

Symbol	Values	Unit	Symbol description	Section
MEMBER: 842 ; COORDINATE: x = 0.59 L = 4.72 m				
Cross-section properties: HEA340-M Vao_Int_11m				
Ax	12721.50	mm ²	Cross-section area	
Ay	9900.00	mm ²	Shear area - y-axis	
Az	2821.50	mm ²	Shear area - z-axis	
x	950452.21	mm ⁴	Torsional constant	
y	747723684.63	mm ⁴	Moment of inertia of a section about the y-axis	
z	74271220.03	mm ⁴	Moment of inertia of a section about the z-axis	
Wply	1761321.37	mm ³	Plastic section modulus about the y (major) axis	
Wplz	749201.06	mm ³	Plastic section modulus about the z (minor) axis	
h	330.00	mm	Height of cross-section	
b	300.00	mm	Top flange width	
b2	300.00	mm	Bottom flange width	
f	16.50	mm	Top flange thickness	
f2	16.50	mm	Bottom flange thickness	
t _w	9.50	mm	Web thickness	
r _y	242.44	mm	Radius of gyration - y-axis	
r _z	76.41	mm	Radius of gyration - z-axis	
A _{nb}	1.00		Net area to gross area ratio	(6.2.2.2)
E _{ta}	1.00		Factor for A _v calculation	(6.2.6.(3))
Material:				
Name			S 275 (S 275)	
f _y	275.00	MPa	Design yield strength of material	(3.2)
f _u	430.00	MPa	limit tensile stress - characteristic value	(3.2)
γ _{M0}	1.00		Partial safety factor	(6.1.(1))
γ _{M1}	1.00		Partial safety factor	(6.1.(1))
γ _{M2}	1.25		Partial safety factor	(6.1.(1))
Designations of additional codes:				
EN112			EN 1991-1-2:2003 - Fire loads on a structure	
EN312			EN 1993-1-2:2005 - Steel structures - fire design	
EN313			EN 1993-1-3:2005 - Steel structures from cold-formed sections	
EN315			EN 1993-1-5:2005 - Steel structures - plated elements	
EC111			ECCS No111:2001 - Guidebook with recommendations for fire calculations	
ENV311			ENV 1993-1-1:1992 - Steel structures - general code	
Class of section				
b _{f1}	141.45	mm	upper flange width	(Table 5.2)
t _{f1}	16.50	mm	upper flange thickness	(Table 5.2)
b _{f1} /t _{f1}	8.57		Flange slenderness	(Table 5.2)
K _{LF}	2		Flange class	(5.5.2)
b _{f2}	141.45	mm	lower flange width	(Table 5.2)
t _{f2}	16.50	mm	lower flange thickness	(Table 5.2)
b _{f2} /t _{f2}	8.57		Flange slenderness	(Table 5.2)

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κLF2	2		Flange class	(5.5.2)
cw	289.40	mm	Web height	(Table 5.2)
t _w	9.50	mm	Web thickness	(Table 5.2)
cw/t _w	30.46		Web slenderness	(Table 5.2)
α _{fl}	0.15		Relative extent of the compressed plastic zone	(Table 5.2)
ψ	-1.30		Stress or strain ratio	(Table 5.2)
κLW	1		Web class	(5.5.2)
(h _w /t _w) _{lim}	66.56		limit slenderness of a web for shear	EN315(5.1)
h _w /t _w	31.26		web slenderness for shear	EN315(5.1)
κLSZ	Plastic		Web class (shear)	EN315(5.1)
κL	2		Section type	(5.5.2)
Parameters of lateral-torsional buckling analysis:				
General method [6.3.2.2]				
L _{cr,upp}	2.20	m	Lateral buckling length of upper flange	active
L _{cr,low}	7.34	m	Lateral buckling length of lower flange	inactive
C1	1.00		Factor for M _{cr} calculations	ENV311(F.1.2.(5))
C2	0.00		Factor for M _{cr} calculations	ENV311(F.1.2.(5))
C3	1.00		Factor for M _{cr} calculations	ENV311(F.1.2.(5))
w	4885653729.08	mm ⁶	Warping constant	(6.3.2.2)
z _g	0.00	mm	Distance from the point where the load is applied to the shear center	ENV311(F.1.2.(1))
M _{cr}	5240.73	kN*m	Critical moment for lateral-torsional buckling	ENV311(F.1)
λ _{am,LT}	0.30		Non-dimens. slend. ratio for lat.-tors. buckling	(6.3.2.2.(1))
Curve,LT	c		Lateral buckling curve	(6.3.2.2.(2))
α _{fl,LT}	0.49		Imperfection factor for lateral buckling curves	(Table 6.3)
η _{1,LT}	0.57		Coefficient for calculation of XLT	(6.3.2.2.(1))
XLT	0.95		Reduction factor for lateral-torsional buckling	(6.3.2.2.(1))
Internal forces at characteristic points of cross section				
N _{Ed}	-528.99	kN	axial force N _{Ed}	
M _{y,Ed}	472.49	kN*m	bending moment M _{y,Ed}	
V _{z,Ed}	-0.03	kN	shear force V _{z,Ed}	
Design forces:				
N _{t,Rd}	3498.41	kN	Design tension resistance	(6.2.3)
M _{b,Rd}	458.74	kN*m	Design buckling resistance moment	(6.3.2.1)
About the y axis of cross-section				
M _{y,pl,Rd}	484.36	kN*m	Design plastic resistance moment	(6.2.5.(2))
M _{y,el,Rd}	1246.21	kN*m	Design elastic resistance moment	(6.2.5.(2))
M _{y,c,Rd}	484.36	kN*m	Design moment resistance	(6.2.5.(2))
M _{N,y,Rd}	473.29	kN*m	Reduced design plastic resistance moment	(6.2.9.1)
V _{z,c,Rd}	447.97	kN	Design plastic shear resistance	(6.2.6.(2))
Verification formulas:				
Section strength check:				
JFS[Nt]	0.15		N _{Ed} /N _{t,Rd}	(6.2.3.(1))
JFS[My]	0.98		M _{y,Ed} /M _{y,c,Rd}	(6.2.5.(1))

Symbol	Values	Unit	Symbol description	Section
JFS[NtMy]	1.00		My,Ed/MN,y,Rd	(6.2.9.1.(2))
JFS[Vz]	0.00		Vz,Ed/Vz,c,Rd	(6.2.6.(1))
Global stability check of member:				
JFB[My]	1.03		My,Ed/Mb,Rd	(6.3.2.1.(1))
Ratio:				
RAT	1.03		Efficiency ratio	Incorrect