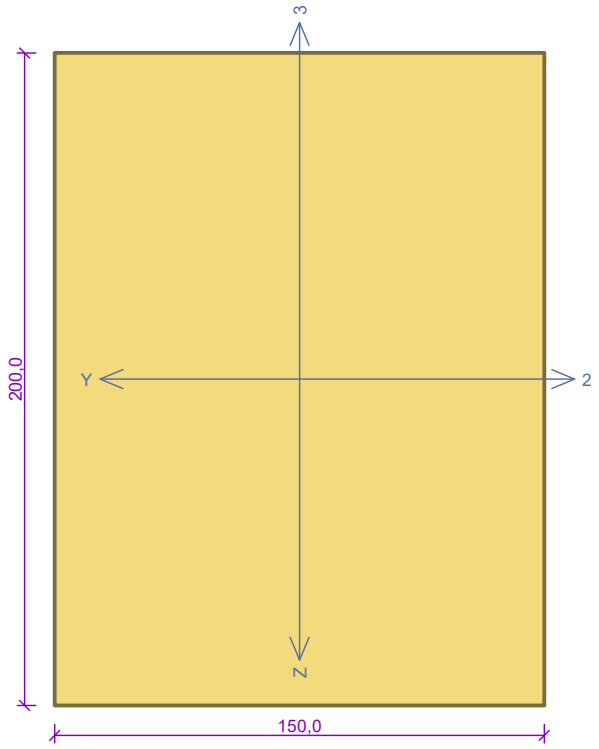
Section 1



Standard **EN 1995-1-1/Czech Rep.**.

Solid timber, basic load combination : γ_M = 1,300
Accidental load combination : γ_M = 1,000

Service class: 1

Section: Rectangular
Dimensions:
Cross-section height h = 200,0 mm
Cross-section width b = 150,0 mm

Material: C22 - coniferous
Timber type: solid
Material characteristics:

Bending strength	$f_{m,k}$	:	22,0 MPa
Tensile strength in fibre direction	$f_{t,0,k}$	:	13,0 MPa
Compressive strength in fibre direction	$f_{c,0,k}$	:	20,0 MPa
Shear strength	$f_{v,k}$	:	2,4 MPa
Compressive strength perpendicular to fibres	$f_{c,90,k}$	:	2,4 MPa
Tensile strength perpendicular to fibres	$f_{t,90,k}$	:	0,5 MPa
Elastic modulus	$E_{0,mean}$	:	10000 MPa
5% elastic modulus quantile	$E_{0.05}$	:	6700 MPa
Shear modulus	G_{mean}	:	630 MPa
Characteristic value of density	ρ_k	:	340,0 kg/m^3

Calculation ignores coefficient k_h for increasing timber strength.

Internal forces in system of cross-section coordinates:
Load with maximal utilization
Load 1
Long-term load
N = -152,000 kN
M_y = 0,000 kNm M_z = 0,000 kNm
V_z = -10,000 kN V_y = 0,000 kN

Buckling:
Calculation with buckling
Sector length for buckling L_z = 2,290 m
Buckling length factor k_z = 1,000 Buckling length $L_{cr,z}$ = 2,290 m
Sector length for buckling L_y = 2,290 m
Buckling length factor k_y = 1,000 Buckling length $L_{cr,y}$ = 2,290 m

Buckling:
Calculation without buckling

Results
Decisive load: Load 1
Internal forces: N = -152,000 kN; M_y = 0,000 kNm; M_z = 0,000 kNm; V_z = -10,000 kN; V_y = 0,000 kN

Buckling compression check:
Resistance: N_R = 241,587 kN
| -0,629 | < 1 **Pass**

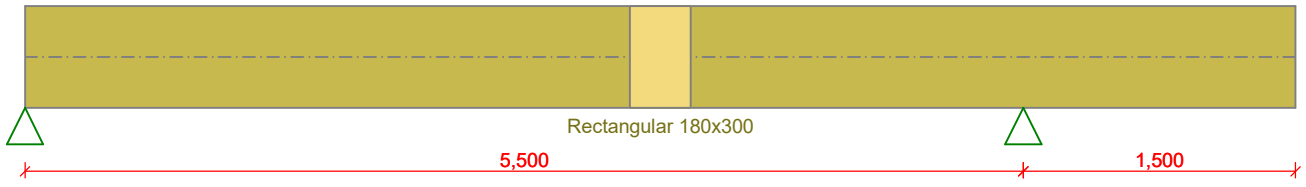
Shear forces check:
Resistance: V_R = 17,317 kN
0,577 < 1 **Pass**

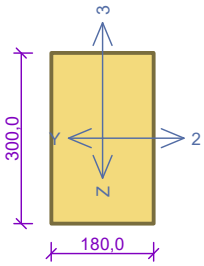
Member slenderness check:
member slenderness: 52,9
limit slenderness: 120,0
Member slenderness ok

Section ok

PASS

Beam 1





Standard **EN 1995-1-1/Czech Rep.**.

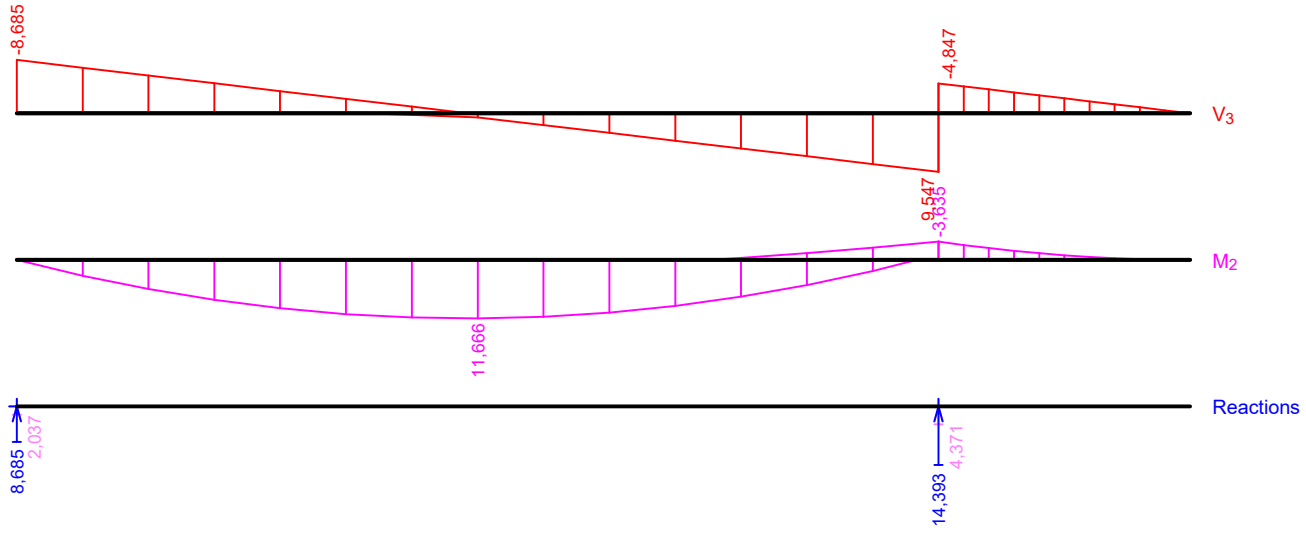
Service class: 2

Material: S10 (C24) - coniferous
Timber type: solid
Calculation uses coefficient k_h for increasing tensile and bending strength.

Load

$f_{g,1}$ =	0,227	kN/m	γ_f =	1,35
$f_{g,2}$ =	0,500	kN/m	γ_f =	1,35
$f_{q,3}$ =	1,500	kN/m	γ_f =	1,5
$f_{q,4}$ =	1,500	kN/m (0,000 - 5,500m)	γ_f =	1,5
$f_{q,5}$ =	1,500	kN/m (5,500 - 7,000m)	γ_f =	1,5

Buckling:
Buckling M_y:
l_{z1} = 7,000 m
Beam and load type: Beam with distributed load
Load position: On the top



Results
Decisive load: Q4:G1+G2
Internal forces: M_y = 11,666 kNm; V_z = 0,201 kN
Bending moment check:
Resistance: $M_{y,R}$ = 34,892 kNm
0,334 < 1 **Pass**

Shear forces check:
Resistance: V_R = 51,951 kN
0,004 < 1 **Pass**

Section ok

Characteristic load states
Maximum deformation is 4,6mm at point x = 7,000m
Maximum allowed deformation is 3,000m / 300,0 = 10,0mm
4,6mm < 10,0mm **Pass**
Final load states
Maximum deformation is 6,3mm at point x = 7,000m
Maximum allowed deformation is 3,000m / 150,0 = 20,0mm
6,3mm < 20,0mm **Pass**
Member deflection PASS

PASS