

# STEEL DESIGN

**CODE:** NF EN 1993-1:2005/NA:2007/AC:2009, Eurocode 3: Design of steel structures.

**ANALYSIS TYPE:** Code Group Design with Optimization Options

**CODE GROUP:** 8 girt's

**MEMBER:** 98 girts\_98  
m

**POINT:** 4

**COORDINATE:** x = 0.50 L = 1.60

## LOADS:

Governing Load Case: 16 ULS /107/ 1\*1.35 + 2\*1.35 + 3\*1.35 + 4\*1.35 + 5\*1.35 + 6\*1.35 + 10\*1.50

## MATERIAL:

ACIER  $f_y = 235.00$  MPa



### SECTION PARAMETERS: UPN 140

h=14.0 cm	gM0=1.00	gM1=1.00	
b=6.0 cm	Ay=13.40 cm <sup>2</sup>	Az=10.10 cm <sup>2</sup>	Ax=20.40 cm <sup>2</sup>
tw=0.7 cm	Iy=605.00 cm <sup>4</sup>	Iz=62.70 cm <sup>4</sup>	Ix=5.68 cm <sup>4</sup>
tf=1.0 cm	Wely=86.43 cm <sup>3</sup>	Welz=14.79 cm <sup>3</sup>	

## INTERNAL FORCES AND CAPACITIES:

N,Ed = 1.06 kN	My,Ed = 5.63 kN*m	Mz,Ed = 0.66 kN*m
Nc,Rd = 479.40 kN	My,Ed,max = 5.63 kN*m	Mz,Ed,max = 0.66 kN*m
Nb,Rd = 479.40 kN	My,c,Rd = 20.31 kN*m	Mz,c,Rd = 3.48 kN*m
	Mb,Rd = 10.46 kN*m	

Class of section = 3



## LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 24.50 kN*m	Curve,LT - d	XLT = 0.51
Lcr,upp=3.20 m	Lam_LT = 0.91	fi,LT = 1.18	

## BUCKLING PARAMETERS:



About y axis:

$$k_{yy} = 1.00$$



About z axis:

$$k_{zz} = 1.00$$

## VERIFICATION FORMULAS:

### Section strength check:

$$N_{Ed}/N_{c,Rd} + M_{y,Ed}/M_{y,c,Rd} + M_{z,Ed}/M_{z,c,Rd} = 0.46 < 1.00 \quad (6.2.1(7))$$

### Global stability check of member:

$$M_{y,Ed,max}/M_{b,Rd} = 0.54 < 1.00 \quad (6.3.2.1.(1))$$

$$N_{Ed}/(X_{min} \cdot N_{Rk}/gM1) + k_{yy} \cdot M_{y,Ed,max}/(XLT \cdot M_{y,Rk}/gM1) + k_{yz} \cdot M_{z,Ed,max}/(M_{z,Rk}/gM1) = 0.62 < 1.00 \quad (6.3.3.(4))$$

$$N_{Ed}/(X_{min} \cdot N_{Rk}/gM1) + k_{zy} \cdot M_{y,Ed,max}/(XLT \cdot M_{y,Rk}/gM1) + k_{zz} \cdot M_{z,Ed,max}/(M_{z,Rk}/gM1) = 0.62 < 1.00 \quad (6.3.3.(4))$$

**Section OK !!!**