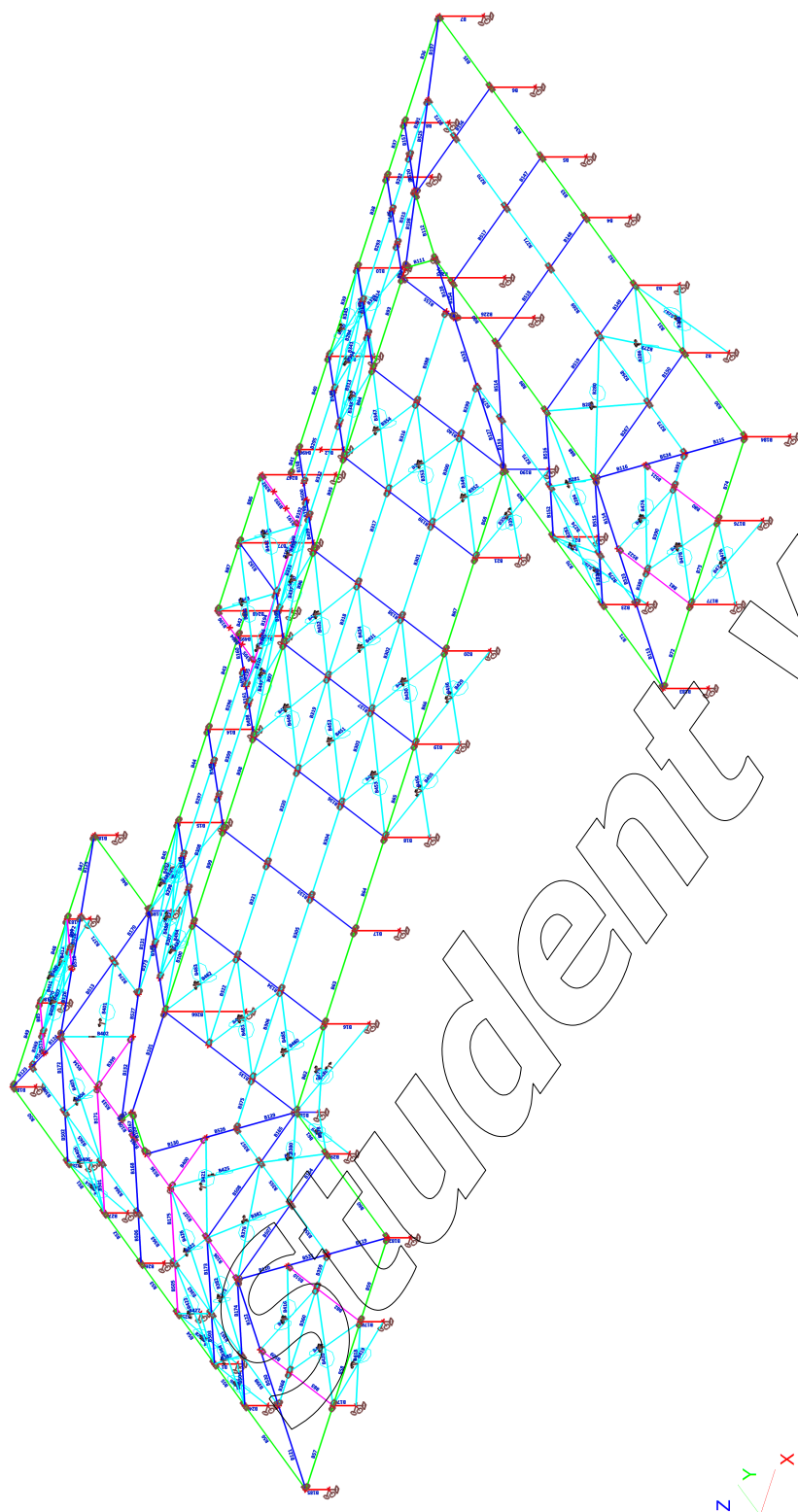


1. Kazalo

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2. Zasnova strešne konstrukcije - 3D model



3. Load cases

Name	Action type	LoadGroup	Load type	Spec	Direction	Duration	Master load case
Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *							
LASTNA	Permanent	LG1	Self weight		-Z		
STALNA	Permanent	LG1	Standard				
SNEG	Variable	LG2	Static	Standard		Short	None
Wy-zadaj	Variable	LG2	Static	Standard		Short	None
Wy-spred	Variable	LG2	Static	Standard		Short	None
Wx-levo	Variable	LG2	Static	Standard		Short	None
Wx-desno	Variable	LG2	Static	Standard		Short	None
Wx-srkLD	Variable	LG2	Static	Standard		Short	None
Wy-srkSP	Variable	LG2	Static	Standard		Short	None
Wy-srkZG	Variable	LG2	Static	Standard		Short	None
bocna	Variable	LG2	Static	Standard		Short	None
Potres x	Variable	LG3	Dynamic	Seismicity			None
Potres y	Variable	LG3	Dynamic	Seismicity			None

4. Nonlinear combinations

Name	Type	Load cases	Coeff. [-]
Student version *Student version* *Student version* *Student version* *Student version* *Student version*			
NC1	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	1,50
		Wx-levo	0,90
NC2	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	1,50
		Wx-desno	0,90
NC3	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	1,50
		Wy-zadaj	0,90
NC4	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	1,50
		Wy-spred	0,90
NC5	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	0,75
		Wy-spred	1,50
NC6	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	0,75
		Wx-levo	1,50
NC7	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	0,75
		Wx-desno	1,50
NC8	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	0,75
		Wy-zadaj	1,50
NC9	Ultimate	LASTNA	1,00
		STALNA	1,00
		Wx-srkLD	1,50
NC10	Ultimate	LASTNA	1,00
		STALNA	1,00
		Wy-srkSP	1,50
NC11	Ultimate	LASTNA	1,00
		STALNA	1,00
		Wy-srkZG	1,50
NC12	Ultimate	LASTNA	1,35
Student version *Student version* *Student version* *Student version* *Student version* *Student version*			
Student version *Student ver. *Student version			

Name	Type	Load cases	Coeff. [-]
<i>*Student version* *Student version* *Student version* *Student version* *Student version* *Student version*</i>			
NC12	Ultimate	STALNA	1,35
		SNEG	1,50
NC13	Ultimate	LASTNA	1,00
		STALNA	1,00
		SNEG	1,00
		Wx-levo	0,60
NC14	Ultimate	LASTNA	1,00
		STALNA	1,00
		SNEG	1,00
		Wx-desno	0,60
NC15	Ultimate	LASTNA	1,00
		STALNA	1,00
		SNEG	1,00
		Wy-zadaj	0,60
NC16	Ultimate	LASTNA	1,00
		STALNA	1,00
		SNEG	1,00
		Wy-spred	0,60
NC17	Ultimate	LASTNA	1,00
		STALNA	1,00
		SNEG	0,50
		Wx-levo	1,00
NC18	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	0,50
		Wx-desno	1,00
NC19	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	0,50
		Wy-zadaj	1,00
NC20	Ultimate	LASTNA	1,35
		STALNA	1,35
		SNEG	0,50
		Wy-spred	1,00

5. Result classes

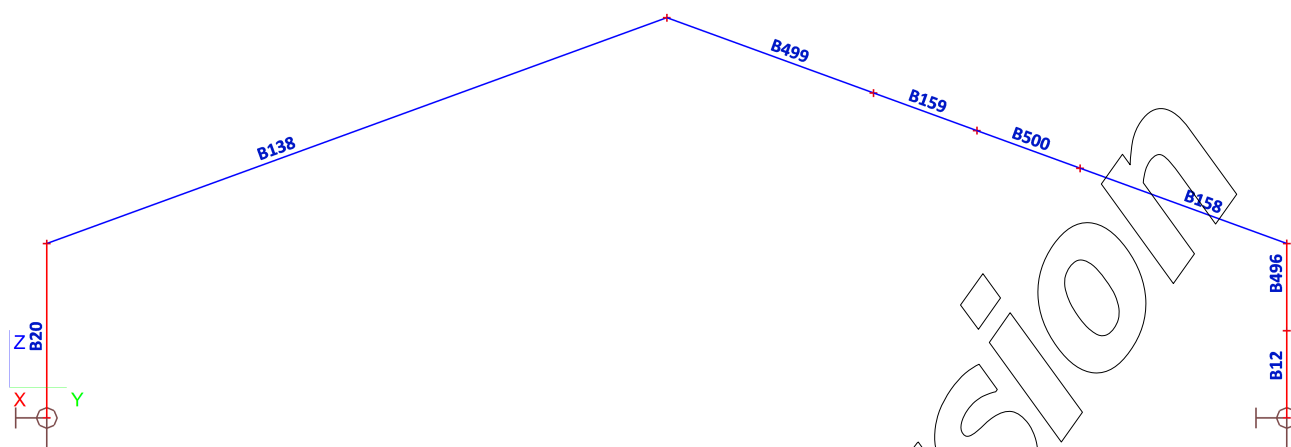
Name	List
<i>*Student version* *Student version* *Student version*</i>	
RC3_MSN_nelin	NC1
	NC2
	NC3
	NC4
	NC5
	NC6
	NC7
	NC8
	NC9
	NC10
	NC11
	NC12
RC5_MSU_nelin	NC13
	NC14
	NC15
	NC16
	NC17
	NC18
	NC19
	NC20

6. Stability combinations

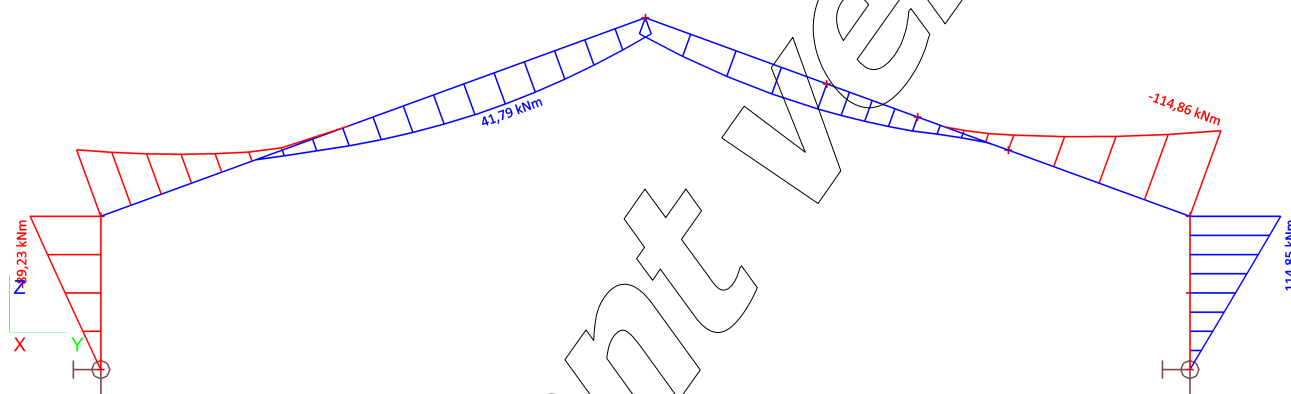
Name	Load cases	Coeff. [-]
<i>*Student version* *Student version* *Student version*</i>		
S1	LASTNA	1,35
	STALNA	1,35
	SNEG	1,50
	Wx-levo	0,90
S2	LASTNA	1,35
	STALNA	1,35
	SNEG	1,50
	Wx-desno	0,90
S3	LASTNA	1,35
	STALNA	1,35
	SNEG	1,50
	Wy-zadaj	0,90
S4	LASTNA	1,35
	STALNA	1,35
	SNEG	1,50
	Wy-spred	0,90
S5	LASTNA	1,35
	STALNA	1,35
	SNEG	0,75
	Wy-spred	1,50
S6	LASTNA	1,35
	STALNA	1,35
	SNEG	0,75
	Wx-levo	1,50
S7	LASTNA	1,35
	STALNA	1,35
	SNEG	0,75
	Wx-desno	1,50
S8	LASTNA	1,35
	STALNA	1,35
	SNEG	0,75
	Wy-zadaj	1,50
S9	LASTNA	1,00
	STALNA	1,00
	Wx-srkLD	1,50
S10	LASTNA	1,00
	STALNA	1,00
	Wy-srkSP	1,50
S11	LASTNA	1,00
	STALNA	1,00
	Wy-srkZG	1,50
S12	LASTNA	1,35
	STALNA	1,35
	SNEG	1,50

7. Critical load coefficients

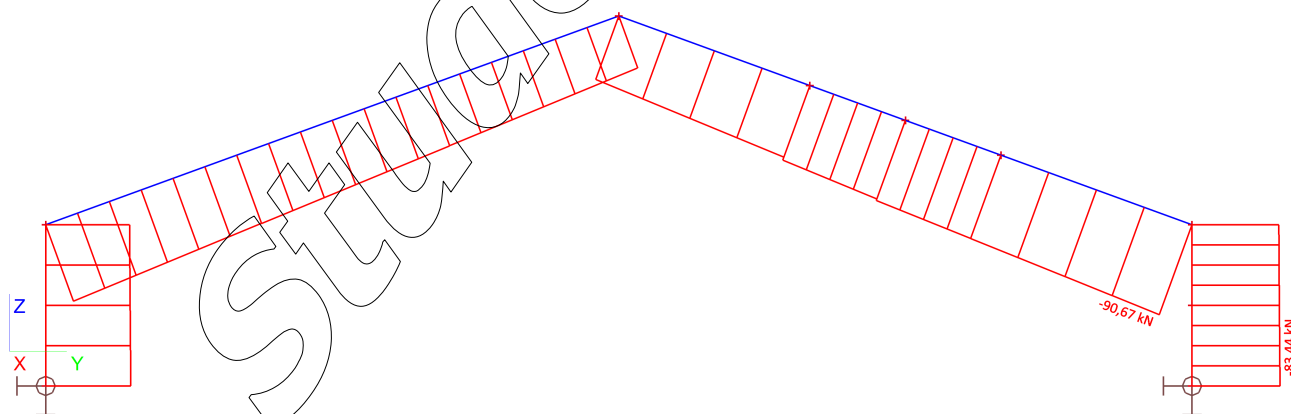
8. Zasnova modela v prečni smeri - Pomični okvir



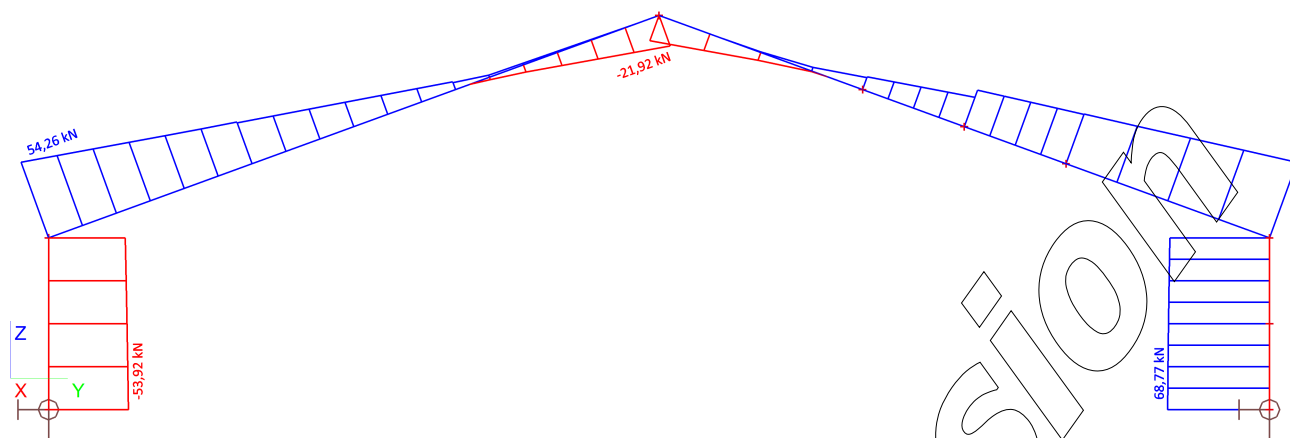
9. Ovojnica MSN - Upogibni moment M_y



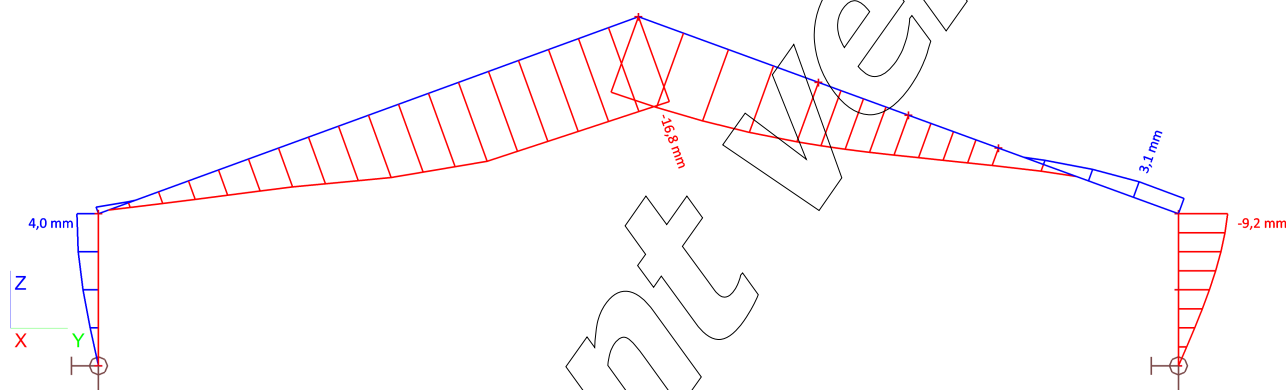
10. Ovojnica MSN - Osna sila N



11. Ovojnica MSN - Prečna sila Vz



12. Vertikalni upogib nosilca uz, horizontalni pomik stebra uy - Ovojnica MSU

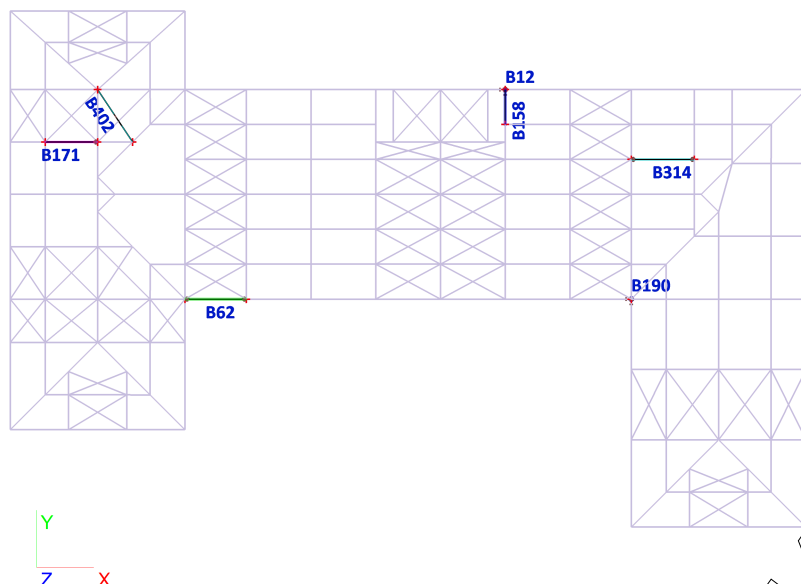


13. Največje izkoriščenosti glede na prečni prerez - MSN

Nonlinear calculation, Extreme : Cross-section
Selection : All
Class : RC3_MSN_nelin

Case	Member	css	mat	dx [m]	un.check [-]	sec.check [-]	stab.check [-]
NC4	B12	CS32 - HEB200	S 355	0,000	0,53	0,14	0,53
NC12	B62	CS27 - HEA140	S 355	1,752	0,16	0,06	0,16
NC1	B171	CS6 - IPE200	S 355	3,189	0,96	0,17	0,96
NC4	B158	CS1 - IPE300	S 355	0,000	0,81	0,51	0,81
NC3	B190	CS9 - IX	S 355	0,000	0,56	0,17	0,56
NC7	B314	CS20 - SHS100/100/4.0	S 235	1,803	0,22	0,12	0,22
NC1	B402	CS31 - RD12	S 355	0,000	0,66	0,66	0,00

14. Pozicija najbolj izkoriščenih elementov



15. Notranje sile za IPE 300 - Ovojnica MSN

Nonlinear calculation, Extreme : Cross-section, System : Principal
Selection : All
Class : RC3_MSN_nelin
Cross-section : CS1 - IPE300

Member	Case	dx [m]	N [kN]	Vy [kN]	Vz [kN]	My [kNm]	Mz [kNm]
Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*							
B506	NC12	2,126	-116,77	0,11	-43,61	-81,87	0,36
B141	NC1	6,377	69,37	-0,54	-29,15	-27,91	-0,60
B531	NC4	0,018	-33,05	-7,77	8,15	22,43	-0,89
B520	NC2	2,388	-13,21	15,95	-3,58	0,00	0,00
B506	NC1	2,126	-113,49	0,10	-45,16	-78,42	0,34
B162	NC4	0,000	-37,93	0,24	60,05	-100,40	-0,46
B158	NC4	0,000	-90,67	1,34	53,37	-114,86	-0,60
B163	NC3	1,063	-45,15	-0,07	2,28	53,64	0,24
B141	NC3	0,000	18,21	2,80	25,35	-26,65	-4,41
B170	NC12	0,000	-47,95	-3,38	25,90	-48,69	4,42

16. Notranje sile za HEB 200 - Ovojnica MSN

Nonlinear calculation, Extreme : Global, System : Principal
Selection : All
Class : RC3_MSN_nelin
Cross-section : CS32 - HEB200

Member	Case	dx [m]	N [kN]	Vy [kN]	Vz [kN]	My [kNm]	Mz [kNm]
Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*							
B266	NC4	3,046	-121,59	-0,13	-1,41	0,00	0,00
B92	NC9	0,131	-0,96	-0,03	-3,06	-0,40	0,00
B187	NC12	0,000	-41,94	-41,98	2,09	0,00	0,00
B182	NC12	0,000	-39,53	36,81	-0,05	0,00	0,00
B26	NC12	0,000	-82,92	0,01	-94,73	0,00	0,00
B12	NC4	0,000	-82,85	0,07	68,77	0,00	0,00
B19	NC3	1,684	-85,20	0,00	-59,69	-102,69	0,01

Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*

Member	Case	dx [m]	N [kN]	Vy [kN]	Vz [kN]	My [kNm]	Mz [kNm]
Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*							
B496	NC4	0,842	-81,80	-0,01	67,28	114,85	-0,01
B187	NC12	0,864	-41,33	-41,82	2,12	1,84	-36,24
B182	NC12	0,864	-38,90	36,68	-0,03	-0,02	31,78

17. Notranje sile za IX 300 - Ovojnica MSN

Nonlinear calculation, Extreme : Global, System : Principal

Selection : All

Class : RC3_MSN_nelin

Cross-section : CS9 - IX (IPE300, IPET300)

Member	Case	dx [m]	N [kN]	Vy [kN]	Vz [kN]	My [kNm]	Mz [kNm]
Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*							
B190	NC3	0,000	-122,47	45,93	-22,27	0,00	0,00
B189	NC9	0,864	-13,14	-4,59	8,77	7,59	-3,97
B189	NC4	0,000	-98,57	-38,45	53,17	0,00	0,00
B190	NC1	1,684	-115,23	35,61	-24,89	-41,41	60,36
B189	NC1	0,000	-91,90	-31,83	59,56	0,00	0,00
B189	NC1	0,864	-90,99	-31,76	59,45	51,48	-27,50
B189	NC4	0,864	-97,65	-38,37	53,07	45,96	-33,23
B190	NC3	1,684	-120,70	45,50	-22,12	-37,50	77,15

18. Notranje sile za IPE 200 - Ovojnica MSN

Nonlinear calculation, Extreme : Global, System : Principal

Selection : All

Class : RC5_MSU_nelin

Cross-section : CS6 - IPE200

Member	Case	dx [m]	N [kN]	Vy [kN]	Vz [kN]	My [kNm]	Mz [kNm]
Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*							
B109	NC15	0,998	-109,02	-0,46	1,52	1,64	-0,53
B196	NC18	0,000	0,06	0,00	3,85	0,00	0,00
B195	NC16	0,750	-2,93	-1,23	-3,70	0,93	0,31
B535	NC13	0,998	-105,26	0,86	0,69	0,00	0,00
B501	NC13	2,126	-36,31	-0,05	-21,81	-22,74	-0,09
B80	NC16	0,000	-15,11	-0,19	14,02	-14,42	0,09
B81	NC15	0,000	-13,58	-0,04	-12,28	15,37	-0,07
B536	NC13	1,999	-50,87	-0,58	-0,63	-0,79	-0,81
B194	NC16	2,700	-4,43	0,44	1,05	3,64	1,22

19. Notranje sile za HEA 140 - Ovojnica MSN

Nonlinear calculation, Extreme : Global, System : Principal

Selection : All

Class : RC3_MSN_nelin

Cross-section : CS27 - HEA140

Member	Case	dx [m]	N [kN]
Student version *Student version* *Student version* *Student version*			
B62	NC12	1,752	-67,55
B102	NC3	0,000	56,97

20. Notranje sile za RD 12 - Ovojnica MSN

Nonlinear calculation, Extreme : Global, System : Principal

Selection : All

Class : RC3_MSN_nelin

Cross-section : CS31 - RD12

Member	Case	dx [m]	N [kN]
Student version *Student version* *Student version* *Student version*			
B425	NC7	2,356	0,00
B402	NC1	0,000	26,39

21. Reakcije Rx, Ry, Rz - Ovojnica MSN

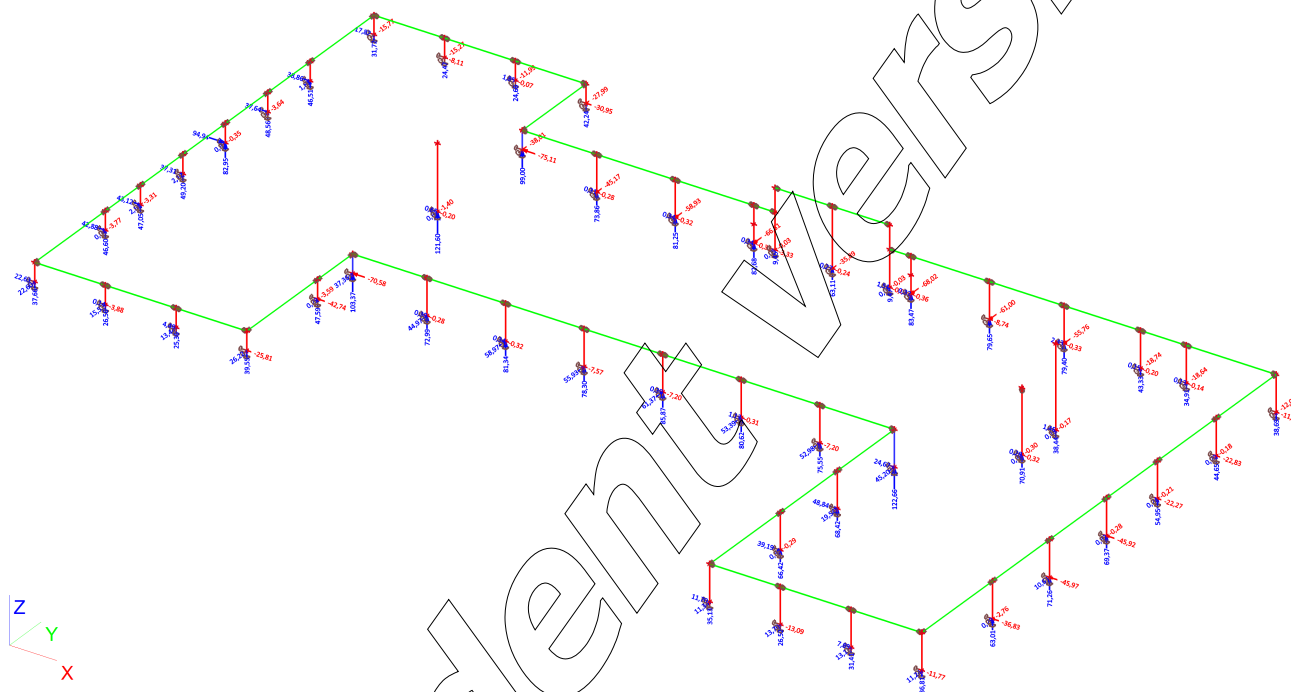
Nonlinear calculation, Extreme : Global

Selection : All

Class : RC3_MSN_nelin

Support	Case	Rx [kN]	Ry [kN]	Rz [kN]
Sn47/N135	NC1	-75,11	-31,43	88,45
Sn34/N52	NC12	94,94	0,37	82,69
Sn59/N22	NC4	0,31	-68,02	83,47
Sn18/N36	NC3	-3,79	61,37	84,87
Sn39/N125	NC9	0,01	2,04	2,47
Sn30/N136	NC3	22,81	45,20	122,66

22. Reakcije Rx, Ry, Rz - Ovojnica MSN



23. Pomiki

Nonlinear calculation, Extreme : Global, System : Principal

Selection : All

Class : RC5_MSU_nelin

Case	Member	dx [m]	ux [mm]	uy [mm]	uz [mm]	fix [deg]	fiy [deg]	fiz [deg]
NC16	B163	3,189	-13,8	-0,7	-20,5	0,0	0,0	0,0
NC16	B444	4,033	7,1	4,4	-0,1	0,0	0,0	0,0
NC16	B194	1,688	1,0	-11,3	-14,3	-0,2	-0,1	0,0
NC16	B443	0,000	-6,4	7,8	-0,1	0,0	0,0	0,0
NC16	B137	6,377	-2,7	0,7	-24,6	0,0	0,0	0,0
NC16	B522	1,417	0,0	-1,2	10,1	0,0	-0,2	-0,1
NC16	B225	0,000	0,1	0,1	-1,2	-0,4	0,0	0,0
NC16	B302	3,700	0,4	-0,9	-9,8	0,3	0,0	0,0
NC15	B374	1,986	-3,0	-1,5	-0,6	-0,1	-0,4	0,0
NC16	B12	0,000	0,0	0,0	0,0	0,0	0,4	0,0
NC20	B42	0,250	-1,1	-6,6	-0,1	0,2	0,0	-0,2
NC16	B92	0,000	1,2	-2,6	-0,1	0,0	0,0	0,4

Bending moment check (My)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
<i>*Student version* *Student version* *Student version* *S</i>		
Mc,Rd	227.91	kNm
Unity check	0.00	-

Bending moment check (Mz)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
<i>*Student version* *Student version* *Student version* *S</i>		
Mc,Rd	108.63	kNm
Unity check	0.00	-

Combined bending, axial force and shear force check

According to article EN 1993-1-1 : 6.2.9.1. and formula (6.31)
Section classification is 1.

Table of values		
<i>*Student version* *Student version* *Student version* *S</i>		
MNVy,Rd	227.91	kNm
MNVz,Rd	108.63	kNm

alfa 2.00 beta 1.00
Unity check 0.00 -

Element satisfies the section check !

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

Flexural Buckling Check

According to article EN 1993-1-1 : 6.3.1.1. and formula (6.46)

Buckling parameters	yy	zz	
<i>*Student version* *Student version* *Student version* *Student version* *Student version</i>			
Sway type	sway	non-sway	
System Length L	1.684	1.684	m
Buckling factor k	1.00	1.00	
Buckling length Lcr	1.684	1.684	m
Critical Euler load Ncr	41607.40	14631.26	kN
Slenderness	19.72	33.26	
Relative slenderness Lambda	0.26	0.44	
Limit slenderness Lambda,0	0.20	0.20	

The slenderness or compression force is such that Flexural Buckling effects may be ignored according to EN 1993-1-1 article 6.3.1.2(4)

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	6.4200e-04	m ³
Elastic critical moment Mcr	2808.61	kNm
Relative slenderness Lambda,LT	0.28	
Limit slenderness Lambda,LT,0	0.40	

Mcr Parameters

<i>*Student version* *Student version* *Student version*</i>		
LTB length	1.684	m
k	1.00	
kw	1.00	
C1	1.76	
C2	0.00	
C3	1.00	

The slenderness or bending moment is such that Lateral Torsional Buckling effects may be ignored according to EN 1993-1-1 article 6.3.2.2(4)

Compression and bending check

According to article EN 1993-1-1 : 6.3.3. and formula (6.61), (6.62)
Interaction Method 1

Table of values		
Student version *Student version* *Student version* *Student version*		
kyy	0.998	
kzy	0.733	
kzy	0.520	
kzz	1.026	
Delta My	0.00	kNm
Delta Mz	0.00	kNm
A	7.8080e-03	m^2
Wy	6.4200e-04	m^3
Wz	3.0600e-04	m^3
NRk	2771.84	kN
My,Rk	227.91	kNm
Mz,Rk	108.63	kNm
My,Ed	114.85	kNm
Mz,Ed	0.03	kNm
Interaction Method 1		
Mcr0	1592.13	kNm
reduced slenderness 0	0.38	
Psi y	0.000	
Psi z	0.051	
Cmy,0	0.999	
Cmz,0	1.005	
Cmy	1.000	
Cmz	1.005	
CmLT	1.000	
muy	1.000	
muz	1.000	
wy	1.127	
wz	1.500	
npl	0.030	
aLT	0.990	
bLT	0.000	
cLT	0.142	
dLT	0.001	
eLT	2.361	
Cyy	1.004	
Cyz	0.954	
Czy	1.002	
Czz	0.985	

Unity check (6.61) = 0.03 + 0.50 + 0.00 = 0.53
Unity check (6.62) = 0.03 + 0.26 + 0.00 = 0.29

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	
Student version *Student version* *Student version* *Student version*	
hw/t	18.889

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

EN 1993-1-1 Code Check

Member B62	HEA140	S 355	NC12	0.16
Basic data EC3 : EN 1993				
Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*				
partial safety factor Gamma M0 for resistance of cross-sections	1.00			
partial safety factor Gamma M1 for resistance to instability	1.00			
partial safety factor Gamma M2 for resistance of net sections	1.25			

Material data		
Student version *Student version* *Student version* *Student version*		
yield strength fy	355.0	MPa
tension strength fu	490.0	MPa
fabrication	rolled	

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

Width-to-thickness ratio for internal compression parts (EN 1993-1-1 : Tab.5.2. sheet 1).

ratio 16.73 on position 0.000 m

ratio		
<i>*Student version* *Student version* *Student version*</i>		
maximum ratio	1	26.85
maximum ratio	2	30.92
maximum ratio	3	34.17

==> Class cross-section 1
Width-to-thickness ratio for outstand flanges (EN 1993-1-1 : Tab.5.2. sheet 2).
ratio 6.50 on position 0.000 m

ratio		
<i>*Student version* *Student version* *Student version*</i>		
maximum ratio	1	7.32
maximum ratio	2	8.14
maximum ratio	3	11.39

==> Class cross-section 1
The critical check is on position 1.752 m

Internal forces		
<i>*Student version* *Student version* *Student version*</i>		
NEd	-67.55	kN
Vy,Ed	0.00	kN
Vz,Ed	0.00	kN
TEd	0.00	kNm
My,Ed	0.52	kNm
Mz,Ed	0.00	kNm

Compression check

According to article EN 1993-1-1 : 6.2.4 and formula (6.9)
Section classification is 1.

Table of values		
<i>*Student version* *Student version* *Student version*</i>		
Nc,Rd	1114.70	kN
Unity check	0.06	-

Bending moment check (My)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
<i>*Student version* *Student version* *Student version*</i>		
Mc,Rd	61.77	kNm
Unity check	0.01	-

Bending moment check (Mz)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
<i>*Student version* *Student version* *Student version*</i>		
Mc,Rd	30.10	kNm
Unity check	0.00	-

Combined bending, axial force and shear force check

According to article EN 1993-1-1 : 6.2.9.1. and formula (6.31)
Section classification is 1.

Table of values		
<i>*Student version* *Student version* *Student version*</i>		
MNVy,Rd	61.77	kNm
MNVz,Rd	30.10	kNm

alfa 2.00 beta 1.00
Unity check 0.01 -

Element satisfies the section check !

.....**STABILITY CHECK**.....

Flexural Buckling Check

According to article EN 1993-1-1 : 6.3.1.1. and formula (6.46)

Buckling parameters	yy	zz	
Sway type	sway	non-sway	
System Length L	3.503	3.503	m
Buckling factor k	1.00	1.00	
Buckling length Lcr	3.503	3.503	m
Critical Euler load Ncr	1739.79	657.07	kN
Slenderness	61.16	99.52	
Relative slenderness Lambda	0.80	1.30	
Limit slenderness Lambda,0	0.20	0.20	
Buckling curve	b	c	
Imperfection Alpha	0.34	0.49	
Reduction factor Chi	0.72	0.39	
Buckling resistance Nb,Rd	807.24	432.25	kN

Table of values		
A	3.1400e-03	m ²
Buckling resistance Nb,Rd	432.25	kN
Unity check	0.16	-

Lateral Torsional Buckling Check

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

LTB Parameters		
Method for LTB curve	Art. 6.3.2.2.	
Wy	1.7400e-04	m ³
Elastic critical moment Mcr	87.23	kNm
Relative slenderness Lambda,LT	0.84	
Limit slenderness Lambda,LT,0	0.40	

Mcr Parameters		
LTB length	3.503	m
k	1.00	
kw	1.00	
C1	1.13	
C2	0.45	
C3	0.53	

The slenderness or bending moment is such that Lateral Torsional Buckling effects may be ignored according to EN 1993-1-1 article 6.3.2.2(4)

Compression and bending check

According to article EN 1993-1-1 : 6.3.3. and formula (6.61), (6.62)
Interaction Method 1

Table of values		
kyy	1.118	
kyz	0.798	
kzy	0.589	
kzz	1.085	
Delta My	0.00	kNm
Delta Mz	0.00	kNm
A	3.1400e-03	m ²
Wy	1.7400e-04	m ³
Wz	8.4800e-05	m ³
NRk	1114.70	kN
My,Rk	61.77	kNm
Mz,Rk	30.10	kNm
My,Ed	0.52	kNm
Mz,Ed	0.00	kNm
Interaction Method 1		
Mcr0	77.40	kNm
reduced slenderness 0	0.89	
Psi y	1.000	
Psi z	1.000	
Cmy,0	1.001	
Cmz,0	1.003	
Cmy	1.001	
Cmz	1.003	
CmLT	1.067	
muy	0.989	
muz	0.934	
wy	1.123	
wz	1.500	

Student version *Student version* *Student version* *Student version*

Table of values		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
npl	0.061	
aLT	0.992	
bLT	0.000	
cLT	0.008	
dLT	0.000	
eLT	0.004	
Cyy	0.983	
Cyz	0.961	
Czy	0.916	
Czz	0.963	

Unity check (6.61) = 0.08 + 0.01 + 0.00 = 0.09

Unity check (6.62) = 0.16 + 0.00 + 0.00 = 0.16

Element satisfies the stability check !

EN 1993-1-1 Code Check

Member B171	IPE200	S 355	NC1	0.96
Basic data EC3 : EN 1993				
<i>*Student version* *Student version* *Student version* *Student version* *Student version* *Student version*</i>				
partial safety factor Gamma M0 for resistance of cross-sections	1.00			
partial safety factor Gamma M1 for resistance to instability	1.00			
partial safety factor Gamma M2 for resistance of net sections	1.25			

Material data		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
yield strength fy	355.0	MPa
tension strength fu	490.0	MPa
fabrication	rolled	

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

Width-to-thickness ratio for internal compression parts (EN 1993-1-1 : Tab.5.2. sheet 1)

ratio 28.39 on position 0.000 m

ratio		
<i>*Student version* *Student version* *Student version*</i>		
maximum ratio	1	26.85
maximum ratio	2	30.92
maximum ratio	3	34.17

==> Class cross-section 2

Width-to-thickness ratio for outstand flanges (EN 1993-1-1 : Tab.5.2. sheet 2)

ratio 4.14 on position 0.000 m

ratio		
<i>*Student version* *Student version* *Student version*</i>		
maximum ratio	1	7.32
maximum ratio	2	8.14
maximum ratio	3	11.39

==> Class cross-section 1

The critical check is on position 3.189 m

Internal forces		
<i>*Student version* *Student version* *Student version*</i>		
NEd	-43.80	kN
Vy,Ed	0.00	kN
Vz,Ed	-11.10	kN
TEd	0.00	kNm
My,Ed	13.01	kNm
Mz,Ed	0.01	kNm

Compression check

According to article EN 1993-1-1 : 6.2.4 and formula (6.9)

Section classification is 1.

Table of values		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
Nc,Rd	1011.75	kN
Unity check	0.04	-

Shear check (Vy)

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

Table of values		
Student version *Student version* *Student version*		
Vc,Rd	374.09	kN
Unity check	0.00	-

Shear check (Vz)

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

Table of values		
Student version *Student version* *Student version*		
Vc,Rd	287.27	kN
Unity check	0.04	-

Bending moment check (My)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
Student version *Student version* *Student version*		
Mc,Rd	78.31	kNm
Unity check	0.17	-

Bending moment check (Mz)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
Student version *Student version* *Student version*		
Mc,Rd	15.84	kNm
Unity check	0.00	-

Combined bending, axial force and shear force check

According to article EN 1993-1-1 : 6.2.9.1. and formula (6.41)
Section classification is 1.

Table of values		
Student version *Student version* *Student version*		
MNVy,Rd	78.31	kNm
MNVz,Rd	15.84	kNm

alfa 2.00 beta 1.00
Unity check 0.03 -

Element satisfies the section check !

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

Flexural Buckling Check

According to article EN 1993-1-1 : 6.3.1.1. and formula (6.46)

Buckling parameters	yy	zz	
Student version *Student version* *Student version* *Student version* *Student version*			
Sway type	sway	non-sway	
System Length L	5.316	3.189	m
Buckling factor k	1.00	1.00	
Buckling length Lcr	5.316	3.189	m
Critical Euler load Ncr	1425.25	290.15	kN
Slenderness	64.38	142.68	
Relative slenderness Lambda	0.84	1.87	
Limit slenderness Lambda,0	0.20	0.20	
Buckling curve	a	b	
Imperfection Alpha	0.21	0.34	
Reduction factor Chi	0.77	0.24	
Buckling resistance Nb,Rd	779.56	239.22	kN

Table of values		
Student version *Student version* *Student version* *Student version* *Stu		
A	2.8500e-03	m ²
Buckling resistance Nb,Rd	239.22	kN
Unity check	0.18	-

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	2.2060e-04	m ³
Elastic critical moment Mcr	54.72	kNm
Relative slenderness Lambda,LT	1.20	
Limit slenderness Lambda,LT,0	0.40	
LTB curve	a	
Imperfection Alpha,LT	0.21	
Reduction factor Chi,LT	0.53	
Buckling resistance Mb,Rd	41.69	kNm
Unity check	0.31	-

Mcr Parameters		
<i>*Student version* *Student version* *Student version*</i>		
LTB length	3.189	m
k	1.00	
kw	1.00	
C1	1.12	
C2	0.27	
C3	0.53	

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

Compression and bending check

According to article EN 1993-1-1 : 6.3.3. and formula (6.61), (6.62)
Interaction Method 1

Table of values		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
kyy	1.154	
kyz	1.241	
kzy	0.600	
kzz	0.965	
Delta My	0.00	kNm
Delta Mz	0.00	kNm
A	2.8500e-03	m ²
Wy	2.2060e-04	m ³
Wz	4.4610e-05	m ³
NRk	1011.75	kN
My,Rk	78.31	kNm
Mz,Rk	15.84	kNm
My,Ed	-32.65	kNm
Mz,Ed	0.01	kNm
Interaction Method 1		
Mcr0	49.03	kNm
reduced slenderness 0	1.26	
Psi y	0.000	
Psi z	0.000	
Cmy,0	0.983	
Cmz,0	0.879	
Cmy	0.996	
Cmz	0.879	
CmLT	1.094	
muy	0.993	
muz	0.880	
wy	1.135	
wz	1.500	
npl	0.043	
aLT	0.996	
bLT	0.000	
cLT	0.729	
dLT	0.000	
eLT	0.137	
Cyy	0.968	
Cyz	0.571	
Czy	0.861	
Czz	0.945	

Unity check (6.61) = 0.06 + 0.90 + 0.00 = 0.96
Unity check (6.62) = 0.18 + 0.47 + 0.00 = 0.65

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

hw/t	32.679
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The web slenderness is such that the Shear Buckling Check is not required.
Element satisfies the stability check !

EN 1993-1-1 Code Check

Member B158	IPE300	S 355	NC4	0.81
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Basic data EC3 : EN 1993	
partial safety factor Gamma M0 for resistance of cross-sections	1.00
partial safety factor Gamma M1 for resistance to instability	1.00
partial safety factor Gamma M2 for resistance of net sections	1.25

Material data

yield strength fy	355.0	MPa
tension strength fu	490.0	MPa
fabrication	rolled	

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

Width-to-thickness ratio for internal compression parts (EN 1993-1-1 : Tab.5.2. sheet 1).
ratio 35.01 on position 8.250 m

ratio		
maximum ratio 1	26.85	
maximum ratio 2	30.92	
maximum ratio 3	45.97	

=> Class cross-section 3

Width-to-thickness ratio for outstand flanges (EN 1993-1-1 : Tab.5.2. sheet 2).
ratio 5.28 on position 8.250 m

ratio		
maximum ratio 1	7.32	
maximum ratio 2	8.14	
maximum ratio 3	11.22	

=> Class cross-section 1

The critical check is on position 0.000 m

Internal forces		
NEd	-90.67	kN
Vy,Ed	1.34	kN
Vz,Ed	53.37	kN
TEd	0.02	kNm
My,Ed	-114.86	kNm
Mz,Ed	-0.60	kNm

Compression check

According to article EN 1993-1-1 : 6.2.4 and formula (6.9)
Section classification is 1.

Table of values		
Nc,Rd	1909.90	kN
Unity check	0.05	-

Shear check (Vy)

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

Table of values		
Vc,Rd	697.26	kN
Unity check	0.00	-

Shear check (Vz)

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

Table of values		
Student version *Student version* *Student version* *		
Vc,Rd	526.12	kN
Unity check	0.10	-

Bending moment check (My)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
Student version *Student version* *Student version* *S		
Mc,Rd	223.08	kNm
Unity check	0.51	-

Bending moment check (Mz)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
Student version *Student version* *Student version* *		
Mc,Rd	44.45	kNm
Unity check	0.01	-

Combined bending, axial force and shear force check

According to article EN 1993-1-1 : 6.2.9.1. and formula (6.41)
Section classification is 1.

Table of values		
Student version *Student version* *Student version* *S		
MNVy,Rd	223.08	kNm
MNVz,Rd	44.45	kNm

alfa 2.00 beta 1.00
Unity check 0.28 -

Element satisfies the section check !

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

Flexural Buckling Check

According to article EN 1993-1-1 : 6.3.1.1. and formula (6.46)

Buckling parameters	yy	zz	
Student version *Student version* *Student version* *Student version* *Student version* *Stu			
Sway type	sway	non-sway	
System Length L	6.377	2.126	m
Buckling factor k	2.00	1.00	
Buckling length Lcr	12.754	2.126	m
Critical Euler load Ncr	1064.67	2769.56	kN
Slenderness	102.34	63.45	
Relative slenderness Lambda	1.34	0.83	
Limit slenderness Lambda,0	0.20	0.20	
Buckling curve	a	b	
Imperfection Alpha	0.21	0.34	
Reduction factor Chi	0.45	0.71	
Buckling resistance Nb,Rd	857.22	1347.44	kN

Table of values		
Student version *Student version* *Student version* *Student version* *Stu		
A	5.3800e-03	m ²
Buckling resistance Nb,Rd	857.22	kN
Unity check	0.11	-

Torsional (-Flexural) Buckling check

According to article EN 1993-1-1 : 6.3.1.1. and formula (6.46)

Table of values		
Student version *Student version* *Student version* *Student version* *Student ve		
Torsional Buckling length	2.126	m
Ncr,T	4443.16	kN
Ncr,TF	1064.67	kN
Relative slenderness Lambda,T	1.34	
Limit slenderness Lambda,0	0.20	
Buckling curve	b	
Imperfection Alpha	0.34	

Student version *Student version* *Student version* *Student version* *Student ve

Table of values		
<i>*Student version* *Student version* *Student version* *Student version* *Student version*</i>		
A	5.3800e-03	m ²
Reduction factor Chi	0.41	
Buckling resistance Nb,Rd	779.97	kN
Unity check	0.12	-

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	5.5710e-04	m ³
Elastic critical moment Mcr	763.46	kNm
Relative slenderness Lambda,LT	0.51	
Limit slenderness Lambda,LT,0	0.40	

Mcr Parameters		
<i>*Student version* *Student version* *Student version*</i>		
LTB length	2.126	m
k	1.00	
kw	1.00	
C1	1.69	
C2	0.03	
C3	1.00	

The slenderness or bending moment is such that Lateral Torsional Buckling effects may be ignored according to EN 1993-1-1 article 6.3.2.2(4)

Compression and bending check

According to article EN 1993-1-1 : 6.3.3. and formula (6.61), (6.62)

Interaction Method 1

Table of values		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
kyy	1.022	
kyz	0.966	
kzy	1.064	
kzz	1.006	
Delta My	0.00	kNm
Delta Mz	0.00	kNm
A	5.3800e-03	m ²
Wy	5.5710e-04	m ³
Wz	8.0500e-05	m ³
NRk	1909.90	kN
My,Rk	197.77	kNm
Mz,Rk	28.58	kNm
My,Ed	-114.86	kNm
Mz,Ed	2.19	kNm
Interaction Method 1		
Mcr0	452.71	kNm
reduced slenderness 0	0.66	
Psi y	-0.187	
Psi z	-0.276	
Cmy,0	0.924	
Cmz,0	0.983	
Cmy	0.983	
Cmz	0.983	
CmLT	1.000	
muy	0.951	
muz	0.990	
wy	1.128	
wz	1.500	
npl	0.047	
aLT	0.998	
bLT	0.906	
cLT	0.417	
dLT	0.060	
eLT	1.020	
Cyy	0.985	
Cyz	0.763	
Czy	0.924	
Czz	0.947	

$$\text{Unity check (6.61)} = 0.11 + 0.59 + 0.07 = 0.77$$

$$\text{Unity check (6.62)} = 0.12 + 0.62 + 0.08 = 0.81$$

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>	
hw/t	39.239

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

EN 1993-1-1 Code Check

Member B190	IX (IPE300, IPET300)	S 355	NC3	0.56
Basic data EC3 : EN 1993				
<i>*Student version* *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*</i>				
partial safety factor Gamma M0 for resistance of cross-sections	1.00			
partial safety factor Gamma M1 for resistance to instability	1.00			
partial safety factor Gamma M2 for resistance of net sections	1.25			

Material data		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
yield strength fy	355.0	MPa
tension strength fu	490.0	MPa
fabrication	welded	

Warning: Strength reduction in function of the thickness is not supported for this type of cross-section.

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

Note: Classification is not supported for this type of cross-section.

The section is checked as elastic, class 3.

The critical check is on position 0.000 m

Axis definition :

- principal y- axis in this code check is referring to the principal z axis in Scia Engineer
- principal z- axis in this code check is referring to the principal y axis in Scia Engineer

Internal forces		
<i>*Student version* *Student version* *Student version* *</i>		
NEd	-122.47	kN
Vy,Ed	-22.27	kN
Vz,Ed	45.93	kN
TEd	-0.03	kNm
My,Ed	0.00	kNm
Mz,Ed	0.00	kNm

Compression check

According to article EN 1993-1-1 : 6.2.4 and formula (6.9)

Section classification is 3.

Table of values		
<i>*Student version* *Student version* *Student version* *</i>		
Nc,Rd	3824.04	kN
Unity check	0.03	-

Shear check (Vy)

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

Table of values		
<i>*Student version* *Student version* *Student version* *</i>		
Vc,Rd	472.29	kN
Unity check	0.05	-

Shear check (Vz)

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

Table of values		
<i>*Student version* *Student version* *Student version* *</i>		
Vc,Rd	481.02	kN
Unity check	0.10	-

Bending moment check (My)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)

Section classification is 3.

Table of values		
Mc,Rd	217.77	kNm
Unity check	0.00	-

Bending moment check (Mz)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 3.

Table of values		
Mc,Rd	212.26	kNm
Unity check	0.00	-

Combined bending, axial force and shear force check

According to article EN 1993-1-1 : 6.2 and formula (6.1)
Section classification is 3.

Table of values		
sigma N	11.4	MPa
sigma Myy	0.0	MPa
sigma Mzz	0.0	MPa
Tau y	-11.0	MPa
Tau z	22.2	MPa
Tau t	-0.5	MPa

ro 0.00 place 40
Unity check 0.17 -

Element satisfies the section check !

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

Flexural Buckling Check

According to article EN 1993-1-1 : 6.3.1.1. and formula (6.46)

Buckling parameters	yy	zz	
Sway type	non-sway	sway	
System Length L	1.684	1.684	m
Buckling factor k	1.00	1.00	
Buckling length Lcr	1.684	1.684	m
Critical Euler load Ncr	68807.28	65527.00	kN
Slenderness	18.01	18.46	
Relative slenderness Lambda	0.24	0.24	
Limit slenderness Lambda,0	0.20	0.20	

The slenderness or compression force is such that Flexural Buckling effects may be ignored according to EN 1993-1-1 article 6.3.1.2(4)

Torsional (-Flexural) Buckling check

According to article EN 1993-1-1 : 6.3.1.1. and formula (6.46)

Table of values		
Torsional Buckling length	1.684	m
Ncr,T	13080.88	kN
Relative slenderness Lambda,T	0.54	
Limit slenderness Lambda,0	0.20	

The slenderness or compression force is such that Torsional (-Flexural) Buckling effects may be ignored according to EN 1993-1-1 article 6.3.1.2(4)

Lateral Torsional Buckling Check

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

LTB Parameters		
Method for LTB curve	Art. 6.3.2.2.	
Wy	6.1345e-04	m^3
Elastic critical moment Mcr	3825.48	kNm
Relative slenderness Lambda,LT	0.24	
Limit slenderness Lambda,LT,0	0.40	

McR Parameters		
LTB length	1.684	m
k	1.00	

Mcr Parameters		
Student version *Student version* *Student version*		
kw	1.00	
C1	1.77	
C2	0.00	
C3	1.00	

The slenderness or bending moment is such that Lateral Torsional Buckling effects may be ignored according to EN 1993-1-1 article 6.3.2(4)

Compression and bending check

According to article EN 1993-1-1 : 6.3.3. and formula (6.61), (6.62)

Interaction Method 1

Table of values		
Student version *Student version* *Student version* *Student version*		
kyy	1.003	
kyz	1.001	
kzy	1.003	
kzz	1.001	
Delta My	0.00	kNm
Delta Mz	0.00	kNm
A	1.0772e-02	m^2
Wy	6.1345e-04	m^3
Wz	5.9792e-04	m^3
NRk	3824.04	kN
My,Rk	217.77	kNm
Mz,Rk	212.26	kNm
My,Ed	77.15	kNm
Mz,Ed	37.50	kNm
Interaction Method 1		
Mcr0	3825.48	kNm
reduced slenderness 0	0.24	
Psi y	0.000	
Psi z	0.000	
Cmy,0	0.999	
Cmz,0	0.999	
Cmy	1.000	
Cmz	0.999	
CmLT	1.001	
muy	1.000	
muz	1.000	
wy	1.260	
wz	1.262	
npl	0.032	
aLT	0.996	
bLT	0.001	
cLT	0.032	
dLT	0.181	
eLT	1.098	
Cyy	1.013	
Cyz	1.006	
Czy	0.967	
Czz	1.004	

$$\text{Unity check (6.61)} = 0.03 + 0.36 + 0.18 = 0.56$$

$$\text{Unity check (6.62)} = 0.03 + 0.36 + 0.18 = 0.56$$

Element satisfies the stability check !

EN 1993-1-1 Code Check

Member B314	SHS100/100/4.0	S 235	NC7	0.22
Basic data EC3 : EN 1993				
Student version *Student version* *Student version* *Student version* *Student version* *Student version* *Student version*				
partial safety factor Gamma M0 for resistance of cross-sections	1.00			
partial safety factor Gamma M1 for resistance to instability	1.00			
partial safety factor Gamma M2 for resistance of net sections	1.25			

Material data		
Student version *Student version* *Student version* *Student version*		
yield strength fy	235.0	MPa
tension strength fu	360.0	MPa
fabrication	rolled	

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

Width-to-thickness ratio for internal compression parts (EN 1993-1-1 : Tab.5.2. sheet 1).

ratio 22.00 on position 0.000 m

ratio		
Student version	*Student version*	*Student version*
maximum ratio	1	33.00
maximum ratio	2	38.00
maximum ratio	3	42.00

==> Class cross-section 1
The critical check is on position 1.803 m

Internal forces		
Student version	*Student version*	*Student version*
N _{Ed}	-15.77	kN
V _{y,Ed}	0.00	kN
V _{z,Ed}	0.00	kN
T _{Ed}	0.17	kNm
M _{y,Ed}	-1.53	kNm
M _{z,Ed}	-0.66	kNm

Compression check

According to article EN 1993-1-1 : 6.2.4 and formula (6.9)
Section classification is 1.

Table of values		
Student version	*Student version*	*Student version*
N _{c,Rd}	357.20	kN
Unity check	0.04	-

Torsion check

According to article EN 1993-1-1 : 6.2.7. and formula (6.23)

Table of values		
Student version	*Student version*	*Student version*
tau t _{Rd}	136.3	MPa
tau t _{Ed}	2.3	MPa
Unity check	0.02	-

Shear check (V_y)

According to article EN 1993-1-1 : 6.2.6. & 6.2.7 and formula (6.25)

Table of values		
Student version	*Student version*	*Student version*
V _{c,Rd}	101.37	kN
Unity check	0.00	-

Shear check (V_z)

According to article EN 1993-1-1 : 6.2.6. & 6.2.7 and formula (6.25)

Table of values		
Student version	*Student version*	*Student version*
V _{c,Rd}	101.37	kN
Unity check	0.00	-

Bending moment check (M_y)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
Student version	*Student version*	*Student version*
M _{c,Rd}	12.69	kNm
Unity check	0.12	-

Bending moment check (M_z)

According to article EN 1993-1-1 : 6.2.5. and formula (6.12)
Section classification is 1.

Table of values		
Student version	*Student version*	*Student version*
M _{c,Rd}	12.69	kNm
Unity check	0.05	-

Combined bending, axial force and shear force check

According to article EN 1993-1-1 : 6.2.9.1. and formula (6.41)
Section classification is 1.

Table of values		
Student version	*Student version*	*Student version*
MNVy,Rd	12.69	kNm
MNVz,Rd	12.69	kNm

alfa 1.66 beta 1.66
Unity check 0.04 -

Element satisfies the section check !

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

Flexural Buckling Check

According to article EN 1993-1-1 : 6.3.1.1. and formula (6.46)

Buckling parameters	yy	zz	
Student version	*Student version*	*Student version*	*Student version*
Sway type	sway	non-sway	
System Length L	3.605	3.605	m
Buckling factor k	1.00	1.00	
Buckling length Lcr	3.605	3.605	m
Critical Euler load Ncr	370.01	370.01	kN
Slenderness	92.27	92.27	
Relative slenderness Lambda	0.98	0.98	
Limit slenderness Lambda,0	0.20	0.20	
Buckling curve	a	a	
Imperfection Alpha	0.21	0.21	
Reduction factor Chi	0.68	0.68	
Buckling resistance Nb,Rd	242.11	242.11	kN

Table of values		
Student version	*Student version*	*Student version*
A	1.5200e-03	m ²
Buckling resistance Nb,Rd	242.11	kN
Unity check	0.07	-

Lateral Torsional Buckling Check

Note: The cross-section concerns an RHS section with 'h / b < 10 / Lambda,red,z'.
This section is thus not susceptible to Lateral Torsional Buckling.

Compression and bending check

According to article EN 1993-1-1 : 6.3.3. and formula (6.61), (6.62)
Interaction Method 1

Table of values		
Student version	*Student version*	*Student version*
kyy	1.036	
kyz	0.639	
kzy	0.639	
kzz	1.036	
Delta My	0.00	kNm
Delta Mz	0.00	kNm
A	1.5200e-03	m ²
Wy	5.3981e-05	m ³
Wz	5.3981e-05	m ³
NRk	357.20	kN
My,Rk	12.69	kNm
Mz,Rk	12.69	kNm
My,Ed	-1.53	kNm
Mz,Ed	-0.66	kNm
Interaction Method 1		
Mcr0	328.75	kNm
reduced slenderness 0	0.20	
Psi y	0.930	
Psi z	0.992	
Cmy,0	1.001	
Cmz,0	1.001	
Cmy	1.001	
Cmz	1.001	
CmLT	1.000	
muy	0.986	
muz	0.986	
wy	1.163	
wz	1.163	
npl	0.044	
aLT	0.000	
bLT	0.000	
cLT	0.000	
dLT	0.000	
eLT	0.000	

Student version *Student version* *Student version* *Student version*

Table of values		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
Cyy	0.995	
Cyz	0.969	
Czy	0.969	
Czz	0.995	

Unity check (6.61) = 0.07 + 0.13 + 0.03 = 0.22

Unity check (6.62) = 0.07 + 0.08 + 0.05 = 0.20

Element satisfies the stability check !

EN 1993-1-1 Code Check

Member B402	RD12	S 355	NC1	0.66
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Basic data EC3 : EN 1993	
<i>*Student version* *Student version* *Student version* *Student version* *Student version* *Student version*</i>	
partial safety factor Gamma M0 for resistance of cross-sections	1.00
partial safety factor Gamma M1 for resistance to instability	1.00
partial safety factor Gamma M2 for resistance of net sections	1.25

Material data		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
yield strength fy	355.0	MPa
tension strength fu	490.0	MPa
fabrication	rolled	

Warning: Strength reduction in function of the thickness is not supported for this type of cross-section.

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

Note: Classification is not supported for this type of cross-section.

The section is checked as elastic, class 3.

The critical check is on position 0.000 m

Internal forces		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
N _{Ed}	26.39	kN
V _{y,Ed}	0.00	kN
V _{z,Ed}	0.00	kN
T _{Ed}	0.00	kNm
M _{y,Ed}	0.00	kNm
M _{z,Ed}	0.00	kNm

Normal force check

According to article EN 1993-1-1 : 6.2.3. and formula (6.5)

Table of values		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
N _{t,Rd}	39.88	kN
Unity check	0.66	-

Combined bending, axial force and shear force check

According to article EN 1993-1-1: 6.2.9.2. & 6.2.10 and formula (6.42)

Section classification is 3.

Table of values		
<i>*Student version* *Student version* *Student version* *Student version*</i>		
sigma N	-233.5	MPa
sigma Myy	0.0	MPa
sigma Mzz	0.0	MPa

ro 0.00 place 20

Unity check 0.66

Element satisfies the section check !

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

Element satisfies the stability check !