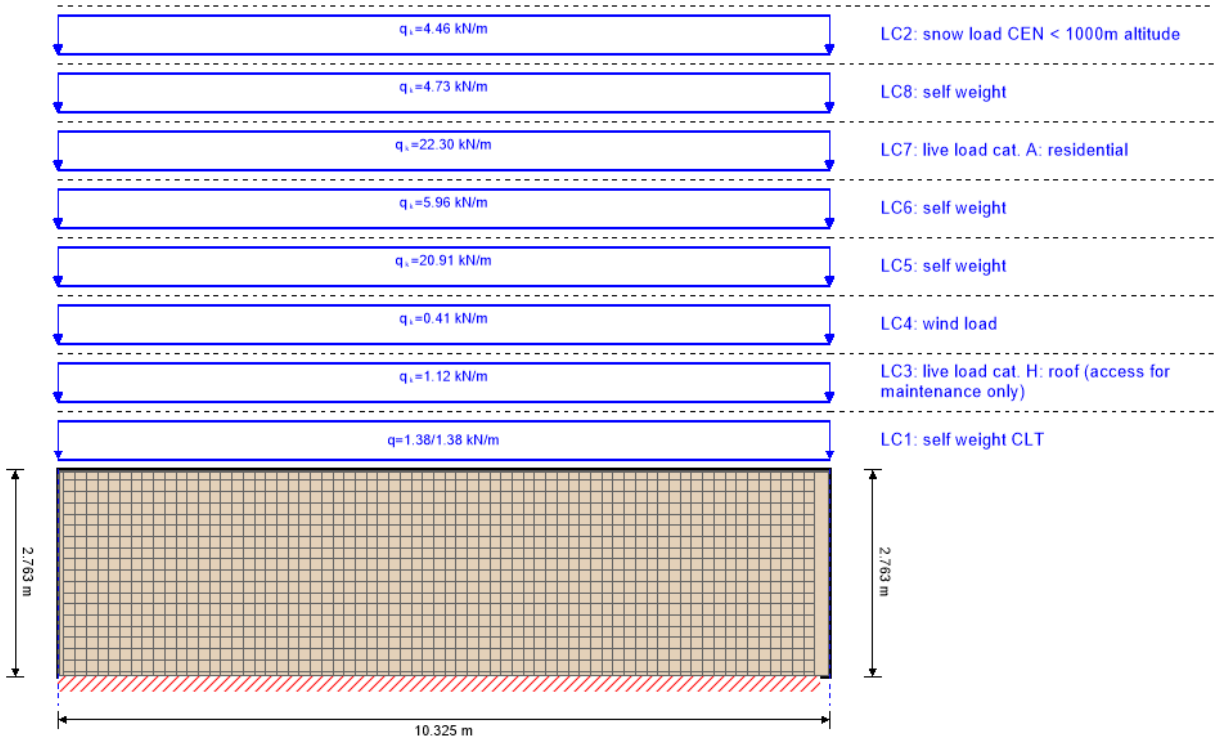
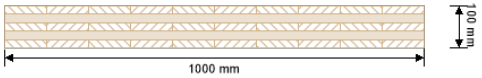
system



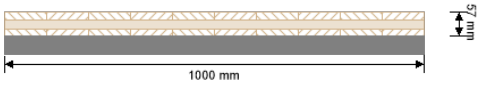
global utilization ratio						25 %
ULS	22 %	ULS fire	25 %	SLS	0 %	

section: CLT 100 L5s



layer	thickness	orientation	material
1	20.0 mm	0°	C24 spruce ETA (2019)
2	20.0 mm	90°	C24 spruce ETA (2019)
3	20.0 mm	0°	C24 spruce ETA (2019)
4	20.0 mm	90°	C24 spruce ETA (2019)
5	20.0 mm	0°	C24 spruce ETA (2019)
t_{CLT}	**100.0 mm**		

section fire: CLT 100 L5s



layer	thickness	orientation	material
1	20.0 mm	0°	C24 spruce ETA (2019)
2	20.0 mm	90°	C24 spruce ETA (2019)
3	17.0 mm	0°	C24 spruce ETA (2019)
t_{CLT}	**57.0 mm**		
fire resistance class:R 90	time	**90 min**	

section fire: CLT 100 L5s

fire protection layering : 2 x 12.5 mm gypsum plasterboard Type F
gypsum plasterboard Type A (acc. to EN 520)gypsum plasterboard Type F (acc. to EN 520)

$t_{ch,h}$	$t_{f,h}$	$t_{a,h}$	$d_{ta,h}$	k_0	d_0	$d_{char,0,h}$	$d_{ef,h}$
[min]	[min]	[min]	[mm]	[-]	[mm]	[mm]	[mm]
49	54	72	25	1	7	37.0	44.0

material values

material	$f_{m,k}$	$f_{t,0,k}$	$f_{t,90,k}$	$f_{c,0,k}$	$f_{c,90,k}$	$f_{v,k}$	$f_{r,k\ min}$	$E_{0,mean}$	G_{mean}	$G_{r,mean}$
	[N/mm²]	[N/mm²]	[N/mm²]	[N/mm²]	[N/mm²]	[N/mm²]	[N/mm²]	[N/mm²]	[N/mm²]	[N/mm²]
C24 spruce ETA (2019) C24 spruce ETA (2019)	24.00	14.00	0.12	21.00	2.50	4.00	1.25	12,000.00	690.00	50.00

load

load case groups

	load case category	Typ	duration	Kmod	γ_{inf}	γ_{sup}	Ψ_0	Ψ_1	Ψ_2
LC1 LC1	self weight CLT self weight CLT	G G	permanent permanent	0.6	1	1.35	1	1	1
LC2 LC2	snow load CEN < 1000m altitude snow load CEN < 1000m altitude	Q Q	short term short term	0.9	0	1.5	0.5	0.2	0
LC3 LC3	live load cat. H: roof (access for maintenance only) live load cat. H: roof (access for maintenance only)	Q Q	short term short term	0.9	0	1.5	0	0	0
LC4 LC4	wind load wind load	Q Q	short term short term	0.9	0	1.5	0.6	0.2	0
LC5 LC5	self weight self weight	G G	permanent permanent	0.6	1	1.35	1	1	1
LC6 LC6	self weight self weight	G G	permanent permanent	0.6	1	1.35	1	1	1
LC7 LC7	live load cat. A: residential live load cat. A: residential	Q Q	medium term medium term	0.8	0	1.5	0.7	0.5	0.3
LC8 LC8	self weight self weight	G G	permanent permanent	0.6	1	1.35	1	1	1

LC1:self weight CLT

trapezoidal load

distance from start	$q_{k,a}$	load at end	load length
[m]	[kN/m]		[m]
0.000	1.3815	1.38	10.325

LC2:snow load CEN < 1000m altitude

continuous load

q_k
[kN/m]
4.46

LC3:live load cat. H: roof (access for maintenance only)

continuous load

q_k
[kN/m]
1.115

LC4:wind load

continuous load
q_k
[kN/m]
0.41

LC5:self weight

continuous load
q_k
[kN/m]
20.91

LC6:self weight

continuous load
q_k
[kN/m]
5.957

LC7:live load cat. A: residential

continuous load
q_k
[kN/m]
22.3

LC8:self weight

continuous load
q_k
[kN/m]
4.7319

ULS combinations

	combination rule
LCO1 LCO1	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8
LCO2 LCO2	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC2 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC2
LCO3 LCO3	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC2 + 1.50/0.00 * 0.00 * LC3 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC2 + 1.50/0.00 * 0.00 * LC3
LCO4 LCO4	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC2 + 1.50/0.00 * 0.00 * LC3 + 1.50/0.00 * 0.60 * LC4 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC2 + 1.50/0.00 * 0.00 * LC3 + 1.50/0.00 * 0.60 * LC4
LCO5 LCO5	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC2 + 1.50/0.00 * 0.00 * LC3 + 1.50/0.00 * 0.60 * LC4 + 1.50/0.00 * 0.70 * LC7 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC2 + 1.50/0.00 * 0.00 * LC3 + 1.50/0.00 * 0.60 * LC4 + 1.50/0.00 * 0.70 * LC7
LCO6 LCO6	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC3 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC3
LCO7 LCO7	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC3 + 1.50/0.00 * 0.50 * LC2 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC3 + 1.50/0.00 * 0.50 * LC2
LCO8 LCO8	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC3 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.60 * LC4 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC3 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.60 * LC4

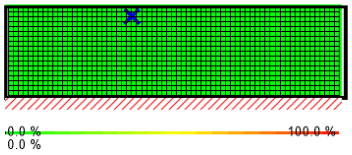
ULS combinations	
	combination rule
LCO9 LCO9	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC3 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.60 * LC4 + 1.50/0.00 * 0.70 * LC7 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC3 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.60 * LC4 + 1.50/0.00 * 0.70 * LC7
LCO10 LCO10	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC4 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC4
LCO11 LCO11	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC4 + 1.50/0.00 * 0.50 * LC2 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC4 + 1.50/0.00 * 0.50 * LC2
LCO12 LCO12	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC4 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.00 * LC3 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC4 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.00 * LC3
LCO13 LCO13	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC4 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.00 * LC3 + 1.50/0.00 * 0.70 * LC7 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC4 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.00 * LC3 + 1.50/0.00 * 0.70 * LC7
LCO14 LCO14	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC7 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC7
LCO15 LCO15	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC7 + 1.50/0.00 * 0.50 * LC2 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC7 + 1.50/0.00 * 0.50 * LC2
LCO16 LCO16	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC7 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.00 * LC3 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC7 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.00 * LC3
LCO17 LCO17	1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC7 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.00 * LC3 + 1.50/0.00 * 0.60 * LC4 1.35/1.00 * LC1 + 1.35/1.00 * LC5 + 1.35/1.00 * LC6 + 1.35/1.00 * LC8 + 1.50/0.00 * LC7 + 1.50/0.00 * 0.50 * LC2 + 1.50/0.00 * 0.00 * LC3 + 1.50/0.00 * 0.60 * LC4

ULS combinations fire	
	combination rule
LCO1 LCO1	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8
LCO2 LCO2	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC2 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC2
LCO3 LCO3	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3
LCO4 LCO4	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC4 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC4
LCO5 LCO5	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.30 * LC7 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.30 * LC7
LCO6 LCO6	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC3 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC3
LCO7 LCO7	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC2 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC2
LCO8 LCO8	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC4 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC4
LCO9 LCO9	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.30 * LC7 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.30 * LC7
LCO10 LCO10	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC4 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC4
LCO11 LCO11	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.00 * LC2 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.00 * LC2
LCO12 LCO12	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3

ULS combinations fire	
	combination rule
LCO13 LCO13	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.30 * LC7 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.00 * LC4 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.30 * LC7
LCO14 LCO14	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.30 * LC7 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.30 * LC7
LCO15 LCO15	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.30 * LC7 + 1.00/0.00 * 0.00 * LC2 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.30 * LC7 + 1.00/0.00 * 0.00 * LC2
LCO16 LCO16	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.30 * LC7 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.30 * LC7 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3
LCO17 LCO17	1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.30 * LC7 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC4 1.00/1.00 * LC1 + 1.00/1.00 * LC5 + 1.00/1.00 * LC6 + 1.00/1.00 * LC8 + 1.00/0.00 * 0.30 * LC7 + 1.00/0.00 * 0.00 * LC2 + 1.00/0.00 * 0.00 * LC3 + 1.00/0.00 * 0.00 * LC4

Ultimate limit state (ULS) - design results

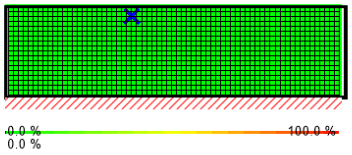
utilization rate of shear stress in plane on net section



LCO14

Id	X	Z	k_{mod}	$f_{IP,Netto,k}$	Q	$\tau_{IP,Net,d}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[N/mm²]	[%]
1182	3.825	2.475	0.8	3.9	0.00	0.00	0 %

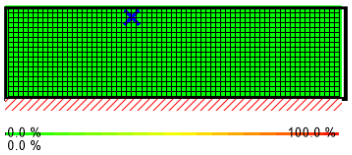
utilization rate of shear stress in plane of gross section



LCO14

Id	X	Z	k_{mod}	$f_{v,IP,Brutto,k}$	Q	$\tau_{IP,Gross,d}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[N/mm²]	[%]
1182	3.825	2.475	0.8	3.5	0.00	0.00	0 %

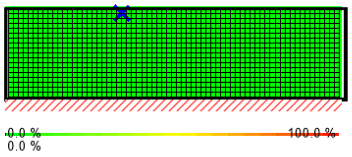
utilization rate of torsional shear stress in face glued surfaces



LCO14

Id	X	Z	k_{mod}	$f_{v,IP,T,k}$	Q	$\tau_{T,Node,d}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[N/mm²]	[%]
1182	3.825	2.475	0.8	2.5	0.00	0.00	0 %

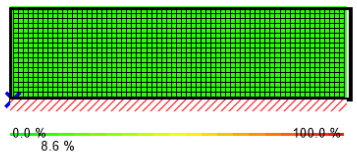
utilization rate of axial force horizontal



LCO14

Id	X	Z	k_{mod}	$f_{m,k}$	$N_{h,max}$	M_y	$\sigma_{h,max}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[kNm]	[N/mm²]	[%]
1248	3.525	2.625	0.8	24.0	0.0000	0.0000	0.00	0 %

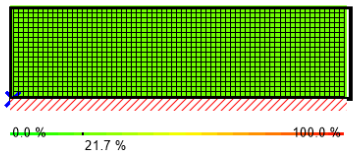
utilization rate of axial force vertical



LCO14

Id	X	Z	k_{mod}	$f_{m,k}$	$N_{v,max}$	M_y	$\sigma_{v,max}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[kNm]	[N/mm²]	[%]
1	0.075	0	0.8	24.0	1.8394	0.0000	1.32	9 %

utilization rate for buckling

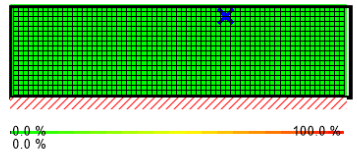


LCO14

Id	X	Z	l_k	λ_y	β_c	$k_{c,y}$	$f_{c,d}$	$\sigma_{c,0,d}$	$\sigma_{m,y,d}$	ratio
[-]	[m]	[m]	[m]	[-]	[-]	[-]	[N/mm²]	[N/mm²]	[N/mm²]	[%]
1	0.075	0	2.763	83	0.2	0.45	13.44	1.32	0.00	22 %

Ultimate limit state (ULS) fire design - results

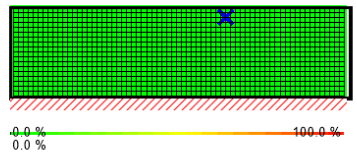
utilization rate of shear stress in plane on net section



LCO5

Id	X	Z	k_{mod}	$f_{IP,Netto,k}$	Q	$\tau_{IP,Net,d}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[N/mm²]	[%]
1200	6.525	2.475	1	3.9	0.00	0.00	0 %

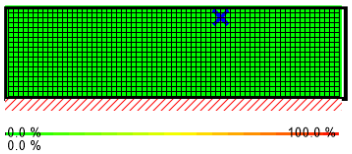
utilization rate of shear stress in plane of gross section



LCO5

Id	X	Z	k_{mod}	$f_{v,IP,Brutto,k}$	Q	$\tau_{IP,Gross,d}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[N/mm²]	[%]
1200	6.525	2.475	1	3.5	0.00	0.00	0 %

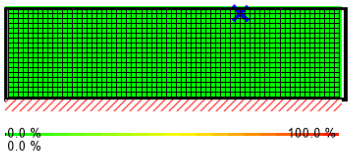
utilization rate of torsional shear stress in face glued surfaces



LCO5

Id	X	Z	k_{mod}	$f_{v,IP,T,k}$	Q	$\tau_{T,Node,d}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[N/mm²]	[%]
1200	6.525	2.475	1	2.5	0.00	0.00	0 %

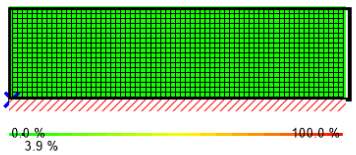
utilization rate of axial force horizontal



LCO5

Id	X	Z	k_{mod}	$f_{m,k}$	$N_{h,max}$	M_y	$\sigma_{h,max}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[kNm]	[N/mm²]	[%]
1272	7.125	2.625	1	24.0	0.0000	0.0000	0.00	0 %

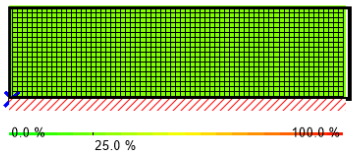
utilization rate of axial force vertical



LCO5

Id	X	Z	k_{mod}	$f_{m,k}$	$N_{v,max}$	M_y	$\sigma_{v,max}$	ratio
[-]	[m]	[m]	[-]	[N/mm²]	[kN]	[kNm]	[N/mm²]	[%]
1	0.075	0	1	24.0	6.0235	0.0000	1.09	4 %

utilization rate for buckling

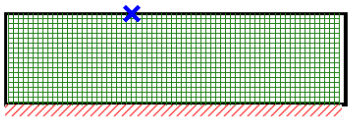


LCO5

Id	X	Z	l_k	λ_y	β_c	$k_{c,y}$	$f_{c,d}$	$\sigma_{c,0,d}$	$\sigma_{m,y,d}$	ratio
[-]	[m]	[m]	[m]	[-]	[-]	[-]	[N/mm²]	[N/mm²]	[N/mm²]	[%]
1	0.075	0	2.763	139	0.2	0.18	24.15	1.09	0.00	25 %

Service limit state design (SLS) - design results

horizontal deformation

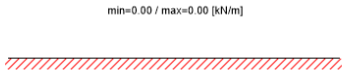


LCO5

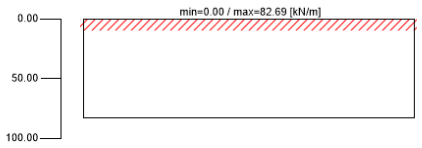
Id	X	Z	w_{limit}	limit	$v_{h,max}$	ratio
[-]	[m]	[m]	[mm]	[mm]	[mm]	[%]
1386	3.825	2.763	9.2	L/300 = 9.2 L/300 = 9.2	0.0000	0.0 %

support reaction

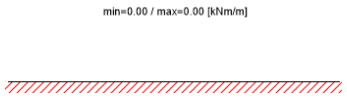
support reaction horizontal min/max



support reaction vertical min/max

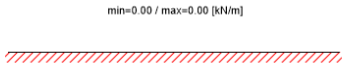


support reaction moment min/max

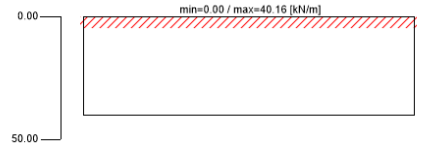


fire support reaction

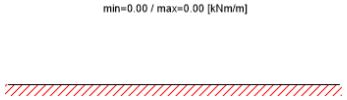
fire support reaction horizontal min/max



fire support reaction vertical min/max



fire support reaction moment min/max



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