

# TIMBER STRUCTURE CALCULATIONS

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

Type: 4423619 / 41262 / 41263 / 41264 / 41265 / 41266 - Domeo 1

## 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  $s_k = 2,05 \text{ kN/m}^2$   
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: 44x140

$ht = 14.0 \text{ cm}$   $A_y = 41.07 \text{ cm}^2$   $A_z = 41.07 \text{ cm}^2$   $A_x = 61.60 \text{ cm}^2$   
 $bf = 4.4 \text{ cm}$   $I_y = 1006.13 \text{ cm}^4$   $I_z = 99.38 \text{ cm}^4$   $I_x = 318.8 \text{ cm}^4$   
 $tw = 2.2 \text{ cm}$   $W_y = 143.73 \text{ cm}^3$   $W_z = 45.17 \text{ cm}^3$   
 $tf = 2.2 \text{ cm}$

## STRESSES

$\text{Sig}_{m,y,d} = MY/W_y = 1.90/143.73 = 13.25 \text{ MPa}$   
 $\text{Tau}_{z,d} = 1.5 * -0.00/61.60 = -0.00 \text{ MPa}$

## ALLOWABLE STRESSES

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

## Factors and additional parameters

$kh_y = 1.01$   $k_{mod} = 0.80$   $K_{sys} = 1.00$   $k_{cr} = 0.67$



$lef = 2.62 \text{ m}$   $\text{Lambda}_{rel m} = 0.89$   
 $\text{Sig}_{cr} = 30.46 \text{ MPa}$   $k_{crit} = 0.89$

## LATERAL BUCKLING PARAMETERS:

$\text{Sig}_{m,y,d}/f_{m,y,d} = 13.25/14.97 = 0.88 < 1.00$  (6.11)  
 $\text{Sig}_{m,y,d}/(k_{crit} * f_{m,y,d}) = 13.25/(0.89 * 14.97) = 0.99 < 1.00$  (6.33)  
 $(\text{Tau}_{z,d}/k_{cr})/f_{v,d} = (0.00/0.67)/1.54 = 0.00 < 1.00$  (6.13)

## VERIFICATION FORMULAS:



$u_{fin,y} = 0.0 \text{ cm} < u_{fin,max,y} = L/200.00 = 1.5 \text{ cm}$   
Governing load case:  $(1+0.6)*1 + (1+0.6)*2 + (1+0*0.6)*3$   
 $u_{fin,z} = 1.1 \text{ cm} < u_{fin,max,z} = L/200.00 = 1.5 \text{ cm}$   
Governing load case:  $(1+0.6)*1 + (1+0.6)*2 + (1+0*0.6)*3$

**Section OK !!!**