

NASLOVNA STRAN NAČRTA

PODATKI O GRADNJI

naziv gradnje

CENTER LIČNA HIŠA

kratek opis gradnje

Na obstoječi stavbi se bo izvedla manjša rekonstrukcija z vzdrževalnimi deli.

VRSTE GRADNJE

označiti vse ustrezne vrste gradnje

- ☐ NOVOGRADNJA - NOVOZGRAJEN OBJEKT
☐ NOVOGRADNJA - PRIZIDAVA
☐ REKONSTRUKCIJA
☐ SPREMEMBA NAMEMBNOSTI
☐ ODSTRANITEV CELOTNEGA OBJEKTA
☐ LEGALIZACIJA
☒ MANJŠA REKONSTRUKCIJA

PODATKI O PROJEKTNI DOKUMENTACIJI

vrsta dokumentacije

PZI projektna dokumentacija za izvedbo manjše rekonstrukcije

številka projekta

10/2026

PODATKI O NAČRTU

strokovno področje načrta

2 načrt gradbeništva

naziv načrta

številka načrta

1303/2026

datum izdelave

Februar 2026

datum spremembe

PODATKI O PROJEKTANTU NAČRTA

projektant načrta (naziv družbe)

Stacion IB d.o.o.

naslov

Lokarjev drevored 1, 5270 Ajdovščina

odgovorna oseba projektanta načrta

Bogomir Ipavec

podpis odgovorne osebe

projektanta načrta

 **STACION IB**
Družba za projektiranje, inženiring in svetovanje, d.o.o.
Lokarjev drevored 1, 5270 Ajdovščina

PODATKI O IZDELOVALCU NAČRTA

ime in priimek pooblaščenega arhitekta, pooblaščenega inženirja

Bogomir Ipavec univ.dipl.inž.grad.

identifikacijska številka

IZS G-0250

podpis pooblaščenega arhitekta, pooblaščenega inženirja

BOGOMIR IPAVEC
univ. dipl. inž. grad.
IZS G-0250

TEHNČNO POROČILO

Investitor Občina Ajdovščina bo izvedla manjšo rekonstrukcijo obstoječega objekta Lične hiše. Predmet manjše rekonstrukcije bo celovita prenova objektov. V naravi gre za dva objekta stojača na parcelah 974/3 (objekt 1) in 974/40 (objekt 2) k.o. Ajdovščina. Prvi objekt na parceli 974/3 je višine pritličje + nadstropje + podstrešje, drugi pa pritličje + nadstropje. V

V konstrukcijskem smislu manjša rekonstrukcija obsega naslednje zamenjave in ojačitve na konstrukciji:

- Ojačitev elementov strešne konstrukcije z zamenjavo nekaterih kritičnih delov na objektu 1. Ob pričetku del je potrebno izvesti natančen pregled konstrukcije in po potrebi zamenjati neustrezne lesene elemente. V tem načrtu je podano dimenzioniranje strešne konstrukcije, ki omogoča naknadno preverjanje ustreznosti strešne konstrukcije.
- Na objektu 1 je predvidena tudi kontrola lesenega stropa nad nadstropjem. Po odstranitvi oblog bo omogočena kontrola elementov. Pred kontrolo je prepovedano odstranjevanje sten v nadstropju ker lahko pomenijo podporo stropnikom. Na osnovi kontrole se določi ali je potrebno posamezne elemente ojačati ali zamenjati. V tem načrtu so podana izhodišča za kontrolo z izračunom.
- V objektu 1 se izvede še nekaj prebojev v nosilnih stenah. Vse preboje je potrebno ojačati z betonskim okvirjem po priloženi risbi
- Na objektu 2 je predvidena zamenjava lesene strešne konstrukcije v celoti. Lesena konstrukcija se izvede iz lesa iglavcev kvalitete C24. Pred izvedbo se izdelajo nove horizontalne armiranobetonske vezi
- Na objektu 2 je predvidena zamenjava lesene konstrukcije stropa nad pritličjem v celoti. Lesena konstrukcija se izvede iz lesa iglavcev kvalitete C24.
- V objektu 2 se izvede še nekaj prebojev v nosilnih stenah. Vse preboje je potrebno ojačati z betonskim okvirjem po priloženi risbi

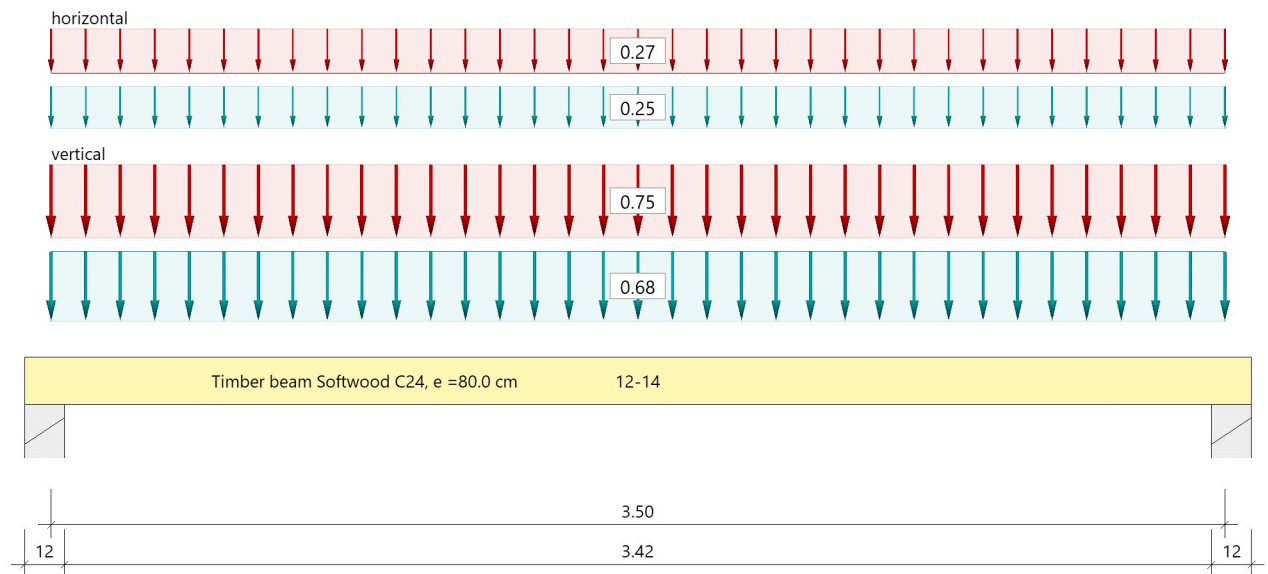
Item: objekt 1 - vzdolžni tramièi na strehi

kontrolirati na objektu

Continuous Beam Timber (x64) HTM+ 02/25 (FRILO R-2025-2/P07)

Basic parameters

Timber beam (e = 80.0 cm) biaxial Softwood C24 DIN EN 1995-1-1/NA:2013-08

System
System image

Material
Softwood C24, acc.to EN 338:2016

	$f_{m,k}$ $f_{v,k}$ [N/mm ²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm ²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm ²]	$E_{0,mean}$ $E_{0,05}$ [N/mm ²]	$E_{90,mean}$ $E_{90,05}$ [N/mm ²]	G_{mean} G_{05} [N/mm ²]	ρ_k ρ_m [kg/m ³]
	24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420
$f_{m,k}$: characteristic value of bending strength $f_{t,0,k}$: characteristic value of tensile strength parallel to grain $f_{t,90,k}$: characteristic value of tensile strength perpendicular to the grain $E_{0,mean}$: Average value of modulus of elasticity parallel to the fiber $E_{90,mean}$: Average value of the modulus of elasticity perpendicular to the grain G_{mean} : Average value of the shear modulus ρ_k : Characteristic value of gross density $f_{v,k}$: characteristic value of shear strength $f_{c,0,k}$: characteristic value of compressive strength parallel to grain $f_{c,90,k}$: characteristic value of compressive strength perpendicular to the grain $E_{0,05}$: 5% fractile value of the modulus of elasticity parallel to grain $E_{90,05}$: 5% fractile value of the modulus of elasticity perpendicular to the grain G_{05} : 5% fractile value of the shear modulus ρ_m : Average value of the density							

Geometry
Cross-sections

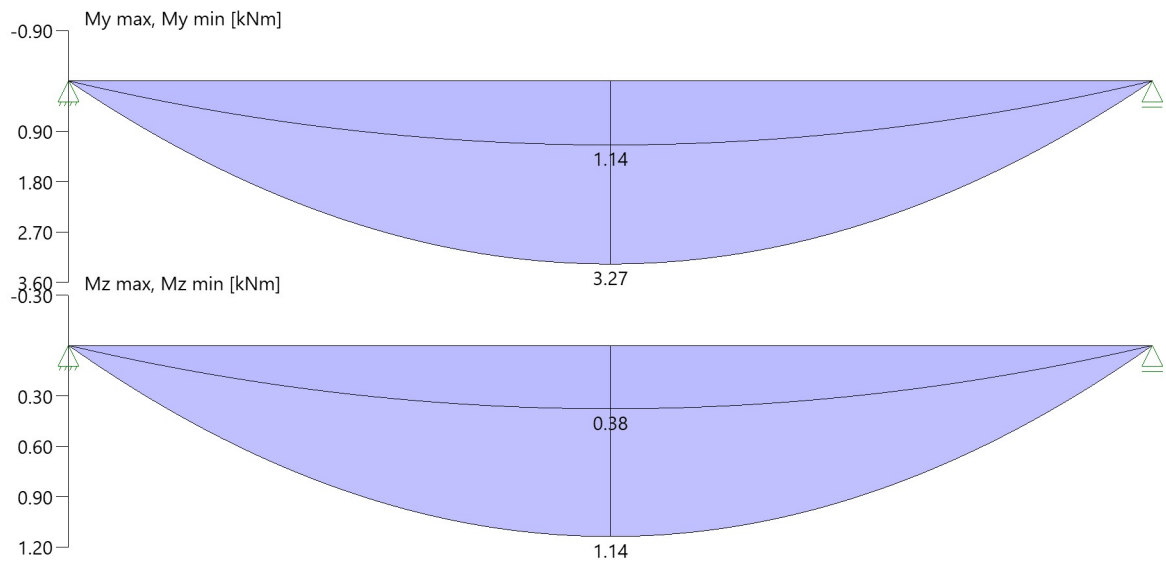
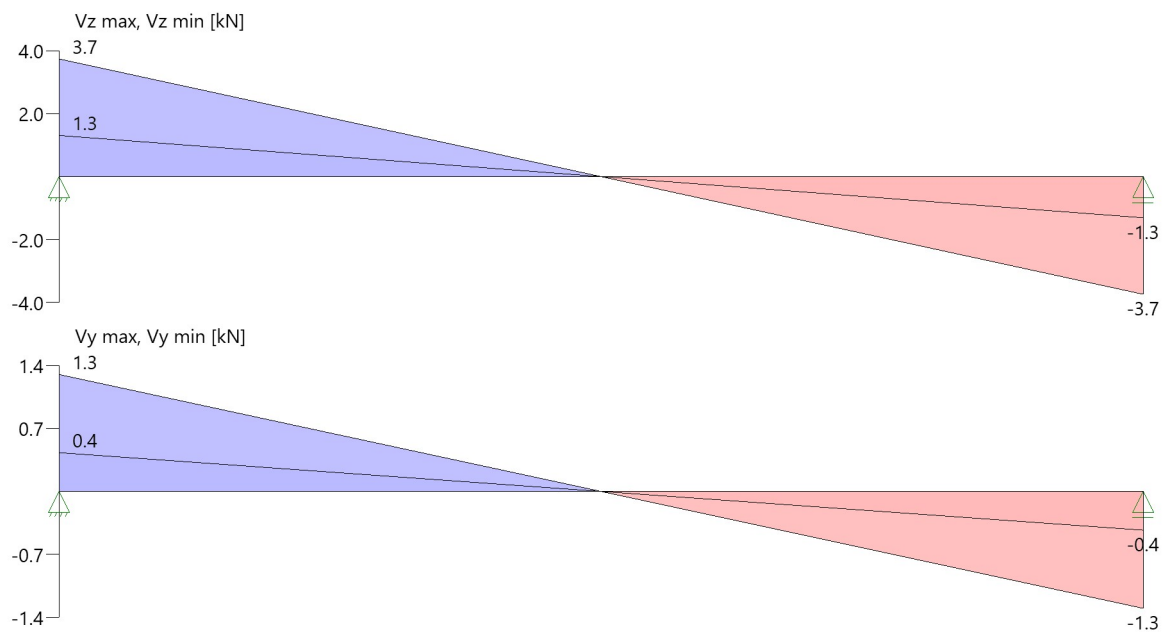
Name	I_y [cm ⁴]	I_z [cm ⁴]	W_y [cm ³]	W_z [cm ³]	A [cm ²]
12-14	2744	2016	392	336	168.0

Cross-section is constant over the entire length of the beam.

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]	$V_{y,Ed}$ [kN]	$M_{z,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	12-14	-3.4	3.27	-1.2	-1.14	0.23	0.63	

Structural safety - Load combination persistent/transient
Internal forces
Envelope of the moments

Envelope of the transverse forces


Support reactions
Support reactions pro [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]	$R_{y,min}$ [kN/m]	$R_{y,max}$ [kN/m]	$M_{z,min}$ [kNm/m]	$M_{z,max}$ [kNm/m]
1	0.00	Permanent loads Snow loads H < 1000 m	1.63	1.63 1.64			0.54	0.54 0.60		
2	3.50	Permanent loads Snow loads H < 1000 m	1.63	1.63 1.64			0.54	0.54 0.60		

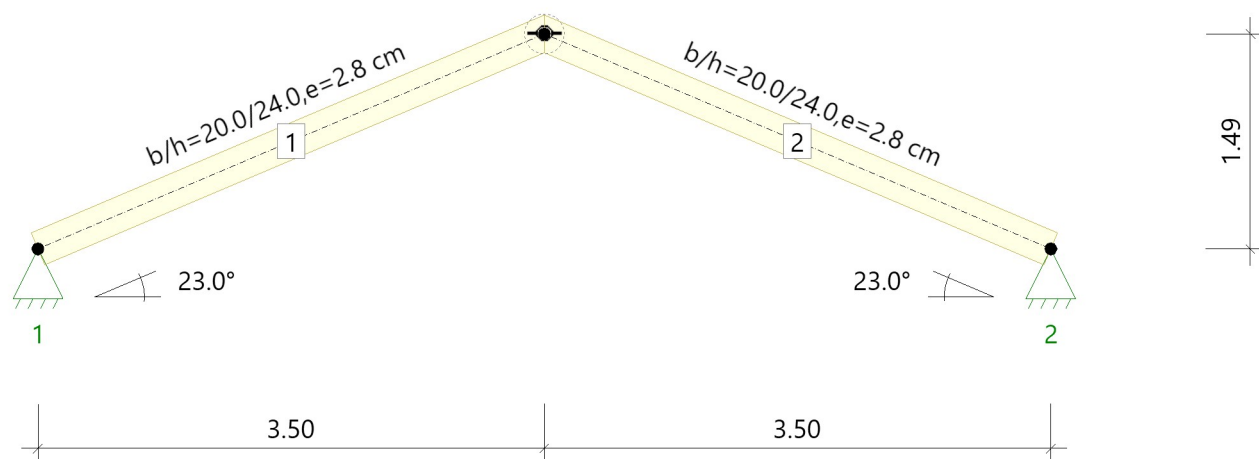
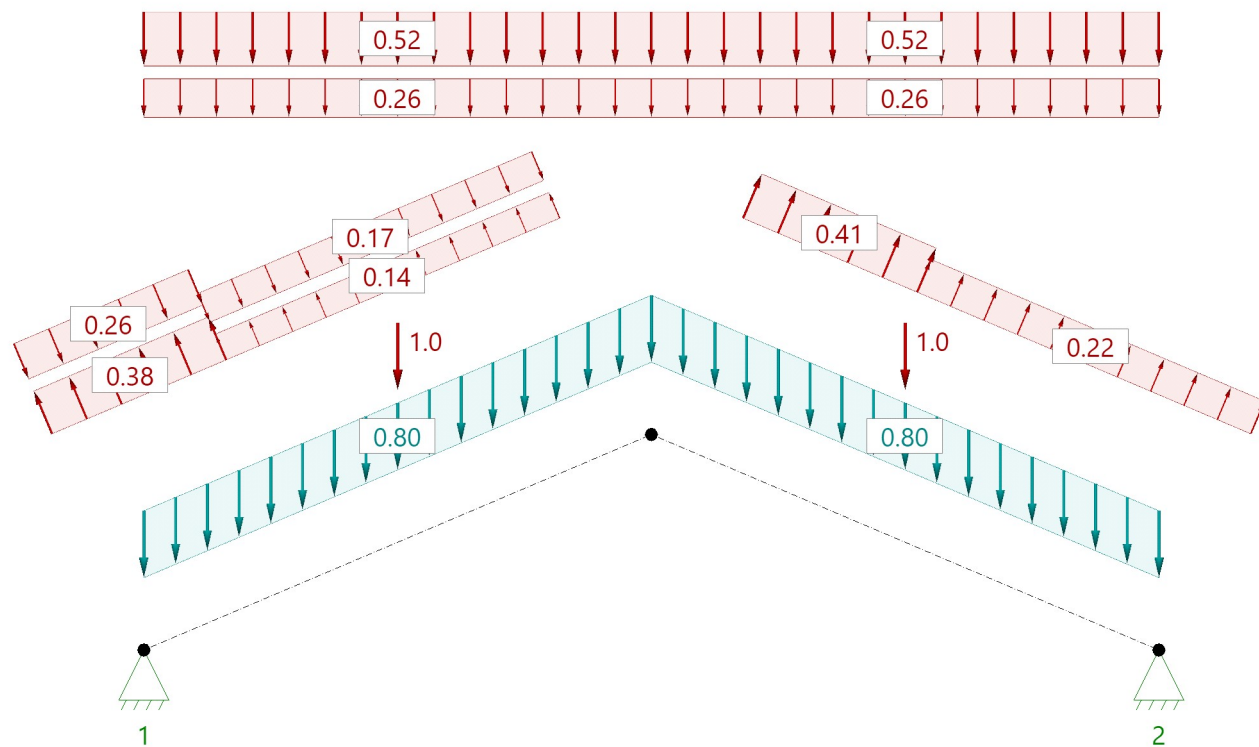
Item: objekt 1 - špirovci

kontrolirati na objektu

Purlin and Rafter Roof (x64) DPD+ 02/25B (FRILO R-2025-2/P07)

System
Common

Softwood C24, Service class roofed, open; AH<85%; BMC<20%, CC 2

System Graphics

Load graphics

Material
Material values Timber

Softwood C24 acc.to EN 338:2016

 $E_{0,mean} = 11000 \text{ N/mm}^2$
 $G_{mean} = 690 \text{ N/mm}^2$
 $\rho_k = 350 \text{ kg/m}^3$

Material Characteristics

$f_{m,k}$ $f_{v,k}$ N/mm ²	$f_{t,0,k}$ $f_{c,0,k}$ N/mm ²	$f_{t,90,k}$ $f_{c,90,k}$ N/mm ²	$E_{0,mean}$ $E_{0,05}$ N/mm ²	$E_{90,mean}$ $E_{90,05}$ N/mm ²	G_{mean} G_{05} N/mm ²	ρ_k ρ_m kg/m ³	γ kN/m ³
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420	6.00

Geometry

Rafter Roof

Rafter spacing $e = 2.8$ m Total ridge height $h = 6.00$ m
Length of Roof $b_{Roof} = 20.00$ m Building length $b_{Wall} = 20.00$ m

Rafter

Span	Length BAR [m]	Length RAR [m]	Page	Slope [°]	Cross-section [cm]
1	3.50	3.80	left	23.0	20.0/24.0
1	3.50	3.80	right	23.0	20.0/24.0
with ridge					

Support

No.	Member	Cx [kN/m]	Cz [kN/m]	Depth of birdsmouth joints t [cm]
1	Rafter left	Rigid	Rigid	0.0
2	Rafter right	Rigid	Rigid	0.0

Tilt-/ Buckling-Lengths

Rafter left

Buckling in plane: from eigenvalue limited to...0.90*L
Buckling out of plane: kept continuously
Tilting: kept continuously

Rafter right

Buckling in plane: from eigenvalue limited to...0.90*L
Buckling out of plane: kept continuously
Tilting: kept continuously

Calculation Rules

Deflections are always taken into account on the cantilever.
The rod length is always used as the reference length for the total deflection verification.
Caution! If bars are connected without a support, their bar lengths are added up.
Wind loads from undergrate blast are assumed to be dependent.
Wind loads from internal wind pressure are assumed to be dependent.
Load cases with loads whose expected deformations are opposite are not included.
Combinations of load cases whose expected deformations are opposite are not used.
The stiffness should be reduced as a result of creep from permanent and quasi-permanent load components.
With wind, k_{mod} is set as the mean value of short and very short.
Wind loads for lateral flow in Inconvenient area
Roof live loads of the category H are only considered as individual loads.
Roof live loads of the category H are not considered in reaction forces.

Loads

Load Pre-settings

Rafter

Roofing $g_1 = 0.80$ kN/m² Act = 99
Construction $g_2 = 0.00$ kN/m²
Loft conversion $g_3 = 0.00$ kN/m²
Loft Conversion bottom $g_b = 0.00$ kN/m²
With dead weight of members, $\gamma = 6.00$ kN/m³
Roofload Cat.H $Q = 1.0$ kN Act = 8

Boundary conditions

Total ridge height $h = 6.00$ m
Length of Roof $b_{Roof} = 20.00$ m
Building length $b_{Wall} = 20.00$ m

Snow / wind loads for the calculation - User-defined value

NTC EN 1991-1-3:2018, NTC EN 1991-1-4:2018

Terrain elevation Altitude = 100.00 m

Ground Snow Load $s_k = 0.65 \text{ kN/m}^2$

Wind pressure $q_{p,0}(h) = 0.56 \text{ kN/m}^2$

Wind pressure $q_{p,90}(h) = 0.56 \text{ kN/m}^2$
Auxiliary values

Wind pressure reference area $A_{ref} = 10.00 \text{ m}^2$

Wind reference length (Roof) $e_0 = 12.00 \text{ m}$ $e_{90} = 7.00 \text{ m}$

Wind reference length (Wall) $e_0 = 12.00 \text{ m}$ $e_{90} = 7.00 \text{ m}$
 $h/d = 0.857$ $h/b = 0.300$ $d/b = 0.350$

for gable-side flow: $h/d = 0.300$ $h/b = 0.857$ $d/b = 2.857$
Classification of Actions

No.	Name	γ_{sup}	γ_{inf}	ψ_0	ψ_1	ψ_2	KLED
99	Permanent loads	1.35	1.00	1.00	1.00	1.00	permanent
8	Cat. H: roofs	1.50	0.00	0.00	0.00	0.00	short-term
9	Wind loads	1.50	0.00	0.60	0.20	0.00	short/instant
10	Snow loads $H < 1000 \text{ m}$	1.50	0.00	0.50	0.20	0.00	short-term

Load values
Snow load

Name	Page	μ			Load value	(according to standard)	
Roof load	left	0.80	0.00	0.00	0.52	0.52	kN/m^2
Non-blown portion (for blown load cases)	left	0.80	0.00	0.00	0.52	0.52	kN/m^2
Blown portion (for blown load cases)	left	0.80	0.00	0.00	0.26	0.26	kN/m^2
Roof load	right	0.80	0.00	0.00	0.52	0.52	kN/m^2
Non-blown portion (for blown load cases)	right	0.80	0.00	0.00	0.52	0.52	kN/m^2
Blown portion (for blown load cases)	right	0.80	0.00	0.00	0.26	0.26	kN/m^2

Wind loads

Name	Page	c_{p+}	c_{p-}	Pressure [kN/m^2]	Suction [kN/m^2]	Pressure (Standard) [kN/m^2]	Suction (Standard) [kN/m^2]
F	from left	0.47	-0.69	0.26	-0.38	0.26	-0.38
G	from left	0.47	-0.64	0.26	-0.36	0.26	-0.36
H	from left	0.31	-0.25	0.17	-0.14	0.17	-0.14
I	from left	0.00	-0.40	0.00	-0.22	0.00	-0.22
J	from left	0.00	-0.73	0.00	-0.41	0.00	-0.41
D	from left	0.78	0.00	0.44	0.00	0.44	0.00
E	from left	0.00	-0.46	0.00	-0.26	0.00	-0.26
I	from the right	0.00	-0.40	0.00	-0.22	0.00	-0.22
J	from the right	0.00	-0.73	0.00	-0.41	0.00	-0.41
F	from the right	0.47	-0.69	0.26	-0.38	0.26	-0.38
G	from the right	0.47	-0.64	0.26	-0.36	0.26	-0.36
H	from the right	0.31	-0.25	0.17	-0.14	0.17	-0.14
D	from the right	0.78	0.00	0.44	0.00	0.44	0.00
E	from the right	0.00	-0.46	0.00	-0.26	0.00	-0.26

Combinations
LC Combinations

No.	Name		Sit	KLED
1	$1.35 \cdot g$	ULS ¹	p/t^2	1 ³
2	$1.35 \cdot g + 1.50 \cdot F_{mL1}$	ULS ¹	p/t^2	4 ⁴
3	$1.35 \cdot g + 1.50 \cdot F_{mR1}$	ULS ¹	p/t^2	4 ⁴
8	$1.35 \cdot g + 1.50 \cdot (w_{rLuv+}) + (w_{rLee-})$	ULS ¹	p/t^2	6 ⁵
11	$1.35 \cdot g + 1.50 \cdot s + 0.90 \cdot (w_{lLuv+}) + (w_{lLee+})$	ULS ¹	p/t^2	6 ⁵
17	$1.35 \cdot g + 1.50 \cdot s + 0.90 \cdot (w_{rLuv+}) + (w_{rLee+})$	ULS ¹	p/t^2	6 ⁵
30	$1.35 \cdot g + 1.50 \cdot s_{DI} + 0.90 \cdot (w_{rLuv+}) + (w_{rLee-})$	ULS ¹	p/t^2	6 ⁵
35	$1.35 \cdot g + 1.50 \cdot s_{Dr} + 0.90 \cdot (w_{lLuv+}) + (w_{lLee-})$	ULS ¹	p/t^2	6 ⁵
41	$1.00 \cdot g$	SLS ⁶	char ⁷	1 ³
42	$1.00 \cdot g + 1.00 \cdot (w_{lLuv+}) + (w_{lLee+})$	SLS ⁶	char ⁷	6 ⁵
43	$1.00 \cdot g + 1.00 \cdot (w_{rLuv+}) + (w_{rLee-})$	SLS ⁶	char ⁷	6 ⁵
45	$1.00 \cdot g + 1.00 \cdot (w_{rLuv+}) + (w_{rLee+})$	SLS ⁶	char ⁷	6 ⁵
48	$1.00 \cdot g + 1.00 \cdot s$	SLS ⁶	char ⁷	4 ⁴

No.	Name		Sit	KLED
49	1.00*g+1.00*s+0.60*(wLuv+)+(wLee+)	SLS ⁶	char ⁷	6 ⁵
51	1.00*g+1.00*s+0.60*(wLuv+)+(wLee-)	SLS ⁶	char ⁷	6 ⁵
55	1.00*g+1.00*s+0.60*(wRuv+)+(wLee+)	SLS ⁶	char ⁷	6 ⁵
71	1.00*g+1.00*sDr+0.60*(wLuv+)+(wLee+)	SLS ⁶	char ⁷	6 ⁵
73	1.00*g+1.00*sDr+0.60*(wLuv+)+(wLee-)	SLS ⁶	char ⁷	6 ⁵

The assignment of the short case names can be found in the table of load cases.

Es wurden nicht alle Kombinationen gebildet. Siehe dazu Einstellungen unter Berechnungsregeln.

- 1 : ULS=Structural failure
- 2 : p/t=persistent/transient (Persistent/Transient Situation)
- 3 : Load duration class:1=permanent
- 4 : Load duration class:4=short-term
- 5 : Load duration class:6=short/instant
- 6 : SLS=Serviceability
- 7 : char=characteristic (Characteristic Situation)

Results

Rafter left 20.0/24.0 e = 2.8 cm

ULS acc.to DIN EN 1995:2013, based on EN 1995:2014, Consequence class 2

Checks in Persistent/Transient Situation

Combi	Sit	Check	N _{x,d} [kN]	M _{y,d} [kNm]	V _{z,d} [kN]	σ _{n,d} [N/mm ²]	σ _{m,y,d} [N/mm ²]	τ _d [N/mm ²]	η	Sk _y [m]	Sk _z [m]	S _b [m]
2	p/t ¹	Stress (Span)	-3.3	2.01	0.7	-0.07	1.05		0.06			
2	p/t ¹	Stress (Column)	-3.6	0.00	1.4	-0.08	0.00		0.01			
2	p/t ¹	Stability	-3.6	2.01	0.0	-0.08	1.05		0.07²	3.42	0.00	0.00
2	p/t ¹	Shear	-3.6	0.00	1.4			0.04	0.03			

The composition of the load case combinations can be found in the table of load case combinations.

- 1 : p/t=persistent/transient (Persistent/Transient Situation)
- 2 : Sk_y=3.42 m, Sk_z=0.00 m, S_b=0.00 m

SLS checks acc.to DIN EN 1995:2013, based on EN 1995:2014, Consequence class 2

Combi	Check		Beam	x [m]	W _{G,inst} [cm]	W _{G,fin} [cm]	W _{Q,inst,char} [cm]	W _{Q,inst,qprm} [cm]	W _{Q,fin} [cm]	W _{tot} [cm]		W _{lim} [cm]	L/..	η
73	W _{inst}	¹	local	1	1.90	0.03		0.0		0.03	<	1.3	300	0.03
49	W _{inst}	¹	total	1	1.90	0.03		0.0		0.03	<	1.3	300	0.03
41	W _{net}	²	local	1	1.90	(0.03)	0.1		(0.0)	0.1	<	1.3	300	0.04
41	W _{net}	²	total	1	1.90	(0.03)	0.1		(0.0)	0.1	<	1.3	300	0.05
73	W _{fin}	³	local	1	1.90	(0.03)	0.1	(0.0)		0.1	<	1.9	200	0.03
49	W _{fin}	³	total	1	1.90	(0.03)	0.1	(0.0)		0.1	<	1.9	200	0.03

Values in () are only informative.

The rod length is always used as the reference length for the total deflection verification.

For the local deflection verification, the member length is always used as the reference length.

Member lengths of members that are connected to each other without support are added up.

- 1 : W_{inst} = W_{G,inst} + W_{Q,inst,char}
- 2 : W_{net} = W_{G,fin} + W_{Q,fin,qprm} - W_c
- 3 : W_{fin} = W_{G,fin} + W_{Q,fin,char}

Rafter right 20.0/24.0 e = 2.8 cm

ULS acc.to DIN EN 1995:2013, based on EN 1995:2014, Consequence class 2

Checks in Persistent/Transient Situation

Combi	Sit	Check	N _{x,d} [kN]	M _{y,d} [kNm]	V _{z,d} [kN]	σ _{n,d} [N/mm ²]	σ _{m,y,d} [N/mm ²]	τ _d [N/mm ²]	η	Sk _y [m]	Sk _z [m]	S _b [m]
3	p/t ¹	Stress (Span)	-2.7	2.01	0.7	-0.06	1.05		0.06			
3	p/t ¹	Stress (Column)	-3.6	0.00	-1.4	-0.08	0.00		0.01			
3	p/t ¹	Stability	-3.6	2.01	0.0	-0.08	1.05		0.07²	3.42	0.00	0.00
3	p/t ¹	Shear	-2.4	0.00	1.4			0.04	0.03			

The composition of the load case combinations can be found in the table of load case combinations.

- 1 : p/t=persistent/transient (Persistent/Transient Situation)
- 2 : Sk_y=3.42 m, Sk_z=0.00 m, S_b=0.00 m

SLS checks acc.to DIN EN 1995:2013, based on EN 1995:2014, Consequence class 2

Combi	Check		Beam	X [m]	W _{G,inst} [cm]	W _{G,fin} [cm]	W _{Q,inst,char} [cm]	W _{Q,inst,qprm} [cm]	W _{Q,fin} [cm]	W _{tot} [cm]		W _{lim} [cm]	L/..	η
55	W _{inst} 1	local	2	1.90	0.03		0.0			0.03	<	1.3	300	0.03
55	W _{inst} 1	total	2	1.90	0.03		0.0			0.03	<	1.3	300	0.03
41	W _{net} 2	local	2	1.90	(0.03)	0.1		(0.0)	0.0	0.1	<	1.3	300	0.04
41	W _{net} 2	total	2	1.90	(0.03)	0.1		(0.0)	0.0	0.1	<	1.3	300	0.05
55	W _{fin} 3	local	2	1.90	(0.03)	0.1	(0.0)		0.0	0.1	<	1.9	200	0.03
55	W _{fin} 3	total	2	1.90	(0.03)	0.1	(0.0)		0.0	0.1	<	1.9	200	0.03

Values in () are only informative.

The rod length is always used as the reference length for the total deflection verification.

For the local deflection verification, the member length is always used as the reference length.

Member lengths of members that are connected to each other without support are added up.

- 1 : W_{inst} = W_{G,inst} + W_{Q,inst,char}
2 : W_{net} = W_{G,fin} + W_{Q,fin,qprm} - W_c
3 : W_{fin} = W_{G,fin} + W_{Q,fin,char}

Support

Support Reactions per Act

Act		Support 1		Support 2	
		max [kN/m]	min [kN/m]	max [kN/m]	min [kN/m]
99	vertical	42.15 ¹	42.15 ¹	42.15 ¹	42.15 ¹
	horizontal	49.65 ¹	49.65 ¹	-49.65 ¹	-49.65 ¹
9	vertical	0.52 ²	-0.61 ³	0.52 ⁴	-0.61 ⁸
	horizontal	0.44 ⁴	-0.66 ⁵	0.66 ⁹	-0.44 ²
10	vertical	1.82 ⁶	1.14 ⁷	1.82 ⁶	1.14 ¹⁰
	horizontal	2.14 ⁶	1.61 ⁷	-1.61 ¹⁰	-2.14 ⁶

all values are characteristic values

Support forces are always positive in the direction of the global and local axes.

- 1 : Load Cases:g
2 : Load Cases:(wLuv+)+(wLee+)
3 : Load Cases:(wLuv-)+(wLee+)
4 : Load Cases:(wRuv+)+(wLee+)
5 : Load Cases:(wLuv+)+(wLee-)
6 : Load Cases:s
7 : Load Cases:sDI
8 : Load Cases:(wRuv-)+(wLee+)
9 : Load Cases:(wRuv+)+(wLee-)
10 : Load Cases:sDr

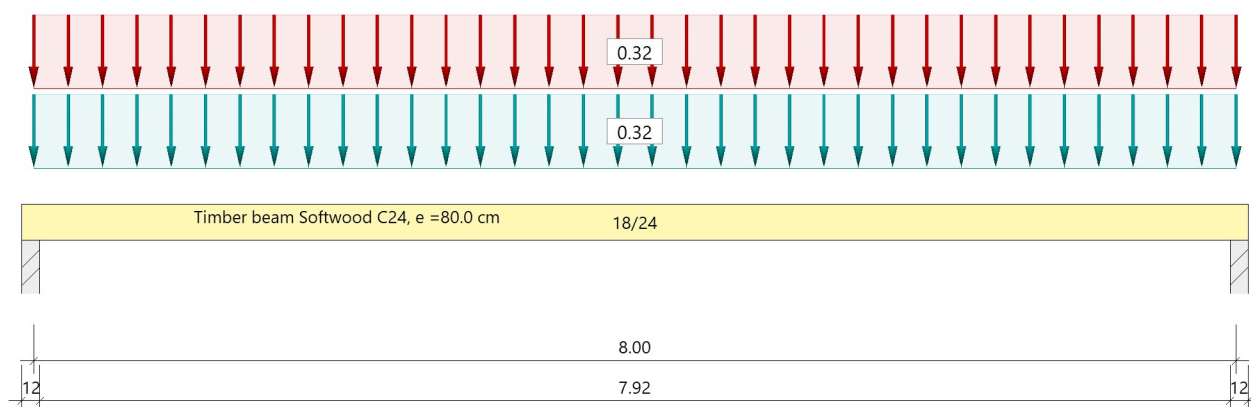
Item: objekt 1 stropnik nad nadstropjem

Continuous Beam Timber (x64) HTM+ 02/25 (FRILO R-2025-2/P07)

kontrolirati objektu
dimenzijsko in način
podpiranja

Basic parameters

Timber beam (e = 80.0 cm) Softwood C24 DIN EN 1995-1-1/NA:2013-08

System
System image

Material
Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm ²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm ²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm ²]	$E_{0,mean}$ $E_{0,05}$ [N/mm ²]	$E_{90,mean}$ $E_{90,05}$ [N/mm ²]	G_{mean} G_{05} [N/mm ²]	ρ_k ρ_m [kg/m ³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

$f_{m,k}$: characteristic value of bending strength
 $f_{t,0,k}$: characteristic value of tensile strength parallel to grain
 $f_{t,90,k}$: characteristic value of tensile strength perpendicular to the grain
 $E_{0,mean}$: Average value of modulus of elasticity parallel to the fiber
 $E_{90,mean}$: Average value of the modulus of elasticity perpendicular to the grain
 G_{mean} : Average value of the shear modulus
 ρ_k : Characteristic value of gross density
 $f_{v,k}$: characteristic value of shear strength
 $f_{c,0,k}$: characteristic value of compressive strength parallel to grain
 $f_{c,90,k}$: characteristic value of compressive strength perpendicular to the grain
 $E_{0,05}$: 5% fractile value of the modulus of elasticity parallel to grain
 $E_{90,05}$: 5% fractile value of the modulus of elasticity perpendicular to the grain
 G_{05} : 5% fractile value of the shear modulus
 ρ_m : Average value of the density

Geometry
Cross-sections

Name	I_y [cm ⁴]	I_z [cm ⁴]	W_y [cm ³]	W_z [cm ³]	A [cm ²]
18/24	20736	11664	1728	1296	432.0

Cross-section is constant over the entire length of the beam.

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	u_y [kN/m]	u_z [kN/m]	Rotations ^{*)}		
							Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	12.0	12.0	1.00	-1	-1	-1	0.0	0.0
2	8.00	12.0	12.0	1.00	-1	-1	0.0	0.0	0.0

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

Loads

Line loads from distributed loads

Reference	No.	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m ²]	W2 [kN/m ²]	acting Span by span	GF	Sim	Alt
System	1	UDL		8.00		0.40		No	Permanent		
	2	UDL		8.00		0.40		Yes	Cat. A		
Reference : System-related (front edge of beam) or span load Type : 1 - uniformly distributed load (GL), 4 - trapezoidal load (TL), 5 - triangular load (DL) A : Distance to the load from the beginning of the span or the front edge of the beam GF : Load effect Sim : Combined group Alt : Alternate group											

Lastbezeichnungen

Nr	Bezeichnung
1	Distance 0.80 m
2	Distance 0.80 m
The load values are multiplied internally by the girder spacing $e = 0.80$ m.	

Self-weight

Total weight = 145 kg taken into account with $\gamma = 4.20 \text{ kN/m}^3$.

Overview of the actions used

Actions

Description	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. A: domestic, residential areas	0.70	0.50	0.30	1.00	1.35 1.50	middle
Consequences class CC 2 according to EN 1990 Tab. B1 -> $K_{Fi} = 1.0$ Tab. B3						

Results

Design parameter

Design code	:	DIN EN 1995-1-1/NA:2013-08
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	DIN EN 1990/NA:2010-12
Consequence class	:	CC 2
$\psi_2 = 0.5$ for snow (AE)	:	not considered
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED at wind	:	Average of short and very short

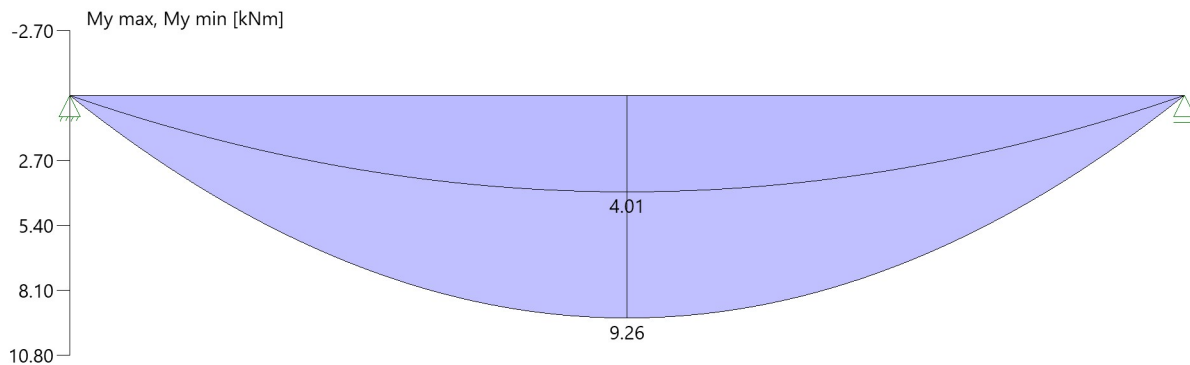
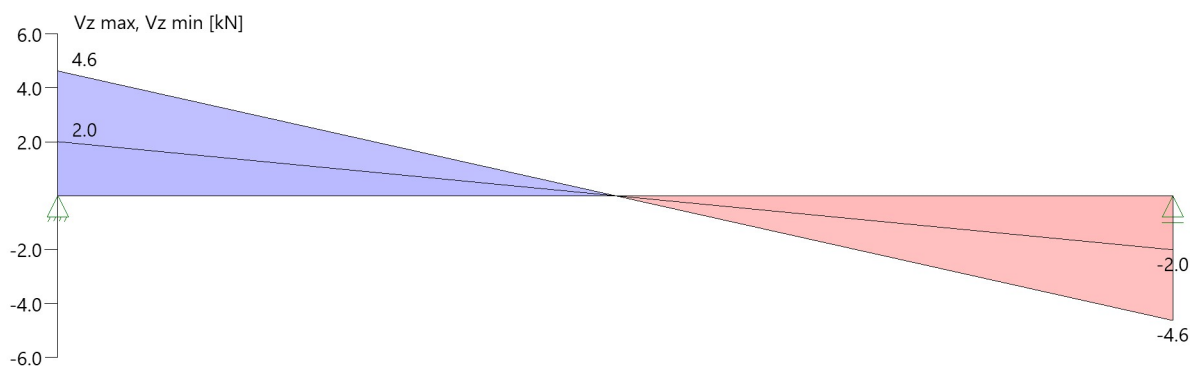
Service class	2	:	roofed, open
Shear stresses	=		Tau with red. Q
Initial deflection	w_{inst}	=	$l/300$
Final deflection	$w_{net,fin}$	=	$l/300$
	w_{fin}	=	$l/200$

Summary

Verification	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Bearing capacity Serviceability	persistent/transient characteristic	0.36	0.12	0.17	1)	0.94
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	18/24	-4.3	9.26	0.12	0.36	

Structural safety - Load combination persistent/transient
Internal forces
Envelope of the moments

Envelope of the transverse forces

Support reactions
Support reactions pro [m] - characteristic of each action

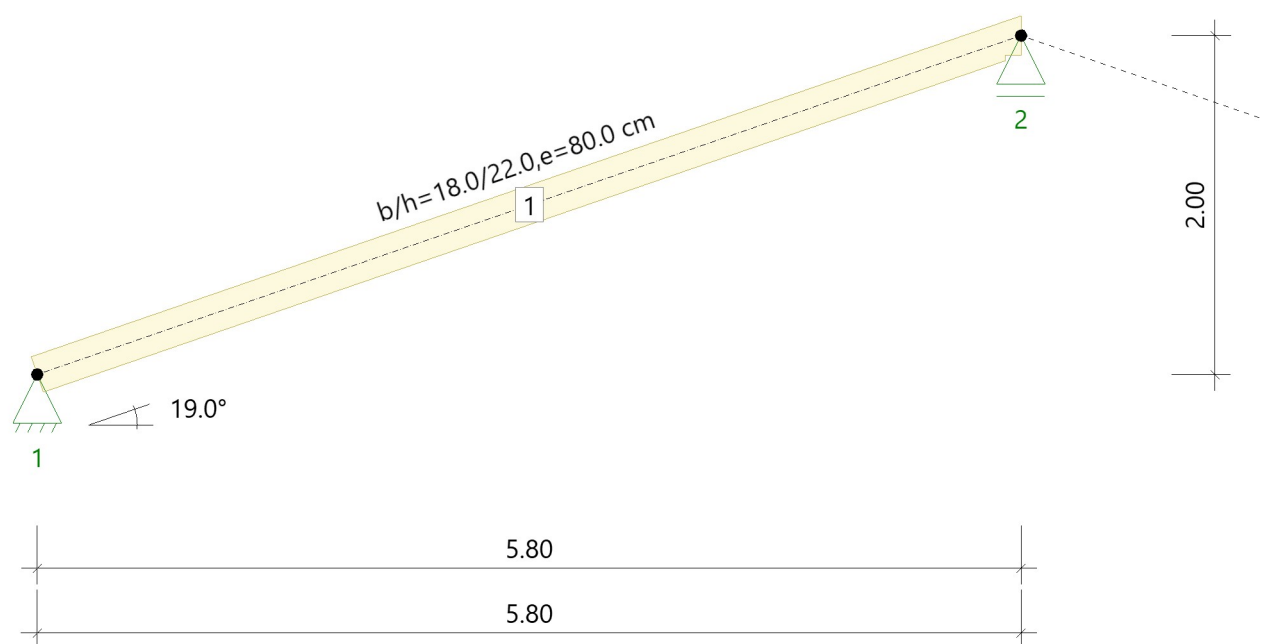
No.	x [m]	Action	R _{z,min} [kN/m]	R _{z,max} [kN/m]	M _{y,min} [kNm/m]	M _{y,max} [kNm/m]
1	0.00	Permanent loads Cat. A: domestic, residential areas	2.51	2.51 1.60		
2	8.00	Permanent loads Cat. A: domestic, residential areas	2.51	2.51 1.60		

Item: objekt 2 - špirovci

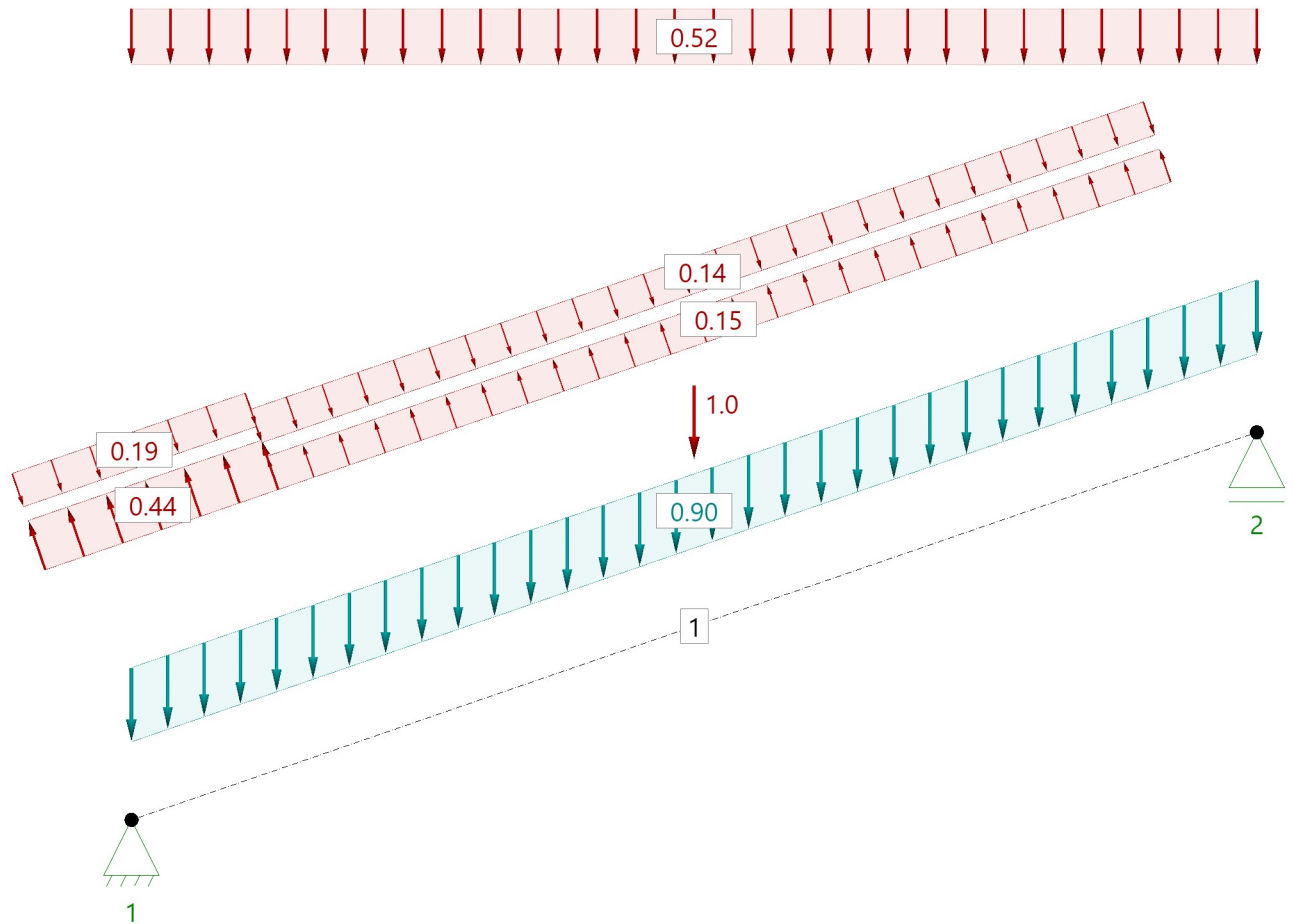
Continuous Rafter (x64) DSP+ 02/25B (FRILO R-2025-2/P07)

System
Common

Softwood C24, Service class roofed, open; AH<85%; BMC<20%, CC 2

System Graphics


Load graphics



Material

Material values Timber

Softwood C24 acc.to EN 338:2016

 $E_{0,mean} = 11000 \text{ N/mm}^2$
 $G_{mean} = 690 \text{ N/mm}^2$
 $\rho_k = 350 \text{ kg/m}^3$

Material Characteristics

$f_{m,k}$ $f_{v,k}$ N/mm ²	$f_{t,0,k}$ $f_{c,0,k}$ N/mm ²	$f_{t,90,k}$ $f_{c,90,k}$ N/mm ²	$E_{0,mean}$ $E_{0,05}$ N/mm ²	$E_{90,mean}$ $E_{90,05}$ N/mm ²	G_{mean} G_{05} N/mm ²	ρ_k ρ_m kg/m ³	γ kN/m ³
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420	6.00

Geometry

Continuous Rafter

Rafter spacing $e = 80.0 \text{ cm}$ Total ridge height $h = 6.00 \text{ m}$
Length of Roof $b_{\text{Roof}} = 20.00 \text{ m}$ Building length $b_{\text{Wall}} = 20.00 \text{ m}$

Rafter

Span	Length BAR [m]	Length RAR [m]	Page	Slope [°]	Cross-section [cm]
1	5.80	6.13	left	19.0	18.0/22.0

Support

No.	Member	Cx [kN/m]	Cz [kN/m]	Depth of birdsmouth joints t [cm]
1	Rafter left	Rigid	Rigid	0.0
2	Rafter left	0.00	Rigid	3.0

Cross-section Properties

Cross-section Properties

Member	Description	A [cm ²]	I _y [cm ⁴]	W _y [cm ³]
Rafter left	18.0/22.0	396.0	15972	1452

Tilt-/ Buckling-Lengths

Rafter left

Buckling in plane: from eingenvale limited to...0.90*L
Buckling out of plane: kept continuously
Tilting: kept continuously

Calculation Rules

Deflections are always taken into account on the cantilever.
The rod length is always used as the reference length for the total deflection verification.
Caution! If bars are connected without a support, their bar lengths are added up.
Wind loads from undergrate blast are assumed to be dependent.
Wind loads from internal wind pressure are assumed to be dependent.
Load cases with loads whose expected deformations are opposite are not included.
Combinations of load cases whose expected deformations are opposite are not used.
The stiffness should be reduced as a result of creep from permanent and quasi-permanent load components.
With wind, kmod is set as the mean value of short and very short.
Wind loads for lateral flow in Inconvenient area
Roof live loads of the category H are only considered as individual loads.
Roof live loads of the category H are not considered in reaction forces.

Loads

Load Pre-settings

Rafter

Roofing $g_1 = 0.90 \text{ kN/m}^2$ Act = 99
Construction $g_2 = 0.00 \text{ kN/m}^2$
Loft conversion $g_3 = 0.00 \text{ kN/m}^2$
Loft Conversion bottom $g_b = 0.00 \text{ kN/m}^2$
With dead weight of members, $\gamma = 6.00 \text{ kN/m}^3$
Roofload Cat.H $Q = 1.0 \text{ kN}$ Act = 8

Boundary conditions

Total ridge height $h = 6.00 \text{ m}$
Length of Roof $b_{\text{Roof}} = 20.00 \text{ m}$
Building length $b_{\text{Wall}} = 20.00 \text{ m}$
Building width on the right $br = 0.00 \text{ m}$

Snow / wind loads for the calculation - User-defined value

NTC EN 1991-1-3:2018, NTC EN 1991-1-4:2018

Terrain elevation Altitude = 0.00 m
Ground Snow Load $s_k = 0.65 \text{ kN/m}^2$
Wind pressure $q_{p,0}(h) = 0.56 \text{ kN/m}^2$
Wind pressure $q_{p,90}(h) = 0.56 \text{ kN/m}^2$

Auxiliary values

Wind pressure reference area $A_{\text{ref}} = 10.00 \text{ m}^2$
Wind reference length (Roof) $e_0 = 12.00 \text{ m}$ $e_{90} = 5.80 \text{ m}$
Wind reference length (Wall) $e_0 = 12.00 \text{ m}$ $e_{90} = 5.80 \text{ m}$
 $h/d = 1.034$ $h/b = 0.300$ $d/b = 0.290$
for gable-side flow: $h/d = 0.300$ $h/b = 1.034$ $d/b = 3.448$

Classification of Actions

No.	Name	γ_{sup}	γ_{inf}	ψ_0	ψ_1	ψ_2	KLED
99	Permanent loads	1.35	1.00	1.00	1.00	1.00	permanent
8	Cat. H: roofs	1.50	0.00	0.00	0.00	0.00	short-term
9	Wind loads	1.50	0.00	0.60	0.20	0.00	short/instant
10	Snow loads H < 1000 m	1.50	0.00	0.50	0.20	0.00	short-term

Load values

Snow load

Name	Page	μ			Load value	(according to standard)	
Roof load	left	0.80	0.00	0.00	0.52	0.52	kN/m ²
Non-blown portion (for blown load cases)	left	0.80	0.00	0.00	0.52	0.52	kN/m ²
Blown portion (for blown load cases)	left	0.80	0.00	0.00	0.26	0.26	kN/m ²

Wind loads

Name	Page	cp+	cp-	Pressure [kN/m ²]	Suction [kN/m ²]	Pressure (Standard) [kN/m ²]	Suction (Standard) [kN/m ²]
F	from left	0.33	-0.79	0.19	-0.44	0.19	-0.44
G	from left	0.33	-0.72	0.19	-0.40	0.19	-0.40
H	from left	0.25	-0.27	0.14	-0.15	0.14	-0.15
D	from left	0.80	0.00	0.45	0.00	0.45	0.00
E	from left	0.00	-0.50	0.00	-0.28	0.00	-0.28
I	from the right	0.00	-0.40	0.00	-0.22	0.00	-0.22
J	from the right	0.00	-0.87	0.00	-0.49	0.00	-0.49
D	from the right	0.80	0.00	0.45	0.00	0.45	0.00
E	from the right	0.00	-0.50	0.00	-0.28	0.00	-0.28

Combinations

LC Combinations

No.	Name		Sit	KLED
1	1.35*g+1.50*s	ULS ¹	p/t ²	4 ³
2	1.35*g+1.50*s+0.90*(wLuv+)	ULS ¹	p/t ²	6 ⁴
6	1.35*g+1.50*s+0.90*(wrLee-)	ULS ¹	p/t ²	6 ⁴
11	1.35*g+1.50*(wrLee-)	ULS ¹	p/t ²	6 ⁴
12	1.35*g	ULS ¹	p/t ²	1 ⁵
13	1.00*g+1.00*s	SLS ⁶	char ⁷	4 ³
14	1.00*g+1.00*s+0.60*(wLuv+)	SLS ⁶	char ⁷	6 ⁴

The assignment of the short case names can be found in the table of load cases.

Es wurden nicht alle Kombinationen gebildet. Siehe dazu Einstellungen unter Berechnungsregeln.

- 1 : ULS=Structural failure
- 2 : p/t=persistent/transient (Persistent/Transient Situation)
- 3 : Load duration class:4=short-term
- 4 : Load duration class:6=short/instant
- 5 : Load duration class:1=permanent
- 6 : SLS=Serviceability
- 7 : char=characteristic (Characteristic Situation)

Results

Rafter left 18.0/22.0 e = 80.0 cm

ULS acc.to DIN EN 1995:2013, based on EN 1995:2014, Consequence class 2

Checks in Persistent/Transient Situation

Combi	Sit	Check	N _{x,d} [kN]	M _{y,d} [kNm]	V _{z,d} [kN]	$\sigma_{n,d}$ [N/mm ²]	$\sigma_{m,y,d}$ [N/mm ²]	τ_d [N/mm ²]	η	S _{ky} [m]	S _{kz} [m]	S _b [m]
12	p/t ¹	Stress (Span)	0.0	5.75	0.0	0.00	3.96		0.36			
12	p/t ¹	Stress (Column)	1.3	0.00	-3.7	0.04	0.00		0.01			
12	p/t ¹	Stability	-1.3	5.75	0.0	-0.03	3.96		0.36²	2.88	0.00	0.00
12	p/t ¹	Shear	1.3	0.00	-3.7			-0.16	0.18			

The composition of the load case combinations can be found in the table of load case combinations.

- 1 : p/t=persistent/transient (Persistent/Transient Situation)
- 2 : S_{ky}=2.88 m, S_{kz}=0.00 m, S_b=0.00 m

SLS checks acc.to DIN EN 1995:2013, based on EN 1995:2014, Consequence class 2

Combi	Check		Beam	X [m]	WG,inst [cm]	WG,fin [cm]	WQ,inst,char [cm]	WQ,inst,qprm [cm]	WQ,fin [cm]	Wtot [cm]		Wlim [cm]	L/..	η
14	Winst 1	local	1	3.07	1.0		0.4			1.4	<	2.0	300	0.68
14	Winst 1	total	1	3.07	1.0		0.4			1.4	<	2.0	300	0.68
13	Wnet 2	local	1	3.07	(1.0)	1.7		(0.0)	0.0	1.7	<	2.0	300	0.84
13	Wnet 2	total	1	3.07	(1.0)	1.7		(0.0)	0.0	1.7	<	2.0	300	0.84
14	Wfin 3	local	1	3.07	(1.0)	1.7	(0.4)		0.4	2.1	<	3.1	200	0.70
14	Wfin 3	total	1	3.07	(1.0)	1.7	(0.4)		0.4	2.1	<	3.1	200	0.70

Values in () are only informative.

The rod length is always used as the reference length for the total deflection verification.

For the local deflection verification, the member length is always used as the reference length.

Member lengths of members that are connected to each other without support are added up.

- 1 : Winst = WG,inst + WQ,inst,char
2 : Wnet = WG,fin + WQ,fin,qprm - Wc
3 : Wfin = WG,fin + WQ,fin,char

Support

Support Reactions per Act

Act		Support 1		Support 2	
		max [kN/m]	min [kN/m]	max [kN/m]	min [kN/m]
99	vertical	3.67 ¹	3.67 ¹	3.67 ¹	3.67 ¹
	horizontal	0.00 ¹	0.00 ¹	0.00 ¹	0.00 ¹
9	vertical	0.41 ²	-0.70 ³	0.47 ²	-1.04 ⁴
	horizontal	0.56 ⁴	-0.30 ²	0.00 ⁶	0.00 ⁶
10	vertical	1.51 ⁵	1.51 ⁵	1.51 ⁵	1.51 ⁵
	horizontal	0.00 ⁶	0.00 ⁶	0.00 ⁶	0.00 ⁶

all values are characteristic values

Support forces are always positive in the direction of the global and local axes.

- 1 : Load Cases:g
2 : Load Cases:(wLuv+)
3 : Load Cases:(wLuv-)
4 : Load Cases:(wLee-)
5 : Load Cases:s
6 : Load Cases:

Item: objekt 2 stropniki

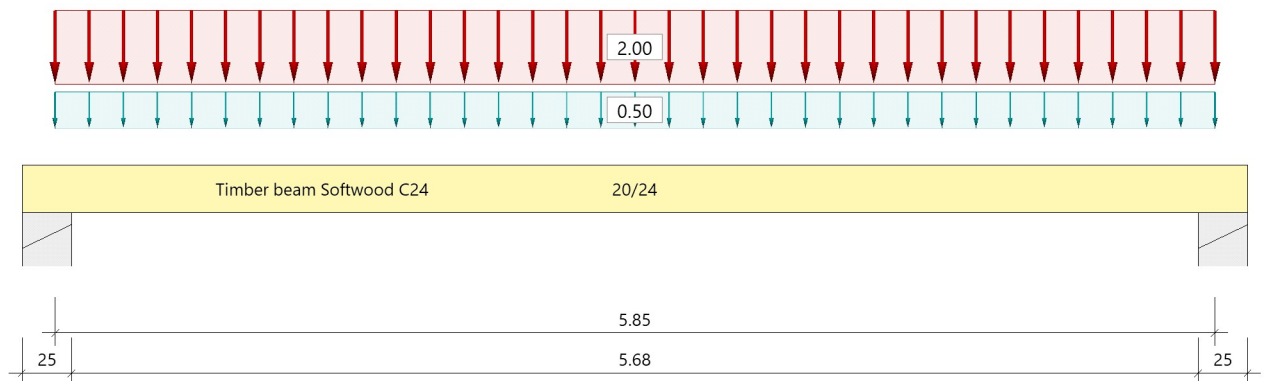
Continuous Beam Timber (x64) HTM+ 02/25 (FRILO R-2025-2/P07)

Basic parameters

Timber beam Softwood C24 DIN EN 1995-1-1/NA:2013-08

System

System image



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm ²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm ²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm ²]	$E_{0,mean}$ $E_{0,05}$ [N/mm ²]	$E_{90,mean}$ $E_{90,05}$ [N/mm ²]	G_{mean} G_{05} [N/mm ²]	ρ_k ρ_m [kg/m ³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

$f_{m,k}$: characteristic value of bending strength
 $f_{t,0,k}$: characteristic value of tensile strength parallel to grain
 $f_{t,90,k}$: characteristic value of tensile strength perpendicular to the grain
 $E_{0,mean}$: Average value of modulus of elasticity parallel to the fiber
 $E_{90,mean}$: Average value of the modulus of elasticity perpendicular to the grain
 G_{mean} : Average value of the shear modulus
 ρ_k : Characteristic value of gross density
 $f_{v,k}$: characteristic value of shear strength
 $f_{c,0,k}$: characteristic value of compressive strength parallel to grain
 $f_{c,90,k}$: characteristic value of compressive strength perpendicular to the grain
 $E_{0,05}$: 5% fractile value of the modulus of elasticity parallel to grain
 $E_{90,05}$: 5% fractile value of the modulus of elasticity perpendicular to the grain
 G_{05} : 5% fractile value of the shear modulus
 ρ_m : Average value of the density

Geometry

Cross-sections

Name	I_y [cm ⁴]	I_z [cm ⁴]	W_y [cm ³]	W_z [cm ³]	A [cm ²]
20/24	23040	16000	1920	1600	480.0

Cross-section is constant over the entire length of the beam.

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	u_y [kN/m]	u_z [kN/m]	Rotations*)		
							Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	25.0	12.0	1.00	-1	-1	-1	0.0	0.0
2	5.85	25.0	12.0	1.00	-1	-1	0.0	0.0	0.0

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

Loads

Line loads

Reference	No.	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	acting Span by span	GF	Sim	Alt
System	1	UDL		5.85		0.50		No	Permanent		
	2	UDL		5.85		2.00		Yes	Cat. A		
Reference : System-related (front edge of beam) or span load Type : 1 - uniformly distributed load (GL), 4 - trapezoidal load (TL), 5 - triangular load (DL) A : Distance to the load from the beginning of the span or the front edge of the beam GF : Load effect Sim : Combined group Alt : Alternate group											

Self-weight

Total weight = 118 kg taken into account with $\gamma = 4.20 \text{ kN/m}^3$.

Overview of the actions used

Actions

Description	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. A: domestic, residential areas	0.70	0.50	0.30	1.00	1.35 1.50	middle
Consequences class CC 2 according to EN 1990 Tab. B1 -> $K_{Fi} = 1.0$ Tab. B3						

Results

Design parameter

Design code	:	DIN EN 1995-1-1/NA:2013-08
Basis	:	EN 1995-1-1/A2:2014
Safety concept / load combinatorics	:	DIN EN 1990/NA:2010-12
Consequence class	:	CC 2
$\psi_2 = 0.5$ for snow (AE)	:	not considered
Permanent loads	:	all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED at wind	:	Average of short and very short

Service class	2	:	roofed, open
Shear stresses	=		Tau with red. Q
Initial deflection	w_{inst}	=	$l/300$
Final deflection	$w_{net,fin}$	=	$l/300$
	w_{fin}	=	$l/200$

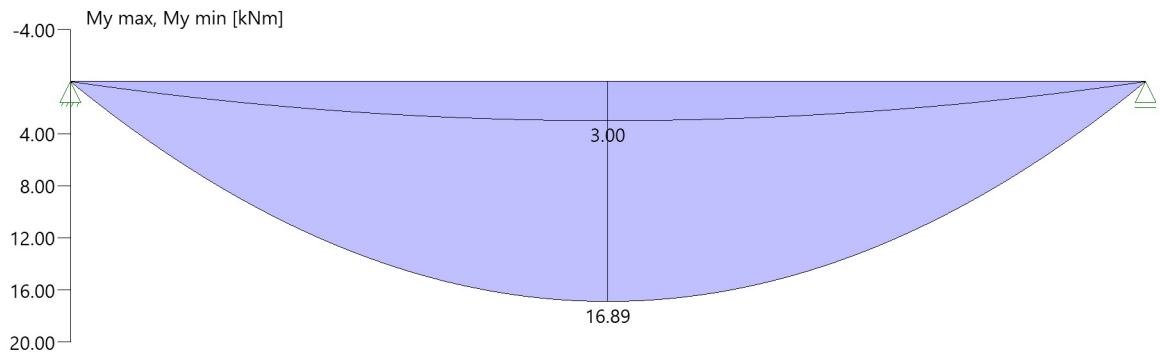
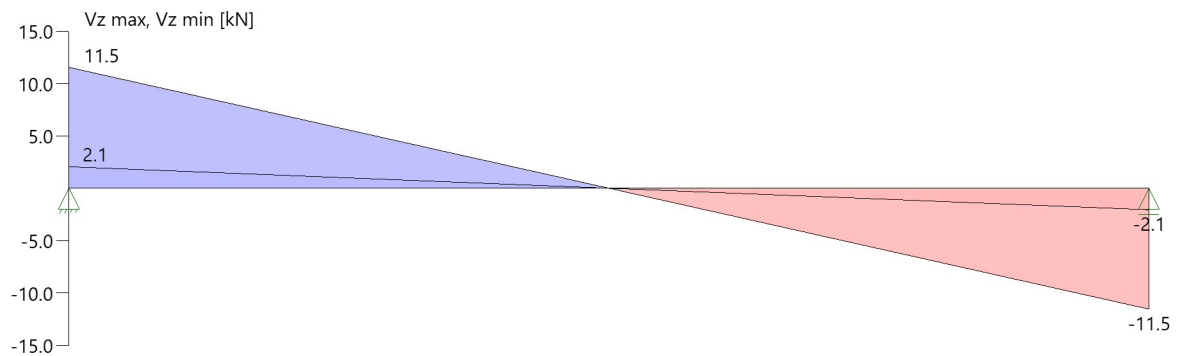
Summary

Verification	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Bearing capacity Serviceability	persistent/transient characteristic	0.60	0.26	0.22	1)	0.83

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	20/24	10.3	16.89	0.26	0.60	

Structural safety - Load combination persistent/transient
Internal forces
Envelope of the moments

Envelope of the transverse forces

Support reactions
Support reactions pro [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. A: domestic, residential areas	2.05	2.05 5.85		
2	5.85	Permanent loads Cat. A: domestic, residential areas	2.05	2.05 5.85		

Item: objekt 2 stropnik ob menjalniku

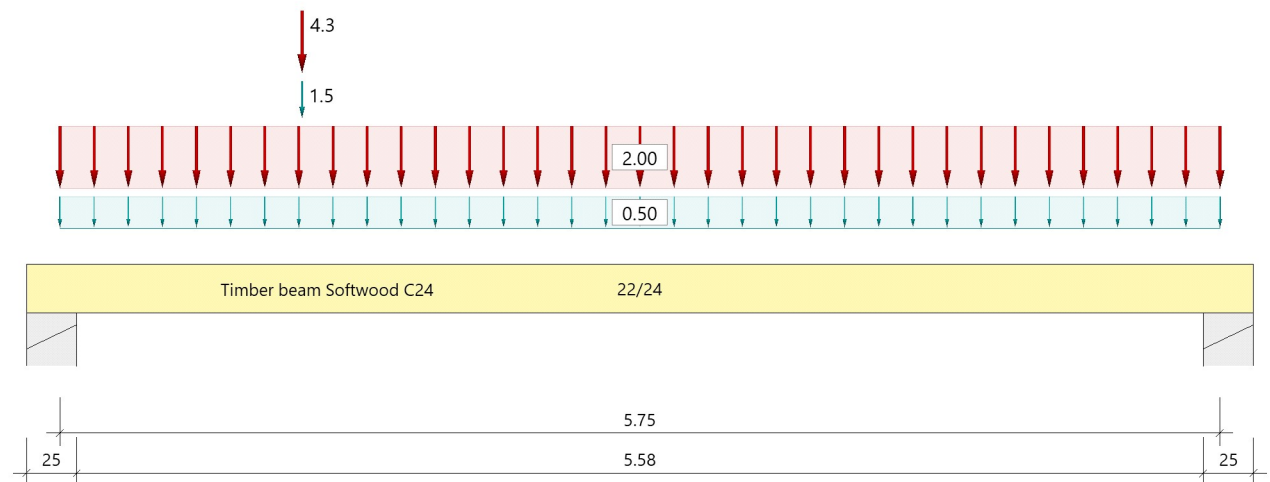
Continuous Beam Timber (x64) HTM+ 02/25 (FRILO R-2025-2/P07)

Basic parameters

Timber beam Softwood C24 DIN EN 1995-1-1/NA:2013-08

System

System image



Material

Softwood C24, acc.to EN 338:2016

$f_{m,k}$ $f_{v,k}$ [N/mm ²]	$f_{t,0,k}$ $f_{c,0,k}$ [N/mm ²]	$f_{t,90,k}$ $f_{c,90,k}$ [N/mm ²]	$E_{0,mean}$ $E_{0,05}$ [N/mm ²]	$E_{90,mean}$ $E_{90,05}$ [N/mm ²]	G_{mean} G_{05} [N/mm ²]	ρ_k ρ_m [kg/m ³]
24.00 4.00	14.50 21.00	0.40 2.50	11000 7400	370 247	690 460	350 420

$f_{m,k}$: characteristic value of bending strength
 $f_{t,0,k}$: characteristic value of tensile strength parallel to grain
 $f_{t,90,k}$: characteristic value of tensile strength perpendicular to the grain
 $E_{0,mean}$: Average value of modulus of elasticity parallel to the fiber
 $E_{90,mean}$: Average value of the modulus of elasticity perpendicular to the grain
 G_{mean} : Average value of the shear modulus
 ρ_k : Characteristic value of gross density
 $f_{v,k}$: characteristic value of shear strength
 $f_{c,0,k}$: characteristic value of compressive strength parallel to grain
 $f_{c,90,k}$: characteristic value of compressive strength perpendicular to the grain
 $E_{0,05}$: 5% fractile value of the modulus of elasticity parallel to grain
 $E_{90,05}$: 5% fractile value of the modulus of elasticity perpendicular to the grain
 G_{05} : 5% fractile value of the shear modulus
 ρ_m : Average value of the density

Geometry

Cross-sections

Name	I_y [cm ⁴]	I_z [cm ⁴]	W_y [cm ³]	W_z [cm ³]	A [cm ²]
22/24	25344	21296	2112	1936	528.0

Cross-section is constant over the entire length of the beam.

Support (Bearing conditions)

No	x [m]	Width [cm]	Depth [cm]	k_{c90}	u_y [kN/m]	u_z [kN/m]	Rotations*)		
							Φ_x [kNm/rad]	Φ_y [kNm/rad]	Φ_z [kNm/rad]
1	0.00	25.0	12.0	1.00	-1	-1	-1	0.0	0.0
2	5.75	25.0	12.0	1.00	-1	-1	0.0	0.0	0.0

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

Loads

Concentrated loads and moments

Reference	No.	Type	A [m]	W []	GF	Sim	Alt
System	1	Force	1.20	1.5 kN	Permanent Cat. A		
	2	Force	1.20	4.3 kN			
Reference : System-related (front edge of beam) or span load A [m] : Distance to the load from the beginning of the span or the front edge of the beam GF : Load effect Sim : Combined group Alt : Alternate group							

Line loads

Reference	No.	Type	A [m]	L1 [m]	L2 [m]	W1 [kN/m]	W2 [kN/m]	acting Span by span	GF	Sim	Alt
System	3	UDL		5.75		0.50		No	Permanent Cat. A		
	4	UDL		5.75		2.00		Yes			
Reference : System-related (front edge of beam) or span load Type : 1 - uniformly distributed load (GL), 4 - trapezoidal load (TL), 5 - triangular load (DL) A : Distance to the load from the beginning of the span or the front edge of the beam GF : Load effect Sim : Combined group Alt : Alternate group											

Self-weight

Total weight = 128 kg taken into account with $\gamma = 4.20 \text{ kN/m}^3$.

Overview of the actions used

Actions

Description	ψ_0	ψ_1	ψ_2	$\gamma_{F,inf}$	$\gamma_{F,sup}$	KLED
Permanent loads Cat. A: domestic, residential areas	0.70	0.50	0.30	1.00	1.35 1.50	middle
Consequences class CC 2 according to EN 1990 Tab. B1 -> $K_{Fi} = 1.0$ Tab. B3						

Results

Design parameter

Design code : DIN EN 1995-1-1/NA:2013-08
Basis : EN 1995-1-1/A2:2014
Safety concept / load combinatorics : DIN EN 1990/NA:2010-12
Consequence class : CC 2
 $\psi_2 = 0.5$ for snow (AE) : not considered
Permanent loads : all equal γ_F ($\gamma_{G,sup}$ or $\gamma_{G,inf}$)
CLED at wind : Average of short and very short

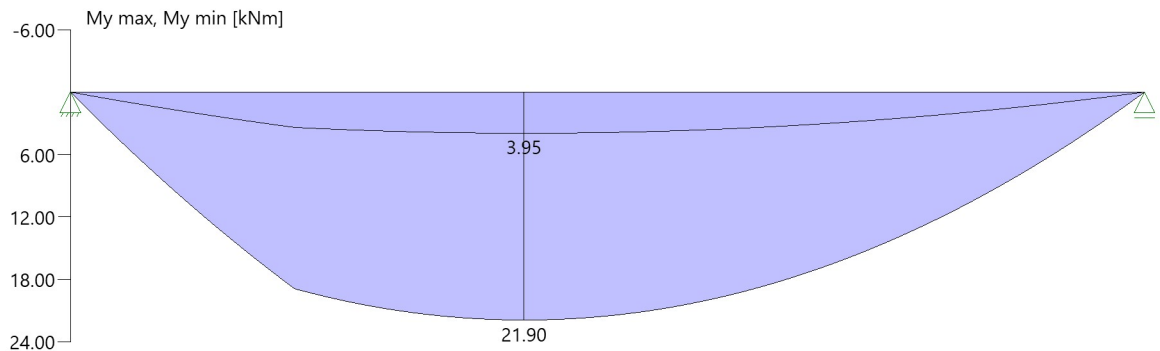
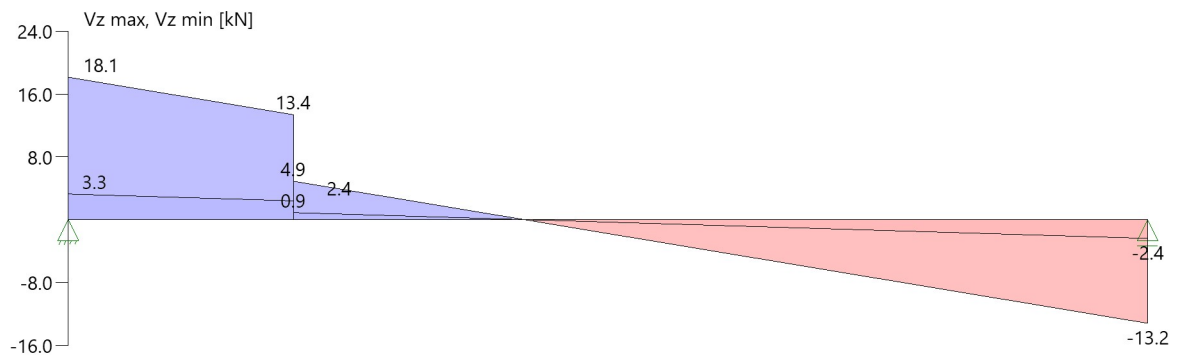
Service class 2 : roofed, open
Shear stresses = Tau with red. Q
Initial deflection $w_{inst} = l/300$
Final deflection $w_{net,fin} = l/300$
 $w_{fin} = l/200$

Summary

Verification	Design situation	$\eta_{Bending}$	η_{Shear}	$\eta_{c,90}$	η_{Stabi}	$\eta_{Deformation}$
Bearing capacity Serviceability	persistent/transient characteristic	0.70	0.39	0.35	1)	0.98
1) Stability check was not carried out because the upper chord is held continuously.						

Structural safety per cross-section (compact)

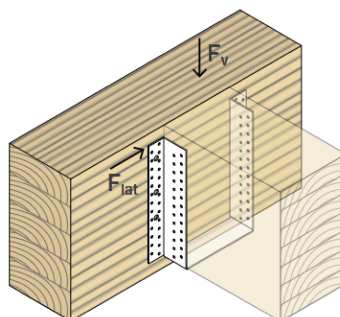
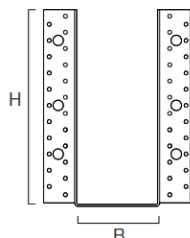
Design situation	Cross-section	$V_{z,Ed}$ [kN]	$M_{y,Ed}$ [kNm]	η_{Shear}	$\eta_{Bending}$	η_{Stabi}
persistent/transient	22/24	16.8	21.90	0.39	0.70	

Structural safety - Load combination persistent/transient
Internal forces
Envelope of the moments

Envelope of the transverse forces

Support reactions
Support reactions pro [m] - characteristic of each action

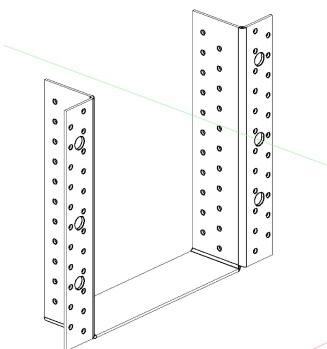
No.	x [m]	Action	$R_{z,min}$ [kN/m]	$R_{z,max}$ [kN/m]	$M_{y,min}$ [kNm/m]	$M_{y,max}$ [kNm/m]
1	0.00	Permanent loads Cat. A: domestic, residential areas	3.26	3.26 9.15		
2	5.75	Permanent loads Cat. A: domestic, residential areas	2.39	2.39 6.65		



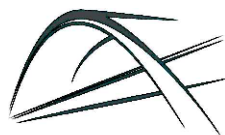
PRIKLJUČEK MENJALNIKA NA STROPNIK



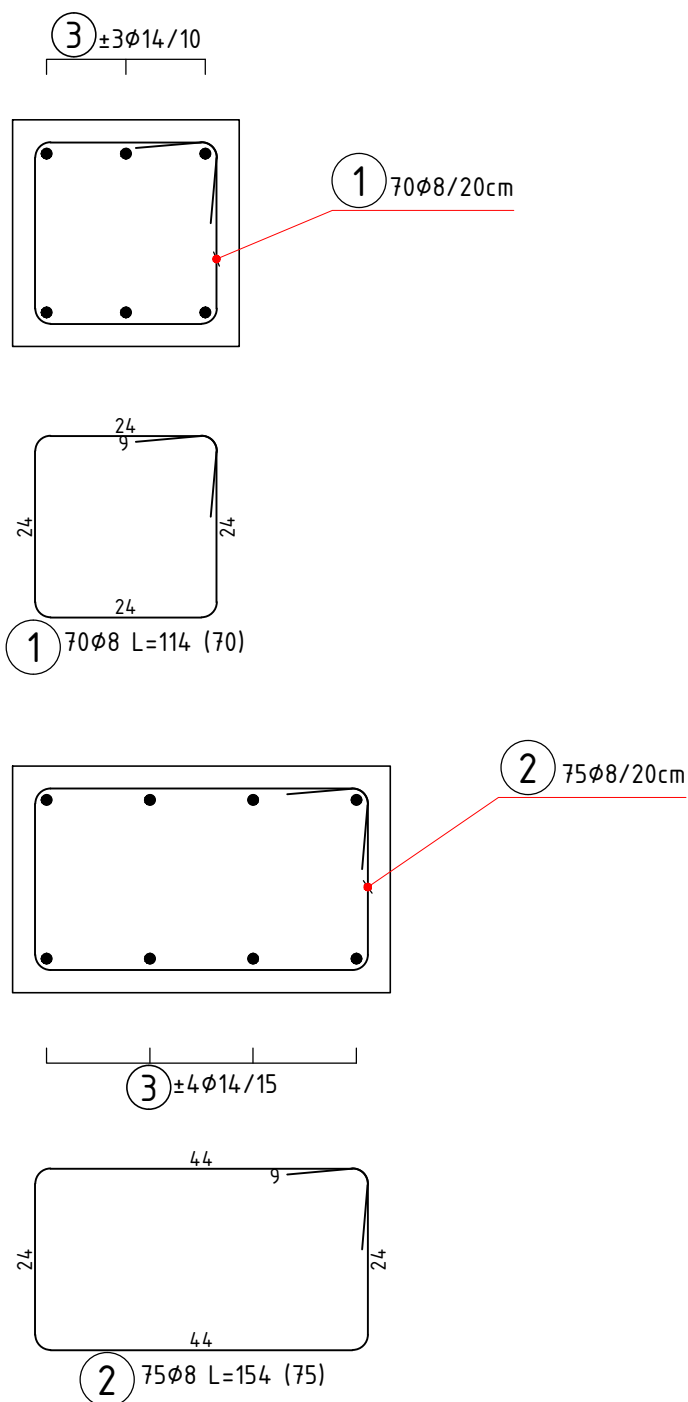
BSAG - LARGE SIZE			PARTIAL NAILING				FULL NAILING				
B	H	LBA nails	fastening number		characteristic values		fastening number		characteristic values		
			n _H ⁽²⁾	n _J ⁽³⁾	R _{v,k}	R _{lat,k}	n _H ⁽²⁾	n _J ⁽³⁾	R _{v,k}	R _{lat,k}	
[mm]	[mm]	d x L [mm]	[pcs]	[pcs]	[kN]	[kN]	[pcs]	[pcs]	[kN]	[kN]	
100	240	Ø4 x 60	24	16	40,7	10,7	46	30	75,6	19,9	
100	280	Ø4 x 60	28	18	47,3	10,8	54	34	85,1	20,3	
120	240	Ø4 x 60	24	16	40,7	12,3	46	30	75,6	22,9	
120	280	Ø4 x 60	28	18	47,3	12,6	54	34	85,1	23,5	
140	240	Ø4 x 60	24	16	40,7	13,7	46	30	75,6	25,6	
140	280	Ø4 x 60	28	18	47,3	14,1	54	34	85,1	26,4	
160	160	Ø4 x 60	16	10	21,2	11,1	30	18	41,6	19,9	
160	200	Ø4 x 60	20	12	30,7	12,3	38	22	56,7	22,4	
160	240	Ø4 x 60	24	16	40,7	15,0	46	30	75,6	27,9	
160	280	Ø4 x 60	28	18	47,3	15,5	54	34	85,1	29,0	
160	320	Ø4 x 60	32	20	52,0	15,9	62	38	94,6	30,0	
180	220	Ø4 x 60	22	14	35,7	15,2	42	26	66,2	27,0	
180	280	Ø4 x 60	28	18	47,3	16,7	54	34	85,1	31,3	
200	200	Ø4 x 60	20	12	30,7	13,7	38	22	56,7	25,0	
200	240	Ø4 x 60	24	16	40,7	16,9	46	30	75,6	31,3	
BSAG200240			200	240	2,5	8	9 1/2	0.10	●	●	10



OBJEKT:	CENTER LIČNA HIŠA	POZICIJA:
INVESTITOR:	OBCINA AJDOVŠČINA, Cesta 5. maja 6a, Ajdovščina	
ST. NAČRTA	1303/2026	

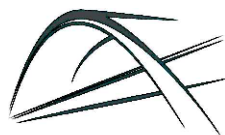


OBJEKT 2 - HORIZONTALNE VEZI

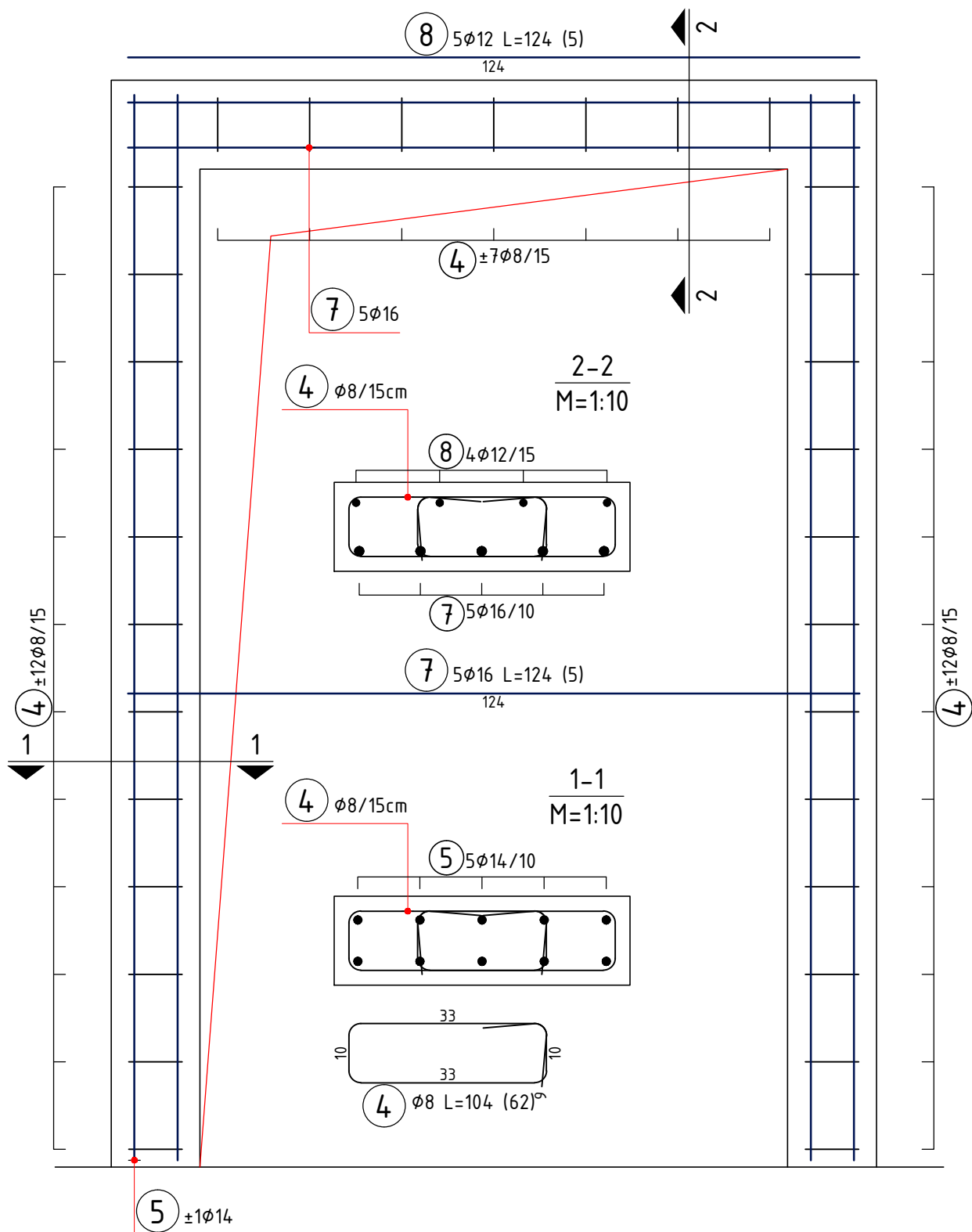


DIMENZIJE PRILAGODITI DEJANSKEMU STANJU

OBJEKT:	CENTER LIČNA HIŠA	POZICIJA:
INVESTITOR:	OBČINA AJDOVŠČINA, Cesta 5. maja 6a, Ajdovščina	
ST. NAČRTA	1303/2026	



OJAČITEV PREBOJA



DIMENZIJE PRILAGODITI DEJANSKEMU STANJU

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ST. NAČRTA	1303/2026	