STEEL DESIGN

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

CODE GROUP:

MEMBER: 40 琥ǁn **POINT:** 7 **COORDINATE:** x = 1.00 L = 4.50 m

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LOADS:

Governing Load Case: 16 ULS /105/ 1*1.35 + 2*1.35 + 3*1.35 + 4*1.35 + 5*1.35 + 6*1.35 + 7*1.05 + 8*1.05 + 9*1.05 + 14*1.50

MATERIAL:

ACIER fy = 235.00 MPa

SECTION PARAMETERS: HEA 180

h=17.1 cm	gM0=1.00	gM1=1.00	
b=18.0 cm	Ay=37.93 cm2	Az=14.47 cm2	Ax=45.25 cm2
tw=0.6 cm	Iy=2510.29 cm4	Iz=924.61 cm4	Ix=14.86 cm4
tf=0.9 cm	Wply=324.85 cm3	Wplz=156.49 cm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 43.17 kN	My,Ed = -58.29 kN*m	Mz,Ed = -0.00 kN*m	Vy,Ed = 0.00 kN
Nc,Rd = 1063.38 kN	My,Ed,max = -58.29 kN*m		Mz,Ed,max = -0.00 kN*m
	Vy,T,Rd = 514.61 kN		
Nb,Rd = 742.80 kN	My,c,Rd = 76.34 kN*m	Mz,c,Rd = 36.78 kN*m	Vz,Ed = -22.21 kN
	MN,y,Rd = 76.34 kN*m	MN,z,Rd = 36.78 kN*m	Vz,T,Rd = 196.32 kN
	Mb,Rd = 76.34 kN*m		Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 0.00	Mcr = 825.93 kN*m	Curve,LT -	XLT = 1.00
Lcr,low=2.25 m	Lam_LT = 0.30	fi,LT = 0.55	XLT,mod = 1.00

BUCKLING PARAMETERS:

About y axis:

About z axis:

Ly = 4.50 m	Lam_y = 0.68	Lz = 4.50 m	Lam_z = 0.74
Lcr,y = 4.76 m	Xy = 0.79	Lcr,z = 3.15 m	Xz = 0.70
Lamy = 63.91	kyy = 0.63	Lamz = 69.69	kyz = 0.59

Torsional buckling:		Flexural-torsional buckling	
Curve,T=c	alfa,T=0.49	Curve,TF=c	alfa,TF=0.49
Lt=2.25 m	fi,T=0.68	Ncr,y=2295.96 kN	fi,TF=0.85
Ncr,T=4832.77 kN	X,T=0.86	Ncr,TF=2295.96 kN	X,TF=0.74
Lam_T=0.47	Nb,T,Rd=914.63 kN	Lam_TF=0.68	Nb,TF,Rd=783.38 kN

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.04 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.76 < 1.00 (6.2.9.1.(2))

Mz,Ed/MN,z,Rd = 0.00 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 2.00 + (Mz,Ed/MN,z,Rd)^1.00 = 0.58 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.00 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.11 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.00 < 1.00 (6.2.6)
Global stability check of member:
Lambda,y = 63.91 < Lambda,max = 210.00 Lambda,z = 69.69 < Lambda,max = 210.00 STABLE
N,Ed/Min(Nb,Rd,Nb,T,Rd,Nb,TF,Rd) = 0.06 < 1.00 (6.3.1)
My,Ed,max/Mb,Rd = 0.76 < 1.00 (6.3.2.1.(1))
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.53 < 1.00 (6.3.3.(4))
N,Ed/(Xz*N,Rk/gM1) + kzy*My,Ed,max/(XLT*My,Rk/gM1) + kzz*Mz,Ed,max/(Mz,Rk/gM1) = 0.31 < 1.00 (6.3.3.(4))

Section OK !!!