

## 1. Priloga A5: Izpisi statičnih izračunov za strešno lego

### 2. Kontrola in dimenzioniranje prečnih prereзов

Linear calculation, Extreme : Member  
Selection : B1  
Class : All ULS

#### EN 1993-1-1 Code Check

National annex: Slovenian SIST-EN NA

Member B1	5,000 m	IPE160	S 235	MSN 1/1	0,92 -
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Partial safety factors	
<i>*Student version* *Student version* *Student version* *Student version* *Student version*</i>	
Gamma M0 for resistance of cross-sections	1,00
Gamma M1 for resistance to instability	1,00
Gamma M2 for resistance of net sections	1,25

Material		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
Yield strength $f_y$	235,0	MPa
Ultimate strength $f_u$	360,0	MPa
Fabrication	Rolled	

#### .....SECTION CHECK:.....

The critical check is on position 5.000 m

Internal forces	Calculated	Unit
<i>*Student version* *Student version* *Student version* *Student version*</i>		
N,Ed	0,00	kN
Vy,Ed	0,00	kN
Vz,Ed	-27,91	kN
T,Ed	0,00	kNm
My,Ed	-24,29	kNm
Mz,Ed	0,00	kNm

#### Classification for cross-section design

According to EN 1993-1-1 article 5.5.2

#### Classification of Internal Compression parts

According to EN 1993-1-1 Table 5.2 Sheet 1

Maximum width-to-thickness ratio	25,44
Class 1 Limit	72,00
Class 2 Limit	83,00
Class 3 Limit	124,00

=> Internal Compression parts Class 1

#### Classification of Outstand Flanges

According to EN 1993-1-1 Table 5.2 Sheet 2

Maximum width-to-thickness ratio	3,99
Class 1 Limit	9,00
Class 2 Limit	10,00
Class 3 Limit	13,77

=> Outstand Flanges Class 1

=> Section classified as Class 1 for cross-section design

#### Bending moment check for $M_y$

According to EN 1993-1-1 article 6.2.5 and formula (6.12), (6.13)

Wpl,y	1,2400e-04	m <sup>3</sup>
Mpl,y,Rd	29,14	kNm
Unity check	0,83	-

#### Shear check for $V_z$

According to EN 1993-1-1 article 6.2.6 and formula (6.17)

Eta	1,20	
Av	9,6660e-04	m <sup>2</sup>
Vpl,z,Rd	131,15	kN
Unity check	0,21	-

The member satisfies the section check.

#### .....STABILITY CHECK:.....

#### Classification for member buckling design

Decisive position for stability classification: 0,500 m

#### Classification of Internal Compression parts

According to EN 1993-1-1 Table 5.2 Sheet 1

Maximum width-to-thickness ratio	25,44
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Class 1 Limit	72,00
Class 2 Limit	83,00
Class 3 Limit	124,00

=> Internal Compression parts Class 1

#### Classification of Outstand Flanges

According to EN 1993-1-1 Table 5.2 Sheet 2

Maximum width-to-thickness ratio	3,99
Class 1 Limit	9,00
Class 2 Limit	10,00
Class 3 Limit	13,77

=> Outstand Flanges Class 1

=> Section classified as Class 1 for member buckling design

#### Lateral Torsional Buckling Check

According to article EN 1993-1-1 : 6.3.2.1. and formula (6.54)

LTB Parameters		
<i>*Student version* *Student version* *Student version* *Student version* *Student version*</i>		
Method for LTB curve	Art. 6.3.2.2.	
Wy	1.2400e-04	m <sup>3</sup>
Elastic critical moment M <sub>cr</sub>	92.16	kNm
Relative slenderness Lambda <sub>LT</sub>	0,56	
Limit slenderness Lambda <sub>LT,0</sub>	0,40	
LTB curve	a	
Imperfection Alpha <sub>LT</sub>	0,21	
Reduction factor Chi <sub>LT</sub>	0,90	
Buckling resistance M <sub>b,Rd</sub>	26.33	kNm
Unity check	0.92	-

Mcr Parameters		
<i>*Student version* *Student version* *Student version*</i>		
LTB length	1.650	m
k	1,00	
k <sub>w</sub>	1,00	
C1	1,66	
C2	0,78	
C3	0,41	

Note: C Parameters according to ECCS 119 2006 / Galea 2002  
load in center of gravity

#### Shear buckling check

in buckling field 1

According to article EN 1993-1-5 : 5. & 7.1. and formula (5.10) & (7.1)

Table of values	
<i>*Student version* *Student version* *Student version*</i>	
h <sub>w</sub> /t	29,040

The web slenderness is such that the Shear Buckling Check is not required.  
The member satisfies the stability check.