

1. input data

1.1. general information

verifications of stability acc. to EN 1993-1-1

c/t-verification (classification of cross-section)

flexural buckling with the method of fictitious bars, no buckling direction

1.2. safety factor of material

resistance of cross-sections $\gamma_{M0} = 1.00$

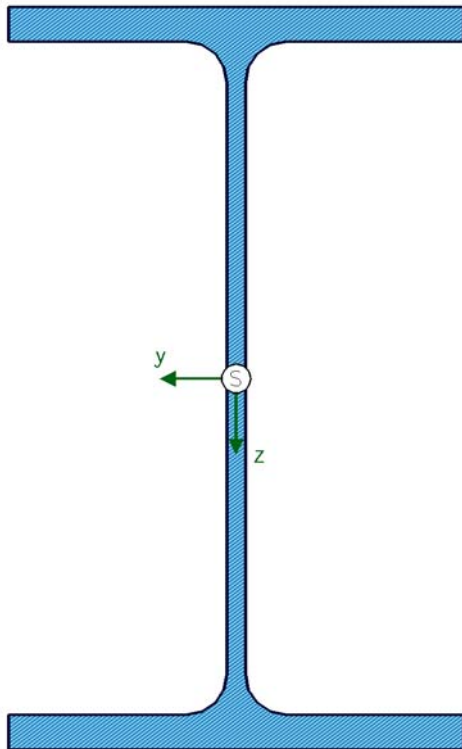
resistance of members in stability failure $\gamma_{M1} = 1.10$

1.3. cross-section

material: S460 N/NL ($E = 210000 \text{ N/mm}^2$, $G = 80769 \text{ N/mm}^2$, $f_{y,k} = 460 \text{ N/mm}^2$)

section: HE500A

section scale 1:5.0



1.4. cross-section values (related to the centre of gravity S)

$I_y = 86970.0 \text{ cm}^4$, $I_z = 10370.0 \text{ cm}^4$, $I_{yz} = 86970.0 \text{ cm}^4$, $I_{\eta} = 10370.0 \text{ cm}^4$, $\alpha = 0.0^\circ$

$I_{\omega} = 5643000.0 \text{ cm}^6$, $I_T = 310.0 \text{ cm}^4$

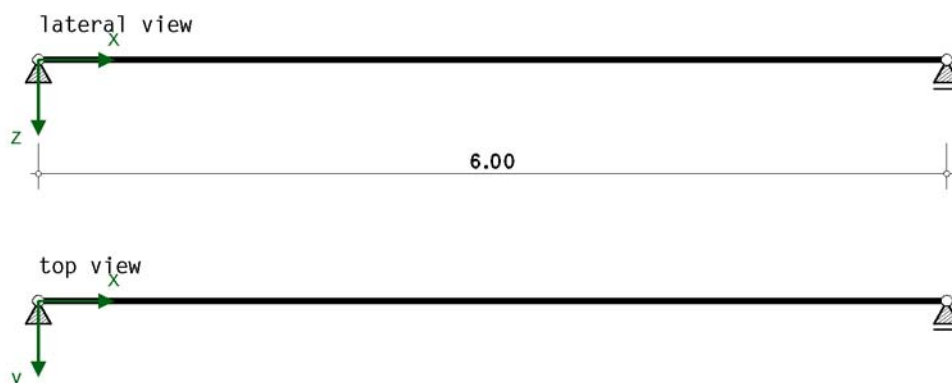
$W_y = 3550.0 \text{ cm}^3$, $W_z = 691.0 \text{ cm}^3$, $W_{pl,y} = 3949.0 \text{ cm}^3$, $W_{pl,z} = 1060.0 \text{ cm}^3$

$z_{m,y} = -0.0 \text{ mm}$, $z_{m,z} = 0.0 \text{ mm}$, $A = 198.0 \text{ cm}^2$

1.5. static system

all bearings with fork restraint, bar length 6.000 [m]

no intermediate bearing in z-direction, no intermediate bearing in y-direction



1.6. buckling coefficients

⊥ y-axis: $\beta_y = 1.000$, ⊥ z-axis: $\beta_z = 1.000$

warping restraint intensity $\beta_0 = 1.000$

1.7. design member forces (load combinations)

Lk	N_d kN
1	7200.00

N_d : constant axial force in the bar

2. verifications

2.1. classification of cross-section

2.1.1. load combination 1 ⇒ section class 4

no	c mm	t mm	c/t -	ϵ -	σ_1 N/mm ²	σ_2 N/mm ²	tab 5.2	α -	ψ -	k_σ -	class -
1	117.0	23.0	5.09	0.715	363.64	363.64	single 1/1	---	---	---	1
2	117.0	23.0	5.09	0.715	363.64	363.64	single 1/1	---	---	---	1
3	390.0	12.0	32.50	0.715	363.64	363.64	both 2/0	---	---	---	4
4	117.0	23.0	5.09	0.715	363.64	363.64	single 1/1	---	---	---	1
5	117.0	23.0	5.09	0.715	363.64	363.64	single 1/1	---	---	---	1

compressive stresses have a positive sign acc. to EC 3.

the verifications are carried out in the smallest possible cross-section class 4:

verifications in section class 4 are not possible !!