My test project

Timber element assessment – EC5 (EN 1995-1-1)

Roof
Date: 24.06.2026
Elements: 3

Material: **C24** kmod: **0.8** γM: **1.3** fm,k: **24 MPa** fc0,k: **21 MPa** fv,k: **4 MPa** E0,05: **7400 MPa**

Element 1 b/h = 100/120 mm · L = 3400 mm

PASS 90,3 %

TIMBER SECTION ASSESSMENT

b (width)	**100 mm**
h (height)	**120 mm**
L (length)	**3400 mm**
β_y	**1.0**
β_z	**1.0**
My	**3.2 kNm**
Mz	**0 kNm**
Vy	**3 kN**
Vz	**0 kN**
N (+ tension / − compression)	**0 kN**

SECTION PROPERTIES

A (cross-section area)	**12 000 mm²**
Wy	**240 000 mm³**
Wz	**200 000 mm³**
fm,d (design bending strength)	**14,77 MPa**
fv,d (design shear strength)	**2,46 MPa**
σm,y (stress from My)	**13,33 MPa**
σm,z (stress from Mz)	**0 MPa**
σN (stress from N)	**0 MPa**
τmax (max. shear stress)	**0,56 MPa**

SECTION UTILIZATION CHECK

CONDITION	UTILIZATION
Bending + axial force [EC5 6.2.3/6.2.4]	**90,3 %**
Shear [EC5 6.1.7]	**22,7 %**
Governing utilization	**90,3 %**

DEFLECTION – EC5 §2.2.3

Scheme	**Simply supported**
gk (permanent)	**1 kN/m** ψ = 1,0
qk (variable)	**0 kN/m** ψ_2 = 0,3
kdef (Dry interior (kdef=0.6))	**0,6**
$w_{inst,g}$	**10,98 mm**
$w_{fin} = w_{inst,g}\cdot(1+k_{def}) + w_{inst,q}\cdot(1+\psi_2\cdot k_{def})$	**17,58 mm**
Limit L / 300	**11,3 mm** ✗

Element 2 b/h = 120/120 mm · L = 4200 mm

PASS 94 %

TIMBER SECTION ASSESSMENT

b (width)	**120 mm**
h (height)	**120 mm**
L (length)	**4200 mm**
β_y	**1.0**
β_z	**1.0**
My	**4 kNm**
Mz	**0 kNm**
Vy	**5 kN**
Vz	**0 kN**
N (+ tension / − compression)	**0 kN**

SECTION PROPERTIES

A (cross-section area)	**14 400 mm²**
Wy	**288 000 mm³**
Wz	**288 000 mm³**
fm,d (design bending strength)	**14,77 MPa**
fv,d (design shear strength)	**2,46 MPa**
σm,y (stress from My)	**13,89 MPa**
σm,z (stress from Mz)	**0 MPa**
σN (stress from N)	**0 MPa**
τmax (max. shear stress)	**0,78 MPa**

SECTION UTILIZATION CHECK

CONDITION	UTILIZATION
Bending + axial force [EC5 6.2.3/6.2.4]	**94 %**
Shear [EC5 6.1.7]	**31,6 %**

CONDITION	UTILIZATION
Governing utilization	**94 %**

Column 1 b/h = 100/100 mm · L = 2800 mm

PASS 28,8 %

TIMBER SECTION ASSESSMENT

b (width)	**100 mm**
h (height)	**100 mm**
L (length)	**2800 mm**
β_y	**1.0**
β_z	**1.0**
My	**0 kNm**
Mz	**0 kNm**
Vy	**0 kN**
Vz	**0 kN**
N (+ tension / − compression)	**-12 kN**

SECTION PROPERTIES

A (cross-section area)	**10 000 mm²**
Wy	**166 667 mm³**
Wz	**166 667 mm³**
fm,d (design bending strength)	**14,77 MPa**
fv,d (design shear strength)	**2,46 MPa**
σm,y (stress from My)	**0 MPa**
σm,z (stress from Mz)	**0 MPa**
σN (stress from N)	**1,2 MPa**
τmax (max. shear stress)	**0 MPa**
kc,y (buckling factor y)	**0,322**
kc,z (buckling factor z)	**0,322**
λy (slenderness y)	**97**
λz (slenderness z)	**97**
λrel,y	**1,645**
λrel,z	**1,645**

SECTION UTILIZATION CHECK

CONDITION	UTILIZATION
Buckling + bending (axis y) [EC5 6.3.2]	**28,8 %**
Buckling + bending (axis z) [EC5 6.3.2]	**28,8 %**
Shear [EC5 6.1.7]	**0 %**
Governing utilization	**28,8 %**