

# TIMBER STRUCTURE CALCULATIONS

Code: EN 1995-1:2004/A1:2008

Type: 4424019 - Domeo 4

## LOADS

Roof covering 0,04 kN/m<sup>2</sup>  
Roof boards, d=18mm 0,09 kN/m<sup>2</sup>

## WIND AND SNOW LOADS:

Ground snow load  $s_k = 1,58 \text{ kN/m}^2$   
Reference wind  $g_{ref} = 0,32 \text{ kN/m}^2$

Governing Load Case: 4 uls (1+2)\*1.20+3\*1.50

MATERIAL: C24

$g_M = 1.30$   $f_{m,0,k} = 24.00 \text{ MPa}$   $f_{t,0,k} = 14.00 \text{ MPa}$   $f_{c,0,k} = 21.00 \text{ MPa}$   
 $f_{v,k} = 2.50 \text{ MPa}$   $f_{t,90,k} = 0.40 \text{ MPa}$   $f_{c,90,k} = 5.30 \text{ MPa}$   $E_{0,moyen} = 11000.00 \text{ MPa}$   
 $E_{0,05} = 7400.00 \text{ MPa}$   $G_{moyen} = 690.00 \text{ MPa}$  Service class: 1  $\beta_c = 0.20$



SECTION PARAMETERS: 70x140

$h_t = 14.0 \text{ cm}$   $A_y = 65.33 \text{ cm}^2$   $A_z = 65.33 \text{ cm}^2$   $A_x = 98.00 \text{ cm}^2$   
 $b_f = 7.0 \text{ cm}$   $I_y = 1600.67 \text{ cm}^4$   $I_z = 400.17 \text{ cm}^4$   $I_x = 1096.5 \text{ cm}^4$   
 $t_w = 3.5 \text{ cm}$   $W_y = 228.67 \text{ cm}^3$   $W_z = 114.33 \text{ cm}^3$   
 $t_f = 3.5 \text{ cm}$

## STRESSES

$\sigma_{m,y,d} = M_y/W_y = 2.84/228.67 = 12.40 \text{ MPa}$   
 $\tau_{z,d} = 1.5 \cdot -0.00/98.00 = -0.00 \text{ MPa}$

## ALLOWABLE STRESSES

$f_{m,y,d} = 14.97 \text{ MPa}$   
 $f_{v,d} = 1.54 \text{ MPa}$

## Factors and additional parameters

$k_{h,y} = 1.01$   $k_{mod} = 0.80$   $K_{sys} = 1.00$   $k_{cr} = 0.67$



$l_{ef} = 3.68 \text{ m}$   $\lambda_{rel,m} = 0.66$   
 $\sigma_{cr} = 54.96 \text{ MPa}$   $k_{crit} = 1.00$

## LATERAL BUCKLING PARAMETERS:

$\sigma_{m,y,d}/f_{m,y,d} = 12.40/14.97 = 0.83 < 1.00$  (6.11)  
 $\sigma_{m,y,d}/(k_{crit} \cdot f_{m,y,d}) = 12.40/(1.00 \cdot 14.97) = 0.83 < 1.00$  (6.33)  
 $(\tau_{z,d}/k_{cr})/f_{v,d} = (0.00/0.67)/1.54 = 0.00 < 1.00$  (6.13)

## VERIFICATION FORMULAS:



$u_{fin,y} = 0.0 \text{ cm} < u_{fin,max,y} = L/200.00 = 2.0 \text{ cm}$   
Governing load case:  $(1+0.6) \cdot 1 + (1+0.6) \cdot 2 + (1+0 \cdot 0.6) \cdot 3$   
 $u_{fin,z} = 2.0 \text{ cm} < u_{fin,max,z} = L/200.00 = 2.0 \text{ cm}$   
Governing load case:  $(1+0.6) \cdot 1 + (1+0.6) \cdot 2 + (1+0 \cdot 0.6) \cdot 3$

Section OK !!!