors

ACT	LDC	action	ψ0	ψ1	ψ2
99	1	Permanent loads	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas	0.70	0.50	0.30

List of Loads

No.	Type	ACT	Q1	a1	Q2, ez	L2, ey	fac	grp	About
1	2 X	99	0.5	2.60			1.00		AUTO_G_Mat
2	2 X	99	110.0	2.60	e= 3.6	e= 0.0	1.00		
3	2 X	1	111.0	2.60	e= 3.6	e= 0.0	1.00		
4	2 X	1	0.0	2.60			1.00		

Type: 2 = concentrated load: Q1[kN] at a1[m]; a1 = Distance to Foot-point
Eccentricities ez, ey[cm]
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Load Cases: Assignment Loads and Actions

Lc	ACT	Alt	About	Involved Loads No
1	99	0	Sup	1, 2
2	1	0	Sup	3
3	1	0	Sup	4

Load Cases: Support Reactions (1.0-fold, TH 1.O)

Lc	x [m]	R_x [kN]	R_y [kN]	R_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
1	2.60	-	-	1.5	-	-	-
	0.00	-110.5	-	-1.5	-	-	-
2	2.60	-	-	1.5	-	-	-
	0.00	-111.0	-	-1.5	-	-	-
3	2.60	-	-	-	-	-	-
	0.00	-	-	-	-	-	-

Special Rules

Same γG for permanent loads	Yes

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Combinations: Decisive Support Reactions (Design, Anchorage)

EL	Co	Direction	Condition	R_{xd} [kN]	K_{mod}	γ_M
1	10	upward	F_d	-110.5	0.80	1.25
1	10	upward	$F_d * \gamma_M$	-110.5	0.80	1.25
1	10	upward	$F_d * \gamma_M / K_{mod}$	-110.5	0.80	1.25
1	1	upward	F_d	-315.7	0.80	1.25
1	1	upward	$F_d * \gamma_M$	-315.7	0.80	1.25
1	1	upward	$F_d * \gamma_M / K_{mod}$	-315.7	0.80	1.25
R_{xd} -> Combinations: Support Reactions (Design, TH 1.O)						

Special Rules

Stability (G- portion): Depending on permanent and quasi-permanent loads	Yes

Buckling Lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = $\pi 2*E*I/(etaNki*Nx)$
Lateral torsion buckling(S) s_b = System length

(E) Eigenvalue , See check for lengths as load depending.
(S) Calculation using spacing of the rigid bearing

x1 m	x2 m	s_{ky} m	s_{kz} m	s_{by} m	s_{bz} m	λ_y	λ_z
0.00	2.60	2.60	2.60	2.60	2.60	37.5	56.3

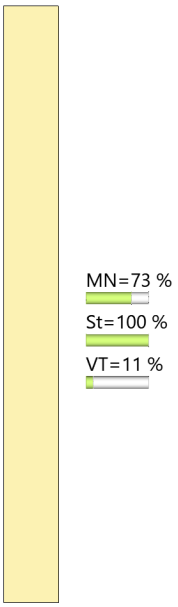
Decisive Combination Design Results (Detailed output)

Co 1: Bearing capacity, permanent/temporary

Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=2.60m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-315.7			-8.22	15.36	0.54
My	-11.34	$k_{m,y}$=1.00		-7.38	16.83	0.44
N,M						**0.73**
Stability Check x=2.60m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-315.7	$k_{c,y}$=0.96	$k_{c,z}$=0.84	-8.22	15.36	0.56
My	-11.34	$k_{crit,y}$=1.00		-7.38	16.83	0.44
N,M						**1.00**
Shear and Torsion Check x=0.00m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vz	-4.4	k_{cr}=0.67		-0.17	2.24	0.11
V,Mt						**0.11**
Co1: 1.35*G1+1.50*Q2+1.50*Q3 Lamella direction || b Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m Slenderness: λ_y=37.5 λ_z=56.3 Share N(g)/N(g+q) = 63%; $\psi 2$(Lc, σ_{max})= 0.00; K_{def}= 0.80						

Decisive Utilizations (Design)

Scale 1 : 33



Decisive Combination Design Results (Brief ouput)

Co 1: Bearing capacity, permanent/temporary

Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross Section Check x=2.60m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-315.7			-8.22	15.36	0.54
My	-11.34	$k_{m,y}$=1.00		-7.38	16.83	0.44
N,M						**0.73**
Stability Check x=2.60m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-315.7	$k_{c,y}$=0.96	$k_{c,z}$=0.84	-8.22	15.36	0.56
My	-11.34	$k_{crit,y}$=1.00		-7.38	16.83	0.44
N,M						**1.00**
Shear and Torsion Check x=0.00m b/h=16.0/24.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vz	-4.4	k_{cr}=0.67		-0.17	2.24	0.11
V,Mt						**0.11**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=37.5 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Deformations

Co	ls	Situation	Analysis	x [m]	L [m]	w [cm]	w_{lim} [h/]	w_{lim} [cm]	η
Direction Z									
9	SLS	rare/cha.	FI, inst	1.30	2.60	-0.2	300	0.9	0.18
9	SLS	rare/cha.	FI, netfin	1.30	2.60	-0.2	250	1.0	0.23
9	SLS	rare/cha.	FI, fin	1.30	2.60	-0.2	150	1.7	0.14
1	STR	permanen.	FI, fin	1.30	2.60	-0.4			

ls(Limit State): SLS(Serviceability) STR(Bearing capacity)
Analysis(System): FI(span)
inst: Elastic; fin: Elastic and creep

Poz.S303 - Steber 16/36 na venec BB

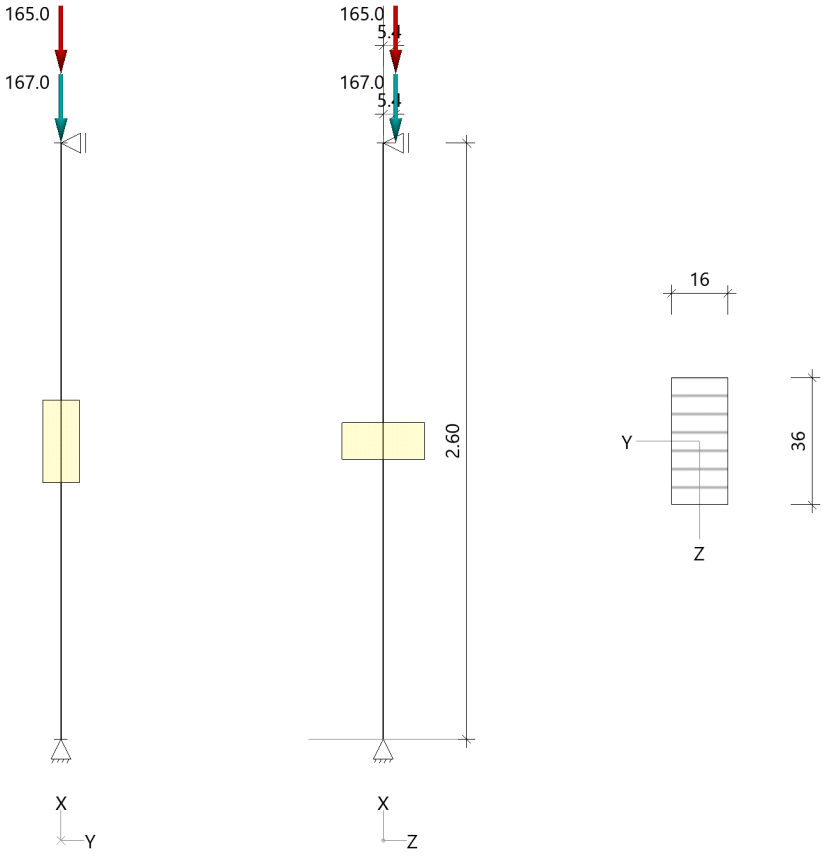
Timber Column HO1+ 01/2021B (FRILO R-2021-1/P06)

Design code

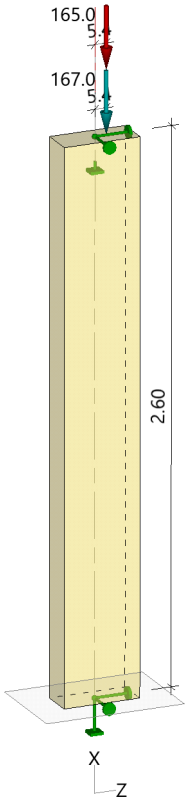
Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 33



System Graphic (isometric)



System

Simply supported, H=2.60m, b/h=16.0/36.0cm
GL24h, SC 2, EN 14080:2013 Lamellas/layers parallel b(y)

Material Values Timber

Glulam GL24h, Service class 2, acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ N/mm²	$f_{t,0,k}$ $f_{c,0,k}$ N/mm²	$f_{t,90,k}$ $f_{c,90,k}$ N/mm²	$E_{0,mean}$ $E_{0,05}$ N/mm²	$E_{90,mean}$ $E_{90,05}$ N/mm²	G_{mean} G_{05} N/mm²	ρ_k ρ_m kg/m³	γ kN/m³	γ_M K_{def}
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420	5.00	1.25 0.80

Section Properties

Rectangle

Modulus of section	$W_{y,ef}$	=	3456	cm³
1st moment of area	$S_{y,ef}$	=	2592	cm³
2nd moment of area	$I_{y,ef}$	=	62208	cm⁴
Modulus of section	$W_{z,ef}$	=	1536	cm³
1st moment of area	$S_{z,ef}$	=	1152	cm³
2nd moment of area	$I_{z,ef}$	=	12288	cm⁴
torsional section modulus	W_t	=	2316	cm³
torsional constant	I_t	=	35021	cm⁴
CS Area	A_{tot}	=	576.0	cm²

Partial Factors

ACT	LDC	Limit State	P/T γ_{sup}	P/T γ_{inf}	A γ_{sup}	A γ_{inf}
99	1	Permanent loads				
		Bearing capacity	1.35	1.00	1.00	1.00
		Safety against displacement	1.10	0.90	1.00	1.00
		Serviceability	1.00	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas				
		Bearing capacity	1.50	0.00	1.00	0.00
		Safety against displacement	1.50	0.00	1.00	0.00
		Serviceability	1.00	0.00	1.00	0.00
STR=Bearing capacity EQU=Safety against displacement SLS=Serviceability						

Combination Factors

ACT	LDC	action	ψ0	ψ1	ψ2
99	1	Permanent loads	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas	0.70	0.50	0.30

List of Loads

No.	Type	ACT	Q1	a1	Q2, ez	L2, ey	fac	grp	About
1	2 X	99	0.7	2.60			1.00		AUTO_G_Mat
2	2 X	99	167.0	2.60	e= 5.4	e= 0.0	1.00		
3	2 X	1	165.0	2.60	e= 5.4	e= 0.0	1.00		
4	2 X	1	0.0	2.60			1.00		

Type: 2 = concentrated load: Q1[kN] at a1[m]; a1 = Distance to Foot-point
Eccentricities ez, ey[cm]
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Load Cases: Assignment Loads and Actions

Lc	ACT	Alt	About	Involved Loads No
1	99	0	Sup	1, 2
2	1	0	Sup	3
3	1	0	Sup	4

Load Cases: Support Reactions (1.0-fold, TH 1.O)

Lc	x [m]	R_x [kN]	R_y [kN]	R_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
1	2.60	-	-	3.5	-	-	-
	0.00	-167.7	-	-3.5	-	-	-
2	2.60	-	-	3.4	-	-	-
	0.00	-165.0	-	-3.4	-	-	-
3	2.60	-	-	-	-	-	-
	0.00	-	-	-	-	-	-

Special Rules

Same γG for permanent loads	Yes

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Combinations: Decisive Support Reactions (Design, Anchorage)

EL	Co	Direction	Condition	R_{xd} [kN]	K_{mod}	γ_M
1	10	upward	F_d	-167.7	0.80	1.25
1	10	upward	$F_d * \gamma_M$	-167.7	0.80	1.25
1	10	upward	$F_d * \gamma_M / K_{mod}$	-167.7	0.80	1.25
1	1	upward	F_d	-474.0	0.80	1.25
1	1	upward	$F_d * \gamma_M$	-474.0	0.80	1.25
1	1	upward	$F_d * \gamma_M / K_{mod}$	-474.0	0.80	1.25
R_{xd} -> Combinations: Support Reactions (Design, TH 1.O)						

Special Rules

Stability (G- portion): Depending on permanent and quasi-permanent loads	Yes

Buckling Lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System length

(E) Eigenvalue , See check for lengths as load depending.
(S) Calculation using spacing of the rigid bearing

x1 m	x2 m	s_{ky} m	s_{kz} m	s_{by} m	s_{bz} m	λ_y	λ_z
0.00	2.60	2.60	2.60	2.60	2.60	25.0	56.3

Decisive Combination Design Results (Detailed output)

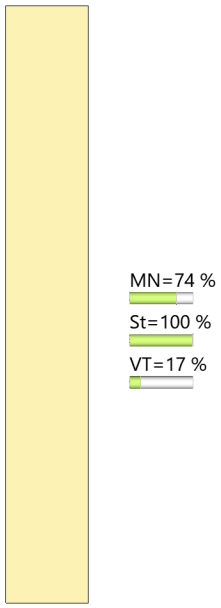
Co 1: Bearing capacity, permanent/temporary

Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=2.60m b/h=16.0/36.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-474.0			-8.23	15.36	0.54
My	-25.54	$k_{m,y}$=1.00		-7.39	16.17	0.46
N,M						**0.74**
Stability Check x=2.60m b/h=16.0/36.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-474.0	$k_{c,y}$=0.99	$k_{c,z}$=0.84	-8.23	15.36	0.54
My	-25.54	$k_{crit,y}$=1.00		-7.39	16.17	0.46
N,M						**1.00**
Shear and Torsion Check x=2.60m b/h=16.0/36.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vz	-9.8	k_{cr}=0.67		-0.26	2.24	0.17
V,Mt						**0.17**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=25.0 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Utilizations (Design)

Scale 1 : 33



Decisive Combination Design Results (Brief ouput)

Co 1: Bearing capacity, permanent/temporary

Cross Secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross Section Check x=2.60m b/h=16.0/36.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-474.0			-8.23	15.36	0.54
My	-25.54	$k_{m,y}$=1.00		-7.39	16.17	0.46
N,M						**0.74**
Stability Check x=2.60m b/h=16.0/36.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-474.0	$k_{c,y}$=0.99	$k_{c,z}$=0.84	-8.23	15.36	0.54
My	-25.54	$k_{crit,y}$=1.00		-7.39	16.17	0.46
N,M						**1.00**
Shear and Torsion Check x=2.60m b/h=16.0/36.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vz	-9.8	k_{cr}=0.67		-0.26	2.24	0.17
V,Mt						**0.17**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=25.0 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Deformations

Co	ls	Situation	Analysis	x [m]	L [m]	w [cm]	w_{lim} [h/]	w_{lim} [cm]	η
Direction Z									
9	SLS	rare/cha.	FI, inst	1.30	2.60	-0.1	300	0.9	0.12
9	SLS	rare/cha.	FI, netfin	1.30	2.60	-0.2	250	1.0	0.15
9	SLS	rare/cha.	FI, fin	1.30	2.60	-0.2	150	1.7	0.09
1	STR	permanen.	FI, fin	1.30	2.60	-0.3			

ls(Limit State): SLS(Serviceability) STR(Bearing capacity)
Analysis(System): FI(span)
inst: Elastic; fin: Elastic and creep

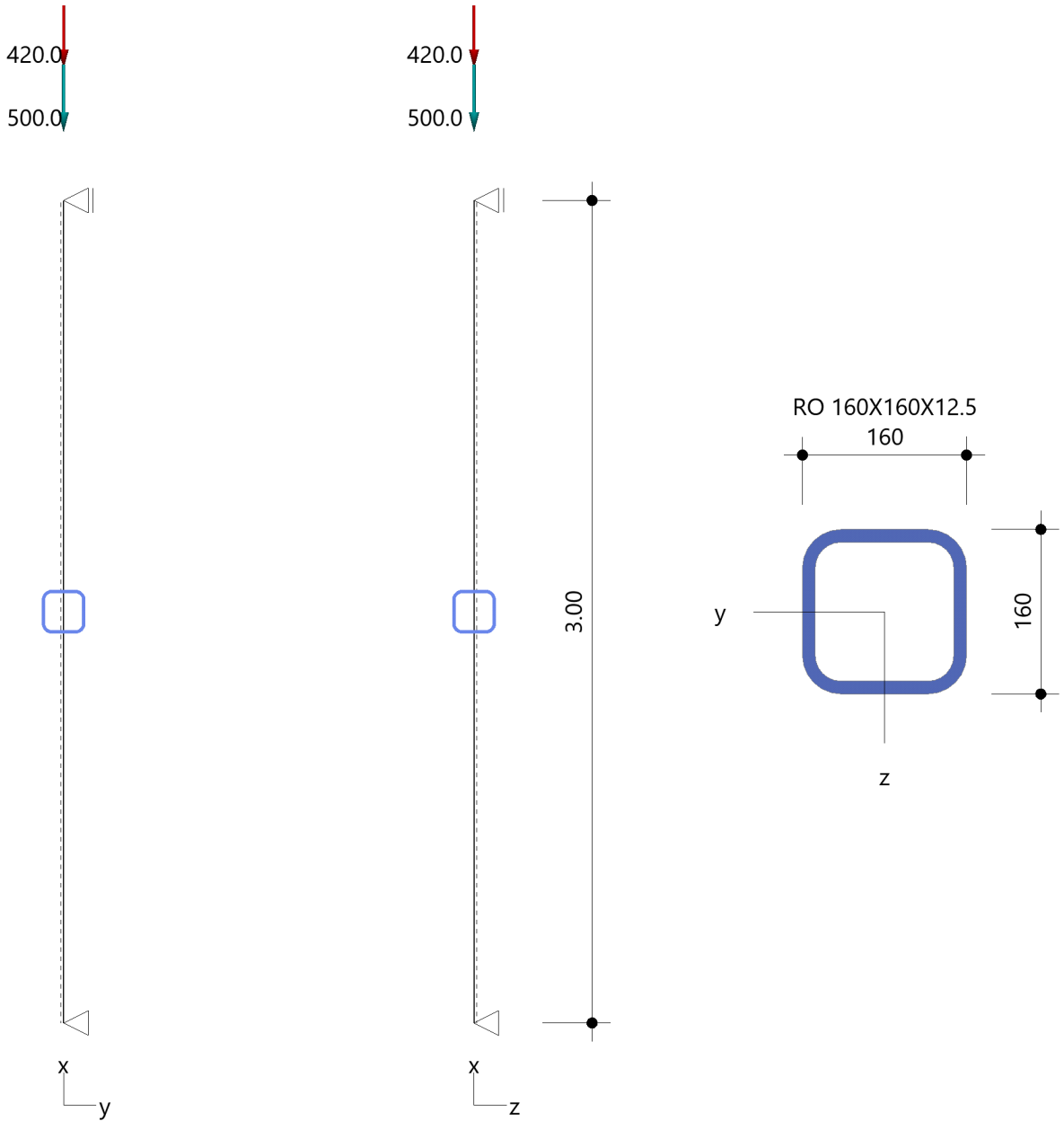
Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.S304 - Steber - 160x160x12.5

Single-span Steel Column STS+ 01/2022 (FRILO R-2022-1/P08)

Basic Parameters

Design code	:	DIN EN 1993-1-1/NA:2015-08	
Safety concept / load combinatorics	:	DIN EN 1990/NA:2010-12	
Ψ_2 for crane loads	:	9.00	
Ψ_2 = 0.5 for snow (AE)	:	not considered	
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)	
Check of cross-section	:	plastic	
Stability	:	6.3.3 - annex B	
Design situation serviceability	:	characteristic	
Check of absolutely deformation	δ_{lim} =	5.0	cm
Check of relative deformation	δ_{lim} =	l_{eff}/ 300	



Support: Height = 3.00 m Material: S235 Cross-section: RO 160X160X12.5(warm)

Bearing conditions

No	x [m]	Translations *) ux [kN/m]	uy [kN/m]	uz [kN/m]	Rotations *) Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	-1	-1	-1	-1	0.0	0.0
2	3.00	0.00	-1	-1	-1	0.0	0.0

*) -1 = fixed, 0 = free, > 0 = elastically restraint

Actions(Act)

Id	Type	Design situation	Name	γ_{sup}	γ_{inf}	ψ_0	ψ_1	ψ_2
99	G	persistent/transient	Permanent loads	1.35	1.00	1.00	1.00	1.00
1	Q	persistent/transient	Cat. A: domestic, residental areas	1.50	0.00	0.70	0.50	0.30

Loads

Types of load

Type 14 = head load kN
The dead weight is automatically taken into account.

Standard loads cases and loads

No.	Type	in/about	pi	a [m]	pj	l [m]	Act
1	14	in x_direction	500.0	3.00		-	99
2	14	in x_direction	420.0	3.00		-	1

Summary

Design situation	Comb	Check	η
persistent/transient	1	Cross-section	0.83
persistent/transient	1	Stability	1.00
characteristic	5	Absolute deflection	0.04

Bearing capacity persistent/transient

Internal forces - Comb 1

x [m]	N_{Ed} [kN]	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	$V_{y,Ed}$ [kN]	$M_{z,Ed}$ [kNm]
0.00	-1307.1	0.0	0.00	0.0	0.00
3.00	-1305.0	0.0	0.00	0.0	0.00

Cross-section capacity acc. to section 6.2 ff - Comb 1 γ_{M0} = 1.00

x [m]	Csc	η_N	η_{Vz}	η_{My}	η_{Vy}	η_{Mz}	η_{MyMz}	η
0.00	1	0.83	0.00	0.00	0.00	0.00	0.00	0.83
3.00	1	0.83	0.00	0.00	0.00	0.00	0.00	0.83

Stability check

x [m]	Csc	N_{Ed} [kN]	$M_{y,Ed}$ [kNm]	Eq	η	Comb
0.00	1	1307.1	0.00	6.46	1.00	1

Serviceability

Deflection check - Absolute deformations f_{cd} = 5.0 cm

x [m]	$f_{x,Ed}$ [cm]	$f_{y,Ed}$ [cm]	$f_{z,Ed}$ [cm]	$f_{res,Ed}$ [cm]	η	Comb
3.00	-0.2	0.0	0.0	0.2	0.04	5

Support Reactions

Supporting forces - characteristic per loadcase

Support	x [m]	Lc	Ew	R_x [kN]	R_z [kN]	M_y [kNm]	R_y [kN]	M_z [kNm]
Foot	0.00	Self-weight	99	-1.6	-	-	-	-
		Lf 1	99	-500.0	-	-	-	-
		Lf 2	1	-420.0	-	-	-	-

Overview of decisive load case combinations

Comb	Design situation	[Load:Factor]
1	persistent/transient	Self-weight:1.35 + 1:1.35 + 2:1.50
5	characteristic	Self-weight:1.00 + 1:1.00 + 2:1.00

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Poz.S305 - Steber 16/28 na venec BB

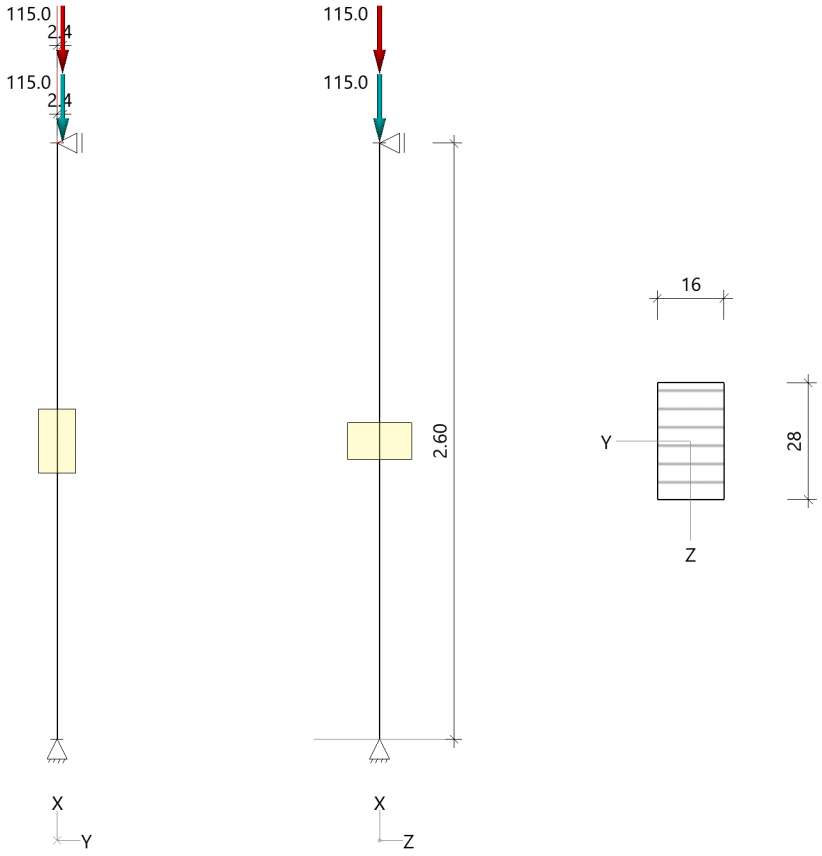
Timber Column HO1+ 01/2022A (FRILO R-2022-1/P08)

Design code

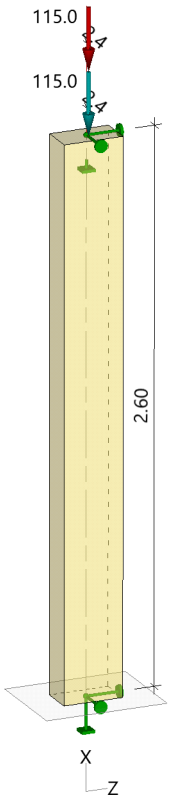
Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 33



System Graphic (isometric)



System

Simply supported, H=2.60m, b/h=16.0/28.0cm
GL24h, SC 2, γ=5.00 kN/m³, EN 14080:2013 Lamellae/layers parallel b(y)

Material Values Timber

Glulam GL24h, Service class 2, acc.to EN 14080:2013

$f_{m,k}$ $f_{v,k}$ N/mm²	$f_{t,0,k}$ $f_{c,0,k}$ N/mm²	$f_{t,90,k}$ $f_{c,90,k}$ N/mm²	$E_{0,mean}$ $E_{0,05}$ N/mm²	$E_{90,mean}$ $E_{90,05}$ N/mm²	G_{mean} G_{05} N/mm²	ρ_k ρ_m kg/m³	γ kN/m³	γ_M K_{def}
24.00 3.50	19.20 24.00	0.50 2.50	11500 9600	300 250	650 540	385 420	5.00	1.25 0.80

Section Properties

Rectangle

Moment of resistance	$W_{y,ef}$	=	2091	cm³
1st moment of area	$S_{y,ef}$	=	1568	cm³
2nd moment of area	$I_{y,ef}$	=	29269	cm⁴
Moment of resistance	$W_{z,ef}$	=	1195	cm³
1st moment of area	$S_{z,ef}$	=	896	cm³
2nd moment of area	$I_{z,ef}$	=	9557	cm⁴
Torsional moment of resistance	W_t	=	1710	cm³
Torsional moment of inertia	I_t	=	24371	cm⁴
CS Area	A_{tot}	=	448.0	cm²

Partial safety factors

ACT	LDC	Limit State	P/T γ_{sup}	P/T γ_{inf}	A γ_{sup}	A γ_{inf}
99	1	Permanent loads				
		Load capacity	1.35	1.00	1.00	1.00
		Equilibrity	1.10	0.90	1.00	1.00
		Usability	1.00	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas				
		Load capacity	1.50	0.00	1.00	0.00
		Equilibrity	1.50	0.00	1.00	0.00
		Usability	1.00	0.00	1.00	0.00
STR=Load capacity EQU=Equilibrity SLS=Usability						

Combination Factors

ACT	LDC	Action	ψ0	ψ1	ψ2
99	1	Permanent loads	1.00	1.00	1.00
1	3	Cat. A: domestic, residental areas	0.70	0.50	0.30

List of Loads

No.	Type	ACT	Q1	a1	Q2, ez	L2, ey	fac	grp	About
1	2 X	99	0.6	2.60			1.00		AUTO_G_Mat
2	2 X	99	115.0	2.60	e= 0.0	e= 2.4	1.00		
3	2 X	1	115.0	2.60	e= 0.0	e= 2.4	1.00		
4	2 X	1	0.0	2.60			1.00		

Type: 2 = Concentrated load: Q1[kN] at a1[m]; a1 = Distance from base point
Eccentricities ez, ey[cm]
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Load Cases: Assignment Loads and Actions

Lc	ACT	Alt	About	Involved Loads No
1	99	0	Sup	1, 2
2	1	0	Sup	3
3	1	0	Sup	4

Load Cases: Support Reactions (1.0 times, TH 1.O)

Lc	x [m]	R_x [kN]	R_y [kN]	R_z [kN]	M_x [kNm]	M_y [kNm]	M_z [kNm]
1	2.60	-	1.1	-	-	-	-
	0.00	-115.6	-1.1	-	-	-	-
2	2.60	-	1.1	-	-	-	-
	0.00	-115.0	-1.1	-	-	-	-
3	2.60	-	-	-	-	-	-
	0.00	-	-	-	-	-	-

Special rules

Same γG for permanent loads	Yes

Probit d.o.o.
Partizanska cesta 3-5
2000 Maribor

Combinations: Decisive Support Reactions (Design, Anchoring)

EL	Co	Direction	Condition	R_{xd} [kN]	K_{mod}	γ_M
1	10	upward	F_d	-115.6	0.80	1.25
1	10	upward	$F_d * \gamma_M$	-115.6	0.80	1.25
1	10	upward	$F_d * \gamma_M / K_{mod}$	-115.6	0.80	1.25
1	1	upward	F_d	-328.5	0.80	1.25
1	1	upward	$F_d * \gamma_M$	-328.5	0.80	1.25
1	1	upward	$F_d * \gamma_M / K_{mod}$	-328.5	0.80	1.25
R_{xd} -> Combinations: Support Reactions (Design, TH 1.O)						

Special rules

Stability (G-part): Depending on permanent and quasi-permanent loads	Yes

Buckling a. tilting lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System lengths

(E) Eigenvalue , See check for lengths because load depending.
(S) Calculation using spacing of the rigid bearing

x1 m	x2 m	s_{ky} m	s_{kz} m	s_{by} m	s_{bz} m	λ_y	λ_z
0.00	2.60	2.60	2.60	2.60	2.60	32.2	56.3

Design Results Decisive Combination (Detailed output)

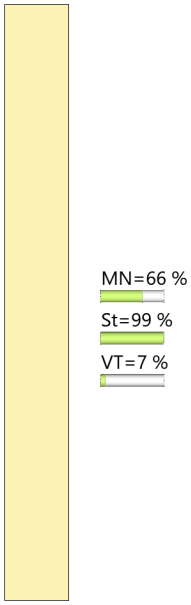
Co 1: Load capacity, permanent/transient

Cross-secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross-section Check x=2.60m b/h=16.0/28.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-328.5			-7.33	15.36	0.48
Mz	-7.87	$k_{m,z}$=1.00		6.58	15.36	0.43
N,M						**0.66**
Stability Check x=2.60m b/h=16.0/28.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-328.5	$k_{c,y}$=0.97	$k_{c,z}$=0.84	-7.33	15.36	0.57
Mz	-7.87	$k_{crit,z}$=1.00		6.58	15.36	0.43
N,M						**0.99**
Shear and Torsion Check x=1.30m b/h=16.0/28.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vy	-3.0	k_{cr}=0.67		-0.10	2.24	0.07
V,Mt						**0.07**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=32.2 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Utilizations (Design)

Scale 1 : 33



Design Results Decisive Combination (Brief ouput)

Co 1: Load capacity, permanent/transient

Cross-secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Cross-section Check x=2.60m b/h=16.0/28.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-328.5			-7.33	15.36	0.48
Mz	-7.87	$k_{m,z}$=1.00		6.58	15.36	0.43
N,M						**0.66**
Stability Check x=2.60m b/h=16.0/28.0cm						
		K_{mod}=0.80	γ_M=1.25			
Nx	-328.5	$k_{c,y}$=0.97	$k_{c,z}$=0.84	-7.33	15.36	0.57
Mz	-7.87	$k_{crit,z}$=1.00		6.58	15.36	0.43
N,M						**0.99**
Shear and Torsion Check x=1.30m b/h=16.0/28.0cm						
		K_{mod}=0.80	γ_M=1.25			
Vy	-3.0	k_{cr}=0.67		-0.10	2.24	0.07
V,Mt						**0.07**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || b
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=32.2 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Decisive Deformations

Co	ls	Situation	Analysis	x [m]	L [m]	w [cm]	wlim [h/]	wlim [cm]	η
Direction Y									
9	SLS	rare/characteristic	VF, inst	1.30	2.60	-0.2	300	0.9	0.24
9	SLS	rare/characteristic	VF, netfin	1.30	2.60	-0.3	250	1.0	**0.31**
9	SLS	rare/characteristic	VF, fin	1.30	2.60	-0.3	150	1.7	0.19
1	STR	permanent/transient	VF, fin	1.30	2.60	-0.6			

ls(Limit State): SLS(Usability) STR(Load capacity)
Analysis(System): VF(Span)
inst: Elastic; fin: Elastic with creep

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Poz.S306 - Steber10/20 na venec 10x8

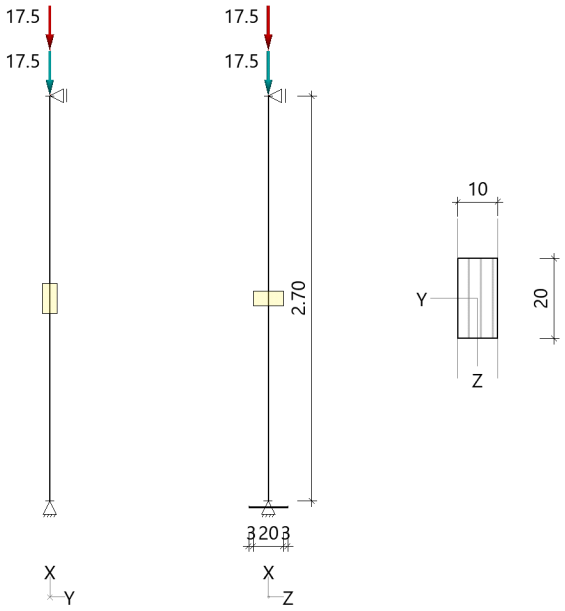
Timber Column HO1+ 01/2022A (FRILO R-2022-1/P07)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 50



System

Simply supported, H=2.70m, b/h=10.0/20.0cm
GL24h, SC 2, γ=5.00 kN/m³, EN 14080:2013 Lamellae/layers parallel h(z)

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	10.0	8.0	3.0	3.0	2 C24	2

Material Design code

Material	Design code
GL24h C24	acc.to EN 14080:2013 acc.to EN 338:2016

List of Loads

No.	Type	ACT	Q1	a1	Q2	L2	fac	grp	About
1	2 X	99	0.3	2.70			1.00		AUTO_G_Mat
2	2 X	99	17.5	2.70			1.00		
3	2 X	1	17.5	2.70			1.00		
4	2 X	1	0.0	2.70			1.00		

Type: 2 = Concentrated load: Q1[kN] at a1[m]; a1 = Distance from base point
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Special rules

Same γG for permanent loads	Yes

Buckling a. tilting lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System lengths

(E) Eigenvalue , See check for lengths because load depending.
(S) Calculation using spacing of the rigid bearing

Design Results Decisive Combination (Brief ouput)

Co 1: Load capacity, permanent/transient

Cross-secti.	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross-section Check x=2.70m b/h=10.0/20.0cm						
Nx	-50.2	K_{mod}=0.80	γ_M=1.25	-2.51	15.36	0.16
N,M						**0.16**
Stability Check x=2.70m b/h=10.0/20.0cm						
Nx	-50.2	K_{mod}=0.80 $k_{c,y}$=0.92	γ_M=1.25 $k_{c,z}$=0.41	-2.51	15.36	0.40
N,M						**0.40**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Lamella direction || h
Buckling length: s_{ky}=2.70m s_{kz}=2.70m Tilting length: s_b=2.70m
Slenderness: λ_y=46.8 λ_z=93.5
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.00; K_{def}= 0.80

Co 1: Load capacity, permanent/transient

Foot Binder: Comp.p.Grain

Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-50.2	26.0	10.0	260.0	1.25	0.80	1.30	-1.93	-1.54	**1.00**

Co1: 1.35*G1+1.50*Q2+1.50*Q3
Pressure without consideration of eccentricities

Decisive Deformations

w=0 => η=0

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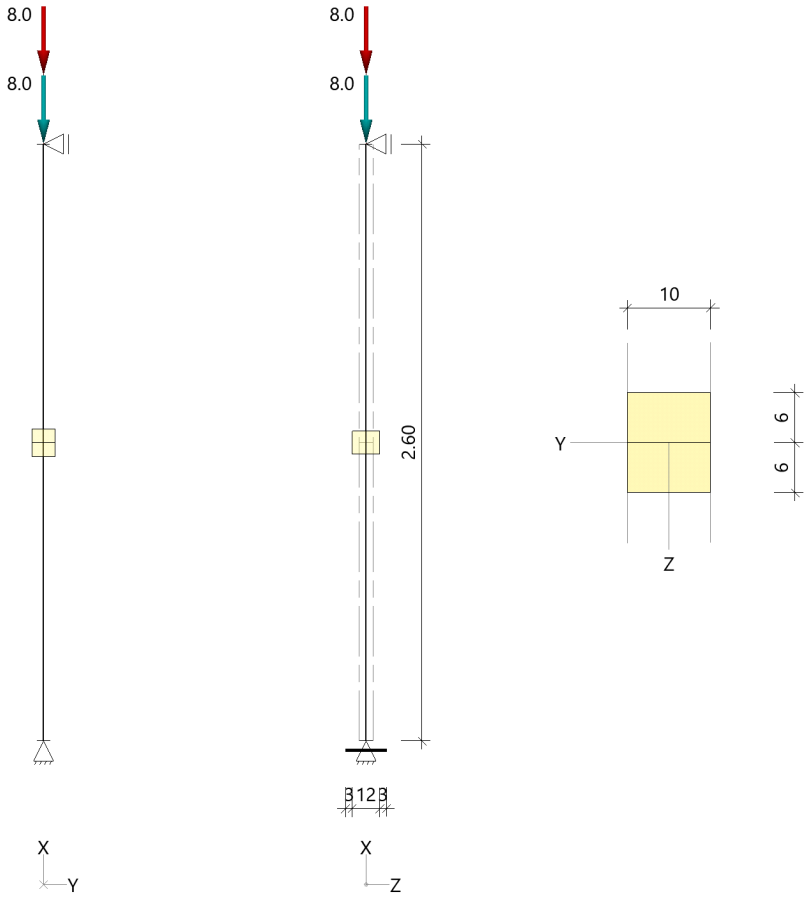
Timber Column HO1+ 01/2021B (FRILO R-2021-1/P09)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 33



System

Simply supported, H=2.60m

Dimensions

Cross Section Type: Direct jointed Beams

	H [m]	b [m]	h [m]
Outer dimensions	2.60	0.10	0.12
Meas of Axis	2.60	-	0.06

Cross Section of Column

No.	z [m]	b [cm]	h [cm]	Material Name	Ser.Cl. SC
1	-0.03	10.0	6.0	1 C24	2
2	0.03	10.0	6.0	1 C24	2

Fastener

Fastener

Direct jointed

Thickness	T_y	=	100.0	mm
Glue Gl.1 N/mm2				
Strength Glue, char	f_k	=	1.00	N/mm^2
Shear Stiffness/(Area1mm^2)	ks	=	1.00	N/mm
Area 1 Fastener	A	=	260000.00	mm^2
Count along	n	=	17	
Count transverse	n	=	1	
Distance along	a1		140.0	mm
Distance transverse	a2	=	140.0	mm

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	10.0	8.0	3.0	3.0	2 C24	2

Material Design code

Material	Design code
C24	acc.to EN 338:2016

Section Properties

Ideational Column (x=2.60m - 0.00m, Lref =2.60 m)

Section Properties			Design Values, sorted by LDC				
		Char.	Permanent	Long Term	Medium Te	Short Ter	Instantan
$W_{y,ef}$	cm^3	125	123	123	123	123	123
$S_{y,ef}$	cm^3	48	47	47	47	47	47
$I_{y,ef}$	cm^4	382	375	375	375	375	375
$W_{z,ef}$	cm^3	200	200	200	200	200	200
$S_{z,ef}$	cm^3	150	150	150	150	150	150
$I_{z,ef}$	cm^4	1000	1000	1000	1000	1000	1000
W_t	cm^3	170	170	170	170	170	170
I_t	cm^4	1082	894	894	894	894	894
A_{tot}	cm^2	120.0	120.0	120.0	120.0	120.0	120.0
$I_{y,tot}$	cm^4	1440	1440	1440	1440	1440	1440
γ_1 B.2		0.010	0.007	0.007	0.007	0.007	0.007
γ_2 B.2		0.010	0.007	0.007	0.007	0.007	0.007
$\lambda_{y,ef}$		145.73	147.13	147.13	147.13	147.13	147.13
f=ΔN/M		0.01	0.01	0.01	0.01	0.01	0.01

List of Loads

No.	Type	ACT	Q1	a1	Q2	L2	fac	grp	About
1	2 X	99	0.2	2.60			1.00		AUTO_G_Mat
2	2 X	99	8.0	2.60			1.00	0_99	
3	2 X	1	8.0	2.60			1.00	0_10	

Type: 2 = concentrated load: Q1[kN] at a1[m]; a1 = Distance to Foot-point
Grp = Simultaneous Group_Alternative Group
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

List of decisive combinations

Lc	Co	1 STR	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
1		1.35											
2		*1.50											

Buckling Lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System length

(E) Eigenvalue , See check for lengths as load depending.
(S) Calculation using spacing of the rigid bearing

Decisive Combination Design Results (Brief ouput)

Co 1: Bearing capacity, permanent/temporary

Cross S. 1	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=2.60m b/h=10.0/6.0cm						
Nx	-11.5	K_{mod}=0.80	γ_M=1.30	-1.92	12.92	0.15
N,M						**0.15**
Stability Check x=2.60m b/h=10.0/6.0cm						
Nx	-11.5	K_{mod}=0.80 $k_{c,y}$=1.00	γ_M=1.30 $k_{c,z}$=0.37	-1.92	12.92	0.40
N,M						0.40
Shear and Torsion Check x=0.00m b/h=10.0/6.0cm						
Vz	2.6	K_{mod}=0.80 k_{cr}=0.67	γ_M=1.30	0.65	2.46	0.39
V,Mt						**0.39**

Co1: 1.35*G1+1.50*Q2
Buckling length: s_{ky}=0.00m s_{kz}=2.60m Tilting length: s_b=0.00m
Slenderness: λ_y=0.0 λ_z=90.0
Share N(g)/N(g+q) = 64%; ψ2(Lc, σ_{max})= 0.30; K_{def}= 0.80

Co 1: Bearing capacity, permanent/temporary

Ideational .	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=2.60m b/h=10.0/12.0cm						
Nx	-23.1	K_{mod}=0.80	γ_M=1.30	-1.92	12.92	0.15
N,M						**0.15**
Stability Check x=2.60m b/h=10.0/12.0cm						
Nx	-23.1	K_{mod}=0.80 $k_{c,y}$=0.15	γ_M=1.30 $k_{c,z}$=0.37	-1.92	12.92	1.00
N,M						**1.00**
Shear and Torsion Check x=2.60m b/h=10.0/12.0cm						
		K_{mod}=0.80	γ_M=1.30			

Ideational .	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Vz	2.6	k_{cr}=0.67		0.32	2.46	0.20
V,Mt						0.20
Co1: 1.35*G1+1.50*Q2 Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m Slenderness: λ_y=75.0 λ_z=90.0 Share N(g)/N(g+q) = 64%; ψ2(Lc, σ_{max})= 0.30; K_{def}= 0.80						

Co 1: Bearing capacity, permanent/temporary

Foot Binder: Comp.p.Grain										
Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-11.5	9.0	10.0	90.0	1.25	0.80	1.30	-1.28	-1.54	**0.67**
2	-11.5	9.0	10.0	90.0	1.25	0.80	1.30	-1.28	-1.54	0.67
Co1: 1.35*G1+1.50*Q2 Pressure without consideration of eccentricities										

Co 1: Bearing capacity, permanent/temporary

Shear Force(Flexural buckling) V_d(N) = 2.6 kN
Shear Force/Fastener V_d = 0.3 kN

Co1: 1.35*G1+1.50*Q2

Glue n	f_k N/mm²	A_{ef} [mm²]	F_{Rk} [N]	K_{mod}	γ_M	F_{Rd} [N]	n_{ef}/n
1	1.000	260000	260000	0.80	1.50	138667	0.67
1	1.000	260000	260000	0.80	1.50	138667	0.25

Fastener Analysis	F_d [N]	K_{mod}	γ_M	F_{Rd} [N]	n_{ef}/n	η
Shear Force	4411.5	0.80	1.50	138667	0.67	0.05
Tensile Force	0.0	0.80	1.50	138667	0.25	0.00
Combined loaded						0.05

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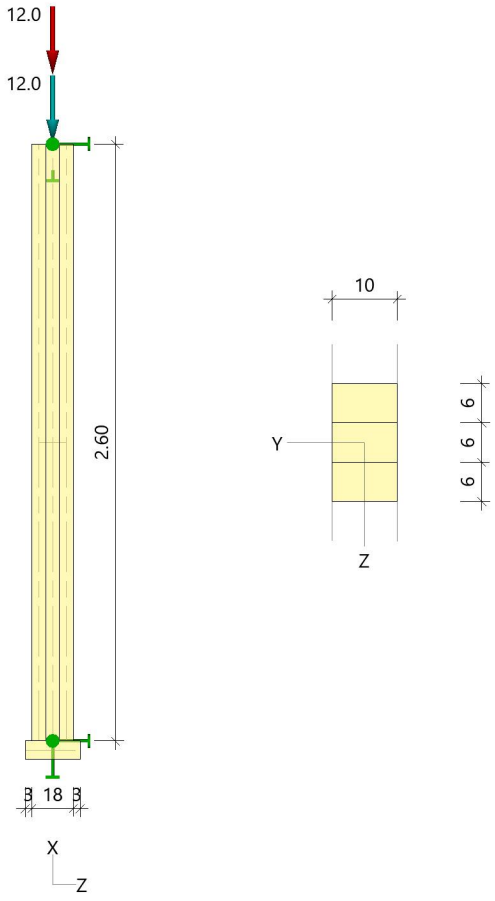
Timber Column HO1+ 01/2021B (FRILO R-2021-1/P06)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphic

Scale 1 : 33



System

Simply supported, H=2.60m

Dimensions

Cross Section Type: Direct jointed Beams

	H [m]	b [m]	h [m]
Outer dimensions	2.60	0.10	0.18
Meas of Axis	2.60	-	0.12

Cross Section of Column

No.	z [m]	b [cm]	h [cm]	Material Name	Ser.Cl. SC
1	-0.06	10.0	6.0	1 C24	2
2	0.00	10.0	6.0	1 C24	2
3	0.06	10.0	6.0	1 C24	2

Fastener

Fastener

Direct jointed

Thickness	T_y	=	100.0	mm
Glue Gl.1 N/mm2				
Strength Glue, char	f_k	=	1.00	N/mm^2
Shear Stiffness/(Area1mm^2)	ks	=	1.00	N/mm
Area 1 Fastener	A	=	260000.00	mm^2
Count along	n	=	17	
Count transverse	n	=	1	
Distance along	a1		140.0	mm
Distance transverse	a2	=	140.0	mm

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	10.0	8.0	3.0	3.0	2 C24	2

Material Design code

Material	Design code
C24	acc.to EN 338:2016

Section Properties

Ideational Column (x=2.60m - 0.00m, Lref =2.60 m)

Section Properties			Design Values, sorted by LDC				
		Char.	Permanent	Long Term	Medium Te	Short Ter	Instantan
$W_{y,ef}$	cm^3	191	187	187	187	187	187
$S_{y,ef}$	cm^3	49	47	47	47	47	47
$I_{y,ef}$	cm^4	584	570	570	570	570	570
$W_{z,ef}$	cm^3	300	300	300	300	300	300
$S_{z,ef}$	cm^3	225	225	225	225	225	225
$I_{z,ef}$	cm^4	1500	1500	1500	1500	1500	1500
W_t	cm^3	255	255	255	255	255	255
I_t	cm^4	1541	1341	1341	1341	1341	1341
A_{tot}	cm^2	180.0	180.0	180.0	180.0	180.0	180.0
$I_{y,tot}$	cm^4	4860	4860	4860	4860	4860	4860
γ_1 B.2		0.010	0.007	0.007	0.007	0.007	0.007
γ_2 B.2		1.000	1.000	1.000	1.000	1.000	1.000
γ_3 B.2		0.010	0.007	0.007	0.007	0.007	0.007
$\lambda_{y,ef}$		144.30	146.15	146.15	146.15	146.15	146.15
f=ΔN/M		0.01	0.00	0.00	0.00	0.00	0.00

List of Loads

No.	Type	ACT	Q1	a1	Q2	L2	fac	grp	About
1	2 X	99	0.3	2.60			1.00		AUTO_G_Mat
2	2 X	99	12.0	2.60			1.00	0_99	
3	2 X	1	12.0	2.60			1.00	0_10	

Type: 2 = concentrated load: Q1[kN] at a1[m]; a1 = Distance to Foot-point
Grp = Simultaneous Group_Alternative Group
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Buckling Lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System length

(E) Eigenvalue , See check for lengths as load depending.
(S) Calculation using spacing of the rigid bearing

Co	x1 m	x2 m	s_{ky} m	s_{kz} m	s_{by} m	s_{bz} m	λ_y	λ_z
1	0.00	2.60	2.60	2.60	2.60	2.60	146.1	90.0
9	0.00	2.60	2.60	2.60	2.60	2.60	144.3	90.0

Decisive Combination Design Results (Brief ouput)

Co 1: Bearing capacity, permanent/temporary

Cross S. 1	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=2.60m b/h=10.0/6.0cm						
Nx	-11.5	K_{mod}=0.80	γ_M=1.30	-1.92	12.92	0.15
N,M						**0.15**
Stability Check x=2.60m b/h=10.0/6.0cm						
Nx	-11.5	K_{mod}=0.80	γ_M=1.30	-1.92	12.92	0.40
		$k_{c,y}$=1.00	$k_{c,z}$=0.37			
N,M						0.40
Shear and Torsion Check x=0.00m b/h=10.0/6.0cm						
Vz	2.6	K_{mod}=0.80	γ_M=1.30	0.64	2.46	0.39
		k_{cr}=0.67				
V,Mt						**0.39**

Co1: 1.35*G1+1.50*Q2
Buckling length: s_{ky}=0.00m s_{kz}=2.60m Tilting length: s_b=0.00m
Slenderness: λ_y=0.0 λ_z=90.0
Share N(g)/N(g+q) = 64%; ψ2(Lc, σ_{max})= 0.30; K_{def}= 0.80

Co 1: Bearing capacity, permanent/temporary

Ideational .	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=2.60m b/h=10.0/18.0cm						
Nx	-34.6	K_{mod}=0.80	γ_M=1.30	-1.92	12.92	0.15
N,M						**0.15**
Stability Check x=2.60m b/h=10.0/18.0cm						
Nx	-34.6	K_{mod}=0.80	γ_M=1.30	-1.92	12.92	0.99
		$k_{c,y}$=0.15	$k_{c,z}$=0.37			
N,M						**0.99**
Shear and Torsion Check x=2.60m b/h=10.0/18.0cm						
		K_{mod}=0.80	γ_M=1.30			

Ideational .	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Vz	3.8	k_{cr}=0.67		0.32	2.46	0.19
V,Mt						0.19
Co1: 1.35*G1+1.50*Q2 Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m Slenderness: λ_y=50.0 λ_z=90.0 Share N(g)/N(g+q) = 64%; ψ2(Lc, σ_{max})= 0.30; K_{def}= 0.80						

Co 1: Bearing capacity, permanent/temporary

Foot Binder: Comp.p.Grain										
Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-11.5	9.0	10.0	90.0	1.25	0.80	1.30	-1.28	-1.54	0.67
2	-11.5	6.0	10.0	60.0	1.25	0.80	1.30	-1.92	-1.54	**1.00**
3	-11.5	9.0	10.0	90.0	1.25	0.80	1.30	-1.28	-1.54	0.67
Co1: 1.35*G1+1.50*Q2 Pressure without consideration of eccentricities										

Co 1: Bearing capacity, permanent/temporary

Shear Force(Flexural buckling) V_d(N) = 3.8 kN
Shear Force/Fastener V_d = 0.3 kN

Co1: 1.35*G1+1.50*Q2

Glue n	f_k N/mm²	A_{ef} [mm²]	F_{Rk} [N]	K_{mod}	γ_M	F_{Rd} [N]	n_{ef}/n
1	1.000	260000	260000	0.80	1.50	138667	0.67
1	1.000	260000	260000	0.80	1.50	138667	0.25

Fastener Analysis	F_d [N]	K_{mod}	γ_M	F_{Rd} [N]	n_{ef}/n	η
Shear Force	4297.7	0.80	1.50	138667	0.67	0.05
Tensile Force	0.0	0.80	1.50	138667	0.25	0.00
Combined loaded						0.05

Decisive Utilizations

Structural component	Analysis	η
BEARING CAPACITY	NORMAL TEMPERATURE (MAX)	1.00
Cross-Section	Stability	0.99
Cross-Section	Stress	0.15
Cross-Section	Shear stress	0.39
Cross-connections	Fastener	0.05
Foot Binder	Comp.p.Grain	1.00

STZ2 venec 16/8

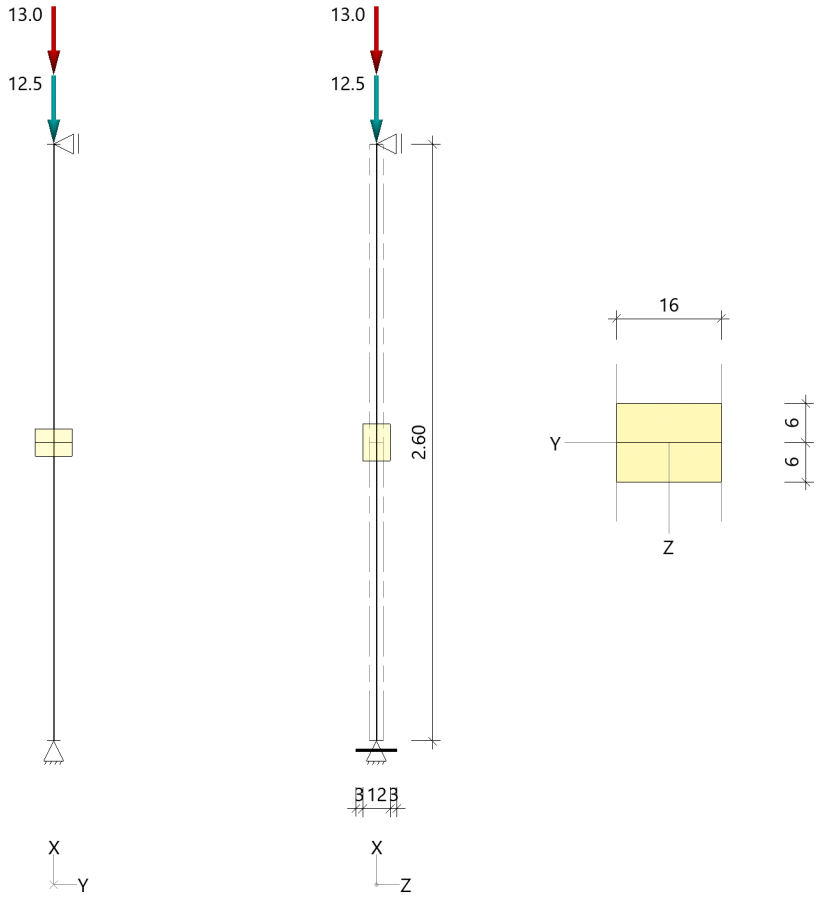
Timber Column HO1+ 01/2021B (FRILO R-2021-1/P09)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphics 2D

Scale 1 : 33



System

Simply supported, H=2.60m

Dimensions

Cross Section Type: Direct jointed Beams

	H [m]	b [m]	h [m]
Outer dimensions	2.60	0.16	0.12
Meas of Axis	2.60	-	0.06

Cross Section of Column

No.	z [m]	b [cm]	h [cm]	Material Name	Ser.Cl. SC
1	-0.03	16.0	6.0	1 C24	2
2	0.03	16.0	6.0	1 C24	2

Fastener

Fastener

Direct jointed

Thickness	T_y	=	160.0	mm
Glue Gl.1 N/mm2				
Strength Glue, char	f_k	=	1.00	N/mm²
Shear Stiffness/(Area1mm²)	ks	=	1.00	N/mm
Area 1 Fastener	A	=	416000.00	mm²
Count along	n	=	9	
Count transverse	n	=	1	
Distance along	a1		250.0	mm
Distance transverse	a2	=	140.0	mm

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	16.0	8.0	3.0	3.0	2 C24	2

Material Design code

Material	Design code
C24	acc.to EN 338:2016

Section Properties

Ideational Column (x=2.60m - 0.00m, Lref =2.60 m)

Section Properties			Design Values, sorted by LDC				
		Char.	Permanent	Long Term	Medium Te	Short Ter	Instantan
$W_{y,ef}$	cm³	200	197	197	197	197	197
$S_{y,ef}$	cm³	76	75	75	75	75	75
$I_{y,ef}$	cm⁴	611	600	600	600	600	600
$W_{z,ef}$	cm³	512	512	512	512	512	512
$S_{z,ef}$	cm³	384	384	384	384	384	384
$I_{z,ef}$	cm⁴	4096	4096	4096	4096	4096	4096
W_t	cm³	300	300	300	300	300	300
I_t	cm⁴	1939	1740	1740	1740	1740	1740
A_{tot}	cm²	192.0	192.0	192.0	192.0	192.0	192.0
$I_{y,tot}$	cm⁴	2304	2304	2304	2304	2304	2304
γ_1 B.2		0.010	0.007	0.007	0.007	0.007	0.007
γ_2 B.2		0.010	0.007	0.007	0.007	0.007	0.007
$\lambda_{y,ef}$		145.73	147.13	147.13	147.13	147.13	147.13
f=ΔN/M		0.01	0.01	0.01	0.01	0.01	0.01

List of Loads

No.	Type	ACT	Q1	a1	Q2	L2	fac	grp	About
1	2 X	99	0.3	2.60			1.00		AUTO_G_Mat
2	2 X	99	12.5	2.60			1.00	0_99	
3	2 X	1	13.0	2.60			1.00	0_10	

Type: 2 = concentrated load: Q1[kN] at a1[m]; a1 = Distance to Foot-point
Grp = Simultaneous Group_Alternative Group
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

List of decisive combinations

Lc	Co	1 STR	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
1		1.35											
2		*1.50											

Buckling Lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System length

(E) Eigenvalue , See check for lengths as load depending.
(S) Calculation using spacing of the rigid bearing

Decisive Combination Design Results (Brief ouput)

Co 1: Bearing capacity, permanent/temporary

Cross S. 1	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=0.00m b/h=16.0/6.0cm						
Nx	-18.4	K_{mod}=0.80	γ_M=1.30	-1.92	12.92	0.15
N,M						**0.15**
Stability Check x=0.00m b/h=16.0/6.0cm						
Nx	-18.4	K_{mod}=0.80 $k_{c,y}$=1.00	γ_M=1.30 $k_{c,z}$=0.72	-1.92	12.92	0.21
N,M						0.21
Shear and Torsion Check x=0.00m b/h=16.0/6.0cm						
Vz	4.1	K_{mod}=0.80 k_{cr}=0.67	γ_M=1.30	0.65	2.46	0.39
V,Mt						**0.39**

Co1: 1.35*G1+1.50*Q2
Buckling length: s_{ky}=0.00m s_{kz}=2.60m Tilting length: s_b=0.00m
Slenderness: λ_y=0.0 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.30; K_{def}= 0.80

Co 1: Bearing capacity, permanent/temporary

Ideational .	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross Section Check x=0.00m b/h=16.0/12.0cm						
Nx	-36.8	K_{mod}=0.80	γ_M=1.30	-1.92	12.92	0.15
N,M						**0.15**
Stability Check x=0.00m b/h=16.0/12.0cm						
Nx	-36.8	K_{mod}=0.80 $k_{c,y}$=0.15	γ_M=1.30 $k_{c,z}$=0.72	-1.92	12.92	1.00
N,M						**1.00**
Shear and Torsion Check x=0.00m b/h=16.0/12.0cm						
		K_{mod}=0.80	γ_M=1.30			

Ideational .	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Vz	4.1	k_{cr}=0.67		0.32	2.46	0.20
V,Mt						0.20
Co1: 1.35*G1+1.50*Q2 Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m Slenderness: λ_y=75.0 λ_z=56.3 Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.30; K_{def}= 0.80						

Co 1: Bearing capacity, permanent/temporary

Foot Binder: Comp.p.Grain										
Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-18.4	9.0	16.0	144.0	1.25	0.80	1.30	-1.28	-1.54	**0.66**
2	-18.4	9.0	16.0	144.0	1.25	0.80	1.30	-1.28	-1.54	0.66
Co1: 1.35*G1+1.50*Q2 Pressure without consideration of eccentricities										

Co 1: Bearing capacity, permanent/temporary

Shear Force(Flexural buckling) V_d(N) = 4.1 kN
Shear Force/Fastener V_d = 0.8 kN

Co1: 1.35*G1+1.50*Q2

Glue n	f_k N/mm²	A_{ef} [mm²]	F_{Rk} [N]	K_{mod}	γ_M	F_{Rd} [N]	n_{ef}/n
1	1.000	416000	416000	0.80	1.50	221867	0.67
1	1.000	416000	416000	0.80	1.50	221867	0.25

Fastener Analysis	F_d [N]	K_{mod}	γ_M	F_{Rd} [N]	n_{ef}/n	η
Shear Force	7038.3	0.80	1.50	221867	0.67	0.05
Tensile Force	0.0	0.80	1.50	221867	0.25	0.00
Combined loaded						0.05

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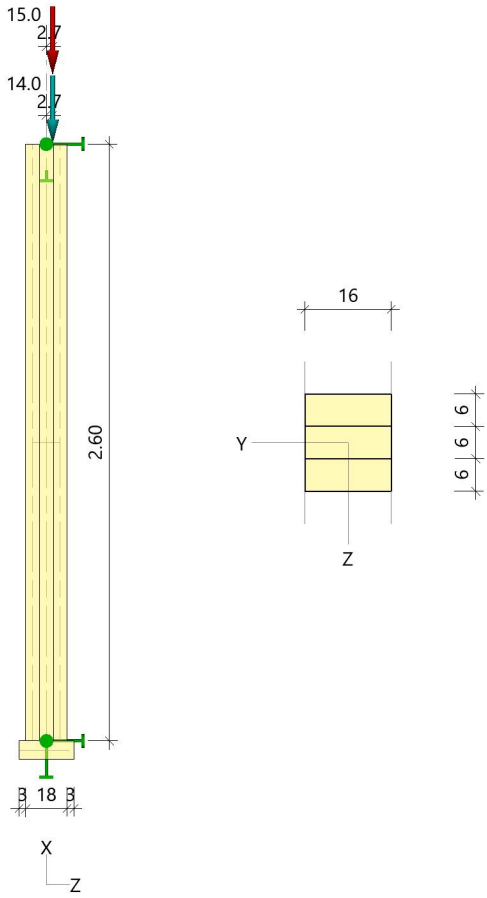
Timber Column HO1+ 01/2022A (FRILO R-2022-1/P05)

Design code

Design	EN 1995-1-1/A2:2014
Combinatorial Analysis	EN 1990:2002/AC:2010
Consequence Class	CC 2

System Graphic

Scale 1 : 33



System

Simply supported, H=2.60m

Dimensions

Cross-section Type: Directly connected in several parts

	H [m]	b [m]	h [m]
External dimensions	2.60	0.16	0.18
Axis dimensions	2.60	-	0.12

Cross-section of Column

No.	z [m]	b [cm]	h [cm]	Material Name	Ser.Cl. SC
1	-0.06	16.0	6.0	1 C24	2
2	0.00	16.0	6.0	1 C24	2
3	0.06	16.0	6.0	1 C24	2

Fastener

Fastener

Directly connected

Thickness	T_y	=	160.0	mm
Glue Gl.1 N/mm2				
Glue strength, char	f_k	=	1.00	N/mm^2
Shear Stiffness/(Area1mm^2)	ks	=	1.00	N/mm
Area 1 Fastener	A	=	416000.00	mm^2
Number along	n	=	9	
Number across	n	=	1	
Distance lengthways	a1		250.0	mm
Distance transverse	a2	=	140.0	mm

Foot Binder

No.	b [cm]	h [cm]	a le [cm]	a ri [cm]	Material Name	Ser.Cl. SC
1	16.0	8.0	3.0	3.0	2 C24	2

Material Design code

Material	Design code
C24	acc.to EN 338:2016

Section Properties

Ideal column (x=2.60m - 0.00m, Lref =2.60 m)

Section Properties		Design Values, sorted by LDC					
		Char.	Permanent	Long	Medium	Short Ter	Very shor
$W_{y,ef}$	cm^3	305	300	300	300	300	300
$S_{y,ef}$	cm^3	78	76	76	76	76	76
$I_{y,ef}$	cm^4	935	911	911	911	911	911
$W_{z,ef}$	cm^3	768	768	768	768	768	768
$S_{z,ef}$	cm^3	576	576	576	576	576	576
$I_{z,ef}$	cm^4	6144	6144	6144	6144	6144	6144
W_t	cm^3	449	449	449	449	449	449
I_t	cm^4	2869	2609	2609	2609	2609	2609
A_{tot}	cm^2	288.0	288.0	288.0	288.0	288.0	288.0
$I_{y,tot}$	cm^4	7776	7776	7776	7776	7776	7776
γ_1 B.2		0.010	0.007	0.007	0.007	0.007	0.007
γ_2 B.2		1.000	1.000	1.000	1.000	1.000	1.000
γ_3 B.2		0.010	0.007	0.007	0.007	0.007	0.007
$\lambda_{y,ef}$		144.30	146.15	146.15	146.15	146.15	146.15
f=ΔN/M		0.01	0.00	0.00	0.00	0.00	0.00

List of Loads

No.	Type	ACT	Q1	a1	Q2, ez	L2, ey	fac	grp	About
1	2 X	99	0.4	2.60			1.00		AUTO_G_Mat
2	2 X	99	14.0	2.60	e= 2.7	e= 0.0	1.00	0_99	
3	2 X	1	15.0	2.60	e= 2.7	e= 0.0	1.00	0_10	

Type: 2 = Concentrated load: Q1[kN] at a1[m]; a1 = Distance from base point
Eccentricities ez, ey[cm]Grp = Simultaneous Group_Alternative Group
ACT: 99=Permanent loads; 1=Cat. A: domestic, residental areas

Buckling a. tilting lengths

Calculation of Buckling Lengths
Flexural buckling(E) s_k = π2*E*I/(etaNki*Nx)
Lateral torsion buckling(S) s_b = System lengths

(E) Eigenvalue , See check for lengths because load depending.
(S) Calculation using spacing of the rigid bearing

Co	x1 m	x2 m	s_{ky} m	s_{kz} m	s_{by} m	s_{bz} m	λ_y	λ_z
1	0.00	2.60	2.60	2.60	2.60	2.60	146.1	56.3
9	0.00	2.60	2.60	2.60	2.60	2.60	144.3	56.3

Design Results Decisive Combination (Brief ouput)

Co 1: Load capacity, permanent/transient

Ideal column	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross-section Check x=2.60m b/h=16.0/18.0cm						
		K_{mod}=0.80	γ_M=1.30			
Nx	-42.0			-1.46	12.92	0.11
My	-1.12	$k_{m,y}$=1.00		-3.73	14.77	0.25
N,M						**0.27**
Stability Check x=2.60m b/h=16.0/18.0cm						
		K_{mod}=0.80	γ_M=1.30			
Nx	-42.0	$k_{c,y}$=0.15	$k_{c,z}$=0.72	-1.46	12.92	0.75
My	-1.12	$k_{crit,y}$=1.00		-3.73	14.77	0.25
N,M						**1.00**
Shear and Torsion Check x=1.30m b/h=16.0/18.0cm						
		K_{mod}=0.80	γ_M=1.30			
Vz	-5.1	k_{cr}=0.67		-0.26	2.46	0.16
V,Mt						0.16

Co1: 1.35*G1+1.50*Q2
Buckling length: s_{ky}=2.60m s_{kz}=2.60m Tilting length: s_b=2.60m
Slenderness: λ_y=50.0 λ_z=56.3
Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.30; K_{def}= 0.80

Co 1: Load capacity, permanent/transient

Cross-s. 1	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	$f_{...d}$ [N/mm²]	η
Cross-section Check x=2.60m b/h=16.0/6.0cm						
		K_{mod}=0.80	γ_M=1.30			
Nx	-13.5			-1.41	12.92	0.11
My	-0.35	$k_{m,y}$=1.00		-3.68	17.74	0.21
N,M						0.22
Stability Check x=2.60m b/h=16.0/6.0cm						
		K_{mod}=0.80	γ_M=1.30			
Nx	-13.5	$k_{c,y}$=1.00	$k_{c,z}$=0.72	-1.41	12.92	0.11
My	-0.35	$k_{crit,y}$=1.00		-3.68	17.74	0.21
N,M						0.32

Cross-s. 1	N,M,V [kN,kNm]	Coefficients		σ,τ [N/mm²]	f...d [N/mm²]	η
Shear and Torsion Check x=2.60m b/h=16.0/6.0cm						
Vz	-3.2	K_{mod}=0.80	γ_M=1.30	-0.51	2.46	0.31
V,Mt		k_{cr}=0.67				**0.31**
Co1: 1.35*G1+1.50*Q2 Buckling length: s_{ky}=0.00m s_{kz}=2.60m Tilting length: s_b=0.00m Slenderness: λ_y=0.0 λ_z=56.3 Share N(g)/N(g+q) = 63%; ψ2(Lc, σ_{max})= 0.30; K_{def}= 0.80						

Co 1: Load capacity, permanent/transient

Foot Binder: Comp.p.Grain										
Cr	$F_{c,90,d}$ [kN]	l_{ef} [cm]	b_{ef} [cm]	A_{ef} [cm²]	$k_{c,90}$	K_{mod}	γ_M	$\sigma_{c,90,d}$ [N/mm²]	$f_{c,90,d}$ [N/mm²]	η
1	-14.0	9.0	16.0	144.0	1.25	0.80	1.30	-0.97	-1.54	0.51
2	-14.0	6.0	16.0	96.0	1.25	0.80	1.30	-1.46	-1.54	**0.76**
3	-14.0	9.0	16.0	144.0	1.25	0.80	1.30	-0.97	-1.54	0.51
Co1: 1.35*G1+1.50*Q2 Pressure without consideration of eccentricities										

Co 1: Load capacity, permanent/transient

Shear Force(Flexural buckling) V_d(N) = 4.7 kN
Shear Force(Shear Loads) V_d(V) = 0.4 kN
Shear Force/Fastener V_d = 0.6 kN

Co1: 1.35*G1+1.50*Q2

Glue n	f_k N/mm²	A_{ef} [mm²]	F_{Rk} [N]	K_{mod}	γ_M	F_{Rd} [N]	n_{ef}/n
1	1.000	416000	416000	0.80	1.50	221867	0.67
1	1.000	416000	416000	0.80	1.50	221867	0.25

Fastener Analysis	F_d [N]	K_{mod}	γ_M	F_{Rd} [N]	n_{ef}/n	η
Shear Force	5702.8	0.80	1.50	221867	0.67	0.04
Tensile Force	0.0	0.80	1.50	221867	0.25	0.00
Combined stress						0.04

Decisive Utilizations

Member	Analysis	η
LOAD CAPACITY	NORMAL TEMPERATURE (MAX)	**1.00**
Column Cross-Section	Stability	**1.00**
Column Cross-Section	Stress	**0.27**
Column Cross-Section	Shear stress	**0.31**
Cross connections	Fastener	**0.04**
Foot Binder	Comp.p.Grain	**0.76**
DEFORMATION	NORMAL TEMPERATURE (MAX)	**0.56**
Deformation	Usability	**0.56**

5 HORIZONTALNE OBREMENITVE

5.1 Nihajni časi konstrukcije

5.1.1 Masa

Lastne teže:

E1:

	Faktor:	A [m^2]	Masa [kN]
Strop	1,00	400,00	1020,00
Zunanja stena E1	0,50	183,39	73,36
Zunanja stena E2	0,50	180,92	72,37
Notranja stena E1	0,50	227,52	58,02
Notranja stena E2	0,50	196,35	50,07
Okna E1	0,50	99,00	39,60
Okna E2	0,50	100,76	40,30
		∑	1353,71

E2:

	Faktor:	A [m^2]	Masse [kN]
Strop	1,00	400,00	1020,00
Zunanja stena E2	0,50	180,92	72,37
Zunanja stena E3	0,50	196,35	50,07
Notranja stena E2	0,50	100,76	40,30
Notranja stena E3	0,50	3,30	1,32
Okna E2	0,50	100,76	40,30
Okna E3	0,50	3,30	1,32
		∑	1229,16

E3:

	Faktor:	A [m^2]	Masse [kN]
Streha	1,00	61,00	91,50
Zunanja stena E3	0,50	88,83	35,53
Notranja stena E3	0,50	37,53	9,57
Okna E3	0,50	3,30	1,32
		∑	137,92

Koristna obtežba:

E1:

Kategorija:	C	
q	3,00	kN/m2
A	400,00	m2
Q	1200,00	kN
ϕ	0,50	
$\psi_{2,i}$	0,30	
$\psi_{E,i}$	0,15	

E2:

Kategorija:	H	
q	0,40	kN/m2
A	400,00	m2
Q	160,00	kN
ϕ	1,00	
$\psi_{2,i}$	0,50	
$\psi_{E,i}$	0,50	

E3:

Kategorija:	H	
q	3,00	kN/m2
A	61,00	m2
Q	183,00	kN
ϕ	1,00	
$\psi_{2,i}$	0,00	
$\psi_{E,i}$	0,00	

Masna matrika [kg]:

156395,10	0,00	0,00
0,00	133497,11	0,00
0,00	0,00	14064,22

5.1.2 Togost elementov

Upogibna togost:

$$(EI_Y)_{eff,u,ser} = \sum E_{b,i} \cdot I_{b,i} + E_{t,i} \cdot (I_{t,i} + 2 \cdot A_t \cdot \gamma_{y,u,ser} \cdot z^2)$$

Strižna togost:

$$GA = G_b \cdot A_b + G_t \cdot A_t$$

$$GA_s = \frac{GA}{1.2}$$

Podajnost:

$$D_p = \frac{H^3}{3 \cdot EI_{eff}} + \frac{H}{GA_s}$$

Steifigkeit:

$$k_p = \frac{1}{D_p}$$

	k_p [kN/m] (SLS)	
	b = 1.25 m	b = 0.625m
Zunanja stena P – Smer X	1972,66	416,44
Zunanja stena P – Smer Y	1972,66	416,44
Zunanja stena 1.N – Smer X	1500,73	282,73
Zunanja stena 1.N – Smer Y	1500,73	282,73
Zunanja stena 2.N – Smer X	1500,73	282,73
Zunanja stena 2.N – Smer Y	1500,73	282,73
Notranja stena P – Smer X	3183,30	655,00
Notranja stena P – Smer Y	3183,30	655,00
Notranja stena 1.N – Smer X	3183,30	655,00
Notranja stena 1.N – Smer Y	3152,74	604,44
Notranja stena 2.N – Smer X	3152,74	604,44
Notranja stena 2.N – Smer Y	3152,74	604,44

Dinamična matrika DM_X :

1,27E-03	1,08E-03	1,14E-04
1,27E-03	2,32E-03	2,45E-04
1,27E-03	2,32E-03	6,65E-04

Dinamična matrika DM_Y :

1,44E-03	1,23E-03	1,30E-04
1,44E-03	2,56E-03	2,70E-04
1,44E-03	2,56E-03	9,14E-04

Nihajni časi:

$T_{1,x}$	0,363	s
$T_{2,x}$	0,148	s
$T_{3,x}$	0,118	s
$T_{1,y}$	0,385	s
$T_{2,y}$	0,164	s
$T_{3,y}$	0,138	s

5.2 Veter

we,D	0,32	kN/m2
we,E	0,20	kN/m2

Ax,1	80,00	m2
Ax,2	78,00	m2
Ax,3	43,00	m2

Ay,1	60,00	m2
Ay,2	45,00	m2
Ay,3	32,00	m2

Fx,1	53,04	kN
Fx,2	51,71	kN
Fx,3	28,51	kN
∑	133,26	kN

Fy,1	39,78	kN
Fy,2	29,84	kN
Fy,3	21,22	kN
∑	90,83	kN

5.3 Potres

Typ	S	TB [s]	TC [s]	TD [s]
D	1,35	0,2	0,8	2

q	3,00

g	0,10	m/s2
γ_I	1,20	m/s2
a_g	1,18	m/s2

T_x	0,36	s
T_y	0,38	s

$S_d(T)$	1,32

λ	1,00	
F_b	402,41	kN

$F_{x,1}$	152,45	kN
$F_{x,2}$	223,07	kN
$F_{x,3}$	26,89	kN
∑	402,41	kN

$F_{y,1}$	154,55	kN
$F_{y,2}$	219,90	kN
$F_{y,3}$	27,97	kN
∑	402,41	kN

5.4 Masno središče, središče togosti in ekscentričnost

Masno središče:

$$x_{j,i} = \frac{\sum M_i \cdot x_i}{\sum M_{ii}} \qquad y_{j,i} = \frac{\sum M_i \cdot y_i}{\sum M_{ii}}$$

E1:

$x_{1,T}$	$y_{1,T}$	
12,95	9,95	m

E2:

$x_{2,T}$	$y_{2,T}$	
12,90	10,14	m

E3:

$x_{3,T}$	$y_{3,T}$	
10,57	8,31	m

Središče togosti:

$$x_s = \frac{\sum b_y \cdot k_p \cdot x_i}{\sum b_{yi} \cdot k_p} \qquad y_s = \frac{\sum b_x \cdot k_p \cdot y_i}{\sum b_{xi} \cdot k_p}$$

E1:

x_s	12,57	m
y_s	9,16	m

E2:

x_s	12,89	m
y_s	7,84	m

E3:

x_s	9,79	m
y_s	8,21	m

Ekscentričnost:

$$e_x = x_{i,T} - x_{i,s} \qquad e_y = y_{i,T} - y_{i,s}$$

$$e_{ai} = \pm 0,05 \cdot L_i$$

E1:

MS_1:

$e_{x,+}$	1,52
$e_{x,-}$	-0,76
$e_{y,+}$	1,92
$e_{y,-}$	-0,32

MS_2:

$e_{x,+}$	1,46
$e_{x,-}$	-0,81
$e_{y,+}$	2,10
$e_{y,-}$	-0,13

MS3:

$e_{x,+}$	-0,87
$e_{x,-}$	-3,14
$e_{y,+}$	0,27
$e_{y,-}$	-1,97

E2:

MS_2:

$e_{x,+}$	1,15
$e_{x,-}$	-1,12
$e_{y,+}$	3,42
$e_{y,-}$	1,18

MS_3:

$e_{x,+}$	-1,18
$e_{x,-}$	-3,45
$e_{y,+}$	1,58
$e_{y,-}$	-0,66

E3:

MS_3:

$e_{x,+}$	1,24
$e_{x,-}$	0,33
$e_{y,+}$	0,43
$e_{y,-}$	-0,24

5.5 Horizontalna obremenitev stenskih elementov

Horizontalna sila na steno v X-smeri:

$$H_{xi} = \frac{b_{xi} \cdot k_p}{\sum b_{xi} \cdot k_p} \cdot F_x + \frac{F_x \cdot e_y \cdot s_{yi} \cdot b_{xi} \cdot k_p}{\sum b_{xi} \cdot k_p \cdot s_{yi}^{\,2} + \sum b_{yi} \cdot k_p \cdot s_{xi}^{\,2}}$$

$$H_{yi} = \frac{F_x \cdot e_y \cdot s_{xi} \cdot b_{yi} \cdot k_p}{\sum b_{xi} \cdot k_p \cdot s_{yi}^{\,2} + \sum b_{yi} \cdot k_p \cdot s_{xi}^{\,2}}$$

Horizontalna sila na steno v Y-smeri:

$$H_{yi} = \frac{b_{yi} \cdot k_p}{\sum b_{yi} \cdot k_p} \cdot F_y + \frac{F_y \cdot e_x \cdot s_{xi} \cdot b_{yi} \cdot k_p}{\sum b_{xi} \cdot k_p \cdot s_{yi}^{\,2} + \sum b_{yi} \cdot k_p \cdot s_{xi}^{\,2}}$$

$$H_{xi} = \frac{F_y \cdot e_x \cdot s_{yi} \cdot b_{xi} \cdot k_p}{\sum b_{xi} \cdot k_p \cdot s_{yi}^{\,2} + \sum b_{yi} \cdot k_p \cdot s_{xi}^{\,2}}$$

Skupna obremenitev na stenski element dolžine 1,25m:

$$F_{b,1.25} = \frac{1{,}25}{b_{xi}} \cdot \max\left\langle (H_{xi} + 0.3H_{yi}); (H_{yi} + 0.3H_{xi}) \right.$$

5.6 Nosilnost stenskih elementov

k_{mod}	1,10
γ_M	1,00

Napetosti v mavčno-vlakneni plošči:

$$\sigma_{t,0,d} = \frac{M_y \cdot E_b}{(EI)_{eff}} \cdot \frac{b}{2} - \frac{N_{fav} \cdot E_b}{(EA)_{eff}}$$

M_y – Moment na panel zaradi horizontalne sile

N_{fav} – Osna sila zaradi lastne teže konstrukcije (deluje ugodno)

Natezna trdnost mavčno-vlaknene plošče:

$$f_{t,0,k} = 0{,}240 \ \frac{kN}{cm^2}$$

$$f_{t,0,d} = 0{,}166 \ \frac{kN}{cm^2}$$

Nosilnost stenskega elementa z eno OSB3 obložno ploščo:

$$F_{i,v,Rk} = F_{v,Rk} \cdot \frac{b_i}{s} \cdot c_i \qquad c_i = \min\left\{1; \frac{b_i}{b_0}\right\} \qquad b_0 = \frac{h}{2}$$

$$F_{v,Rk,Met.A} = 0.78\,kN$$

	$F_{i,v,Rd}$ [kN]		
	s [m]	b = 1.25 m	b = 0.625m
Zunanja stena P – Smer X	0,035	25,58	6,39
Zunanja stena P – Smer Y	0,035	25,58	6,39
Zunanja stena 1.N – Smer X	0,050	17,90	4,48
Zunanja stena 1.N – Smer Y	0,050	17,90	4,48
Zunanja stena 2.N – Smer X	0,075	11,94	2,98
Zunanja stena 2.N – Smer Y	0,075	11,94	2,98
Notranja stena P – Smer X	0,050	35,81	8,95
Notranja stena P – Smer Y	0,050	35,81	8,95
Notranja stena 1.N – Smer X	0,075	23,87	5,97
Notranja stena 1.N – Smer Y	0,075	23,87	5,97
Notranja stena 2.N – Smer X	0,075	11,94	2,98
Notranja stena 2.N – Smer Y	0,075	11,94	2,98

5.7 Dimenzioniranje stenskih elementov

E1:

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
1-Z-X-1	6,53	0,00	25,58	25,52	OSB
1-Z-X-2	0,65	0,00	6,39	10,14	OSB
1-Z-X-3	5,84	0,00	25,58	22,82	OSB
1-Z-X-4	0,77	0,00	6,39	12,05	OSB
1-Z-X-5	0,77	0,00	6,39	12,05	OSB
1-Z-X-6	7,75	0,00	25,58	30,32	OSB
1-Z-X-7	0,77	0,00	6,39	12,05	OSB
1-Z-X-8	0,77	0,00	6,39	12,05	OSB
1-Z-X-9	7,11	0,00	25,58	27,80	OSB
1-Z-X-10	7,11	0,00	25,58	27,80	OSB
1-Z-X-11	7,11	0,00	25,58	27,80	OSB
1-Z-X-12	7,11	0,00	25,58	27,80	OSB
1-Z-X-13	0,71	0,00	6,39	11,05	OSB
1-Z-X-14	0,65	0,00	6,39	10,17	OSB
1-Z-X-15	0,65	0,00	6,39	10,17	OSB
1-Z-X-16	0,65	0,00	6,39	10,17	OSB
1-Z-X-17	7,11	0,00	25,58	27,80	OSB
1-Z-X-18	7,11	0,00	25,58	27,80	OSB

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
1-Z-Y-1	7,85	0,00	25,58	30,69	OSB
1-Z-Y-2	7,42	0,00	25,58	29,00	OSB
1-Z-Y-3	0,74	0,00	6,39	11,55	OSB
1-Z-Y-4	0,69	0,00	6,39	10,76	OSB
1-Z-Y-5	6,93	0,00	25,58	27,09	OSB
1-Z-Y-6	7,41	0,00	25,58	28,96	OSB
1-Z-Y-7	7,41	0,00	25,58	28,96	OSB
1-Z-Y-8	7,41	0,00	25,58	28,96	OSB
1-Z-Y-9	0,65	0,00	6,39	10,19	OSB
1-Z-Y-10	7,06	0,00	25,58	27,62	OSB

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
1-N-X-1	11,15	0,25	35,81	31,13	OSB
1-N-X-2	11,15	0,25	35,81	31,13	OSB
1-N-X-3	10,54	0,23	35,81	29,44	OSB
1-N-X-4	10,10	0,22	35,81	28,21	OSB
1-N-X-5	9,42	0,21	35,81	26,32	OSB
1-N-X-6	10,01	0,22	35,81	27,96	OSB
1-N-X-7	10,01	0,22	35,81	27,96	OSB
1-N-X-8	10,01	0,22	35,81	27,96	OSB
1-N-X-9	11,12	0,24	35,81	31,05	OSB
1-N-X-10	11,12	0,24	35,81	31,05	OSB
1-N-X-11	10,69	0,24	35,81	29,86	OSB

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
1-N-Y-1	12,16	0,27	35,81	33,95	OSB
1-N-Y-2	12,35	0,27	35,81	34,49	OSB
1-N-Y-3	1,15	0,08	8,95	12,90	OSB
1-N-Y-4	1,14	0,07	8,95	12,76	OSB
1-N-Y-5	1,03	0,07	8,95	11,46	OSB
1-N-Y-6	1,03	0,07	8,95	11,46	OSB
1-N-Y-7	1,03	0,07	8,95	11,46	OSB
1-N-Y-8	11,03	0,24	35,81	30,81	OSB
1-N-Y-9	1,03	0,07	8,95	11,47	OSB
1-N-Y-10	1,03	0,07	8,95	11,47	OSB
1-N-Y-11	10,82	0,24	35,81	30,23	OSB
1-N-Y-12	10,82	0,24	35,81	30,23	OSB
1-N-Y-13	11,26	0,25	35,81	31,46	OSB
1-N-Y-14	11,13	0,25	35,81	31,08	OSB
1-N-Y-15	10,82	0,24	35,81	30,23	OSB

E2:

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
2-Z-X-1	0,52	0,00	4,48	11,55	OSB
2-Z-X-2	5,81	0,00	17,90	32,47	OSB
2-Z-X-3	0,52	0,00	4,48	11,55	OSB
2-Z-X-4	0,52	0,00	4,48	11,55	OSB
2-Z-X-5	3,74	0,00	17,90	20,89	OSB
2-Z-X-6	3,56	0,00	17,90	19,88	OSB
2-Z-X-7	4,57	0,00	17,90	25,55	OSB
2-Z-X-8	4,57	0,00	17,90	25,55	OSB
2-Z-X-9	4,57	0,00	17,90	25,55	OSB
2-Z-X-10	4,57	0,00	17,90	25,55	OSB
2-Z-X-11	4,57	0,00	17,90	25,55	OSB
2-Z-X-12	0,41	0,00	4,48	9,09	OSB
2-Z-X-13	0,41	0,00	4,48	9,09	OSB
2-Z-X-14	4,58	0,00	17,90	25,55	OSB
2-Z-X-15	3,56	0,00	17,90	19,88	OSB

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
2-Z-Y-1	4,63	0,00	17,90	25,84	OSB
2-Z-Y-2	4,00	0,00	17,90	22,32	OSB
2-Z-Y-3	4,26	0,00	17,90	23,79	OSB
2-Z-Y-4	4,26	0,00	17,90	23,79	OSB
2-Z-Y-5	0,38	0,00	4,48	8,47	OSB
2-Z-Y-6	4,26	0,00	17,90	23,79	OSB

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
2-N-X-1	7,68	0,17	23,87	32,17	OSB
2-N-X-2	8,30	0,18	23,87	34,78	OSB
2-N-X-3	8,30	0,18	23,87	34,78	OSB
2-N-X-4	8,30	0,18	23,87	34,78	OSB
2-N-X-5	8,30	0,18	23,87	34,78	OSB

2-N-X-6	7,68	0,17	23,87	32,17	OSB
2-N-X-7	7,68	0,17	23,87	32,17	OSB
2-N-X-8	7,06	0,16	23,87	29,59	OSB
2-N-X-9	6,86	0,15	23,87	28,73	OSB
2-N-X-10	8,08	0,18	23,87	33,85	OSB
2-N-X-11	8,08	0,18	23,87	33,85	OSB
2-N-X-12	9,03	0,20	23,87	37,85	OSB
2-N-X-13	9,03	0,20	23,87	37,85	OSB

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
2-N-Y-1	7,86	0,19	23,87	32,94	OSB
2-N-Y-2	7,39	0,18	23,87	30,96	OSB
2-N-Y-3	7,54	0,18	23,87	31,57	OSB
2-N-Y-4	8,36	0,20	23,87	35,01	OSB
2-N-Y-5	7,86	0,19	23,87	32,91	OSB
2-N-Y-6	0,67	0,05	5,97	11,30	OSB
2-N-Y-7	0,67	0,05	5,97	11,30	OSB
2-N-Y-8	7,54	0,18	23,87	31,59	OSB
2-N-Y-9	8,35	0,20	23,87	35,00	OSB
2-N-Y-10	7,54	0,18	23,87	31,59	OSB
2-N-Y-11	7,54	0,18	23,87	31,60	OSB

E3:

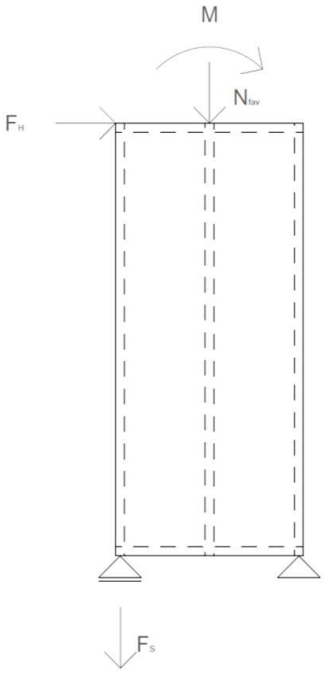
		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
3-Z-X-1	1,25	0,00	11,94	10,45	OSB
3-Z-X-2	1,24	0,00	11,94	10,36	OSB

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
3-Z-Y-1	2,10	0,00	11,94	17,63	OSB
3-Z-Y-2	2,29	0,00	11,94	19,17	OSB
3-Z-Y-3	2,29	0,00	11,94	19,18	OSB

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
3-N-X-1	2,29	0,05	11,94	20,73	MVP
3-N-X-2	2,45	0,06	11,94	22,16	MVP

		MVP	OSB3		
Stenski element:	$F_{b,1.25}$	$\sigma_{t,0,d}$ [kN/cm2]	$F_{i,v,Rd}$ [kN]	Izkoriščenost [%]	
3-N-Y-1	3,71	0,09	11,94	33,59	MVP
3-N-Y-2	3,68	0,09	11,94	33,26	MVP
3-N-Y-3	0,34	0,02	2,98	9,28	MVP
3-N-Y-4	0,34	0,02	2,98	9,28	MVP
3-N-Y-5	3,70	0,09	11,94	33,49	MVP

5.8 Sidranje stenskih elementov



$$F_s = \frac{2 \cdot F_H \cdot H + 2 \cdot M - N_{fav} \cdot b}{b}$$

E1:

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
1-Z-X-1	6,53	3,75	13,79
1-Z-X-2	0,65	1,88	2,17
1-Z-X-3	5,84	3,75	12,13
1-Z-X-4	0,77	1,88	2,76
1-Z-X-5	0,77	4,06	4,15
1-Z-X-6	7,75	8,13	28,50
1-Z-X-7	0,77	4,06	4,15
1-Z-X-8	0,77	4,06	4,15
1-Z-X-9	7,11	8,13	23,98
1-Z-X-10	7,11	8,13	23,98
1-Z-X-11	7,11	8,13	23,98
1-Z-X-12	7,11	8,13	23,98
1-Z-X-13	0,71	4,06	23,32
1-Z-X-14	0,65	1,88	2,18
1-Z-X-15	0,65	1,88	2,18
1-Z-X-16	0,65	1,88	2,18
1-Z-X-17	7,11	8,13	13,98
1-Z-X-18	7,11	8,13	23,98

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
1-Z-Y-1	7,85	8,13	25,88
1-Z-Y-2	7,42	3,75	15,93
1-Z-Y-3	0,74	1,88	2,61
1-Z-Y-4	0,69	4,06	20,45
1-Z-Y-5	6,93	8,13	22,15
1-Z-Y-6	7,41	8,13	23,94
1-Z-Y-7	7,41	8,13	14,62
1-Z-Y-8	7,41	8,13	23,94
1-Z-Y-9	0,65	1,88	2,19
1-Z-Y-10	7,06	3,75	15,08

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
1-N-X-1	11,15	0,00	26,75
1-N-X-2	11,15	0,00	26,75
1-N-X-3	10,54	0,00	25,30

1-N-X-4	10,10	0,00	24,24
1-N-X-5	9,42	0,00	22,62
1-N-X-6	10,01	0,00	24,03
1-N-X-7	10,01	0,00	24,03
1-N-X-8	10,01	0,00	24,03
1-N-X-9	11,12	0,00	26,69
1-N-X-10	11,12	0,00	26,69
1-N-X-11	10,69	0,00	25,66

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
1-N-Y-1	12,16	0,00	29,17
1-N-Y-2	12,35	0,00	29,64
1-N-Y-3	1,15	0,00	5,54
1-N-Y-4	1,14	0,00	5,48
1-N-Y-5	1,03	0,00	4,92
1-N-Y-6	1,03	0,00	4,92
1-N-Y-7	1,03	0,00	4,92
1-N-Y-8	11,03	0,00	26,48
1-N-Y-9	1,03	0,00	4,93
1-N-Y-10	1,03	0,00	4,93
1-N-Y-11	10,82	0,00	25,98
1-N-Y-12	10,82	0,00	25,98
1-N-Y-13	11,26	0,00	27,03
1-N-Y-14	11,13	0,00	26,71
1-N-Y-15	10,82	0,00	25,98

E2:

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
2-Z-X-1	0,52	0,00	2,48
2-Z-X-2	5,81	0,00	13,95
2-Z-X-3	0,52	0,00	2,48
2-Z-X-4	0,52	0,00	2,48
2-Z-X-5	3,74	0,00	8,97
2-Z-X-6	3,56	0,00	8,54
2-Z-X-7	4,57	0,00	10,98
2-Z-X-8	4,57	0,00	10,98
2-Z-X-9	4,57	0,00	10,98

2-Z-X-10	4,57	0,00	10,98
2-Z-X-11	4,57	0,00	10,98
2-Z-X-12	0,41	0,00	1,95
2-Z-X-13	0,41	0,00	1,95
2-Z-X-14	4,58	0,00	10,98
2-Z-X-15	3,56	0,00	8,54

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
2-Z-Y-1	4,63	0,00	11,10
2-Z-Y-2	4,00	0,00	9,59
2-Z-Y-3	4,26	0,00	10,22
2-Z-Y-4	4,26	0,00	10,22
2-Z-Y-5	0,38	0,00	1,82
2-Z-Y-6	4,26	0,00	10,22

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
2-N-X-1	7,68	0,00	18,43
2-N-X-2	8,30	0,00	19,93
2-N-X-3	8,30	0,00	19,93
2-N-X-4	8,30	0,00	19,92
2-N-X-5	8,30	0,00	19,92
2-N-X-6	7,68	0,00	18,43
2-N-X-7	7,68	0,00	18,43
2-N-X-8	7,06	0,00	16,95
2-N-X-9	6,86	0,00	16,46
2-N-X-10	8,08	0,00	19,39
2-N-X-11	8,08	0,00	19,39
2-N-X-12	9,03	0,00	21,68
2-N-X-13	9,03	0,00	21,68

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
2-N-Y-1	7,86	0,00	18,87
2-N-Y-2	7,39	0,00	17,74
2-N-Y-3	7,54	0,00	18,09
2-N-Y-4	8,36	0,00	20,06
2-N-Y-5	7,86	0,00	18,86
2-N-Y-6	0,67	0,00	3,24
2-N-Y-7	0,67	0,00	3,24

2-N-Y-8	7,54	0,00	18,10
2-N-Y-9	8,35	0,00	20,05
2-N-Y-10	7,54	0,00	18,10
2-N-Y-11	7,54	0,00	18,10

E3:

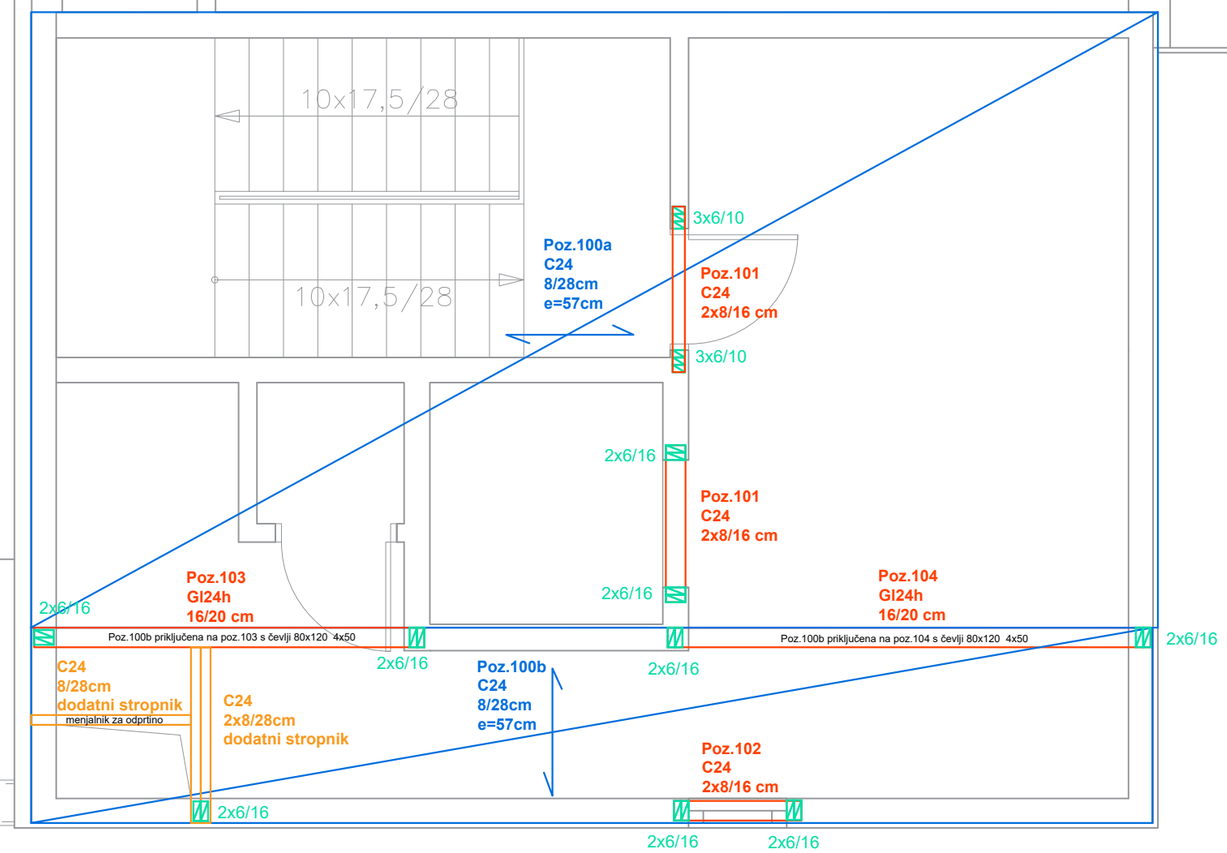
Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
3-Z-X-1	1,25	0,00	2,99
3-Z-X-2	1,24	0,00	2,97

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
3-Z-Y-1	2,10	0,00	5,05
3-Z-Y-2	2,29	0,00	5,49
3-Z-Y-3	2,29	0,00	5,49

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
3-N-X-1	2,29	0,00	5,50
3-N-X-2	2,45	0,00	5,88

Stenski element:	$F_{b,1.25}$ [kN]	N_{SLS} [kN]	F_S [kN]
3-N-Y-1	3,71	0,00	8,91
3-N-Y-2	3,68	0,00	8,82
3-N-Y-3	0,34	0,00	1,62
3-N-Y-4	0,34	0,00	1,62
3-N-Y-5	3,70	0,00	8,89

POZICIJSKI NAČRT 2. NADSTROPJA



-Kjer je skupaj več pokončnikov v steni, mora biti posponkan vsak pokončnik.

-Glede na steber v nadstropju, mora bit v stropu enaka površina lesa (za prenos obtežbe iz zgornje etaže na spodnjo).

-Pod vsakem sidru v nadstropju je potreben les v stropu, za namestitev strižnih in dvižnih sider.

-Če je potreben menjalnik v stropu (npr. okoli dimnika) se doda levo in desno dodaten stropnik.

-Če ni posebej določeno je potrebno vsak jekleni nosilec konstrukcijsko povezat s stebrom (jeklena ploščica + 2 vijaka fi10)

-Lesene konstrukcije izvedene iz certificiranega lesa zahtevane kvalitete

-Vse delavniške načrte za lesene in jeklene konstrukcije izvede izvajalec in jih pred izvedbo pošlje projektantu gradbenih konstrukcij v pregled in potrditev!

VSAK, pokončnik, ki je v stenskih elementih mora bit posponkan (MVP ali OSB plošča) na razdalji min 7,5cm!

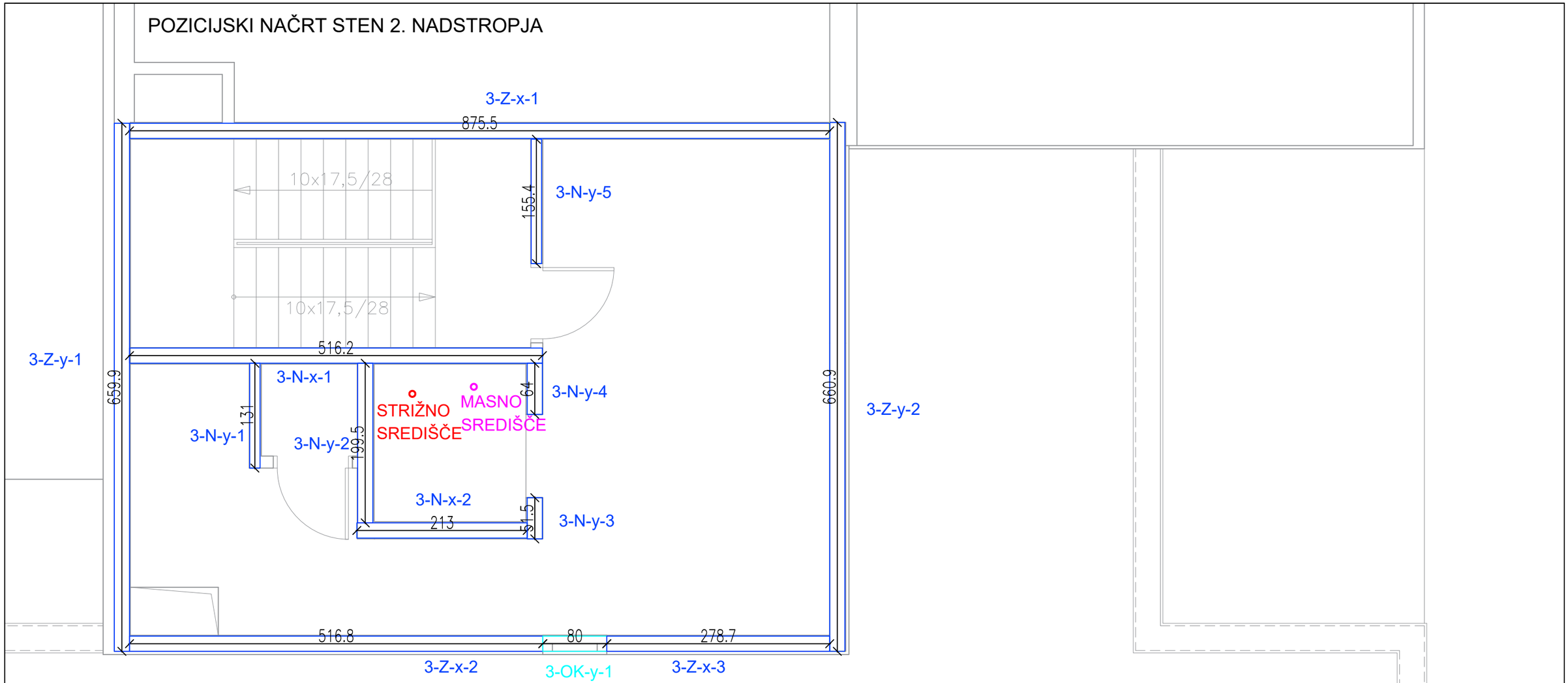
1x6/16		1x6/10	
2x6/16		2x6/10	
3x6/16		3x6/10	

probit d.o.o.
Projektiranje gradbenih objektov

KONTAKT:
Partizanska cesta 5
2000 Maribor
tel: 041 267 12
email: probit1@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	**VSEBINA DELA NAČRTA**	Pozicijski načrt 2. nastropja		
NAČRT ŠT.:	22-P035-K				
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	**ODGOV. VODJA PROJEKTA**	BRANKO HOJNIK, u.d.i.a.	ZAPS A-0949	
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	**ODGOV. PROJEKTANT FAZE**	VID LEŠIČ, mag. inž. grad.	IZS PI G-4647	
		SODELAVCI			
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	**TA LIST NADOMEŠČA LIST ŠT.:**			
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	**MERILO:**	**VRSTA PR. DOK.:** PZI	**DATUM:** MAJ, 2022	**LIST ŠT.:** 1

POZICIJSKI NAČRT STEN 2. NADSTROPJA



OBLOGE:

Zunanje stene:

- Smer X: 1X zunanja obložna plošča OSB3 15mm; Razdalja med sponkicami: s=7,5 cm
- Smer Y: 1X zunanja obložna plošča OSB3 15mm; Razdalja med sponkicami: s=7,5 cm

Notranje stene:

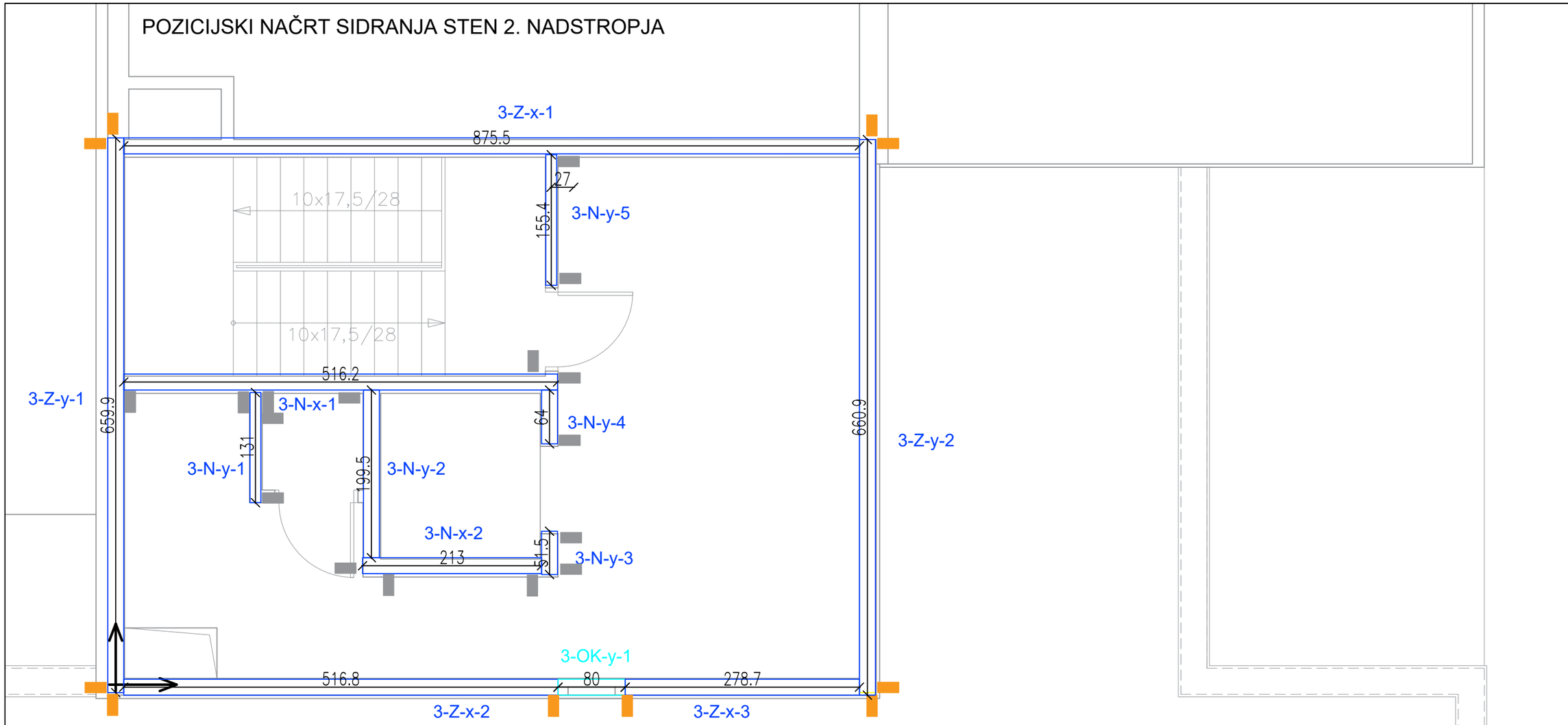
- Smer X: 2X MVP 15mm; Razdalja med sponkicami: s=7.5 cm
- Smer Y: 2X MVP 15mm; Razdalja med sponkicami: s=7,5 cm

probit d.o.o.
Projektiranje gradbenih objektov

KONTAKT:
Partizanska cesta 5
2000 Maribor
tel: 041 267 12
email: probit1@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	VSEBINA DELA NAČRTA	Pozicijski načrt sten 2. nastropja		
NAČRT ŠT.:	22-P035-K				
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. VODJA PROJEKTA	BRANKO HOJNIK, u.d.i.a.	ZAPS A-0949	
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. PROJEKTANT FAZE	VID LEŠIČ, mag. inž. grad.	IZS PI G-4647	
		SODELAVCI			
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	TA LIST NADOMEŠČA LIST ŠT.:			
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	MERILO:	VRSTA PR. DOK.: PZI	DATUM: MAJ, 2022	LIST ŠT.: 2

POZICIJSKI NAČRT SIDRANJA STEN 2. NADSTROPJA



Dvižna sidra:

Würth kotni veznik TYP A z rebrom: 90x105x105x1,5; Žičniki: 22X 4,0X50

Würth perforirana pločevina: 200x120x2mm; Žičniki: 2X 12X 4,0X50

Strižna sidra:

ZUNANJE STENE:

Würth kotni veznik TYP A z rebrom: 90x105x105x1,5; Žičniki: 4,0X50

NOTRANJE STENE:

2x Würth ASSY plus VG 6X160

Strižna sidra so nameščena na vseh stenah na razmaku e=80 cm.

Zaradi zagotovitve zadostnih odmikov od roba pokončnika je potrebno uporabiti pokončnik širine 8 cm (sidra širine 60 in 65 mm) oziroma 10 cm (sidro širine 80 mm)!

Zaradi zagotovitve zadostnih odmikov žičnikov od obremenjenega roba (razdalja od spodnjega roba pokončnika do prvega žičnika) je potrebno pustiti brez žičnikov toliko spodnjih lukenj, da ta razdalja znaša 6 cm (2 vrsti pri HTA sidrih in 6 vrst pri Vplus sidrih)!

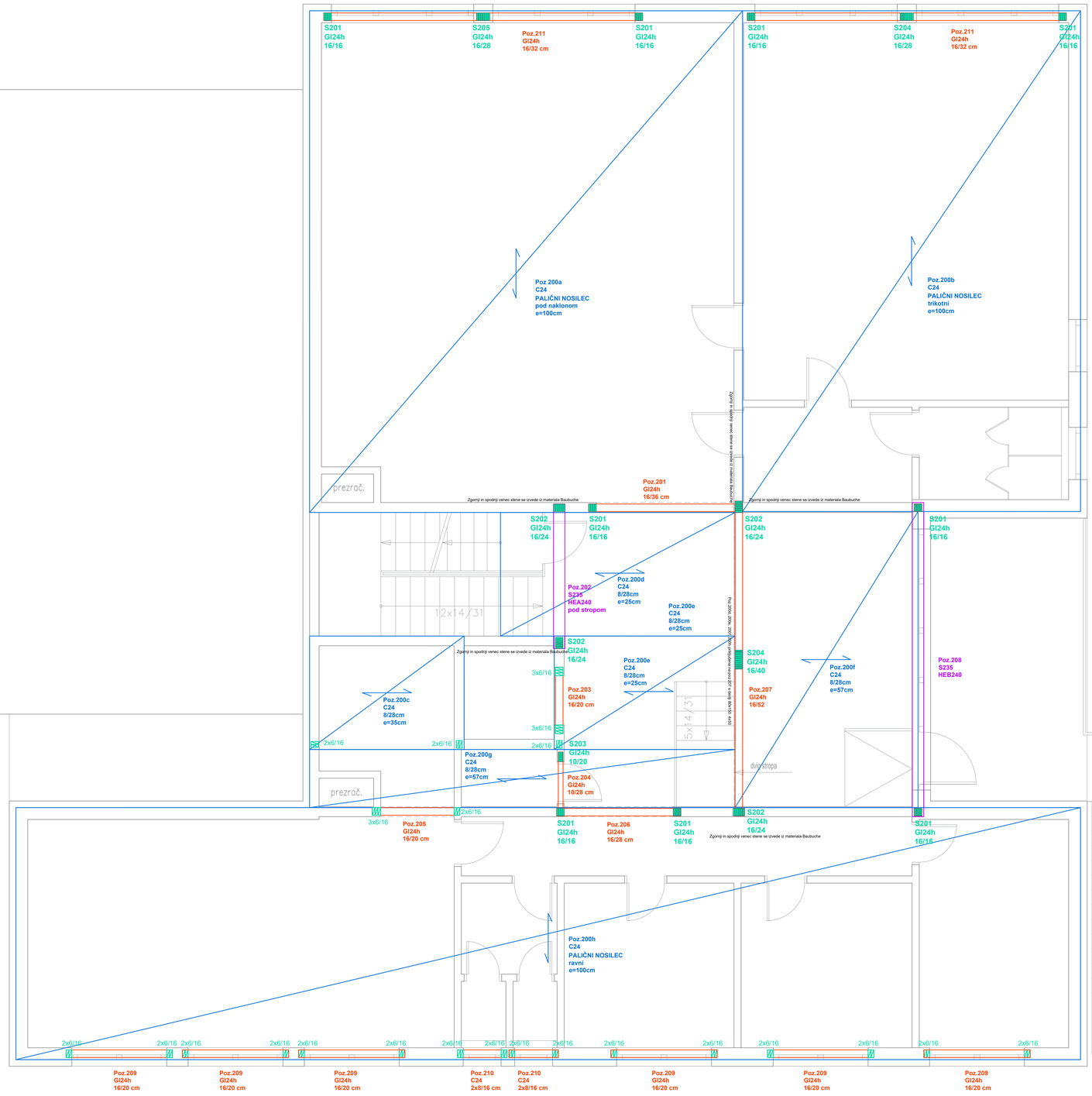
Kjer je na enem mestu predvideno večje število sider (2, 3) je potrebno namestiti dodatne pokončnike, za zagotovitev prenosa sil in možnosti sidranja!

probit d.o.o.
Projektiranje gradbenih objektov

KONTAKT:
Partizanska cesta 5
2000 Maribor
tel: 041 267 12
email: probit1@siol.net

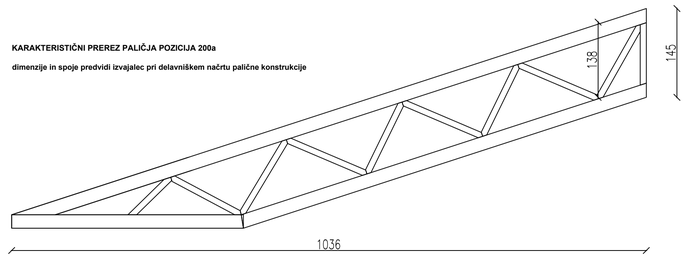
PROJEKT ŠT.:	01/04-2021-PZI	VSEBINA DELA NAČRTA	Pozicijski načrt sidranja sten 2. nadstropja	
NAČRT ŠT.:	22-P035-K			
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. VODJA PROJEKTA	BRANKO HOJNIK, u.d.i.a.	ZAPS A-0949
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. PROJEKTANT FAZE	VID LEŠIČ, mag. inž. grad.	IZS PI G-4647
		SODELAVCI		
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	TA LIST NADOMEŠČA LIST ŠT.:		
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	MERILO:	VRSTA PR. DOK.: PZI	DATUM: MAJ, 2022 / LIST ŠT.: 3

POZICIJSKI NAČRT 1. NADSTROPJA



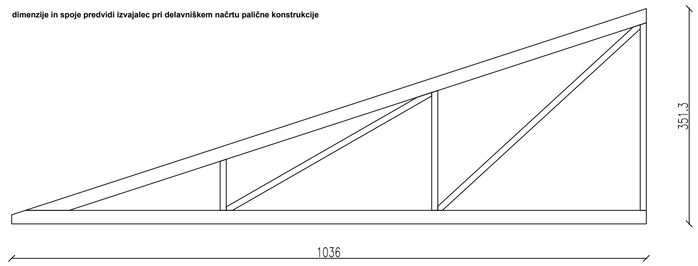
KARAKTERISTIČNI PREREZ PALIČJA POZICIJA 200a

dimenzije in spoje predvidi izvajalec pri delavniškem načrtu palične konstrukcije



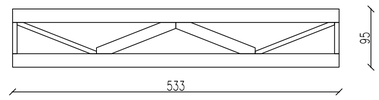
KARAKTERISTIČNI PREREZ PALIČJA POZICIJA 200b

dimenzije in spoje predvidi izvajalec pri delavniškem načrtu palične konstrukcije



KARAKTERISTIČNI PREREZ PALIČJA POZICIJA 200i

dimenzije in spoje predvidi izvajalec pri delavniškem načrtu palične konstrukcije



-Kjer je skupaj več pokončnikov v steni, mora biti posponkan vsak pokončnik.

-Glede na steber v nadstropju, mora bit v stropu enaka površina lesa (za prenos obtežbe iz zgornje etaže na spodnjo).

-Pod vsakem sidru v nadstropju je potreben les v stropu, za namestitev strižnih in dvižnih sider.

-Če je potreben menjalnik v stropu (npr. okoli dimnika) se doda levo in desno dodaten stropnik.

-Če ni posebej določeno je potrebno vsak jekleni nosilec konstrukcijsko povezat s stebrom (jeklena ploščica + 2 vijaka fi10)

-Lesene konstrukcije izvedene iz certificiranega lesa zahtevane kvalitete

-Vse delavniške načrte za lesene in jeklene konstrukcije izvede izvajalec in jih pred izvedbo pošlje projektantu gradbenih konstrukcij v pregled in potrditev!

VSAK, pokončnik, ki je v stenskih elementih mora bit posponkan (MVP ali OSB plošča) na razdalji min 7,5cm!

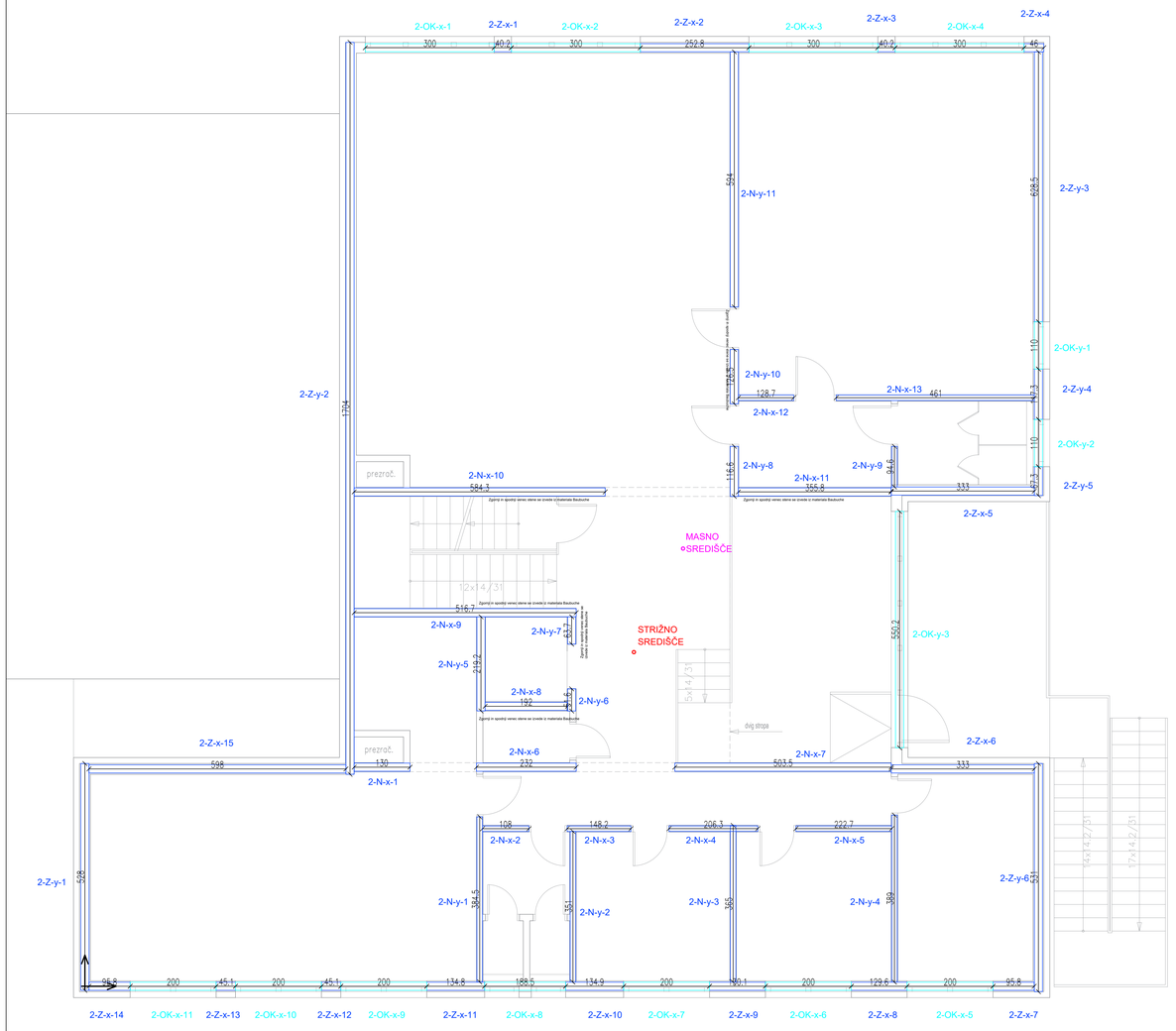
1x6/16		1x6/10	
2x6/16		2x6/10	
3x6/16		3x6/10	

probit d.o.o.
Projektiranje gradbenih objektov

KONTAKT:
Partizanska cesta 5
2000 Maribor
tel: 041 267 12
email: probit1@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	**VSEBINA DELA NAČRTA**	Pozicijski načrt 1. nadstropja		
NAČRT ŠT.:	22-P035-K				
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	**ODGOV. VODJA PROJEKTA**	BRANKO HOJNIK, u.d.i.a.		ZAPS A-0949
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	**ODGOV. PROJEKTANT FAZE**	VID LEŠIČ, mag. inž. grad.		IZS PI G-4647
		SODELAVCI			
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	**TA LIST NADOMEŠČA LIST ŠT.:**			
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	**MERILO:**	**VRSTA PR. DOK.:** PZI	**DATUM:** MAJ, 2022	**LIST ŠT.:** 4

POZICIJSKI NAČRT STEN 1. NADSTROPJA



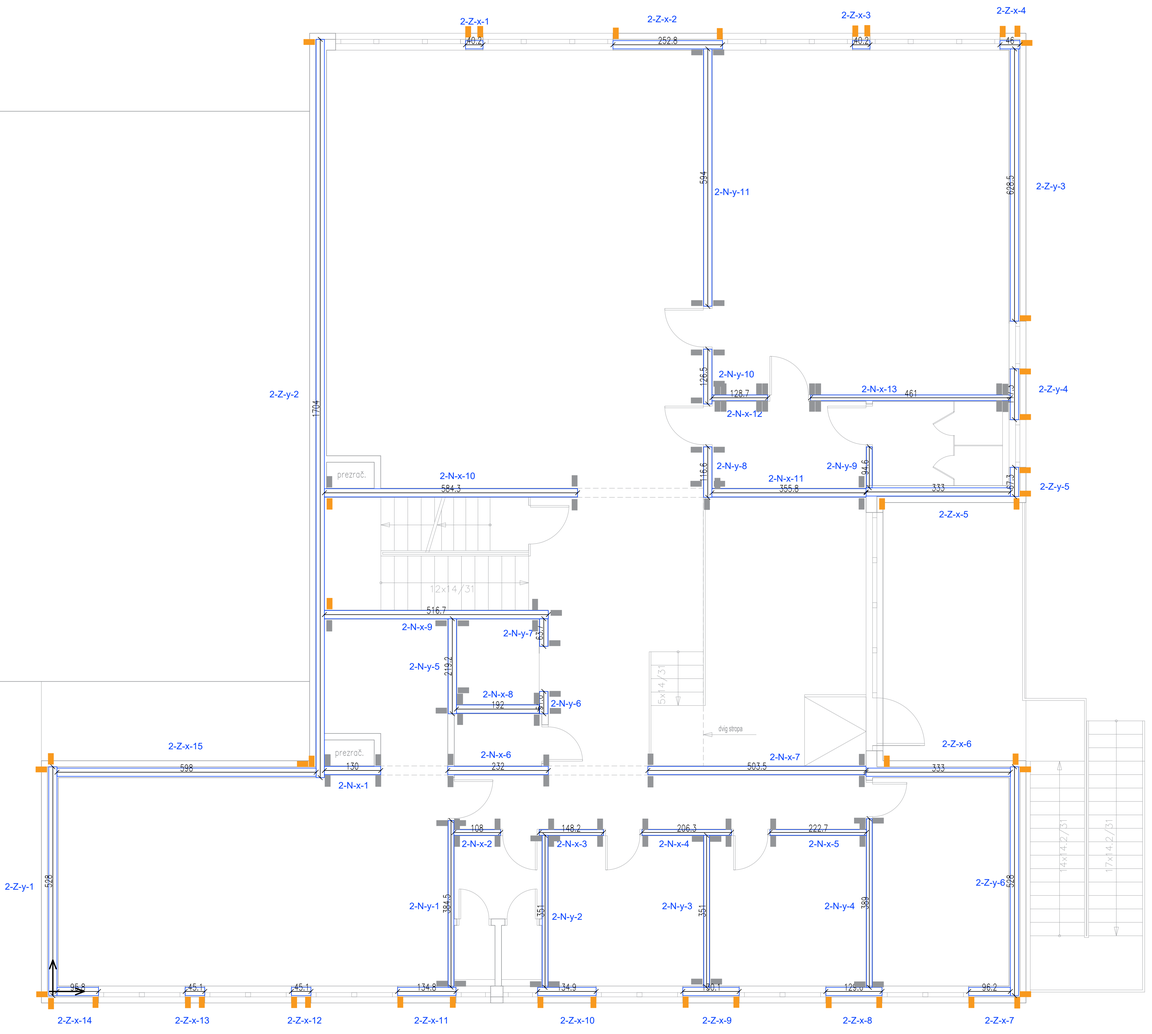
OBLOGE:

Zunanje stene:
- Smer X: 1X zunanja obložna plošča OSB3 15mm; Razdalja med sponkicami: s=5,0 cm
- Smer Y: 2X zunanja obložna plošča OSB3 15mm; Razdalja med sponkicami: s=5,0 cm

Notranje stene:
- Smer X: 2X OSB3 15mm; Razdalja med sponkicami: s=5,0 cm
- Smer Y: 2X OSB3 15mm; Razdalja med sponkicami: s=5,0 cm

Vse stene imajo pokončnike zgoščene vsaj na e=57 cm, razen, če je navedeno drugače!

POZICIJSKI NAČRT SIDRANJA STEN 1. NADSTROPJA



Dvižna sidra:
- Würth kotni veznik TYP A z rebrom: 90x105x105x1,5; Žebniki: 22X 4,0X50
- Würth perforirana ploščevina: 200x120x2mm; Žebniki: 2X 12X 4,0X50

Strižna sidra:

ZUNANJE STENE:
- Würth kotni veznik TYP A z rebrom: 90x105x105x1,5; Žebniki: 4,0X50

NOTRANJE STENE:
- 2x Würth ASSY plus VG 6X160

Strižna sidra so nameščena na vseh stenah na razmaku e=100 cm.

Zaradi zagotovitve zadostnih odmikov od roba pokončnika je potrebno uporabiti pokončnik širine 8 cm (sidra širine 60 in 65 mm) oziroma 10 cm (sidro širine 80 mm)!

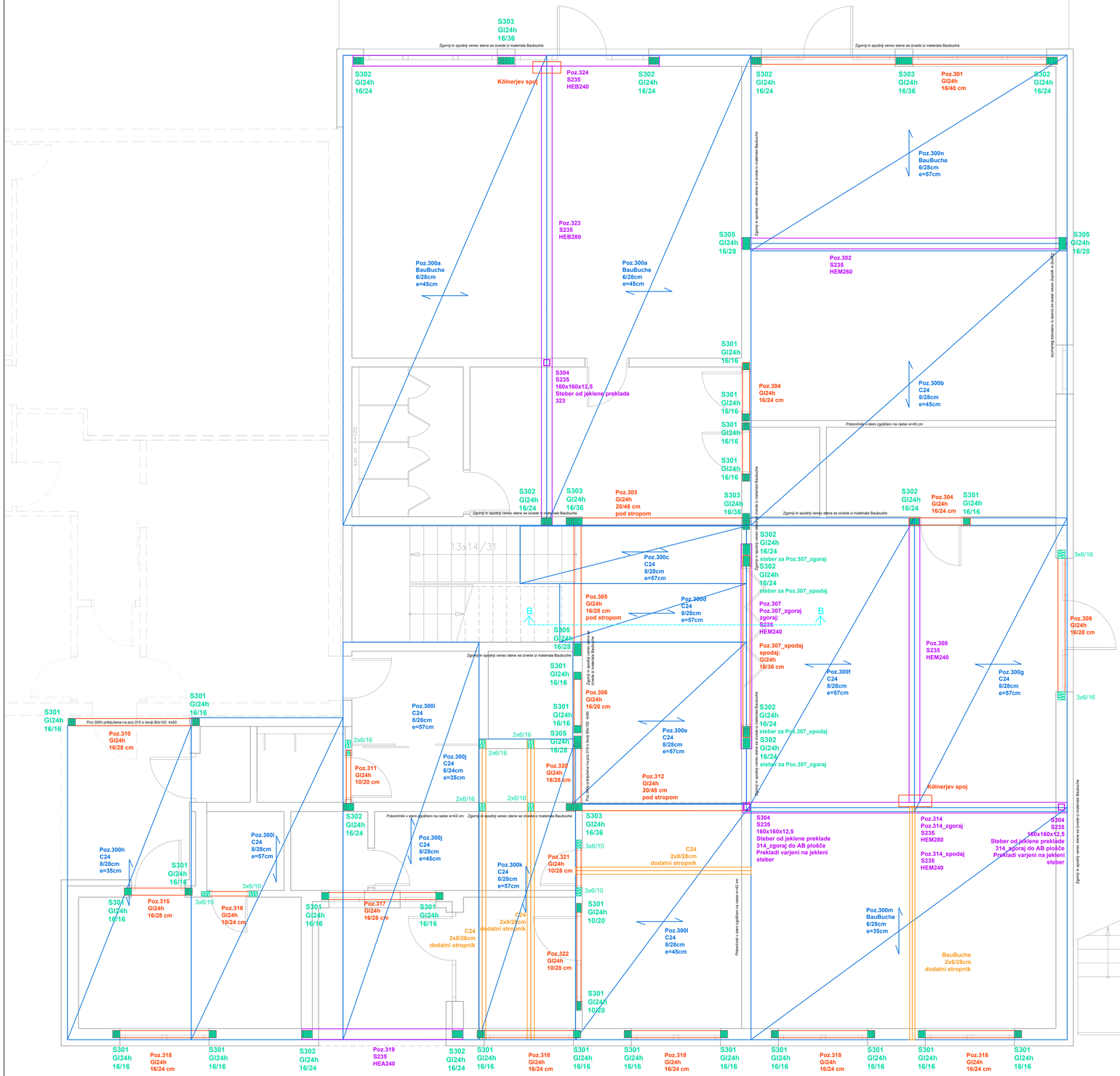
Zaradi zagotovitve zadostnih odmikov žičnikov od obremenjenega roba (razdalja od spodnjega roba pokončnika do prvega žičnika) je potrebno puščti prez žičnikov toliko spodnjih lukenj, da ta razdalja znaša 6 cm (2 vrsti pri HTA sidrih in 6 vrst pri Vplus sidrih)!

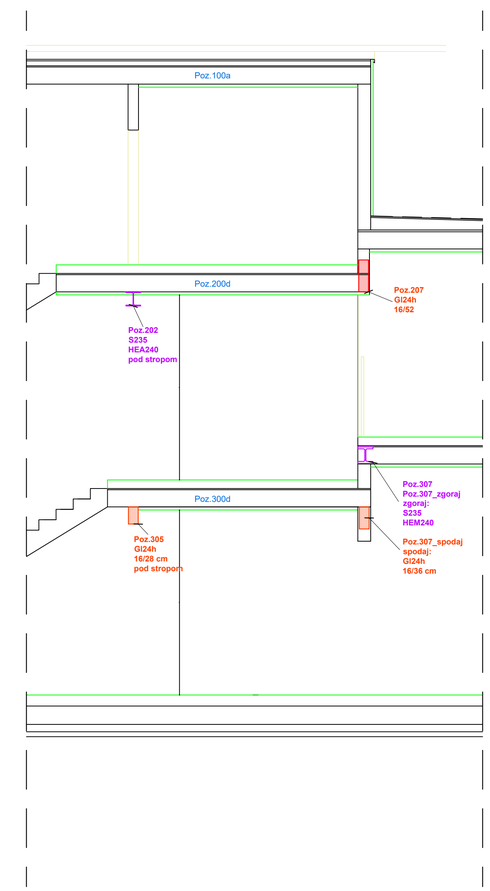
Kjer je na enem mestu predvideno večje število sider (2, 3) je potrebno namestiti dodatne pokončnike, za zagotovitev prenosa sil in možnosti sidranja!

probit d.o.o.
Projektiranje gradbenih objektov
KONTAKT
Partizanska cesta 5
2000 Maribor
tel: 041 387 12
email: probit1@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	VSEBINA DELA NAČRTA	Pozicijski načrt in sidranje sten 1. nadstropja
NAČRT ŠT.:	22-P035-K	ODGOV. VODJA PROJEKTA	BRANKO HOJNIK, u.d.i.a. ZAPS A-0949
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše		
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. PROJEKTANT FAZE	VID LEŠIČ, mag. inž. grad. IZS PI G-4647
		SODELAVCI	
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	TA LIST NADOMEŠČA LIST ŠT.:	
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	MERILO:	VRSTA PR. DOK.: PZI / DATUM: MAJ, 2022 / LIST ŠT.: 5

POZICIJSKI NAČRT PRITLIČJA





-Kjer je skupaj več pokončnikov v steni, mora biti posponkan vsak pokončnik.

-Glede na steber v nadstropju, mora bit v stropu enaka površina lesa (za prenos obtežbe iz zgornje etaže na spodnjo).

-Pod vsakem sidru v nadstropju je potreben les v stropu, za namestitev strižnih in dvižnih sider.

-Če je potreben menjalnik v stropu (npr. okoli dimnika) se doda levo in desno dodaten stropnik.

-Če ni posebej določeno je potrebno vsak jekleni nosilec konstrukcijsko povezat s stebrom (jeklena ploščica + 2 vijaka fi10)

-Lesene konstrukcije izvedene iz certificiranega lesa zahtevane kvalitete

-Vse delavniške načrte za lesene in jeklene konstrukcije izvede izvajalec in jih pred izvedbo pošlje projektantu gradbenih konstrukcij v pregled in potrditev!

VSI JEKLENI STEBRI LEŽIJO NA JEKLENI PLOŠČICI b/h=40x40cm DEBELINE d= 2cm IN SO PRIVIJAČENI V AB PLOŠČO!

VSAK, pokončnik, ki je v stenskih elementih mora bit posponkan (MVP ali OSB plošča) na razdalji min 7,5cm!

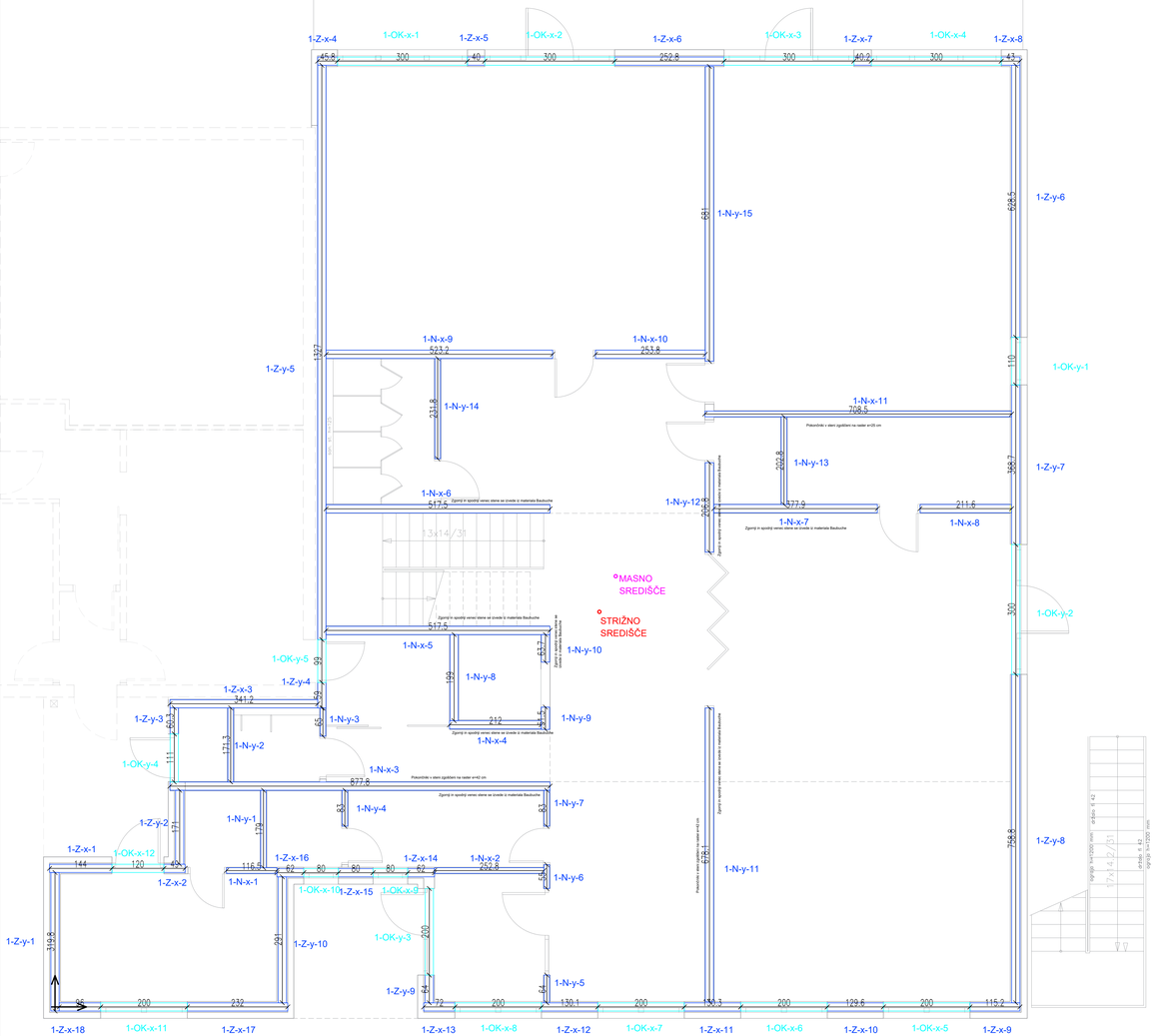
1x6/16		1x6/10	
2x6/16		2x6/10	
3x6/16		3x6/10	

probit d.o.o.
Projektiranje gradbenih objektov

KONTAKT:
Partizanska cesta 5
2000 Maribor
tel: 041 267 12
email: probit1@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	VSEBINA DELA NAČRTA	Pozicijski načrt pritličja		
NAČRT ŠT.:	22-P035-K				
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. VODJA PROJEKTA	BRANKO HOJNIK, u.d.i.a.		ZAPS A-0949
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. PROJEKTANT FAZE	VID LEŠIČ, mag. inž. grad.		IZS PI G-4647
		SODELAVCI			
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	TA LIST NADOMEŠČA LIST ŠT.:			
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	MERILO:	VRSTA PR. DOK.: PZI	DATUM: MAJ, 2022	LIST ŠT.: 6

POZICIJSKI NAČRT STEN PRITLIČJA



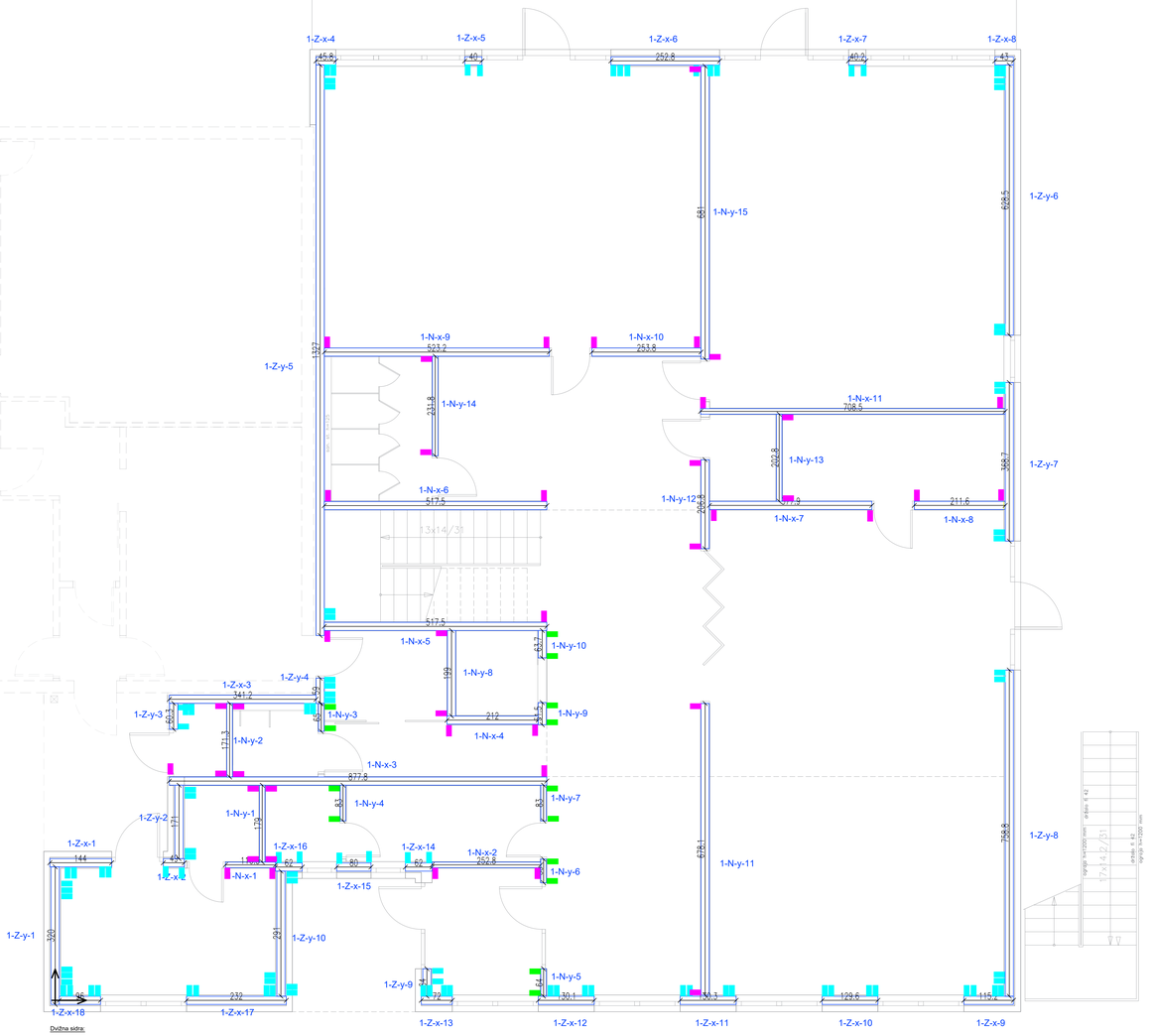
OBLOGE:

Zunanje stene:
- Smer X: zunanja obložna plošča OSB3 15mm; Razdalja med sponkicami: s=3,5 cm
- Smer Y: zunanja obložna plošča OSB3 15mm; Razdalja med sponkicami: s=3,5 cm

Notranje stene:
- Smer X: ZK OSB3 15mm; Razdalja med sponkicami: s=5,0 cm
- Smer Y: ZK OSB3 15mm; Razdalja med sponkicami: s=5,0 cm

Vse stene imajo pokončnike zgoščene vsaj na e=57 cm, razen, če je navedeno drugače!

POZICIJSKI NAČRT SIDRANJA STEN PRTILIČJA



Držna sidra:

- Würth dvodelno HTA-2PIL; Würth BP 340x60x3,0 mm + HTA-2PIL 195x95x60x3,0/5,0 mm;
  Povezovalni vijaki ZEBRA pias 6,3x19,6 kom; WIT-VM 100 + Wurth W-VIZ/S M16 - h_{ef}=145mm;
  Žlebki CNA 4,0X50 15 kom
- Würth Vplus - 460x90x60x3 Würth - W-VIZ/S M 16 (h_{ef} = 145 mm) + WIT-VM 100 (injekcijska masa);
  žlebki 4,0x50 - 22 kom
- Würth Typ V - 65x285x90x4; Würth W-FAZ/S M16 - h_{ef}=85mm; (z U-ploščico 30x3mm);
  Žlebki 4,0X50 8 kom

Strižna sidra:

Spodnja venca med seboj
1x Wurth ASSY BX140

smer x na razmaku e=25 cm
smer y na razmaku e=25 cm

Spodnji venec:
Wurth kotni veznik TYP A z rebrom - 90x105x105x1,5; Wurth W-FAZ/S M12; Žlebki 4,0X50
Strižna sidra so nameščena na stenah v smeri X in Y na razmaku e=80 cm

Zaradi zagotovitve zadostnih odmikov od roba pokončnika je potrebno uporabiti pokončnik širine 8 cm (sidra širine 60 in 65 mm) oziroma 10 cm (sidro širine 80 mm)!

Zaradi zagotovitve zadostnih odmikov žlebkov od obremenjenega roba (razdalja od spodnjega roba pokončnika do prvega žlebka) je potrebno pustiti brez žlebkov toliko spodnjih lukenj, da ta razdalja znaša 6 cm (2 vrsti pri HTA sidrih in 6 vrsti pri Vplus sidrih)!

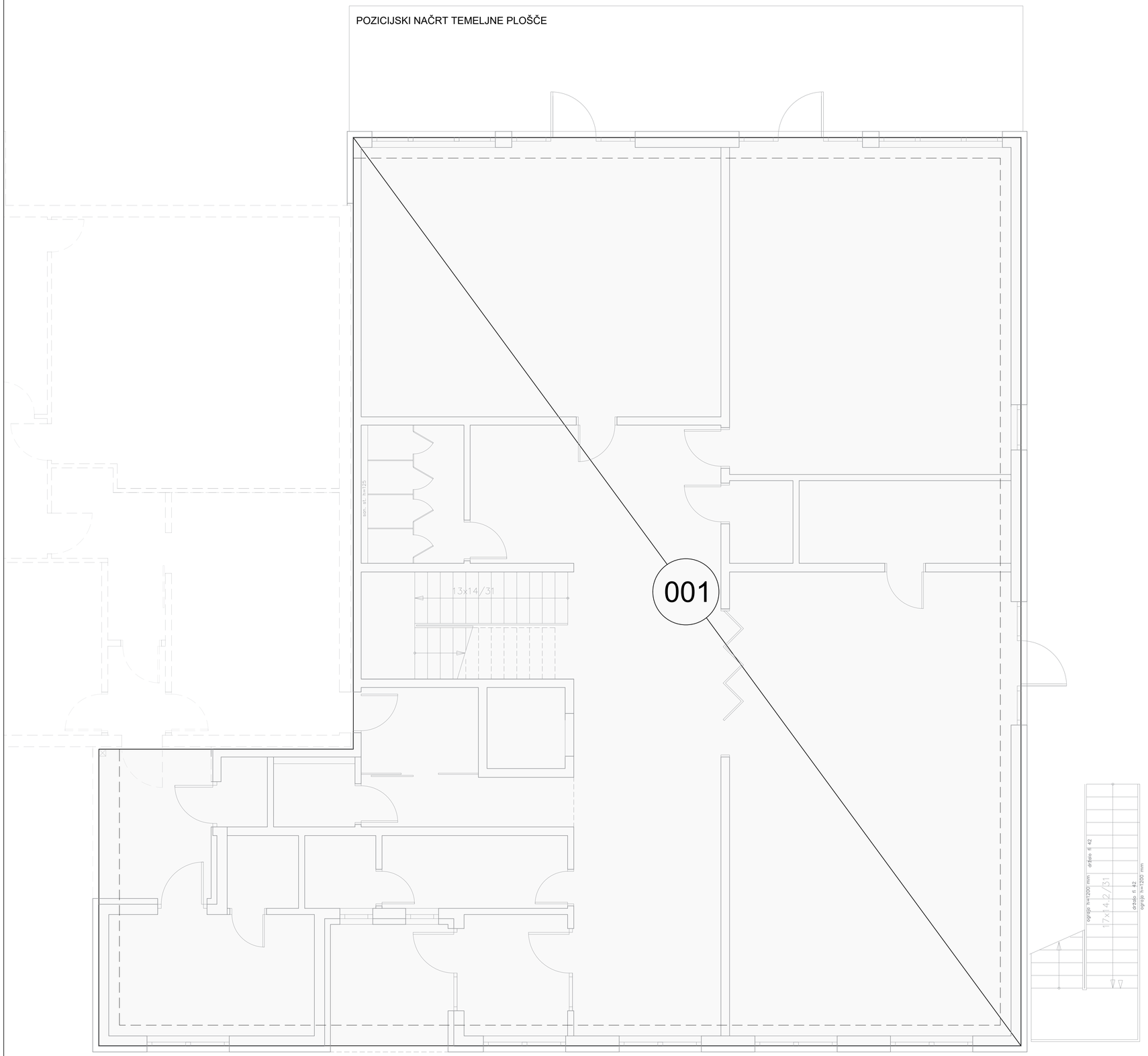
Kjer je na enem mestu predvideno večje število sider (2, 3) je potrebno namestiti dodatne pokončnike, za zagotovitev prenosa sil in možnosti sidranja!

probit d.o.o.
Projektiranje gradbenih objektov

KONTAKT
Partizanska cesta 5
2000 Maribor
tel: 041 387 12
email: probit@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	VSEBINA DELA NAČRTA	Pozicijski načrt in sidranje sten pritličja
NAČRT ŠT.:	22-P035-K	ODGOV. VODJA PROJEKTA	BRANKO HOJNIK, u.d.i.a. ZAPS A-0949
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše		
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. PROJEKTANT FAZE	VID LEŠIČ, mag. inž. grad. IZS PI G-4647
		SODELAVCI	
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	TA LIST NADOMEŠČA LIST ŠT.:	
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	MERILO:	VRSTA PR. DOK.: PZI / DATUM: MAJ, 2022 / LIST ŠT.: 7

POZICIJSKI NAČRT TEMELJNE PLOŠČE



LEGENDA

Armirani beton (obravnavan)

VGRAJENI MATERIALI

KONSTRUKCIJSKI ELEMENT	POZICIJA	DIMENZIJA	OZNAKA BETONA	KROVNI SLOJ
Temeljna plošča	001	d=25 cm	C25/30, XC-2, Cl 0,2, D_{max}16, S4	C_{nom}=3,5 cm (vsi robovi)

Jeklo za armiranje:	B500 B	Armaturne mreže:	B500B

SIDRNE DOLŽINE ARMATURNIH PALIC (C25/30)									
Ø	8	10	12	14	16	20	25	28
cm	29	33	43	51	58	72	91	101

SIDRNE DOLŽINE MREŽ:
- Q mreže - 45 cm

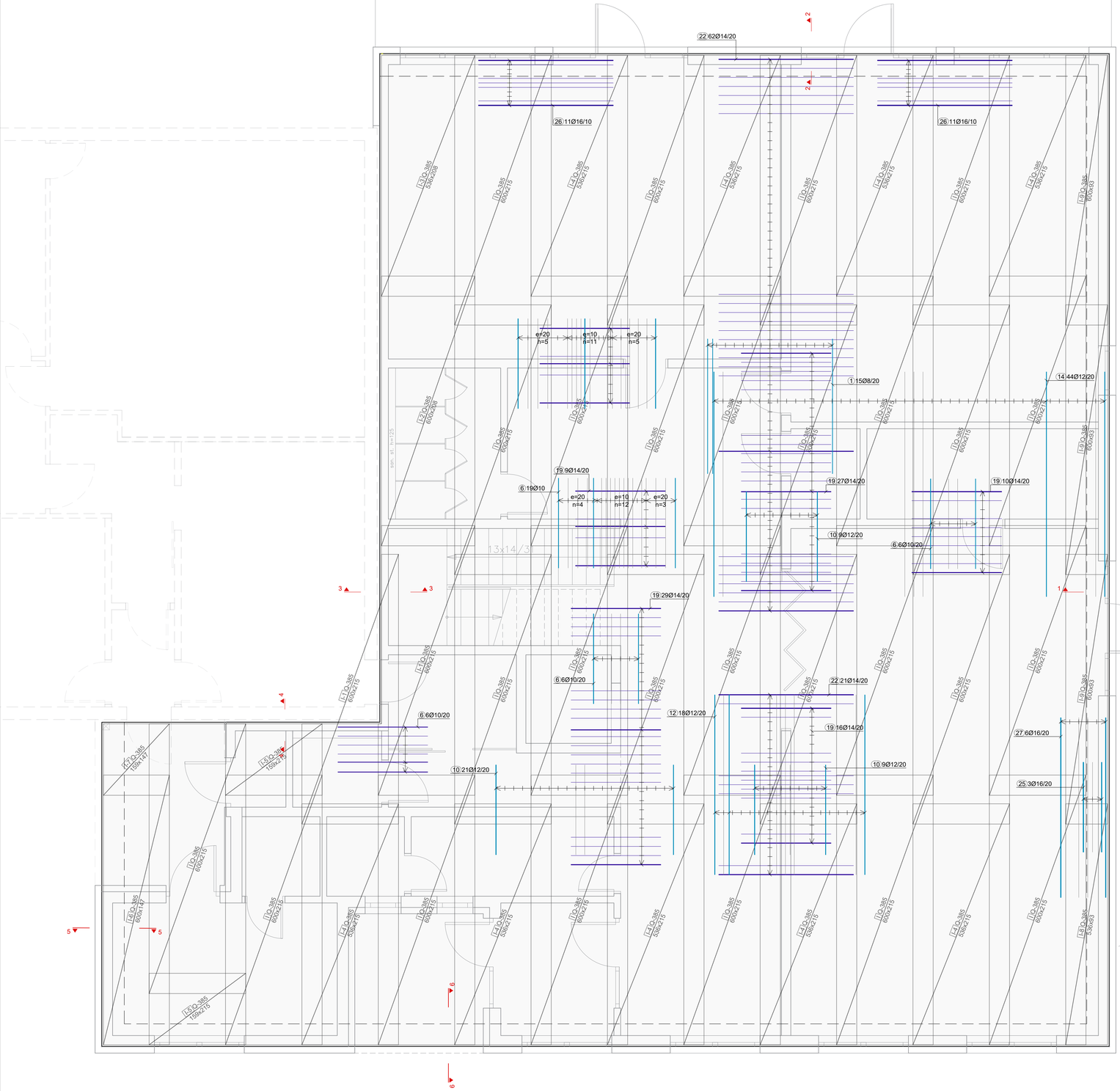
OPOMBE
- Morebitna neskladja med posameznimi načrti (arhitektura, gradbene konstrukcije, elektro in strojne inštalacije) je potrebno nemudoma sporočiti odgovornemu vodji projekta. Kakršno koli prilagajanje brez njegove potrditve ni dovoljeno!
- Vse potrditve, spremembe ipd. s strani odgovornih projektantov morajo biti pisne in navedene v gradbenem dnevniku.
- Za prebroje, ki niso vrisani v načrtu gradbenih konstrukcij in so večji od Ø150 mm, je potrebno pridobiti mnenje odgovornega projektanta gradbenih konstrukcij. Kakršnekoli spremembe brez njegove potrditve niso dovoljene.
- V projektu je upoštevan modul reakcije tal 6000 kN/m^3 po celotni površini pasovnih temeljev in temeljne plošče, kar mora potrditi geomehanik ob pregledu izkopov pred zabetoniranem temeljev. Geomehanik bo ob pregledu podal svoje mnenje na osnovi katerega se bo po potrebi izvedla sprememba temeljenja.

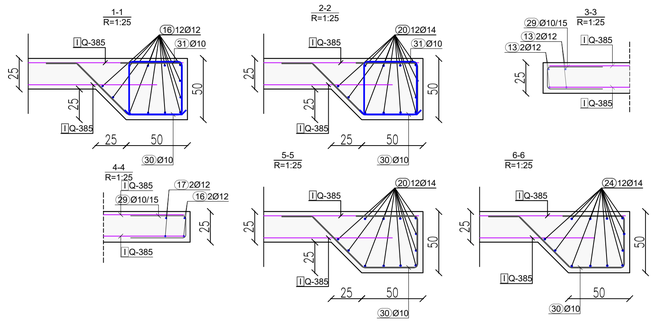
probit d.o.o.
Projektiranje gradbenih objektov

KONTAKT:
Partizanska cesta 5
2000 Maribor
tel: 041 267 12
email: probit1@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	**VSEBINA DELA NAČRTA**	Pozicijski načrt temeljne plošče		
NAČRT ŠT.:	22-P035-K				
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	**ODGOV. VODJA PROJEKTA**	BRANKO HOJNIK, u.d.i.a.		ZAPS A-0949
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	**ODGOV. PROJEKTANT FAZE**	VID LEŠIČ, mag. inž. grad.		IZS PI G-4647
		SODELAVCI			
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	**TA LIST NADOMEŠČA LIST ŠT.:**			
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	**MERILO:**	**VRSTA PR. DOK.:** PZI	**DATUM:** MAJ, 2022	**LIST ŠT.:** 8

ARMATURNI NAČRT TEMELJNE PLOŠČE
spodnja cona - mrežna in palična armatura

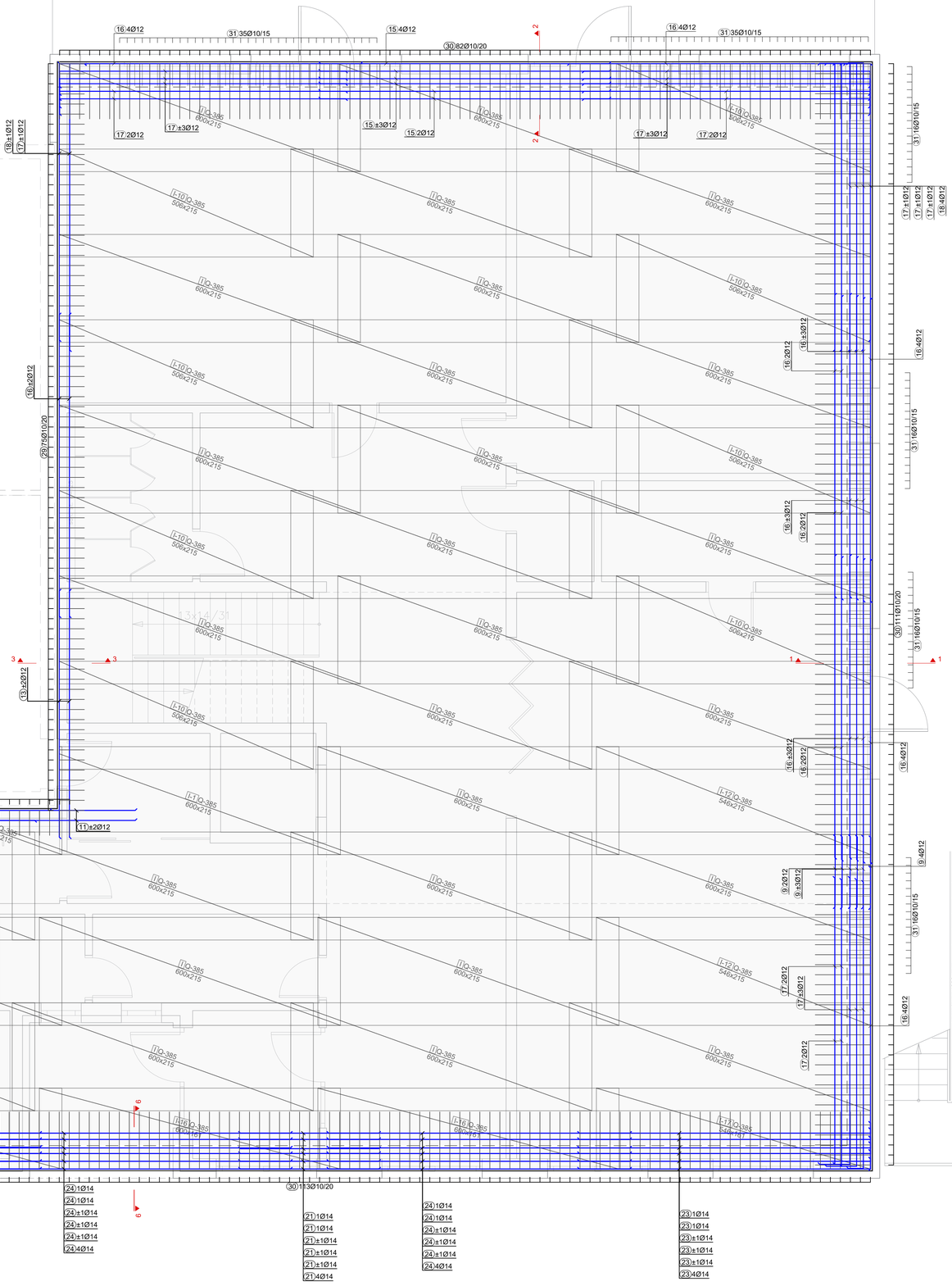


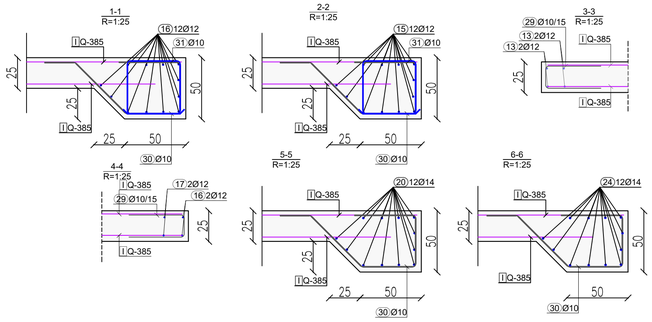


① 7Ø8/20 L=300 (83) — 300
② 12Ø8/20/10 L=350 (24) — 350
③ 78Ø8/20 L=400 (256) — 400
④ 23Ø8/20/10 L=500 (46) — 500
⑤ 51Ø8/20 L=600 (96) — 600
⑥ 6Ø10/20 L=200 (37) — 200
⑦ 12Ø10/20/10 L=350 (24) — 350
⑧ 81Ø10/20 L=600 (81) — 600
⑨ 4Ø12 L=140 (12) — 140
⑩ 21Ø12/20 L=200 (39) — 200
⑪ ±1Ø12 L=300 (4) — 300
⑫ 18Ø12/20 L=400 (18) — 400
⑬ ±1Ø12 L=490 (4) — 490
⑭ 44Ø12/20 L=500 (44) — 500
⑮ 4Ø12 L=575 (12) — 575
⑯ ±1Ø12 L=600 (42) — 600
⑰ ±1Ø12 L=600 (36) — 570
⑱ 4Ø12 L=600 (6) — 550
⑲ 16Ø14/20 L=200 (121) — 200
⑳ 4Ø14 L=254 (12) — 234
㉑ 1Ø14 L=276 (12) — 276
㉒ 21Ø14/20 L=300 (83) — 300
㉓ 1Ø14 L=600 (36) — 580
㉔ ±1Ø14 L=600 (24) — 600
㉕ 3Ø16/20 L=200 (3) — 200
㉖ 11Ø16/10 L=300 (22) — 300
㉗ 6Ø16/20 L=400 (6) — 400
㉘ 1Ø16 L=545 (2) — 500
㉙ 75Ø10/20 L=117 (108)
㉚ 113Ø10/20 L=220 (343)

probit d.o.o. *Projektiranje gradbenih objektov*				KONTAKT: Partizanska cesta 5, 2000 Maribor, tel: 041 267 12, email: probit1@siol.net
PROJEKT ŠT.: 01/04-2021-PZI	**VSEBINA DELA NAČRTA**	Armaturni načrt temeljne plošče - spodnja cona		
NAČRT ŠT.: 22-P035-K				
INVESTITOR OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	**ODGOV. VODJA PROJEKTA**	BRANKO HOJNIK, u.d.i.a.		ZAPS A-0949
NAROČNIK OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	**ODGOV. PROJEKTANT FAZE**	VID LEŠIČ, mag. inž. grad.		IZS PI G-4647
OBJEKT IN LOKACIJA PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	**SODELAVCI**			
	TA LIST NADOMEŠČA LIST ŠT.:			
VRSTA PROJEKTA GRADBENE KONSTRUKCIJE	**MERILO:**	**VRSTA PR. DOK.:** PZI	**DATUM:** MAJ, 2022	**LIST ŠT.:** 9

ARMATURNI NAČRT TEMELJNE PLOŠČE
zgornja cona - mrežna armatura in robna armatura





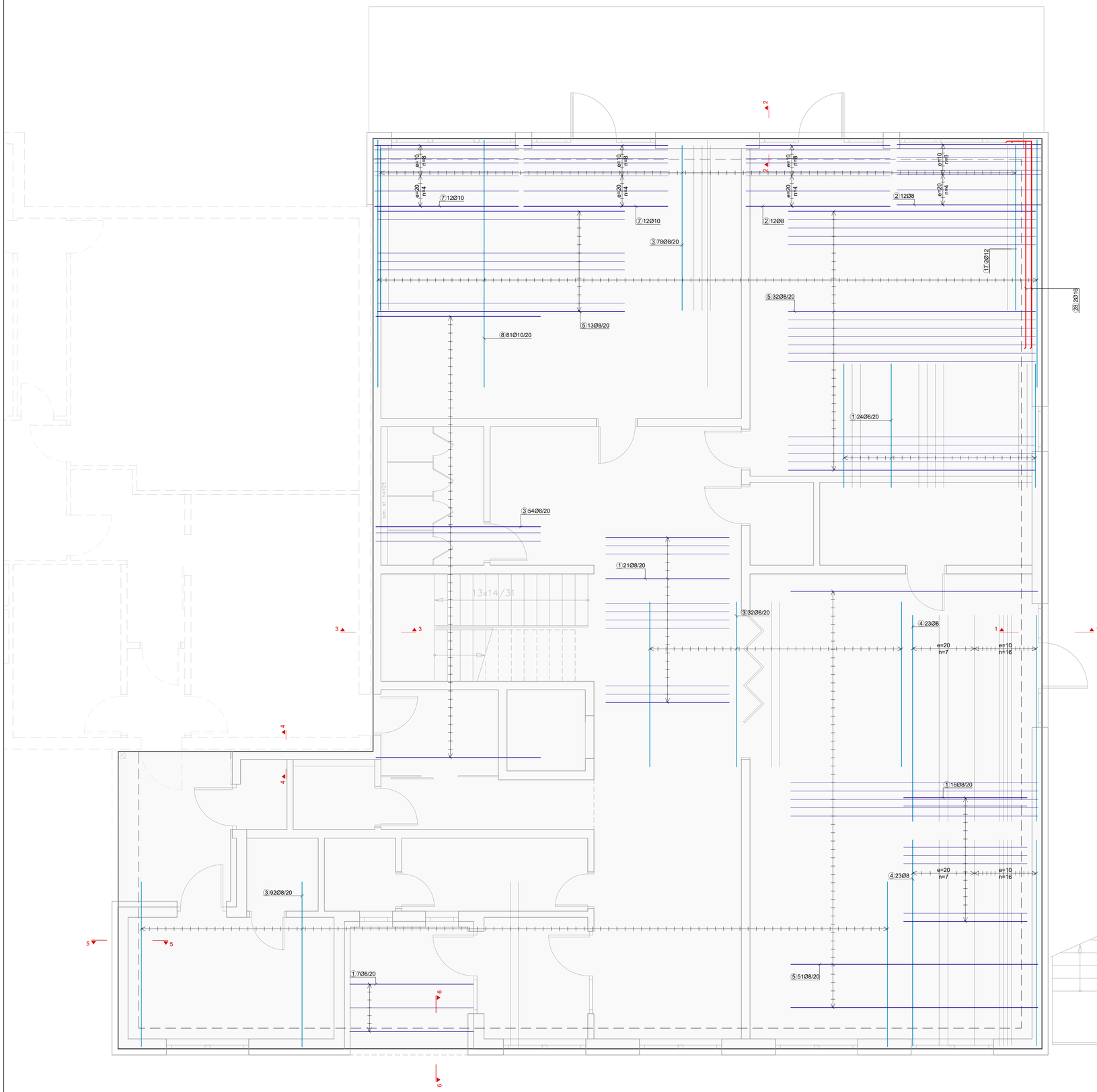
① 7Ø8/20 L=300 (83) — 300
② 12Ø8/20/10 L=350 (24) — 350
③ 78Ø8/20 L=400 (256) — 400
④ 23Ø8/20/10 L=500 (46) — 500
⑤ 51Ø8/20 L=600 (96) — 600
⑥ 6Ø10/20 L=200 (37) — 200
⑦ 12Ø10/20/10 L=350 (24) — 350
⑧ 81Ø10/20 L=600 (81) — 600
⑨ 4Ø12 L=140 (12) — 140
⑩ 21Ø12/20 L=200 (39) — 200
⑪ ±1Ø12 L=300 (4) — 300
⑫ 18Ø12/20 L=400 (18) — 400
⑬ ±1Ø12 L=490 (4) — 490
⑭ 44Ø12/20 L=500 (44) — 500
⑮ 4Ø12 L=575 (12) — 575
⑯ ±1Ø12 L=600 (42) — 600
⑰ ±1Ø12 L=600 (36) — 570
⑱ 4Ø12 L=600 (6) — 550
⑲ 16Ø14/20 L=200 (121) — 200
⑳ 4Ø14 L=254 (12) — 234
㉑ 1Ø14 L=276 (12) — 276
㉒ 21Ø14/20 L=300 (83) — 300
㉓ 1Ø14 L=600 (36) — 580
㉔ ±1Ø14 L=600 (24) — 600
㉕ 3Ø16/20 L=200 (3) — 200
㉖ 11Ø16/10 L=300 (22) — 300
㉗ 6Ø16/20 L=400 (6) — 400
㉘ 1Ø16 L=545 (2) — 500
㉙ 75Ø10/20 L=117 (108) — 50 + 50 + 17
㉚ 113Ø10/20 L=220 (343) — 25 + 50 + 68 + 44 + 42

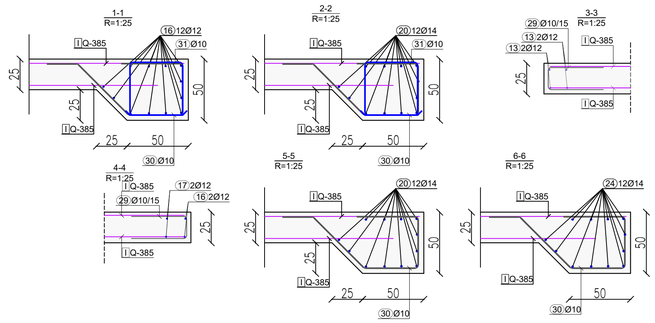
probit d.o.o.
Projektiranje gradbenih objektov

KONTAKT:
Partizanska cesta 5
2000 Maribor
tel: 041 267 12
email: probit1@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	VSEBINA DELA NAČRTA	Armaturni načrt temeljne plošče - zgornja cona - mrežna in robna armatura		
NAČRT ŠT.:	22-P035-K				
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. VODJA PROJEKTA	BRANKO HOJNIK, u.d.i.a.		ZAPS A-0949
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. PROJEKTANT FAZE	VID LEŠIČ, mag. inž. grad.		IZS PI G-4647
		SODELAVCI			
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	TA LIST NADOMEŠČA LIST ŠT.:			
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	MERILO:	VRSTA PR. DOK.: PZI	DATUM: MAJ, 2022	LIST ŠT.: 10

ARMATURNI NAČRT TEMELJNE PLOŠČE
zgornja cona - palična armatura





① 7Ø8/20 L=300 (83) — 300
② 12Ø8/20/10 L=350 (24) — 350
③ 78Ø8/20 L=400 (256) — 400
④ 23Ø8/20/10 L=500 (46) — 500
⑤ 51Ø8/20 L=600 (96) — 600
⑥ 6Ø10/20 L=200 (37) — 200
⑦ 12Ø10/20/10 L=350 (24) — 350
⑧ 81Ø10/20 L=600 (81) — 600
⑨ 4Ø12 L=140 (12) — 140
⑩ 21Ø12/20 L=200 (39) — 200
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⑫ 18Ø12/20 L=400 (18) — 400
⑬ ±1Ø12 L=490 (4) — 490
⑭ 44Ø12/20 L=500 (44) — 500
⑮ 4Ø12 L=575 (12) — 575
⑯ ±1Ø12 L=600 (42) — 600
⑰ ±1Ø12 L=600 (36) — 570
⑱ 4Ø12 L=600 (6) — 550
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㉗ 6Ø16/20 L=400 (6) — 400
㉘ 1Ø16 L=545 (2) — 500
㉙ 75Ø10/20 L=117 (108)
㉚ 113Ø10/20 L=220 (343)

probit d.o.o.
Projektiranje gradbenih objektov
KONTAKT:
Partizanska cesta 5
2000 Maribor
tel: 041 267 12
email: probit1@siol.net

PROJEKT ŠT.:	01/04-2021-PZI	VSEBINA DELA NAČRTA	Armaturni načrt temeljne plošče - zgornja cona - palična armatura		
NAČRT ŠT.:	22-P035-K				
INVESTITOR	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. VODJA PROJEKTA	BRANKO HOJNIK, u.d.i.a.		ZAPS A-0949
NAROČNIK	OBČINA RUŠE, Trg vstaje 11, 2342 Ruše	ODGOV. PROJEKTANT FAZE	VID LEŠIČ, mag. inž. grad.		IZS PI G-4647
		SODELAVCI			
OBJEKT IN LOKACIJA	PRIZIDAVA IN DELNA REKONSTRUKCIJA VRTCA RUŠE, k.o. 665 Ruše, parc. št.: 750, 751	TA LIST NADOMEŠČA LIST ŠT.:			
VRSTA PROJEKTA	GRADBENE KONSTRUKCIJE	MERILO:	VRSTA PR. DOK.: PZI	DATUM: MAJ, 2022	LIST ŠT.: 11

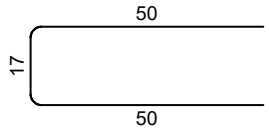
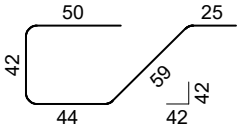
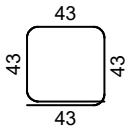
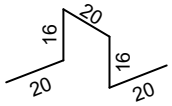
Izvleček in kosovnica armature - Vrtec Ruše

Obseg: temeljna plošča

Palice - specifikacija						
ozn	oblika in mere [cm]	Ø	lg [m]	n [kos]	lgn [m]	Opomba
Pozicija 001 - Temeljna plošča (1 kos)						
1	300	8	3.00	83	249.00	
2	350	8	3.50	24	84.00	
3	400	8	4.00	256	1024.00	
4	500	8	5.00	46	230.00	
5	600	8	6.00	96	576.00	
6	200	10	2.00	37	74.00	
7	350	10	3.50	24	84.00	
8	600	10	6.00	81	486.00	
9	140	12	1.40	12	16.80	
10	200	12	2.00	39	78.00	
11	300	12	3.00	4	12.00	
12	400	12	4.00	18	72.00	
13	490	12	4.90	4	19.60	
14	500	12	5.00	44	220.00	
15	575	12	5.75	12	69.00	
16	600	12	6.00	42	252.00	
17	570 30	12	6.00	36	216.00	
18	50 550	12	6.00	6	36.00	
19	200	14	2.00	121	242.00	
20	20 234	14	2.54	12	30.48	
21	276	14	2.76	12	33.12	
22	300	14	3.00	83	249.00	
23	20 580	14	6.00	36	216.00	
24	600	14	6.00	24	144.00	
25	200	16	2.00	3	6.00	
26	300	16	3.00	22	66.00	
27	400	16	4.00	6	24.00	
28	500 45	16	5.45	2	10.90	

Izvleček in kosovnica armature - Vrtec Ruše

Obseg: temeljna plošča

Palice - specifikacija						
ozn	oblika in mere [cm]	Ø	lg [m]	n [kos]	lgn [m]	Opomba
29		10	1.17	108	126.36	
30		10	2.20	343	754.60	
31		10	2.15	134	288.10	
Distančniki (1 kos)						
32	 3D geometrija	10	0.92	801	736.92	

Palice - izvleček			
Ø [mm]	lgn [m]	Teža enote [kg/m']	Teža [kg]
B500B			
8	2163.00	0.40	854.38
10	2549.98	0.62	1573.34
12	991.40	0.89	880.36
14	914.60	1.21	1106.67
16	106.90	1.58	168.90
Skupaj (B500B)			4583.65
Skupaj			4583.65

Izvleček in kosovnica armature - Vrtec Ruše

Obseg: temeljna plošča

Mreže - specifikacija							
Pozicija	Oznaka mreže	B [cm]	L [cm]	n	Teža enote [kg/m2]	Skupna teža [kg]	Opomba
Pozicija 001 - Temeljna plošča (1 kos)							
I	Q-385	215	600	53	6.04	4129.55	
I-1	Q-385	215	600	4	6.04	311.66	
I-2	Q-385	208	600	1	6.04	75.38	
I-3	Q-385	208	536	1	6.04	67.34	
I-4	Q-385	215	536	9	6.04	626.44	
I-5	Q-385	215	159	2	6.04	41.30	
I-6	Q-385	147	600	1	6.04	53.18	
I-7	Q-385	147	159	1	6.04	14.09	
I-8	Q-385	93	536	1	6.04	30.19	
I-9	Q-385	93	600	3	6.04	101.38	
I-10	Q-385	215	506	8	6.04	525.93	
I-11	Q-385	88	69	1	6.04	3.67	
I-12	Q-385	215	546	2	6.04	141.81	
I-13	Q-385	215	570	2	6.04	148.04	
I-14	Q-385	215	69	1	6.04	8.96	
I-15	Q-385	161	69	1	6.04	6.71	
I-16	Q-385	161	600	3	6.04	175.04	
I-17	Q-385	161	546	1	6.04	53.10	
Skupaj						6513.76	

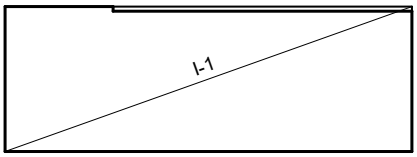
Mreže - izvleček						
Oznaka mreže	B [cm]	L [cm]	n	Teža enote [kg/m2]	Skupna teža [kg]	Neto vgrajena teža [kg]
Q-385	215	600	88	6.04	6856.61	6422.92
Skupaj					6856.61	6422.92

Izvleček in kosovnica armature - Vrtec Ruše

Obseg: temeljna plošča

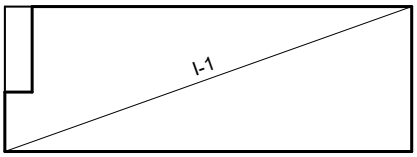
Mreže - načrt razreza
Q-385 (600 cm x 215 cm)

1x



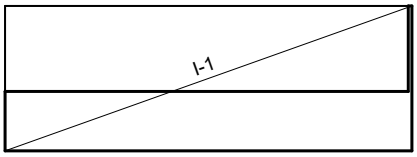
I-1 600 x 215

1x



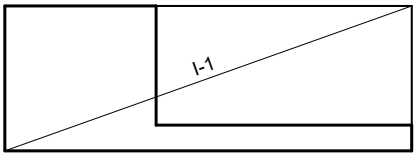
I-1 600 x 215

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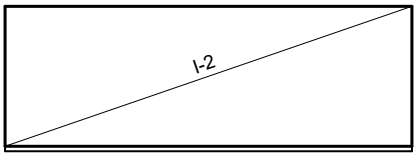
I-1 600 x 215

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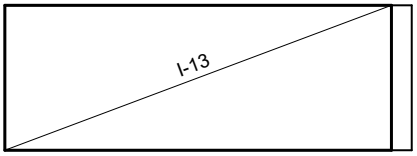
I-1 600 x 215

1x



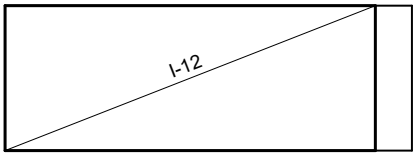
I-2 600 x 208

2x



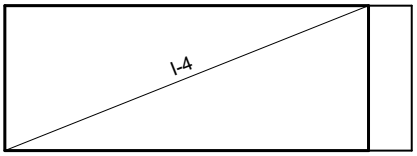
I-13 570 x 215

2x



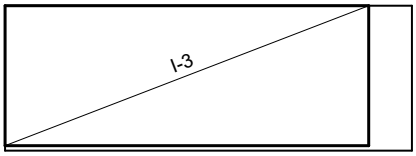
I-12 546 x 215

9x



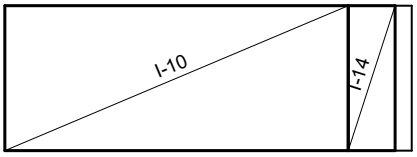
I-4 536 x 215

1x



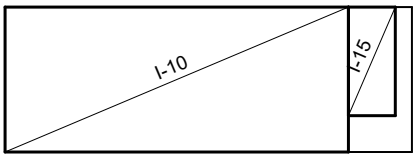
I-3 536 x 208

1x



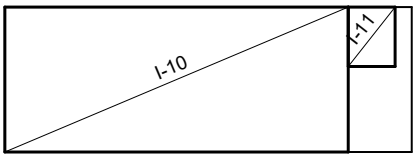
I-10 506 x 215
I-14 69 x 215

1x



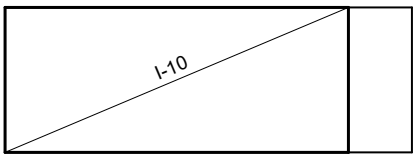
I-10 506 x 215
I-15 69 x 161

1x



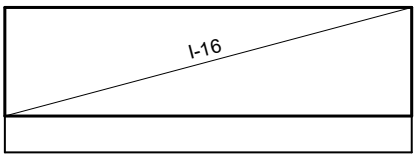
I-10 506 x 215
I-11 69 x 88

5x



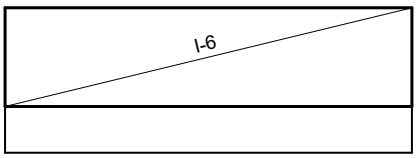
I-10 506 x 215

3x



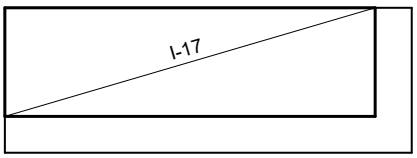
I-16 600 x 161

1x



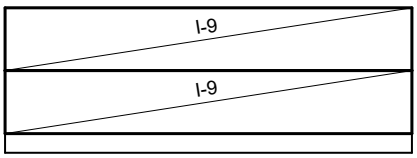
I-6 600 x 147

1x



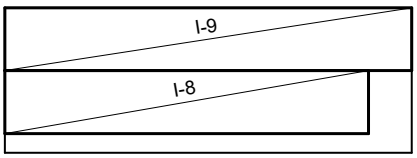
I-17 546 x 161

1x



I-9 600 x 93
I-9 600 x 93

1x



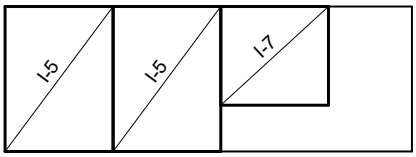
I-9 600 x 93
I-8 536 x 93

Izvleček in kosovnica armature - Vrtec Ruše

Obseg: temeljna plošča

Mreže - načrt razreza

1x



I-5 159 x 215
I-5 159 x 215
I-7 159 x 147