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TITLE PAGE OF THE TECHNICAL PROJECT	Copies. •••••

Intent name	Technical design of the modular facility "LUK"

Developed:	Industry:	Name and surname	Building licenses	Signature
Designer	Construction	5.1, 2, e M.Sc.	POM/0008/PBKb/21 for unlimited design in the construction specialty	

Chojnice, 19.06.2023 r.

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Technical description

1.0. GENERAL PART

1.1. Subject of the study

The subject of the study is a technical design of a building in a steel structure with dimensions of 2.5 m x 2.5 m. The study includes static calculations of the structure and technical drawings. The designed object consists of 2 boxes and decorative Christmas trees and an arch.

1.2. Scope of the study

This study includes:

(a) a technical design for the construction industry.

1.3. General assumptions

Calculations and design were carried out using the following standards: BS-EN 1990:2004, BS-EN 1991-1-3/4:2005/2008, BS-EN 1993-1:2005/NA:2008/A1:2014

The facility was designed with the following assumptions:

- snow load zone: III (s $k_{=1.20\ kN/m2)}$
- wind load zone: II-IV (qb,0= 0.42 kN/m2)
- steel grade S235

2.0. DESIGN SOLUTIONS

The scope of the investment is the technical design of a modular facility in the field of construction industry. The facility was designed in a steel structure, SHS square tubes and RSH rectangular tubes. The beams and columns of the module are welded together to the full thickness of the element. The Christmas tree is attached to the ceiling of the box with sheets and screws. The bow is attached to the Christmas tree in place of reinforced arms through a steel connection and screws. Both the Christmas tree and the arch are decorative elements designed for a maximum wind speed of up to 10 m / s. In the case of forecasts of wind of greater strength, these ornaments should be dismantled due to the possible occurrence of significant displacements.

The supporting structure of the object was loaded in the analytical model according to the table of collected loads. When installing structures in coastal or mountainous areas, anchor the structure to the foundation to prevent the structure from being picked up or moved due to sudden gusts of wind.

The object (boxes) have been designed for wind and snow zones in accordance with point 1.3, in the case of installation of structures in zones with higher loads, static recalculations for the zones should be carried out. The boxes are weighted with concrete blocks in the floor, however, it is recommended to additionally anchor the ground in order to protect the structure against possible displacement from wind forces, in particular due to high decorative Christmas trees and wind pressure occurring on them. In order for the curve to transfer loads from a stronger wind, rope lashings must be used.

The designed object is a temporary object, dismantled for a specified period of time and dismantled and stored in a warehouse. Before each re-disassembly of the object, it is necessary to verify that the structure is in good condition and that there are no elements that would be replaced. The construction of the object, connection, sheet metal, screws, etc. is checked.

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Structural calculations

1. Collect loads

1.1 Collecting loads

ROOF and WALLS (fixed)

L.p.	Description of the impact	The value of char. kN/m^2
1.	Boards 2x 2 cm (max. 600 kg/m3) [0,240kN/m^2]	0,24
	Σ:	**0,24**

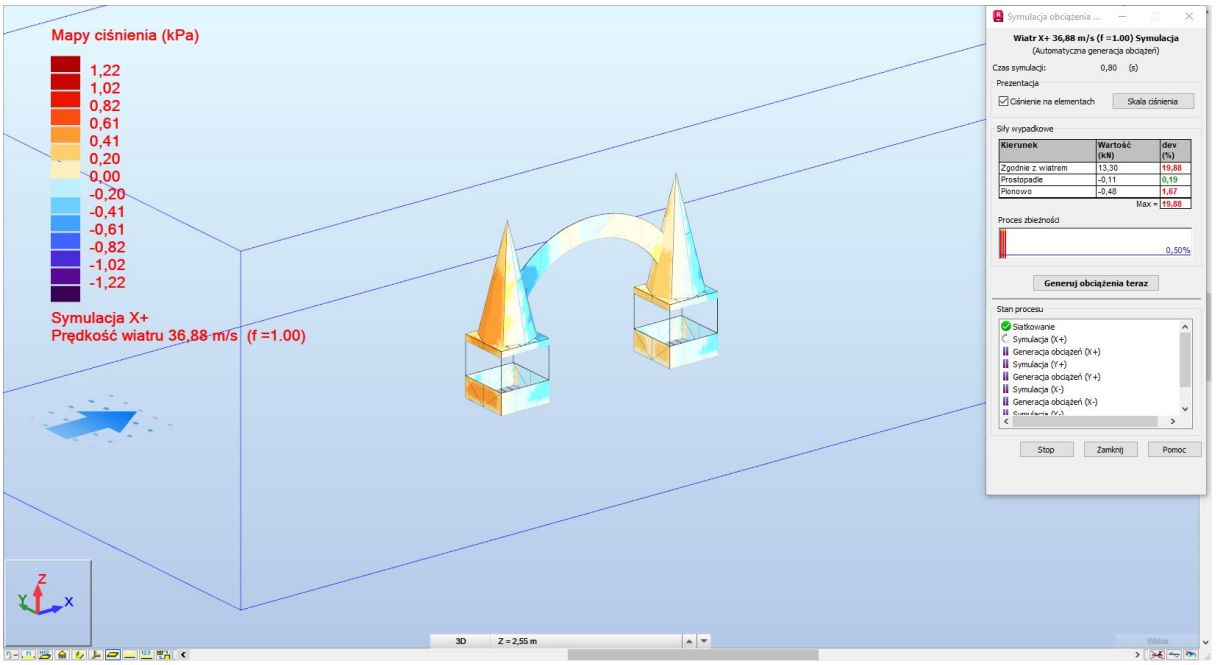
ROOF (snow)

L.p.	Description of the impact	The value of char. kN/m^2
1.	Snow load of ornamental Christmas trees (10 kg/m2 of Christmas tree sheathing was assumed)	0,10

WIND

The collection of wind loads was performed automatically in a computer program. An analysis of wind flow in real conditions was carried out. The peak wind speed pressure value is q_p = 0.85 kN/m2 for boxes, the decorative arch and Christmas trees are designed for max. wind speed up to 10 m/s.

Note: In the case of installation of structures in wind or snow zones with loads greater than designed, static calculations for current weather conditions in a given region should be checked.



Wind 1

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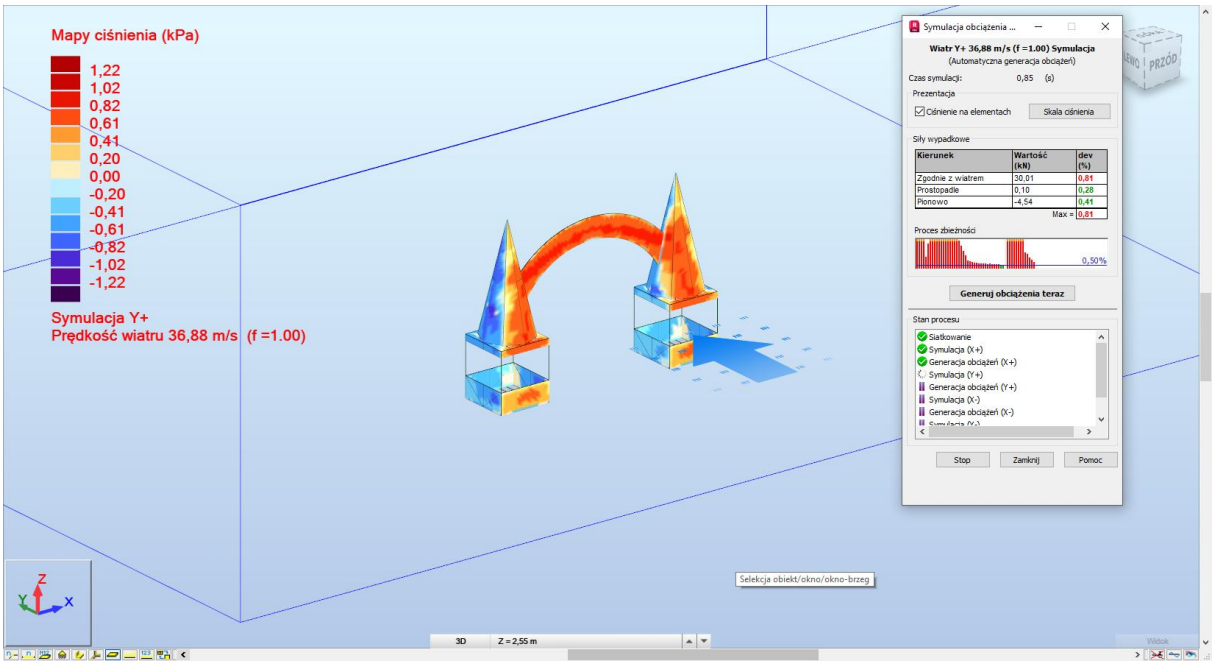
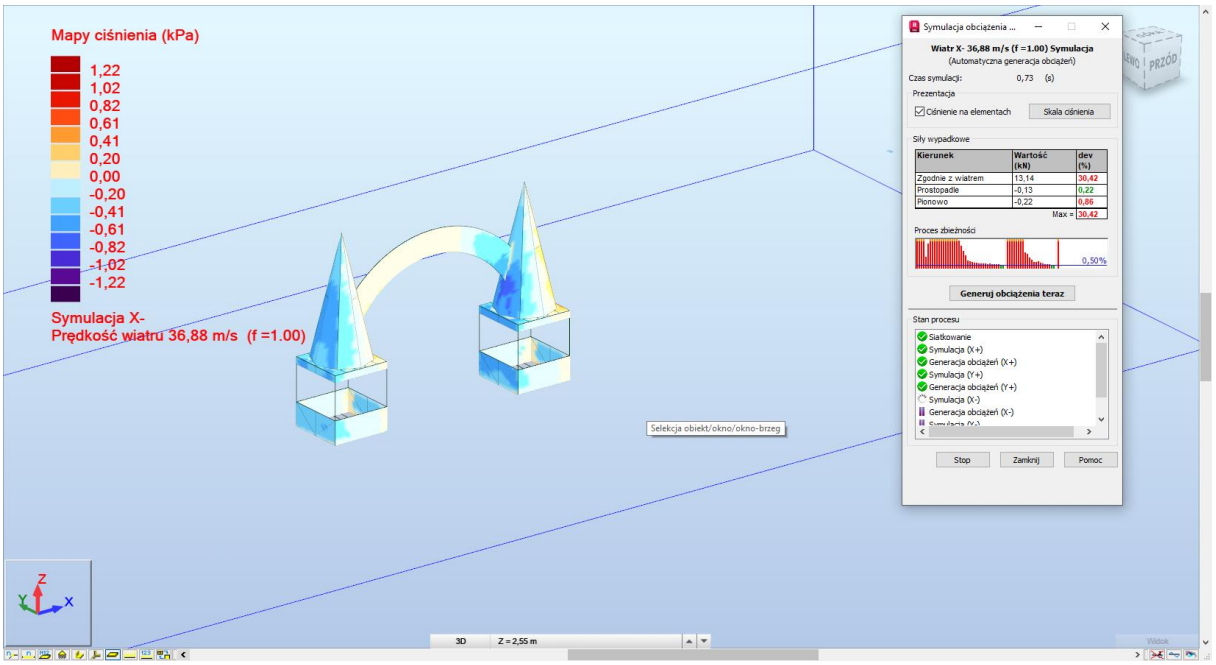
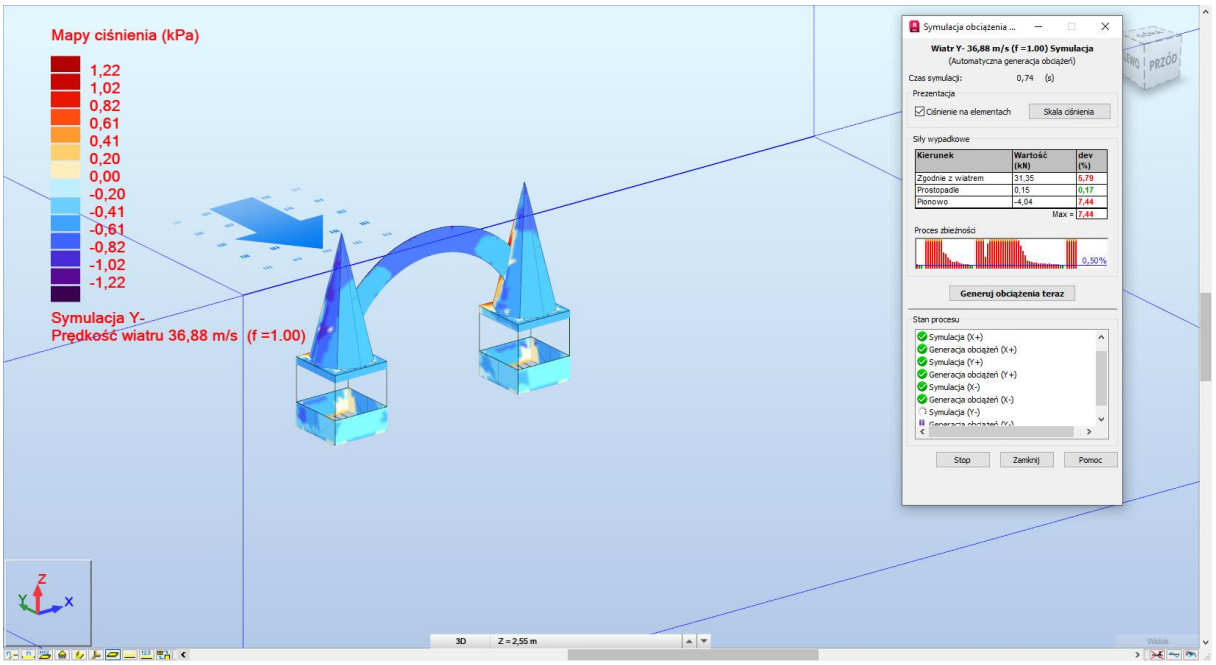


Wind 2



Wind 3



Wind 4

2. Results

2.1 Construction of the object

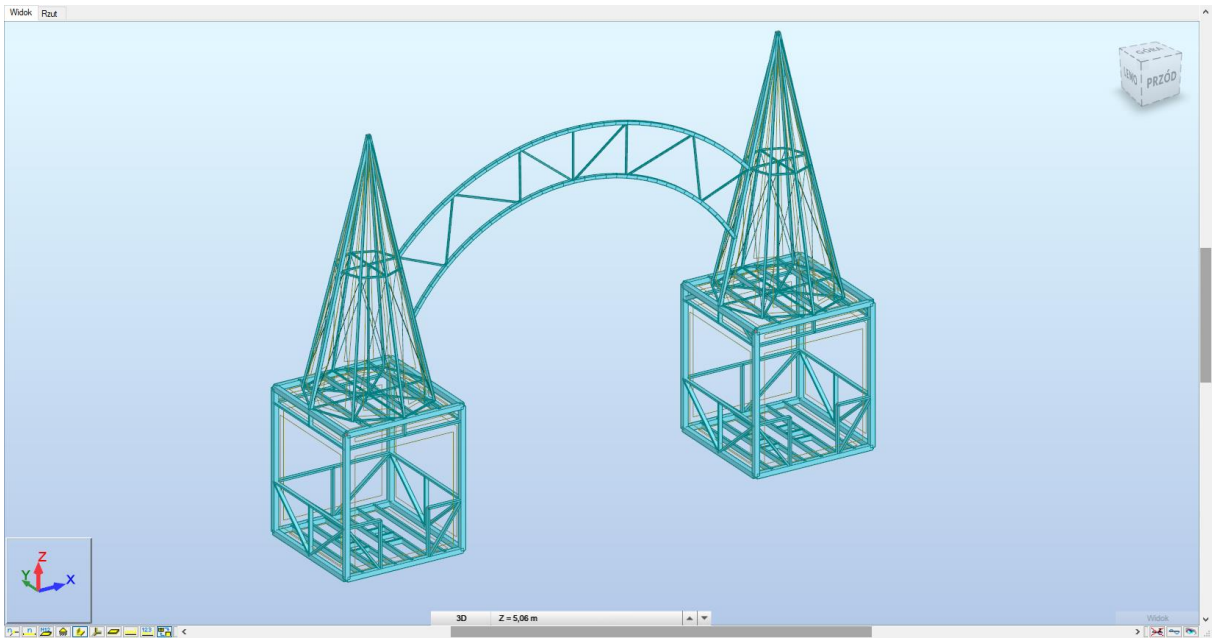


Fig. 1 Static diagram

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BS-EN 1993-1:2005/NA:2008/A1:2014 - Member Verification (SLS ; ULS) 55do108 260

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case	Ratio(uy	Case (uy)	Ratio(uz	Case (uz)	Ratio(vx)	Case (vx)	Ratio(vy)	Case (vy)
55 słupy_55	OK	SHS 100x4	S 235	179.05	179.05	0.77	20 SGN/3=1*1.35 +	-	-	-	-	0.07	22 SGU:CHR/3=1*1.	0.33	22 SGU:CHR/3=1*1.
58 słupy_58	OK	SHS 100x4	S 235	179.05	179.05	0.74	20 SGN/3=1*1.35 +	-	-	-	-	0.07	22 SGU:CHR/3=1*1.	0.22	22 SGU:CHR/3=1*1.
88 słupki_88	OK	RHS 80x40x3	S 235	10.02	17.25	0.55	20 SGN/3=1*1.35 +	-	-	-	-	0.02	22 SGU:CHR/3=1*1.	0.27	22 SGU:CHR/3=1*1.
86 słupki_86	OK	RHS 80x40x3	S 235	10.02	17.25	0.40	20 SGN/3=1*1.35 +	-	-	-	-	0.00	22 SGU:CHR/3=1*1.	0.18	22 SGU:CHR/3=1*1.
60 słupy_60	OK	SHS 100x4	S 235	179.05	179.05	0.37	20 SGN/3=1*1.35 +	-	-	-	-	0.05	22 SGU:CHR/3=1*1.	0.33	22 SGU:CHR/3=1*1.
63 belki_63	OK	SHS 100x4	S 235	61.83	61.83	0.34	20 SGN/3=1*1.35 +	0.02	22 SGU:CHR/3=1*1.	0.07	22 SGU:CHR/3=1*1.	0.14	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
64 belki_64	OK	SHS 100x4	S 235	61.83	61.83	0.34	20 SGN/3=1*1.35 +	0.01	22 SGU:CHR/3=1*1.	0.17	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.
87 belki_87	OK	RHS 80x40x3	S 235	85.88	147.88	0.29	20 SGN/3=1*1.35 +	0.08	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.12	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
62 słupy_62	OK	SHS 100x4	S 235	179.05	179.05	0.24	20 SGN/3=1*1.35 +	-	-	-	-	0.04	22 SGU:CHR/3=1*1.	0.22	22 SGU:CHR/3=1*1.
91 belki_91	OK	RHS 80x40x3	S 235	85.88	147.88	0.23	21 SGN/8=1*1.00 +	0.08	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.12	22 SGU:CHR/3=1*1.
79 belki_79	OK	RHS 80x40x3	S 235	55.21	95.07	0.23	21 SGN/8=1*1.00 +	0.07	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.
66 belki_66	OK	SHS 100x4	S 235	61.83	61.83	0.20	21 SGN/8=1*1.00 +	0.01	22 SGU:CHR/3=1*1.	0.08	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.
85 belki_85	OK	RHS 80x40x3	S 235	85.88	147.88	0.18	20 SGN/3=1*1.35 +	0.04	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
89 belki_89	OK	RHS 80x40x3	S 235	85.88	147.88	0.18	20 SGN/3=1*1.35 +	0.17	22 SGU:CHR/3=1*1.	0.03	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.12	22 SGU:CHR/3=1*1.
65 belki_65	OK	SHS 100x4	S 235	61.83	61.83	0.17	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.04	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
75 belki_75	OK	RHS 80x40x3	S 235	55.21	95.07	0.17	21 SGN/8=1*1.00 +	0.05	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.
90 słupki_90	OK	RHS 80x40x3	S 235	10.02	17.25	0.16	20 SGN/3=1*1.35 +	-	-	-	-	0.05	22 SGU:CHR/3=1*1.	0.10	22 SGU:CHR/3=1*1.
69 belki_69	OK	RHS 80x40x3	S 235	42.91	73.89	0.15	20 SGN/3=1*1.35 +	0.01	22 SGU:CHR/3=1*1.	0.04	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.
102 belki_102	OK	RHS 100x50x	S 235	68.91	118.77	0.15	20 SGN/3=1*1.35 +	0.01	22 SGU:CHR/3=1*1.	0.05	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
99 belki_99	OK	RHS 100x50x	S 235	68.91	118.77	0.14	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.06	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
84 belki_84	OK	RHS 80x40x3	S 235	55.21	95.07	0.13	20 SGN/3=1*1.35 +	0.02	22 SGU:CHR/3=1*1.	0.04	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.
77 belki_77	OK	RHS 80x40x3	S 235	85.88	147.88	0.12	20 SGN/3=1*1.35 +	0.04	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
101 belki_101	OK	RHS 100x50x	S 235	68.91	118.77	0.12	20 SGN/3=1*1.35 +	0.01	22 SGU:CHR/3=1*1.	0.04	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
80 belki_80	OK	RHS 80x40x3	S 235	55.21	95.07	0.11	20 SGN/3=1*1.35 +	0.06	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.
100 belki_100	OK	RHS 100x50x	S 235	68.91	118.77	0.11	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.05	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
72 belki_72	OK	RHS 80x40x3	S 235	42.91	73.89	0.10	20 SGN/3=1*1.35 +	0.01	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.
73 belki_73	OK	RHS 80x40x3	S 235	85.88	147.88	0.09	20 SGN/3=1*1.35 +	0.03	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
93 belki_93	OK	RHS 100x50x	S 235	68.91	118.77	0.08	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.06	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
76 belki_76	OK	RHS 80x40x3	S 235	55.21	95.07	0.08	20 SGN/3=1*1.35 +	0.04	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.
98 belki_98	OK	RHS 100x50x	S 235	68.91	118.77	0.07	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.06	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
92 słupki_92	OK	RHS 80x40x3	S 235	10.02	17.25	0.07	21 SGN/8=1*1.00 +	-	-	-	-	0.03	22 SGU:CHR/3=1*1.	0.21	22 SGU:CHR/3=1*1.
71 słupki_71	OK	RHS 80x40x3	S 235	34.71	59.77	0.06	21 SGN/8=1*1.00 +	-	-	-	-	0.01	22 SGU:CHR/3=1*1.	0.08	22 SGU:CHR/3=1*1.
68 słupki_68	OK	RHS 80x40x3	S 235	34.71	59.77	0.06	21 SGN/8=1*1.00 +	-	-	-	-	0.00	22 SGU:CHR/3=1*1.	0.07	22 SGU:CHR/3=1*1.
78 słupki_78	OK	RHS 80x40x3	S 235	34.71	59.77	0.06	20 SGN/3=1*1.35 +	-	-	-	-	0.00	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.
56 belki_56	OK	SHS 100x4	S 235	61.83	61.83	0.06	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
61 belki_61	OK	SHS 100x4	S 235	61.83	61.83	0.05	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
83 belki_83	OK	RHS 80x40x3	S 235	55.21	95.07	0.05	21 SGN/8=1*1.00 +	0.01	22 SGU:CHR/3=1*1.	0.03	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.
74 słupki_74	OK	RHS 80x40x3	S 235	34.71	59.77	0.04	20 SGN/3=1*1.35 +	-	-	-	-	0.01	22 SGU:CHR/3=1*1.	0.02	22 SGU:CHR/3=1*1.
70 belki_70	OK	RHS 80x40x3	S 235	25.23	43.44	0.04	20 SGN/3=1*1.35 +	0.01	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.08	22 SGU:CHR/3=1*1.
67 belki_67	OK	RHS 80x40x3	S 235	25.23	43.44	0.04	20 SGN/3=1*1.35 +	0.01	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.07	22 SGU:CHR/3=1*1.
59 belki_59	OK	SHS 100x4	S 235	61.83	61.83	0.04	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
82 słupki_82	OK	RHS 80x40x3	S 235	34.71	59.77	0.04	20 SGN/3=1*1.35 +	-	-	-	-	0.00	22 SGU:CHR/3=1*1.	0.03	22 SGU:CHR/3=1*1.
57 belki_57	OK	SHS 100x4	S 235	61.83	61.83	0.03	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
81 belki_81	OK	RHS 80x40x3	S 235	85.88	147.88	0.03	20 SGN/3=1*1.35 +	0.01	22 SGU:CHR/3=1*1.	0.01	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
94 belki_94	OK	RHS 100x50x	S 235	68.91	118.77	0.03	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
97 belki_97	OK	RHS 100x50x	S 235	68.91	118.77	0.03	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
96 belki_96	OK	RHS 100x50x	S 235	68.91	118.77	0.02	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
95 belki_95	OK	RHS 100x50x	S 235	68.91	118.77	0.02	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
260 belki_260	OK	RHS 100x50x	S 235	13.78	23.75	0.00	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.13	22 SGU:CHR/3=1*1.
108 belki_108	OK	RHS 100x50x	S 235	9.84	16.96	0.00	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.
105 belki_105	OK	RHS 100x50x	S 235	9.84	16.96	0.00	20 SGN/3=1*1.35 +	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.	0.00	22 SGU:CHR/3=1*1.

Table 1 Results of the main steel structure

BS-EN 1993-1:2005/NA:2008/A1:2014 - Member Verification (SLS ; ULS) 109do143 179 180 248do252 258 362do377 386 387

Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case	Ratio(uy	Case (uy)	Ratio(uz	Case (uz)	Ratio(vx)	Case (vx)	Ratio(vy)	Case (vy)
258 łyk słupki_25	OK	SHSH 30x30x3	S 235	91.48	91.48	0.01	38 SGN/14=1*1.00 +	0.00	56 SGU:CHR/4=1*1.	0.00	54 SGU:CHR/2=1*1.	0.00	58 SGU:CHR/6=1*1.	0.86	56 SGU:CHR/4=1*1.
250 łyk słupki_25	OK	SHSH 30x30x3	S 235	94.37	94.37	0.02	38 SGN/14=1*1.00 +	0.00	57 SGU:CHR/5=1*1.	0.00	56 SGU:CHR/4=1*1.	0.00	57 SGU:CHR/5=1*1.	0.78	56 SGU:CHR/4=1*1.
252 łyk słupki_25	OK	SHSH 30x30x3	S 235	99.62	99.62	0.06	38 SGN/14=1*1.00 +	0.02	56 SGU:CHR/4=1*1.	0.00	56 SGU:CHR/4=1*1.	0.01	56 SGU:CHR/4=1*1.	0.69	56 SGU:CHR/4=1*1.
248 łyk słupki_24	OK	SHSH 30x30x3	S 235	123.64	123.64	0.05	29 SGN/5=1*1.35 +	0.01	57 SGU:CHR/5=1*1.	0.00	56 SGU:CHR/4=1*1.	0.02	57 SGU:CHR/5=1*1.	0.59	56 SGU:CHR/4=1*1.
249 łyk słupki_24	OK	SHSH 30x30x3	S 235	135.21	135.21	0.03	28 SGN/4=1*1.35 +	0.06	56 SGU:CHR/4=1*1.	0.01	56 SGU:CHR/4=1*1.	0.00	57 SGU:CHR/5=1*1.	0.50	57 SGU:CHR/5=1*1.
251 łyk słupki_25	OK	SHSH 30x30x3	S 235	129.49	129.49	0.02	28 SGN/4=1*1.35 +	0.04	56 SGU:CHR/4=1*1.	0.01	56 SGU:CHR/4=1*1.	0.00	58 SGU:CHR/6=1*1.	0.32	56 SGU:CHR/4=1*1.
127 słup_127	OK	SHSH 30x30x3	S 235	229.07	229.07	0.01	28 SGN/4=1*1.35 +	-	-	-	-	0.01	58 SGU:CHR/6=1*1.	0.03	56 SGU:CHR/4=1*1.
117 słupki choinki	OK	SHSC 70x70x3	S 355	94.72	94.72	0.01	30 SGN/6=1*1.35 +	-	-	-	-	0.01	57 SGU:CHR/5=1*1.	0.03	60 SGU:CHR/8=1*1.
121 słupki choinki	OK	SHSH 40x40x3	S 235	171.20	171.20	0.05	32 SGN/8=1*1.35 +	-	-	-	-	0.01	61 SGU:CHR/9=1*1.	0.03	60 SGU:CHR/8=1*1.
120 słupki choinki	OK	SHSH 40x40x3	S 235	171.20	171.20	0.05	28 SGN/4=1*1.35 +	-	-	-	-	0.01	57 SGU:CHR/5=1*1.	0.03	57 SGU:CHR/5=1*1.
119 słupki choinki	OK	SHSH 40x40x3	S 235	171.20	171.20	0.07	32 SGN/8=1*1.35 +	-	-	-	-	0.01	61 SGU:CHR/9=1*1.	0.03	60 SGU:CHR/8=1*1.
118 słupki choinki	OK	SHSH 40x40x3	S 235	171.20	171.20	0.07	28 SGN/4=1*1.35 +	-	-	-	-	0.01	57 SGU:CHR/5=1*1.	0.03	56 SGU:CHR/4=1*1.
122 słupki choinki	OK	SHSH 40x40x3	S 235	171.20	171.20	0.11	32 SGN/8=1*1.35 +	-	-	-	-	0.01	61 SGU:CHR/9=1*1.	0.02	60 SGU:CHR/8=1*1.
123 słupki choinki	OK	SHSH 40x40x3	S 235	171.20	171.20	0.11	28 SGN/4=1*1.35 +	-	-	-	-	0.01	57 SGU:CHR/5=1*1.	0.02	56 SGU:CHR/4=1*1.
116 słupki choinki	OK	SHSC 70x70x3	S 355	94.72	94.72	0.03	28 SGN/4=1*1.35 +	-	-	-	-	0.01	57 SGU:CHR/5=1*1.	0.02	60 SGU:CHR/8=1*1.
387 super G	OK	SHSC 70x70x3	S 355	41.03	206.80	0.04	28 SGN/4=1*1.35 +	0.23	56 SGU:CHR/4=1*1.	0.01	56 SGU:CHR/4=1*1.	0.01	56 SGU:CHR/4=1*1.	0.00	56 SGU:CHR/4=1*1.
386 super G	OK	SHSC 70x70x3	S 355	41.31	212.04	0.10	28 SGN/4=1*1.35 +	0.29	56 SGU:CHR/4=1*1.	0.01	56 SGU:CHR/4=1*1.	0.01	64 SGU:CHR/12=1*1	0.00	56 SGU:CHR/4=1*1.
368 Pręt_368	OK	8 mm	S 235	1325.87	1325.87	0.06	29 SGN/5=1*1.35 +	-	-	-	-	-	-	-	-
375 Pręt_375	OK	8 mm	S 235	1325.87	1325.87	0.06	33 SGN/9=1*1.35 +	-	-	-	-	-	-	-	-
374 Pręt_374	OK	8 mm	S 235	1325.87	1325.87	0.06	38 SGN/14=1*1.00 +	-	-	-	-	-	-	-	-
369 Pręt_369	OK	8 mm	S 235	1325.87	1325.87	0.06	42 SGN/18=1*1.00 +	-	-	-	-	-	-	-	-
180 RevitBeam_1	OK	SHSC 70x70x3	S 355	9.18	9.18	0.06	29 SGN/5=1*1.35 +	-	-	-	-	-	-	-	-
129 beleczki male	OK	SHSH 30x30x3	S 235	84.16	84.16	0.05	28 SGN/4=1*1.35 +	0.00	56 SGU:CHR/4=1*1.	0.01	56 SGU:CHR/4=1*1.	-	-	-	-
131 beleczki male	OK	SHSH 30x30x3	S 235	84.16	84.16	0.03	32 SGN/8=1*1.35 +	0.01	60 SGU:CHR/8=1*1.	0.01	56 SGU:CHR/4=1*1.	-	-	-	-
136 beleczki male	OK	SHSH 30x30x3	S 235	42.08	42.08	0.01	26 SGN/2=1*1.35 +	0.00	57 SGU:CHR/5=1*1.	0.00	62 SGU:CHR/10=1*1	-	-	-	-
125 beleczki male	OK	SHSH 30x30x3	S 235	54.98	54.98	0.05	28 SGN/4=1*1.35 +	0.01	61 SGU:CHR/9=1*1.	0.01	56 SGU:CHR/4=1*1.	-	-	-	-
126 beleczki male	OK	SHSH 30x30x3	S 235	54.98	54.98	0.05	32 SGN/8=1*1.35 +	0.01	57 SGU:CHR/5=1*1.	0.01	60 SGU:CHR/8=1*1.	-	-	-	-
365 Pręt_365	OK	8 mm	S 235	1325.87	1325.87	0.00	38 SGN/14=1*1.00 +	-	-	-	-	-	-	-	-
115 beleczki male	OK	SHSH 30x30x3	S 235	109.95	109.95	0.04	32 SGN/8=1*1.35 +	0.00	65 SGU:CHR/13=1*1	0.01	54 SGU:CHR/2=1*1.	-	-	-	-
114 beleczki male	OK	SHSH 30x30x3	S 235	109.95	109.95	0.04	32 SGN/8=1*1.35 +	0.00	63 SGU:CHR/11=1*1	0.01	65 SGU:CHR/13=1*1	-	-	-	-
134 beleczki male	OK	SHSH 30x30x3	S 235	84.16	84.16	0.10	32 SGN/8=1*1.35 +	0.00	60 SGU:CHR/8=1*1.	0.01	60 SGU:CHR/8=1*1.	-	-	-	-
132 beleczki male	OK	SHSH 30x30x3	S 235	84.16	84.16	0.03	28 SGN/4=1*1.35 +	0.01	56 SGU:CHR/4=1*1.	0.01	60 SGU:CHR/8=1*1.	-	-	-	-
377 Pręt_377	OK	8 mm	S 235	1325.87	1325.87	0.03	33 SGN/9=1*1.35 +	-	-	-	-	-	-	-	-
109 beleczki male	OK	SHSH 30x30x3	S 235	219.91	219.91	0.03	30 SGN/6=1*1.35 +	0.00	57 SGU:CHR/5=1*1.	0.02	62 SGU:CHR/10=1*1	-	-	-	-
366 Pręt_366	OK	8 mm	S 235	1325.87	1325.87	0.03	29 SGN/5=1*1.35 +	-	-	-	-	-	-	-	-

Table 2 Results of the decorative Christmas tree and arch

mgr in 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 55 words upy_55 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 21.70 kN	My,Ed = 0.25 kN*m	Mz,Ed = 0.62 kN*m	Vy,Ed = 4.42 kN
Nc,Rd = 347.80 kN	My,Ed,max = -2.24 kN*m	Mz,Ed,max = -4.49 kN*m	Vy,T,Rd = 100.03 kN
Nb,Rd = 84.66 kN	My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = -1.02 kN
	MN,y,Rd = 12.36 kN*m	MN,z,Rd = 12.36 kN*m	Vz,T,Rd = 100.03 kN
			Tt,Ed = -0.04 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:

Ly = 6.95 m	Lam_y = 1.91	Lz = 6.95 m	Lam_z = 1.91
Lcr,y = 6.95 m	Xy = 0.24	Lcr,z = 6.95 m	Xz = 0.24
Llamas = 179.05	kzy = 0.65	Lamz in Philippine = 179.05	
	KZZ in 1.08		



About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nc,Rd = 0.06 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.02 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.05 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.67 + (Mz,Ed/MN,z,Rd)^1.67 = 0.01 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.04 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.01 < 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 = 179.05 < Lambda,max = 210.00 Lambda,z = 179.05 < Lambda,max = 210.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.69 < 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) = 0.77 < 1.00

(6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 1 mm < vx max = L/150.00 = 19 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 6 mm < vy max = L/150.00 = 19 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 58 words upy_58 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 22.05 kN	My,Ed = 0.25 kN*m	Mz,Ed = 0.33 kN*m	Vy,Ed = 2.81 kN
Nc,Rd = 347.80 kN	My,Ed,max = 3.67 kN*m	Mz,Ed,max = -2.94 kN*m	Vy,T,Rd = 99.63 kN
Nb,Rd = 84.66 kN	My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = -1.12 kN
	MN,y,Rd = 12.36 kN*m	MN,z,Rd = 12.36 kN*m	Vz,T,Rd = 99.63 kN
			Tt,Ed = 0.08 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis:

Ly = 6.95 m	Lam_y = 1.91	Lz = 6.95 m	Lam_z = 1.91
Lcr,y = 6.95 m	Xy = 0.24	Lcr,z = 6.95 m	Xz = 0.24
Llamas = 179.05	kyy in 1.09	Lamz in Philippine = 179.05	
	Kyz = 0.65		

About with axis:

VERIFICATION FORMULAS:

Section strength check:
N,Ed/Nc,Rd = 0.06 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.02 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.03 < 1.00 (6.2.9.1.(2))

(My,Ed/MN,y,Rd)^ 1.67 + (Mz,Ed/MN,z,Rd)^1.67 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.03 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Global stability check of member:
Lambda,y = 179.05 < Lambda,max = 210.00 Lambda,z = 179.05 < Lambda,max = 210.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.74 < 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) = 0.71 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM): *Not analyzed*



Displacements (GLOBAL SYSTEM):
vx = 1 mm < vx max = L/150.00 = 19 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 4 mm < vy max = L/150.00 = 19 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 88 sl upki_88 **POINT:** **COORDINATE:** x = 1.00 L = 0.28 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.21 kN	My,Ed = 0.01 kN*m	Mz,Ed = -1.28 kN*m	Vy,Ed = 7.80 kN
Nc,Rd = 153.45 kN	My,Ed,max = 0.01 kN*m	Mz,Ed,max = -1.28 kN*m	Vy,T,Rd = 28.47 kN
NB,Rd = 153.45 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.02 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 56.94 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.08 kN*m
			Class of section = 1




LATERAL BUCKLING PARAMETERS:

z = 0.00	Mcr = 685.39 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=0.28 m	Lam_LT = 0.07	fi,LT = 0.38	XLT, mod = 1.00

BUCKLING PARAMETERS:

mgr in 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

About y axis:

Ly = 0.28 m | Lam_y = 0.11
Lcr,y = 0.28 m | Xy = 1.00
Llamas = 10.02 | kzy = 0.54

About with axis:

Lz = 0.28 m | Lam_z = 0.18
Lcr,z = 0.28 m | Xz = 1.00
Lamz in Lamz = 17.25 | KZZ in 0.90

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.55 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.37 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.27 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.04 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.04 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 10.02 < Lambda,max = 210.00 Lambda,z = 17.25 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.00 < 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) = 0.30 < 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) = 0.49 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 86 sl upki_86 **POINT:** **COORDINATE:** x = 1.00 L = 0.28 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: RHS 80x40x3

h=80 mm | gM0=1.00 | gM1=1.00
b=40 mm | Ay=218 mm2 | Az=435 mm2 | Ax=653 mm2
tw=3 mm | Iy=510000 mm4 | Iz=172000 mm4 | Ix=429252 mm4
tf=3 mm | Influence=16200 mm3 | Wplz=10000 mm3

INTERNAL FORCES AND CAPACITIES:
N,Ed = 0.00 kN | My,Ed = -0.01 kN*m | Mz,Ed = -0.93 kN*m | Vy,Ed = 5.48 kN

Nc,Rd = 153.45 kN	My,Ed,max = -0.01 kN*m	Mz,Ed,max = -0.93 kN*m	Vy,T,Rd = 29.26 kN
NB,Rd = 153.45 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.01 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.52 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.02 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 0.00	Mcr = 462.67 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=0.28 m	Lam_LT = 0.09	fi,LT = 0.39	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis:

Ly = 0.28 m	Lam_y = 0.11
Lcr,y = 0.28 m	Xy = 1.00
Llamas = 10.02	kzy = 0.54

About with axis:

Lz = 0.28 m	Lam_z = 0.18
Lcr,z = 0.28 m	Xz = 1.00
Lamz in Lamz = 17.25	KZZ in 0.90

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.40 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.22 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.19 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 10.02 < Lambda,max = 210.00 Lambda,z = 17.25 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.00 < 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) = 0.22 < 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) = 0.36 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 60 words upy_60 **POINT:** **COORDINATE:** x = 0.35 L = 0.97 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:

mgr in. 5.1, 2, e
projektant - branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -6.24 kN	My,Ed = 0.67 kN*m	Mz,Ed = -4.53 kN*m	Vy,Ed = -5.36 kN
Nt,Rd = 347.80 kN	My,pl,Rd = 12.36 kN*m	Mz,pl,Rd = 12.36 kN*m	Vy,T,Rd = 98.13 kN
	My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = -0.75 kN
	MN,y,Rd = 12.36 kN*m	MN,z,Rd = 12.36 kN*m	Vz,T,Rd = 98.13 kN
			Tt,Ed = 0.23 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.05 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.37 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.20 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.05 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 1 mm < vx max = L/150.00 = 19 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 6 mm < vy max = L/150.00 = 19 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 63 belki_63 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHS 100x4

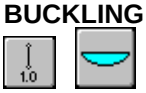
h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 5.04 kN	My,Ed = -3.94 kN*m	Mz,Ed = 0.08 kN*m	Vy,Ed = -0.62 kN
Nc,Rd = 347.80 kN	My,Ed,max = -3.94 kN*m	Mz,Ed,max = -0.90 kN*m	Vy,T,Rd = 97.38 kN
NB,Rd = 301.35 kN	My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = 6.17 kN
	MN,y,Rd = 12.36 kN*m	MN,z,Rd = 12.36 kN*m	Vz,T,Rd = 97.38 kN
			Tt,Ed = -0.30 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 2.40 m	Lam_y = 0.66	Lz = 2.40 m	Lam_z = 0.66
Lcr,y = 2.40 m	Xy = 0.87	Lcr,z = 2.40 m	Xz = 0.87
Llamas in = 61.83	kyy = 0.91	Lamz in Lamz = 61.83	Kyz = 0.54

VERIFICATION FORMULAS:

Section strength check:
N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.32 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.15 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.06 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.03 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.03 < 1.00 (6.2.6)
Global stability check of member:
Lambda,y = 61.83 < Lambda,max = 210.00 Lambda,z = 61.83 < Lambda,max = 210.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.34 < 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) = 0.26 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS


Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 1 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:


Displacements (GLOBAL SYSTEM):
vx = 2 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified

mgr in[redacted] 5.1, 2, e
projektant [redacted]
tel.: 662-165-812, e-mail 5.1, 2, e [redacted]gmail.com

Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 64 belki_64 **POINT:** **COORDINATE:** x = 0.80 L = 1.92 m

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LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 11.62 kN	My,Ed = 1.07 kN*m	Mz,Ed = -0.37 kN*m	Vy,Ed = -0.60 kN
Nc,Rd = 347.80 kN	My,Ed,max = -3.83 kN*m	Mz,Ed,max = -0.37 kN*m	Vy,T,Rd = 92.94 kN
NB,Rd = 301.35 kN	My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = -7.78 kN
	MN,y,Rd = 12.36 kN*m	MN,z,Rd = 12.36 kN*m	Vz,T,Rd = 92.94 kN
			Tt,Ed = -0.74 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:


About y axis:


About with axis:

Ly = 2.40 m	Lam_y = 0.66	Lz = 2.40 m	Lam_z = 0.66
Lcr,y = 2.40 m	Xy = 0.87	Lcr,z = 2.40 m	Xz = 0.87
Llamas in = 61.83	kyy = 0.92	Lamz in Lamz = 61.83	kyz = 0.55

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.03 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.09 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.03 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.02 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.08 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.07 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.07 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 61.83 < Lambda,max = 210.00 Lambda,z = 61.83 < Lambda,max = 210.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.34 < 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) = 0.24 < 1.00 (6.3.3.(4))

mgr in[redacted] 5.1, 2, e
projektant [redacted]
tel.: 662-165-812, e-mail [redacted] 5.1, 2, e [redacted]gmail.com

---

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 1 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 2 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 87 belki_87 **POINT:** **COORDINATE:** x = 1.00 L = 2.40 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.50 kN	My,Ed = 0.09 kN*m	Mz,Ed = -0.68 kN*m	Vy,Ed = 1.10 kN
Nt,Rd = 153.45 kN	My,pl,Rd = 3.81 kN*m	Mz,pl,Rd = 2.35 kN*m	Vy,T,Rd = 29.25 kN
	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.05 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.49 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.02 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 50.96 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=2.40 m	Lam_LT = 0.27	fi,LT = 0.48	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

mgr in 5.1, 2, e
projektant
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.02 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.29 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.13 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.04 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

My,ed/mb,Rd = 0.02 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 1 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 2 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 62 words upy_62 **POINT:** **COORDINATE:** x = 0.35 L = 0.97 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -7.99 kN	My,Ed = 0.63 kN*m	Mz,Ed = -2.99 kN*m	Vy,Ed = -3.55 kN
Nt,Rd = 347.80 kN	My,pl,Rd = 12.36 kN*m	Mz,pl,Rd = 12.36 kN*m	Vy,T,Rd = 99.14 kN
	My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = -0.83 kN

MN,y,Rd = 12.36 kN*m MN,z,Rd = 12.36 kN*m Vz,T,Rd = 99.14 kN
Tt,Ed = 0.13 kN*m
Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.05 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.24 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.10 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.04 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 1 mm < vx max = L/150.00 = 19 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 4 mm < vy max = L/150.00 = 19 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 91 belki_91 **POINT:** **COORDINATE:** x = 0.50 L = 1.20 m

---

LOADS:

Governing Load Case: 21 SGN/8=1*1.00 + 2*1.00 + 4*1.50 (1+2)*1.00+4*1.50

MATERIAL:

S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 6.90 kN	My,Ed = -0.02 kN*m	Mz,Ed = 0.12 kN*m	Vy,Ed = 0.21 kN
Nc,Rd = 153.45 kN	My,Ed,max = -0.05 kN*m	Mz,Ed,max = 0.22 kN*m	Vy,T,Rd = 28.86 kN

NB,Rd = 52.58 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.09 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 57.72 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.05 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 50.96 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=2.40 m	Lam_LT = 0.27	fi,LT = 0.48	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis:

Ly = 2.40 m	Lam_y = 0.91	Lz = 2.40 m	Lam_z = 1.57
Lcr,y = 2.40 m	Xy = 0.72	Lcr,z = 2.40 m	Xz = 0.34
Llamas in Llamas = 85.88	kzy = 0.56	Lamz in Lamz = 147.88	kzz in 0.99

About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.04 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.05 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 85.88 < Lambda,max = 210.00 Lambda,z = 147.88 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.01 < 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) = 0.13 < 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) = 0.23 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 1 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 2 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:

mgr in[illegible] 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

MEMBER: 79 belki_79 **POINT:** **COORDINATE:** x = 1.00 L = 1.54 m

---

LOADS:

Governing Load Case: 21 SGN/8=1*1.00 + 2*1.00 + 4*1.50 (1+2)*1.00+4*1.50

MATERIAL:

S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 14.29 kN	My,Ed = 0.02 kN*m	Mz,Ed = 0.19 kN*m	Vy,Ed = -0.14 kN
Nc,Rd = 153.45 kN	My,Ed,max = 0.02 kN*m	Mz,Ed,max = 0.19 kN*m	Vy,T,Rd = 29.41 kN
Nb,Rd = 100.81 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.03 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.81 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.01 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 78.21 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=1.54 m	Lam_LT = 0.22	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 1.54 m	Lam_y = 0.59	Lz = 1.54 m	Lam_z = 1.01
Lcr,y = 1.54 m	Xy = 0.89	Lcr,z = 1.54 m	Xz = 0.66
Llamas = 55.21	kzy = 0.56	Lamz in Philippine = 95.07	KZZ = 1.00

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.09 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.08 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.68 + (Mz,Ed/MN,z,Rd)^1.68 = 0.02 < 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 = 0.00 < 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 = 55.21 < Lambda,max = 210.00 Lambda,z = 95.07 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.01 < 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) = 0.16 < 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) = 0.23 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 5 mm Verified

mgr in[redacted] 5.1, 2, e
projektant [redacted]
tel.: 662-165-812, e-mail [redacted] 5.1, 2, e [redacted]gmail.com

Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 5 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 66 belki_66 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 21 SGN/8=1*1.00 + 2*1.00 + 4*1.50 (1+2)*1.00+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -6.49 kN	My,Ed = 2.44 kN*m	Mz,Ed = 0.21 kN*m	Vy,Ed = 0.84 kN
Nt,Rd = 347.80 kN	My,pl,Rd = 12.36 kN*m	Mz,pl,Rd = 12.36 kN*m	Vy,T,Rd = 96.27 kN
	My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = -6.84 kN
	MN,y,Rd = 12.36 kN*m	MN,z,Rd = 12.36 kN*m	Vz,T,Rd = 96.27 kN
			Tt,Ed = 0.41 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.20 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.02 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.07 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.07 < 1.00 (6.2.6-7)

Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.04 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.04 < 1.00 (6.2.6)

LIMIT DISPLACEMENTS

 ***Deflections (LOCAL SYSTEM):***

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 1 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

 ***Displacements (GLOBAL SYSTEM):***

vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 2 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 85 belki_85 **POINT:** **COORDINATE:** x = 1.00 L = 2.40 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

 **SECTION PARAMETERS: RHS 80x40x3**

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.44 kN	My,Ed = -0.02 kN*m	Mz,Ed = -0.43 kN*m	Vy,Ed = 0.71 kN
Nc,Rd = 153.45 kN	My,Ed,max = -0.02 kN*m	Mz,Ed,max = -0.43 kN*m	Vy,T,Rd = 29.30 kN
NB,Rd = 52.58 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.06 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.61 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.02 kN*m
			Class of section = 1

 **LATERAL BUCKLING PARAMETERS:**

z = 1.00	Mcr = 50.96 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=2.40 m	Lam_LT = 0.27	fi,LT = 0.48	XLT, mod = 1.00

BUCKLING PARAMETERS:

mgr in 5.1, 2, e
projektant
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

About y axis:

Ly = 2.40 m Lam_y = 0.91
Lcr,y = 2.40 m Xy = 0.72
Llamas in Llamas = 85.88 kzy = 0.54

About with axis:

Lz = 2.40 m Lam_z = 1.57
Lcr,z = 2.40 m Xz = 0.34
Lamz in Lamz = 147.88 KZZ = 0.91

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.18 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.06 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.02 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 85.88 < Lambda,max = 210.00 Lambda,z = 147.88 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.01 < 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) = 0.11 < 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) = 0.18 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 2 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 89 belki_89 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

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LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

---

mgr in 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -10.06 kN	My,Ed = 0.14 kN*m	Mz,Ed = 0.42 kN*m	Vy,Ed = 0.73 kN
Nt,Rd = 153.45 kN	My,pl,Rd = 3.81 kN*m	Mz,pl,Rd = 2.35 kN*m	Vy,T,Rd = 29.07 kN
	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.26 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.14 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.04 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 50.96 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=2.40 m	Lam_LT = 0.27	fi,LT = 0.48	XLT, mod = 1.00

BUCKLING PARAMETERS:

 About y axis:

 About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.07 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.04 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.18 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.67 + (Mz,Ed/MN,z,Rd)^1.67 = 0.06 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.03 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)

Global stability check of member:

My,ed/mb,Rd = 0.04 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 1 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 2 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

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mgr in: 5.1, 2, e
projektant
tel.: 662-165-812, e-mail: 5.1, 2, e gmail.com

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 65 belki_65 **POINT:** **COORDINATE:** x = 0.80 L = 1.92 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 2.44 kN	My,Ed = 0.69 kN*m	Mz,Ed = -0.02 kN*m	Vy,Ed = -0.33 kN
Nc,Rd = 347.80 kN	My,Ed,max = -2.03 kN*m	Mz,Ed,max = 0.36 kN*m	Vy,T,Rd = 99.38 kN
NB,Rd = 301.35 kN	My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = 1.34 kN
	MN,y,Rd = 12.36 kN*m	MN,z,Rd = 12.36 kN*m	Vz,T,Rd = 99.38 kN
			Tt,Ed = 0.10 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 2.40 m	Lam_y = 0.66	Lz = 2.40 m	Lam_z = 0.66
Lcr,y = 2.40 m	Xy = 0.87	Lcr,z = 2.40 m	Xz = 0.87
Llamas in = 61.83	kyy in 0.90	Lamz in Lamz = 61.83	Kyz = 0.54

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.06 < 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)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Global stability check of member:
Lambda,y = 61.83 < Lambda,max = 210.00 Lambda,z = 61.83 < Lambda,max = 210.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.17 < 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) = 0.12 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified

Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):
vx = 2 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 75 belki_75 **POINT:** **COORDINATE:** x = 1.00 L = 1.54 m

---

LOADS:
Governing Load Case: 21 SGN/8=1*1.00 + 2*1.00 + 4*1.50 (1+2)*1.00+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 9.49 kN	My,Ed = -0.15 kN*m	Mz,Ed = 0.12 kN*m	Vy,Ed = -0.06 kN
Nc,Rd = 153.45 kN	My,Ed,max = -0.15 kN*m	Mz,Ed,max = 0.12 kN*m	Vy,T,Rd = 29.52 kN
Nb,Rd = 100.81 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.11 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 59.03 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.00 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 78.21 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=1.54 m	Lam_LT = 0.22	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 1.54 m	Lam_y = 0.59	Lz = 1.54 m	Lam_z = 1.01
Lcr,y = 1.54 m	Xy = 0.89	Lcr,z = 1.54 m	Xz = 0.66
Llamas = 55.21	kzy = 0.55	Lamz in Philippine = 95.07	kzz in 0.97

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nc,Rd = 0.06 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.04 < 1.00 (6.2.9.1.(2))

mgr in: 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail: 5.1, 2, e gmail.com

Mz,Ed/MN,z,Rd = 0.05 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.67 + (Mz,Ed/MN,z,Rd)^1.67 = 0.01 < 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 = 0.00 < 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 = 55.21 < Lambda,max = 210.00 Lambda,z = 95.07 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.04 < 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) = 0.14 < 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) = 0.17 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 5 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 90 sl upki_90 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.87 kN	My,Ed = 0.11 kN*m	Mz,Ed = 0.20 kN*m	Vy,Ed = 1.90 kN
Nc,Rd = 153.45 kN	My,Ed,max = 0.19 kN*m	Mz,Ed,max = -0.33 kN*m	Vy,T,Rd = 29.42 kN
NB,Rd = 153.45 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.34 kN

MN,y,Rd = 3.81 kN*m | MN,z,Rd = 2.35 kN*m | Vz,T,Rd = 58.84 kN
Mb,Rd = 3.81 kN*m | | Tt,Ed = 0.01 kN*m
| | | Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 0.00	Mcr = 508.69 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=0.28 m	Lam_LT = 0.09	fi,LT = 0.38	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis:		About with axis:	
Ly = 0.28 m	Lam_y = 0.11	Lz = 0.28 m	Lam_z = 0.18
Lcr,y = 0.28 m	Xy = 1.00	Lcr,z = 0.28 m	Xz = 1.00
Llamas = 10.02	kzy = 0.54	Lamz in Lamz = 17.25	KZZ in 0.90

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.03 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.09 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.02 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.06 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.01 < 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 = 10.02 < Lambda,max = 210.00 Lambda,z = 17.25 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.05 < 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) = 0.13 < 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) = 0.16 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 69 belki_69 **POINT:** **COORDINATE:** x = 1.00 L = 1.20 m

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LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

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mgr in 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -2.60 kN	My,Ed = -0.57 kN*m	Mz,Ed = -0.05 kN*m	Vy,Ed = 0.10 kN
Nt,Rd = 153.45 kN	My,pl,Rd = 3.81 kN*m	Mz,pl,Rd = 2.35 kN*m	Vy,T,Rd = 28.94 kN
	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.81 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 57.88 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.05 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 99.57 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=1.20 m	Lam_LT = 0.20	fi,LT = 0.44	XLT, mod = 1.00

BUCKLING PARAMETERS:

 About y axis:

 About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.02 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.15 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.02 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.04 < 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 = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)

Global stability check of member:

My,ed/mb,Rd = 0.15 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 4 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 4 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 4 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 4 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

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mgr in[redacted] 5.1, 2, e
projektant[redacted]
tel.: 662-165-812, e-mail[redacted] 5.1, 2, e [redacted]gmail.com

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 102 belki_102 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

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LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

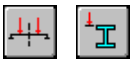


SECTION PARAMETERS: RHS 100x50x4

h=100 mm	gM0=1.00	gM1=1.00	
b=50 mm	Ay=360 mm2	Az=720 mm2	Ax=1080 mm2
tw=4 mm	Iy=1310000 mm4	Iz=441000 mm4	Ix=1104710 mm4
tf=4 mm	Influence=33400 mm3	Wplz=20600 mm3	

INTERNAL FORCES AND CAPACITIES:

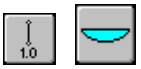
N,Ed = 1.68 kN	My,Ed = -1.12 kN*m	Mz,Ed = -0.08 kN*m	Vy,Ed = -0.03 kN
Nc,Rd = 253.80 kN	My,Ed,max = -1.12 kN*m	Mz,Ed,max = -0.08 kN*m	Vy,T,Rd = 42.84 kN
NB,Rd = 124.51 kN	My,c,Rd = 7.85 kN*m	Mz,c,Rd = 4.84 kN*m	Vz,Ed = 6.20 kN
	MN,y,Rd = 7.85 kN*m	MN,z,Rd = 4.84 kN*m	Vz,T,Rd = 85.67 kN
	Mb,Rd = 7.85 kN*m		Tt,Ed = 0.59 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 130.12 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=2.40 m	Lam_LT = 0.25	fi,LT = 0.46	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 2.40 m	Lam_y = 0.73	Lz = 2.40 m	Lam_z = 1.26
Lcr,y = 2.40 m	Xy = 0.83	Lcr,z = 2.40 m	Xz = 0.49
Llamas = 68.91	kyy in 0.90	Lamz in Lamz = 118.77	kyz = 0.55

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.14 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.02 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.04 < 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 = 0.07 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.12 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.12 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 68.91 < Lambda,max = 210.00 Lambda,z = 118.77 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.14 < 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) = 0.15 < 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) = 0.11 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

mgr in: 5.1, 2, e
projektant [illegible] konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):
vx = 2 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 99 belki_99 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: RHS 100x50x4

h=100 mm	gM0=1.00	gM1=1.00	
b=50 mm	Ay=360 mm2	Az=720 mm2	Ax=1080 mm2
tw=4 mm	Iy=1310000 mm4	Iz=441000 mm4	Ix=1104710 mm4
tf=4 mm	Influence=33400 mm3	Wplz=20600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 1.02 kN	My,Ed = -1.05 kN*m	Mz,Ed = 0.13 kN*m	Vy,Ed = 0.28 kN
Nc,Rd = 253.80 kN	My,Ed,max = -1.05 kN*m	Mz,Ed,max = 0.13 kN*m	Vy,T,Rd = 43.08 kN
NB,Rd = 124.51 kN	My,c,Rd = 7.85 kN*m	Mz,c,Rd = 4.84 kN*m	Vz,Ed = 4.95 kN
	MN,y,Rd = 7.85 kN*m	MN,z,Rd = 4.84 kN*m	Vz,T,Rd = 86.16 kN
	Mb,Rd = 7.85 kN*m		Tt,Ed = -0.57 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 130.12 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=2.40 m	Lam_LT = 0.25	fi,LT = 0.46	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

Ly = 2.40 m	Lam_y = 0.73	Lz = 2.40 m	Lam_z = 1.26
Lcr,y = 2.40 m	Xy = 0.83	Lcr,z = 2.40 m	Xz = 0.49
Llamas = 68.91	kyy in 0.90	Lamz in Lamz = 118.77	Kyz = 0.54

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.13 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.03 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.04 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.06 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.12 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.12 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 68.91 < Lambda,max = 210.00 Lambda,z = 118.77 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.13 < 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) = 0.14 < 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) = 0.11 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 1 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 2 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 84 belki_84 **POINT:** **COORDINATE:** x = 1.00 L = 1.54 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

mgr in 5.1, 2, e
projektant
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

INTERNAL FORCES AND CAPACITIES:

N,Ed = 5.22 kN	My,Ed = -0.35 kN*m	Mz,Ed = 0.01 kN*m	Vy,Ed = 0.06 kN
Nc,Rd = 153.45 kN	My,Ed,max = -0.35 kN*m	Mz,Ed,max = -0.05 kN*m	Vy,T,Rd = 28.90 kN
Nb,Rd = 100.81 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.32 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 57.79 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.05 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 78.21 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=1.54 m	Lam_LT = 0.22	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis:

Ly = 1.54 m	Lam_y = 0.59	Lz = 1.54 m	Lam_z = 1.01
Lcr,y = 1.54 m	Xy = 0.89	Lcr,z = 1.54 m	Xz = 0.66
Llamas = 55.21	kyy = 0.91	Lamz in Philippine = 95.07	kyz = 0.56

About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.03 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.09 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.02 < 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 = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 55.21 < Lambda,max = 210.00 Lambda,z = 95.07 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.09 < 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) = 0.13 < 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) = 0.12 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 5 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 77 belki_77 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

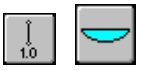
N,Ed = 0.08 kN	My,Ed = -0.09 kN*m	Mz,Ed = 0.23 kN*m	Vy,Ed = 0.19 kN
Nc,Rd = 153.45 kN	My,Ed,max = -0.09 kN*m	Mz,Ed,max = -0.27 kN*m	Vy,T,Rd = 29.43 kN
NB,Rd = 52.58 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.08 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.87 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.01 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 50.96 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=2.40 m	Lam_LT = 0.27	fi,LT = 0.48	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 2.40 m	Lam_y = 0.91	Lz = 2.40 m	Lam_z = 1.57
Lcr,y = 2.40 m	Xy = 0.72	Lcr,z = 2.40 m	Xz = 0.34
Llamas in Llamas = 85.88	kzy = 0.54	Lamz in Lamz = 147.88	KZZ in 0.90

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.02 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.10 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.02 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 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 = 85.88 < Lambda,max = 210.00 Lambda,z = 147.88 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.02 < 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) = 0.08 < 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) = 0.12 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

mgr in: 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 101 belki_101 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: RHS 100x50x4

h=100 mm	gM0=1.00	gM1=1.00	
b=50 mm	Ay=360 mm2	Az=720 mm2	Ax=1080 mm2
tw=4 mm	Iy=1310000 mm4	Iz=441000 mm4	Ix=1104710 mm4
tf=4 mm	Influence=33400 mm3	Wplz=20600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -2.54 kN	My,Ed = 0.04 kN*m	Mz,Ed = -0.45 kN*m	Vy,Ed = -5.39 kN
Nt,Rd = 253.80 kN	My,pl,Rd = 7.85 kN*m	Mz,pl,Rd = 4.84 kN*m	Vy,T,Rd = 46.02 kN
	My,c,Rd = 7.85 kN*m	Mz,c,Rd = 4.84 kN*m	Vz,Ed = 0.13 kN
	MN,y,Rd = 7.85 kN*m	MN,z,Rd = 4.84 kN*m	Vz,T,Rd = 92.05 kN
	Mb,Rd = 7.85 kN*m		Tt,Ed = 0.28 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 130.12 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=2.40 m	Lam_LT = 0.25	fi,LT = 0.46	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:

Section strength check:
N,Ed/Nt,Rd = 0.01 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.09 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.02 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.12 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.06 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.06 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/Mb,Rd = 0.03 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS

 ***Deflections (LOCAL SYSTEM):***
uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

 ***Displacements (GLOBAL SYSTEM):***
vx = 2 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 80 belki_80 **POINT:** **COORDINATE:** x = 1.00 L = 1.54 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

 **SECTION PARAMETERS: RHS 80x40x3**

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -13.13 kN	My,Ed = 0.04 kN*m	Mz,Ed = 0.26 kN*m	Vy,Ed = -0.33 kN
Nt,Rd = 153.45 kN	My,pl,Rd = 3.81 kN*m	Mz,pl,Rd = 2.35 kN*m	Vy,T,Rd = 29.40 kN
	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.05 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.80 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.01 kN*m

mgr in: 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail: 5.1, 2, e gmail.com

Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 78.21 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=1.54 m	Lam_LT = 0.22	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.09 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.11 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.67 + (Mz,Ed/MN,z,Rd)^1.67 = 0.03 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 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:

My,ed/mb,Rd = 0.01 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 5 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 100 belki_100 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 100x50x4

h=100 mm	gM0=1.00	gM1=1.00	
b=50 mm	Ay=360 mm2	Az=720 mm2	Ax=1080 mm2
tw=4 mm	Iy=1310000 mm4	Iz=441000 mm4	Ix=1104710 mm4
tf=4 mm	Influence=33400 mm3	Wplz=20600 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -2.43 kN	My,Ed = -0.03 kN*m	Mz,Ed = 0.33 kN*m	Vy,Ed = 4.93 kN
Nt,Rd = 253.80 kN	My,pl,Rd = 7.85 kN*m	Mz,pl,Rd = 4.84 kN*m	Vy,T,Rd = 46.17 kN
	My,c,Rd = 7.85 kN*m	Mz,c,Rd = 4.84 kN*m	Vz,Ed = 0.18 kN
	MN,y,Rd = 7.85 kN*m	MN,z,Rd = 4.84 kN*m	Vz,T,Rd = 92.34 kN
	Mb,Rd = 7.85 kN*m		Tt,Ed = -0.26 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 130.12 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=2.40 m	Lam_LT = 0.25	fi,LT = 0.46	XLT, mod = 1.00

BUCKLING PARAMETERS:

 About y axis:

 About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.01 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.07 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.11 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.05 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.05 < 1.00 (6.2.6)

Global stability check of member:

My,ed/mb,Rd = 0.01 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 2 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

---

mgr in: 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail: 5.1, 2, e gmail.com

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 72 belki_72 **POINT:** **COORDINATE:** x = 0.75 L = 0.90 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

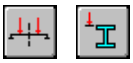


SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

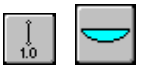
N,Ed = 2.50 kN	My,Ed = -0.17 kN*m	Mz,Ed = -0.02 kN*m	Vy,Ed = 0.00 kN
Nc,Rd = 153.45 kN	My,Ed,max = -0.33 kN*m	Mz,Ed,max = -0.02 kN*m	Vy,T,Rd = 29.05 kN
NB,Rd = 123.25 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.49 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.10 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.04 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 99.57 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=1.20 m	Lam_LT = 0.20	fi,LT = 0.44	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 1.20 m	Lam_y = 0.46	Lz = 1.20 m	Lam_z = 0.79
Lcr,y = 1.20 m	Xy = 0.94	Lcr,z = 1.20 m	Xz = 0.80
Llamas = 42.91	kyy in 0.90	Lamz in Lamz = 73.89	kyz = 0.55

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.02 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.05 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 42.91 < Lambda,max = 210.00 Lambda,z = 73.89 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.09 < 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) = 0.10 < 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) = 0.08 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/300.00 = 4 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 4 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 4 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 4 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/150.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 73 belki_73 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.18 kN	My,Ed = 0.11 kN*m	Mz,Ed = 0.15 kN*m	Vy,Ed = 0.11 kN
Nc,Rd = 153.45 kN	My,Ed,max = 0.11 kN*m	Mz,Ed,max = -0.19 kN*m	Vy,T,Rd = 29.34 kN
NB,Rd = 52.58 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.07 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.68 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.02 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 50.96 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=2.40 m	Lam_LT = 0.27	fi,LT = 0.48	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

Ly = 2.40 m	Lam_y = 0.91	Lz = 2.40 m	Lam_z = 1.57
Lcr,y = 2.40 m	Xy = 0.72	Lcr,z = 2.40 m	Xz = 0.34
Llamas in Llamas = 85.88	kzy = 0.54	Lamz in Lamz = 147.88	KZZ in 0.90

mgr in: 5.1, 2, e
projektant [illegible]
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.03 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.06 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 85.88 < Lambda,max = 210.00 Lambda,z = 147.88 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.03 < 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) = 0.07 < 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) = 0.09 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 93 belki_93 **POINT:** **COORDINATE:** x = 1.00 L = 2.40 m

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LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 100x50x4

h=100 mm	gM0=1.00	gM1=1.00	
b=50 mm	Ay=360 mm2	Az=720 mm2	Ax=1080 mm2
tw=4 mm	Iy=1310000 mm4	Iz=441000 mm4	Ix=1104710 mm4
tf=4 mm	Influence=33400 mm3	Wplz=20600 mm3	

INTERNAL FORCES AND CAPACITIES:

My,Ed = -0.61 kN*m	Mz,Ed = 0.00 kN*m	Vy,Ed = -0.00 kN
My,pl,Rd = 7.85 kN*m	Mz,pl,Rd = 4.84 kN*m	Vy,T,Rd = 48.83 kN
My,c,Rd = 7.85 kN*m	Mz,c,Rd = 4.84 kN*m	Vz,Ed = -1.56 kN
		Vz,T,Rd = 97.67 kN
Mb,Rd = 7.85 kN*m		Tt,Ed = -0.00 kN*m
		Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 130.12 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=2.40 m	Lam_LT = 0.25	fi,LT = 0.46	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:

Section strength check:

My,Ed/My,c,Rd = 0.08 < 1.00 (6.2.5.(1))
Mz,Ed/Mz,c,Rd = 0.00 < 1.00 (6.2.5.(1))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.02 < 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:

My,Ed/(XLT*My,Rk/gM1) + Mz,Ed/(Mz,Rk/gM1) = 0.08 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 1 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 76 belki_76 **POINT:** **COORDINATE:** x = 1.00 L = 1.54 m

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LOADS:

mgr in[redacted]
projektant [redacted]
tel.: 662-165-812, e-mail[redacted]gmail.com

Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:

S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -8.63 kN	My,Ed = 0.15 kN*m	Mz,Ed = 0.18 kN*m	Vy,Ed = -0.25 kN
Nt,Rd = 153.45 kN	My,pl,Rd = 3.81 kN*m	Mz,pl,Rd = 2.35 kN*m	Vy,T,Rd = 29.47 kN
	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.16 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.95 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.00 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 78.21 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=1.54 m	Lam_LT = 0.22	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:



About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.06 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.04 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.08 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.67 + (Mz,Ed/MN,z,Rd)^1.67 = 0.02 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 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:

My,ed/mb,Rd = 0.04 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 5 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

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mgr in[redacted] 5.1, 2, e
projektant [redacted]
tel.: 662-165-812, e-mail: 5.1, 2, e [redacted]gmail.com

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 98 belki_98 **POINT:** **COORDINATE:** x = 1.00 L = 2.40 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 100x50x4

h=100 mm	gM0=1.00	gM1=1.00	
b=50 mm	Ay=360 mm2	Az=720 mm2	Ax=1080 mm2
tw=4 mm	Iy=1310000 mm4	Iz=441000 mm4	Ix=1104710 mm4
tf=4 mm	Influence=33400 mm3	Wplz=20600 mm3	

INTERNAL FORCES AND CAPACITIES:

My,Ed = -0.56 kN*m	Mz,Ed = -0.00 kN*m	Vy,Ed = 0.00 kN
My,pl,Rd = 7.85 kN*m	Mz,pl,Rd = 4.84 kN*m	Vy,T,Rd = 48.84 kN
My,c,Rd = 7.85 kN*m	Mz,c,Rd = 4.84 kN*m	Vz,Ed = -1.52 kN
		Vz,T,Rd = 97.68 kN
Mb,Rd = 7.85 kN*m		Tt,Ed = -0.00 kN*m
		Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 130.12 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=2.40 m	Lam_LT = 0.25	fi,LT = 0.46	XLT, mod = 1.00

BUCKLING PARAMETERS:

 About y axis:

 About with axis:

VERIFICATION FORMULAS:
Section strength check:
My,Ed/My,c,Rd = 0.07 < 1.00 (6.2.5.(1))
Mz,Ed/Mz,c,Rd = 0.00 < 1.00 (6.2.5.(1))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.02 < 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:
My,Ed/(XLT*My,Rk/gM1) + Mz,Ed/(Mz,Rk/gM1) = 0.07 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 1 mm < uz max = L/300.00 = 8 mm Verified

mgr in 5.1, 2, e
projektant
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 92 words upki_92 **POINT:** **COORDINATE:** x = 1.00 L = 0.28 m

---

LOADS:
Governing Load Case: 21 SGN/8=1*1.00 + 2*1.00 + 4*1.50 (1+2)*1.00+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.64 kN	My,Ed = 0.02 kN*m	Mz,Ed = 0.16 kN*m	Vy,Ed = -0.98 kN
Nt,Rd = 153.45 kN	My,pl,Rd = 3.81 kN*m	Mz,pl,Rd = 2.35 kN*m	Vy,T,Rd = 29.38 kN
	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.21 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.76 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.01 kN*m
			Class of section = 1




LATERAL BUCKLING PARAMETERS:

z = 0.00	Mcr = 629.78 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=0.28 m	Lam_LT = 0.08	fi,LT = 0.38	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:



About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.07 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 1.00 (6.2.9.1.(6))

Vy,Ed/Vy,T,Rd = 0.03 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Global stability check of member:
My,ed/mb,Rd = 0.02 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS

 ***Deflections (LOCAL SYSTEM):*** *Not analyzed*

 ***Displacements (GLOBAL SYSTEM):***

vx = 0 mm < vx max = L/150.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 71 sl upki_71 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 21 SGN/8=1*1.00 + 2*1.00 + 4*1.50 (1+2)*1.00+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

 **SECTION PARAMETERS: RHS 80x40x3**

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.31 kN	My,Ed = -0.23 kN*m	Mz,Ed = -0.02 kN*m	Vy,Ed = -0.05 kN
Nc,Rd = 153.45 kN	My,Ed,max = -0.23 kN*m	Mz,Ed,max = -0.02 kN*m	Vy,T,Rd = 29.17 kN
Nb,Rd = 134.37 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.42 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.33 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.03 kN*m
			Class of section = 1

 **LATERAL BUCKLING PARAMETERS:**

z = 0.00	Mcr = 194.34 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=0.97 m	Lam_LT = 0.14	fi,LT = 0.41	XLT, mod = 1.00

BUCKLING PARAMETERS:

 About y axis:

Ly = 0.97 m	Lam_y = 0.37	Lz = 0.97 m	Lam_z = 0.64
Lcr,y = 0.97 m	Xy = 0.96	Lcr,z = 0.97 m	Xz = 0.88
Llamas in Llamas = 34.71	kyy in 0.90	Lamz in Lamz = 59.77	Kyz = 0.54

 About with axis:

mgr in: 5.1, 2, e
projektant
tel.: 662-165-812, e-mail: 5.1, 2, e gmail.com

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.06 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 34.71 < Lambda,max = 210.00 Lambda,z = 59.77 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.06 < 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) = 0.06 < 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) = 0.04 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM): *Not analyzed*



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 6 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 6 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 68 words upki_68 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:

Governing Load Case: 21 SGN/8=1*1.00 + 2*1.00 + 4*1.50 (1+2)*1.00+4*1.50

MATERIAL:

S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.08 kN	My,Ed = 0.22 kN*m	Mz,Ed = 0.01 kN*m	Vy,Ed = 0.02 kN
Nc,Rd = 153.45 kN	My,Ed,max = 0.22 kN*m	Mz,Ed,max = -0.02 kN*m	Vy,T,Rd = 29.21 kN
Nb,Rd = 134.37 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.36 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.43 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.03 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 0.00	Mcr = 170.89 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=0.97 m	Lam_LT = 0.15	fi,LT = 0.41	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis:

Ly = 0.97 m	Lam_y = 0.37	Lz = 0.97 m	Lam_z = 0.64
Lcr,y = 0.97 m	Xy = 0.96	Lcr,z = 0.97 m	Xz = 0.88
Llamas in Llamas = 34.71	kyy in 0.90	Lamz in Lamz = 59.77	Kyz = 0.54

About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.06 < 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)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 34.71 < Lambda,max = 210.00 Lambda,z = 59.77 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.06 < 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) = 0.06 < 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) = 0.04 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 6 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 6 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 78 words upki_78 **POINT:** **COORDINATE:** x = 1.00 L = 0.97 m

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LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.13 kN	My,Ed = 0.01 kN*m	Mz,Ed = -0.13 kN*m	Vy,Ed = 0.22 kN
Nc,Rd = 153.45 kN	My,Ed,max = 0.01 kN*m	Mz,Ed,max = -0.13 kN*m	Vy,T,Rd = 29.48 kN
Nb,Rd = 134.37 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = 0.02 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.95 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 0.00	Mcr = 307.82 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=0.97 m	Lam_LT = 0.11	fi,LT = 0.39	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis:

Ly = 0.97 m	Lam_y = 0.37	Lz = 0.97 m	Lam_z = 0.64
Lcr,y = 0.97 m	Xy = 0.96	Lcr,z = 0.97 m	Xz = 0.88
Llamas in Llamas = 34.71	kzy = 0.54	Lamz in Lamz = 59.77	KZZ in 0.90

About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.06 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 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 = 34.71 < Lambda,max = 210.00 Lambda,z = 59.77 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.00 < 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) = 0.03 < 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) = 0.05 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 6 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 6 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:

mgr in[redacted]
projektant [redacted]
tel.: 662-165-812, e-mail [redacted]

MEMBER: 56 belki_56 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:

Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:

S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

My,Ed = 0.68 kN*m	Mz,Ed = 0.01 kN*m	Vy,Ed = 0.00 kN
My,pl,Rd = 12.36 kN*m	Mz,pl,Rd = 12.36 kN*m	Vy,T,Rd = 100.33 kN
My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = -0.36 kN
		Vz,T,Rd = 100.33 kN
		Tt,Ed = 0.01 kN*m
		Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:

Section strength check:

My,Ed/My,c,Rd = 0.05 < 1.00 (6.2.5.(1))
Mz,Ed/Mz,c,Rd = 0.00 < 1.00 (6.2.5.(1))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.00 < 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:

My,Ed/(XLT*My,Rk/gM1) + Mz,Ed/(Mz,Rk/gM1) = 0.06 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

mgr in: 5.1, 2, e
projektant
tel.: 662-165-812, e-mail: 5.1, 2, e gmail.com

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 61 belki_61 **POINT:** **COORDINATE:** x = 1.00 L = 2.40 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHS 100x4

h=100 mm	gM0=1.00	gM1=1.00	
b=100 mm	Ay=740 mm2	Az=740 mm2	Ax=1480 mm2
tw=4 mm	Iy=2230000 mm4	Iz=2230000 mm4	Ix=3547136 mm4
tf=4 mm	Influence=52600 mm3	Wplz=52600 mm3	

INTERNAL FORCES AND CAPACITIES:

My,Ed = 0.22 kN*m	Mz,Ed = -0.07 kN*m	Vy,Ed = 0.21 kN
My,pl,Rd = 12.36 kN*m	Mz,pl,Rd = 12.36 kN*m	Vy,T,Rd = 95.24 kN
My,c,Rd = 12.36 kN*m	Mz,c,Rd = 12.36 kN*m	Vz,Ed = 0.76 kN
		Vz,T,Rd = 95.24 kN
		Tt,Ed = 0.51 kN*m
		Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About with axis:

VERIFICATION FORMULAS:
Section strength check:
My,Ed/My,c,Rd = 0.02 < 1.00 (6.2.5.(1))
Mz,Ed/Mz,c,Rd = 0.01 < 1.00 (6.2.5.(1))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.05 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.05 < 1.00 (6.2.6)
Global stability check of member:
My,Ed/(XLT*My,Rk/gM1) + Mz,Ed/(Mz,Rk/gM1) = 0.02 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 8 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

u inst,y = 0 mm < u inst,max,y = L/300.00 = 8 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 8 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 16 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 83 belki_83 **POINT:** **COORDINATE:** x = 1.00 L = 1.54 m

---

LOADS:
Governing Load Case: 21 SGN/8=1*1.00 + 2*1.00 + 4*1.50 (1+2)*1.00+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.90 kN	My,Ed = -0.19 kN*m	Mz,Ed = 0.07 kN*m	Vy,Ed = -0.12 kN
Nt,Rd = 153.45 kN	My,pl,Rd = 3.81 kN*m	Mz,pl,Rd = 2.35 kN*m	Vy,T,Rd = 29.07 kN
	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.17 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.14 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.04 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 78.21 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=1.54 m	Lam_LT = 0.22	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.01 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.05 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.03 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 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 = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.02 < 1.00 (6.2.6)
Global stability check of member:
My,ed/mb,rd = 0.05 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 5 mm Verified
Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 10 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 74 words upki_74 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.30 kN	My,Ed = 0.02 kN*m	Mz,Ed = 0.05 kN*m	Vy,Ed = 0.15 kN
Nc,Rd = 153.45 kN	My,Ed,max = 0.02 kN*m	Mz,Ed,max = -0.09 kN*m	Vy,T,Rd = 29.50 kN
Nb,Rd = 134.37 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.04 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 59.00 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.00 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 0.00	Mcr = 228.25 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=0.97 m	Lam_LT = 0.13	fi,LT = 0.40	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:

Ly = 0.97 m	Lam_y = 0.37
Lcr,y = 0.97 m	Xy = 0.96
Llamas in Llamas = 34.71	kzy = 0.54

About with axis:

Lz = 0.97 m	Lam_z = 0.64
Lcr,z = 0.97 m	Xz = 0.88
Lamz in Lamz = 59.77	KZZ in 0.90

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.02 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 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 = 34.71 < Lambda,max = 210.00 Lambda,z = 59.77 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.01 < 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) = 0.03 < 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) = 0.04 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM): *Not analyzed*



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 6 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 6 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 70 belki_70 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

---

mgr in: 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail: 5.1, 2, e gmail.com

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.05 kN	My,Ed = 0.11 kN*m	Mz,Ed = -0.06 kN*m	Vy,Ed = -0.08 kN
Nc,Rd = 153.45 kN	My,Ed,max = 0.11 kN*m	Mz,Ed,max = -0.06 kN*m	Vy,T,Rd = 29.12 kN
N.B.B.,Rd = 143.56 kN	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.24 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 58.24 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = 0.03 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 163.80 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=0.71 m	Lam_LT = 0.15	fi,LT = 0.41	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis:

Ly = 0.71 m	Lam_y = 0.27	Lz = 0.71 m	Lam_z = 0.46
Lcr,y = 0.71 m	Xy = 0.98	Lcr,z = 0.71 m	Xz = 0.94
Llamas in Llamas = 25.23	kyy in 0.90	Lamz in Lamz = 43.44	Kyz = 0.54

About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.03 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.02 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 25.23 < Lambda,max = 210.00 Lambda,z = 43.44 < Lambda,max = 210.00 STABLE
My,Ed,max/Mb,Rd = 0.03 < 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) = 0.04 < 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) = 0.04 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/300.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 2 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 2 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*

ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 67 belki_67 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 20 SGN/3=1*1.35 + 2*1.35 + 4*1.50 (1+2)*1.35+4*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: RHS 80x40x3

h=80 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=218 mm2	Az=435 mm2	Ax=653 mm2
tw=3 mm	Iy=510000 mm4	Iz=172000 mm4	Ix=429252 mm4
tf=3 mm	Influence=16200 mm3	Wplz=10000 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.02 kN	My,Ed = 0.15 kN*m	Mz,Ed = -0.07 kN*m	Vy,Ed = -0.15 kN
Nt,Rd = 153.45 kN	My,pl,Rd = 3.81 kN*m	Mz,pl,Rd = 2.35 kN*m	Vy,T,Rd = 28.65 kN
	My,c,Rd = 3.81 kN*m	Mz,c,Rd = 2.35 kN*m	Vz,Ed = -0.29 kN
	MN,y,Rd = 3.81 kN*m	MN,z,Rd = 2.35 kN*m	Vz,T,Rd = 57.31 kN
	Mb,Rd = 3.81 kN*m		Tt,Ed = -0.07 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 163.80 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=0.71 m	Lam_LT = 0.15	fi,LT = 0.41	XLT, mod = 1.00

BUCKLING PARAMETERS:

 About y axis:

 About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.04 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.03 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.01 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.03 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.03 < 1.00 (6.2.6)
Global stability check of member:
My,ed/mb,Rd = 0.04 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS

 ***Deflections (LOCAL SYSTEM):***
uy = 0 mm < uy max = L/300.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
uz = 0 mm < uz max = L/300.00 = 2 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
u inst,y = 0 mm < u inst,max,y = L/300.00 = 2 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/300.00 = 2 mm Verified
Governing Load Case:

mgr in: 5.1, 2, e
projektant [illegible]
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/150.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00
vy = 0 mm < vy max = L/150.00 = 5 mm Verified
Governing Load Case: 22 SGU:CHR/3=1*1.00 + 2*1.00 + 4*1.00 (1+2+4)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 258 sips of the word upki_258 **POINT: COORDINATE:** x = 1.00 L = 1.00 m

---

LOADS:
Governing Load Case: 38 SGN/14=1*1.00 + 2*1.00 + 22*1.50 (1+2)*1.00+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHSH 30x30x3

h=30 mm	gM0=1.00	gM1=1.00	
b=30 mm	Ay=157 mm2	Az=157 mm2	Ax=314 mm2
tw=3 mm	Iy=37400 mm4	Iz=37400 mm4	ix=60021 mm4
tf=3 mm	Influence=3140 mm3	Wplz=3140 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.21 kN	My,Ed = 0.00 kN*m	Mz,Ed = -0.01 kN*m	Vy,Ed = 0.04 kN
Nt,Rd = 73.79 kN	My,pl,Rd = 0.74 kN*m	Mz,pl,Rd = 0.74 kN*m	Vy,T,Rd = 21.30 kN
	My,c,Rd = 0.74 kN*m	Mz,c,Rd = 0.74 kN*m	Vz,Ed = 0.00 kN
	MN,y,Rd = 0.74 kN*m	MN,z,Rd = 0.74 kN*m	Vz,T,Rd = 21.30 kN
			Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:
About y axis: About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/200.00 = 5 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
uz = 0 mm < uz max = L/200.00 = 5 mm Verified
Governing Load Case: 54 SGU:CHR/2=1*1.00 + 2*1.00 + 20*0.50 + 21*1.00 (1+2+21)*1.00+20*0.50
u inst,y = 0 mm < u inst,max,y = L/200.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/200.00 = 5 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/300.00 = 3 mm Verified
Governing Load Case: 58 SGU:CHR/6=1*1.00 + 2*1.00 + 20*0.50 + 23*1.00 (1+2+23)*1.00+20*0.50
vy = 3 mm < vy max = L/300.00 = 3 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 250 sips of upki_250 **POINT:** **COORDINATE:** x = 1.00 L = 1.03 m

---

LOADS:
Governing Load Case: 38 SGN/14=1*1.00 + 2*1.00 + 22*1.50 (1+2)*1.00+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHSH 30x30x3

h=30 mm	gM0=1.00	gM1=1.00	
b=30 mm	Ay=157 mm2	Az=157 mm2	Ax=314 mm2
tw=3 mm	Iy=37400 mm4	Iz=37400 mm4	ix=60021 mm4
tf=3 mm	Influence=3140 mm3	Wplz=3140 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.11 kN	My,Ed = 0.00 kN*m	Mz,Ed = 0.02 kN*m	Vy,Ed = -0.05 kN
Nt,Rd = 73.79 kN	My,pl,Rd = 0.74 kN*m	Mz,pl,Rd = 0.74 kN*m	Vy,T,Rd = 21.19 kN
	My,c,Rd = 0.74 kN*m	Mz,c,Rd = 0.74 kN*m	Vz,Ed = -0.00 kN
	MN,y,Rd = 0.74 kN*m	MN,z,Rd = 0.74 kN*m	Vz,T,Rd = 21.19 kN
			Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))

My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.02 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/200.00 = 5 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
uz = 0 mm < uz max = L/200.00 = 5 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
u inst,y = 0 mm < u inst,max,y = L/200.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/200.00 = 5 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/300.00 = 3 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
vy = 3 mm < vy max = L/300.00 = 3 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 252 sips of upki_252 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 38 SGN/14=1*1.00 + 2*1.00 + 22*1.50 (1+2)*1.00+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHSH 30x30x3

h=30 mm	gM0=1.00	gM1=1.00	
b=30 mm	Ay=157 mm2	Az=157 mm2	Ax=314 mm2
tw=3 mm	Iy=37400 mm4	Iz=37400 mm4	ix=60021 mm4
tf=3 mm	Influence=3140 mm3	Wplz=3140 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.71 kN	My,Ed = -0.00 kN*m	Mz,Ed = -0.05 kN*m	Vy,Ed = -0.11 kN
Nt,Rd = 73.79 kN	My,pl,Rd = 0.74 kN*m	Mz,pl,Rd = 0.74 kN*m	Vy,T,Rd = 21.04 kN
	My,c,Rd = 0.74 kN*m	Mz,c,Rd = 0.74 kN*m	Vz,Ed = 0.01 kN
	MN,y,Rd = 0.74 kN*m	MN,z,Rd = 0.74 kN*m	Vz,T,Rd = 21.04 kN
	Mb,Rd = 0.74 kN*m		Tt,Ed = 0.01 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 19.60 kN*m	Curve,LT - d	XLT = 1.00
Lcr,low=1.09 m	Lam_LT = 0.19	fi,LT = 0.44	XLT, mod = 1.00

BUCKLING PARAMETERS:

 About y axis:

 About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.01 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.06 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.01 < 1.00 (6.2.9.1.(6))
Vy,Ed/Vy,T,Rd = 0.01 < 1.00 (6.2.6-7)
Vz,Ed/Vz,T,Rd = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

My,ed/mb,Rd = 0.01 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS

 ***Deflections (LOCAL SYSTEM):***

uy = 0 mm < uy max = L/200.00 = 5 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
uz = 0 mm < uz max = L/200.00 = 5 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
u inst,y = 0 mm < u inst,max,y = L/200.00 = 5 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/200.00 = 5 mm Verified
Governing Load Case:

 ***Displacements (GLOBAL SYSTEM):***

vx = 0 mm < vx max = L/300.00 = 4 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
vy = 3 mm < vy max = L/300.00 = 4 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 248 sips of the word upki_248 **POINT: COORDINATE:** x = 1.00 L = 1.35 m

---

LOADS:
Governing Load Case: 29 SGN/5=1*1.35 + 2*1.35 + 22*1.50 (1+2)*1.35+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

 **SECTION PARAMETERS: SHSH 30x30x3**

h=30 mm	gM0=1.00	gM1=1.00	
b=30 mm	Ay=157 mm2	Az=157 mm2	Ax=314 mm2

tw=3 mm	Iy=37400 mm4	Iz=37400 mm4	ix=60021 mm4
tf=3 mm	Influence=3140 mm3	Wplz=3140 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.69 kN	My,Ed = 0.00 kN*m	Mz,Ed = -0.01 kN*m	Vy,Ed = -0.01 kN
Nc,Rd = 73.79 kN	My,Ed,max = 0.00 kN*m	Mz,Ed,max = -0.02 kN*m	Vy,T,Rd = 21.15 kN
NB,Rd = 34.03 kN	My,c,Rd = 0.74 kN*m	Mz,c,Rd = 0.74 kN*m	Vz,Ed = -0.00 kN
	MN,y,Rd = 0.74 kN*m	MN,z,Rd = 0.74 kN*m	Vz,T,Rd = 21.15 kN
	Mb,Rd = 0.74 kN*m		Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 15.87 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=1.35 m	Lam_LT = 0.22	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis:

Ly = 1.35 m	Lam_y = 1.32	Lz = 1.35 m	Lam_z = 1.32
Lcr,y = 1.35 m	Xy = 0.46	Lcr,z = 1.35 m	Xz = 0.46
Llamas in = 123.64	kzy = 0.55	Lamz in Lamz = 123.64	KZZ = 0.91

About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 123.64 < Lambda,max = 215.00 Lambda,z = 123.64 < Lambda,max = 215.00 STABLE
My,Ed,max/Mb,Rd = 0.00 < 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) = 0.04 < 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) = 0.05 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 0 mm < uy max = L/200.00 = 7 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
uz = 0 mm < uz max = L/200.00 = 7 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
u inst,y = 0 mm < u inst,max,y = L/200.00 = 7 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/200.00 = 7 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 4 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
vy = 3 mm < vy max = L/300.00 = 4 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

mgr in[redacted] 5.1, 2, e
projektant branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 249 sips of the word upki_249 **POINT: COORDINATE:** x = 0.63 L = 0.93 m

---

LOADS:
Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHSH 30x30x3

h=30 mm	gM0=1.00	gM1=1.00	
b=30 mm	Ay=157 mm2	Az=157 mm2	Ax=314 mm2
tw=3 mm	Iy=37400 mm4	Iz=37400 mm4	ix=60021 mm4
tf=3 mm	Influence=3140 mm3	Wplz=3140 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -1.03 kN	My,Ed = 0.00 kN*m	Mz,Ed = 0.02 kN*m	Vy,Ed = 0.00 kN
Nt,Rd = 73.79 kN	My,pl,Rd = 0.74 kN*m	Mz,pl,Rd = 0.74 kN*m	Vy,T,Rd = 21.24 kN
	My,c,Rd = 0.74 kN*m	Mz,c,Rd = 0.74 kN*m	Vz,Ed = -0.01 kN
	MN,y,Rd = 0.74 kN*m	MN,z,Rd = 0.74 kN*m	Vz,T,Rd = 21.24 kN
	Mb,Rd = 0.74 kN*m		Tt,Ed = -0.00 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 14.53 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=1.48 m	Lam_LT = 0.23	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:

 About y axis:

 About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.01 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.03 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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:
My,ed/mb,Rd = 0.01 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS

 ***Deflections (LOCAL SYSTEM):***
uy = 0 mm < uy max = L/200.00 = 7 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
uz = 0 mm < uz max = L/200.00 = 7 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

u inst,y = 0 mm < u inst,max,y = L/200.00 = 7 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/200.00 = 7 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/300.00 = 5 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
vy = 2 mm < vy max = L/300.00 = 5 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 251 sips of the word upki_251 **POINT: COORDINATE:** x = 0.51 L = 0.72 m

---

LOADS:
Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHSH 30x30x3

h=30 mm	gM0=1.00	gM1=1.00	
b=30 mm	Ay=157 mm2	Az=157 mm2	Ax=314 mm2
tw=3 mm	Iy=37400 mm4	Iz=37400 mm4	ix=60021 mm4
tf=3 mm	Influence=3140 mm3	Wplz=3140 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.28 kN	My,Ed = 0.00 kN*m	Mz,Ed = 0.02 kN*m	Vy,Ed = 0.00 kN
Nt,Rd = 73.79 kN	My,pl,Rd = 0.74 kN*m	Mz,pl,Rd = 0.74 kN*m	Vy,T,Rd = 21.09 kN
	My,c,Rd = 0.74 kN*m	Mz,c,Rd = 0.74 kN*m	Vz,Ed = -0.00 kN
	MN,y,Rd = 0.74 kN*m	MN,z,Rd = 0.74 kN*m	Vz,T,Rd = 21.09 kN
	Mb,Rd = 0.74 kN*m		Tt,Ed = -0.01 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 15.16 kN*m	Curve,LT - d	XLT = 1.00
Lcr,upp=1.41 m	Lam_LT = 0.22	fi,LT = 0.45	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.02 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Global stability check of member:
My,ed/mb,Rd = 0.01 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):
uy = 0 mm < uy max = L/200.00 = 7 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
uz = 0 mm < uz max = L/200.00 = 7 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
u inst,y = 0 mm < u inst,max,y = L/200.00 = 7 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/200.00 = 7 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/300.00 = 5 mm Verified
Governing Load Case: 58 SGU:CHR/6=1*1.00 + 2*1.00 + 20*0.50 + 23*1.00 (1+2+23)*1.00+20*0.50
vy = 1 mm < vy max = L/300.00 = 5 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 127 slup_127 **POINT:** **COORDINATE:** x = 1.00 L = 2.50 m

---

LOADS:
Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHSH 30x30x3

h=30 mm	gM0=1.00	gM1=1.00	
b=30 mm	Ay=157 mm2	Az=157 mm2	Ax=314 mm2
tw=3 mm	Iy=37400 mm4	Iz=37400 mm4	ix=60021 mm4
tf=3 mm	Influence=3140 mm3	Wplz=3140 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = -0.37 kN	My,Ed = -0.00 kN*m	Mz,Ed = 0.00 kN*m	Vy,Ed = -0.00 kN
Nt,Rd = 73.79 kN	My,pl,Rd = 0.74 kN*m	Mz,pl,Rd = 0.74 kN*m	Vy,T,Rd = 21.27 kN
	My,c,Rd = 0.74 kN*m	Mz,c,Rd = 0.74 kN*m	Vz,Ed = -0.00 kN
	MN,y,Rd = 0.74 kN*m	MN,z,Rd = 0.74 kN*m	Vz,T,Rd = 21.27 kN
			Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

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projektant
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

About y axis:

About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.00 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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)

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/150.00 = 17 mm Verified
Governing Load Case: 58 SGU:CHR/6=1*1.00 + 2*1.00 + 20*0.50 + 23*1.00 (1+2+23)*1.00+20*0.50
vy = 1 mm < vy max = L/150.00 = 17 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 117 bars choinki_117 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

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LOADS:
Governing Load Case: 30 SGN/6=1*1.35 + 2*1.35 + 20*0.75 + 23*1.50 (1+2)*1.35+20*0.75+23*1.50

MATERIAL:
S 355 (S 355) fy = 355.00 MPa

SECTION PARAMETERS: SHSC 70x70x3

h=70 mm	gM0=1.00	gM1=1.00	
b=70 mm	Ay=391 mm2	Az=391 mm2	Ax=781 mm2
tw=3 mm	Iy=575000 mm4	Iz=575000 mm4	Ix=904701 mm4
tf=3 mm	Influence=19400 mm3	Wplz=19400 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 1.01 kN	My,Ed = 0.04 kN*m	Mz,Ed = 0.00 kN*m	Vy,Ed = 0.00 kN
Nc,Rd = 277.25 kN	My,Ed,max = -0.06 kN*m	Mz,Ed,max = 0.00 kN*m	Vy,T,Rd = 80.04 kN
Nb,Rd = 140.16 kN	My,c,Rd = 6.89 kN*m	Mz,c,Rd = 6.89 kN*m	Vz,Ed = -0.02 kN
	MN,y,Rd = 6.89 kN*m	MN,z,Rd = 6.89 kN*m	Vz,T,Rd = 80.04 kN
			Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

 About y axis:

Ly = 5.14 m	Lam_y = 1.24
Lcr,y = 2.57 m	Xy = 0.51
Llamas = 94.72	kyy = 0.91

 About with axis:

Lz = 5.14 m	Lam_z = 1.24
Lcr,z = 2.57 m	Xz = 0.51
Lamz in Lamz = 94.72	Kyz = 0.54

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.00 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.01 < 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)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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 = 94.72 < Lambda,max = 215.00 Lambda,z = 94.72 < Lambda,max = 215.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.01 < 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) = 0.01 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

 ***Deflections (LOCAL SYSTEM):*** *Not analyzed*

 ***Displacements (GLOBAL SYSTEM):***

vx = 0 mm < vx max = L/300.00 = 17 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
vy = 1 mm < vy max = L/300.00 = 17 mm Verified
Governing Load Case: 60 SGU:CHR/8=1*1.00 + 2*1.00 + 20*0.50 + 24*1.00 (1+2+24)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 121 bars choinki_121 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

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LOADS:
Governing Load Case: 32 SGN/8=1*1.35 + 2*1.35 + 20*0.75 + 24*1.50 (1+2)*1.35+20*0.75+24*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

 **SECTION PARAMETERS: SHSH 40x40x3**

h=40 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=217 mm2	Az=217 mm2	Ax=434 mm2
tw=3 mm	Iy=97800 mm4	Iz=97800 mm4	Ix=153291 mm4
tf=3 mm	Influence=5970 mm3	Wplz=5970 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.84 kN	My,Ed = 0.02 kN*m	Mz,Ed = 0.01 kN*m	Vy,Ed = 0.01 kN

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projektant [illegible]
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

Nc,Rd = 101.99 kN	My,Ed,max = 0.02 kN*m	Mz,Ed,max = 0.01 kN*m	Vy,T,Rd = 29.35 kN
Nb,Rd = 26.94 kN	My,c,Rd = 1.40 kN*m	Mz,c,Rd = 1.40 kN*m	Vz,Ed = -0.04 kN
	MN,y,Rd = 1.40 kN*m	MN,z,Rd = 1.40 kN*m	Vz,T,Rd = 29.35 kN
			Tt,Ed = 0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis:

Ly = 5.14 m	Lam_y = 1.82
Lcr,y = 2.57 m	Xy = 0.26
Llamas in Llamas = 171.20	kyy = 0.92

About with axis:

Lz = 5.14 m	Lam_z = 1.82
Lcr,z = 2.57 m	Xz = 0.26
Lamz in Lamz = 171.20	kyz = 0.55

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.02 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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 = 171.20 < Lambda,max = 215.00 Lambda,z = 171.20 < Lambda,max = 215.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.05 < 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) = 0.05 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 17 mm Verified
Governing Load Case: 61 SGU:CHR/9=1*1.00 + 2*1.00 + 24*1.00 (1+2+24)*1.00
vy = 1 mm < vy max = L/300.00 = 17 mm Verified
Governing Load Case: 60 SGU:CHR/8=1*1.00 + 2*1.00 + 20*0.50 + 24*1.00 (1+2+24)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 120 bars choinki_120 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:

Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:

S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHSH 40x40x3

h=40 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=217 mm2	Az=217 mm2	Ax=434 mm2
tw=3 mm	Iy=97800 mm4	Iz=97800 mm4	Ix=153291 mm4
tf=3 mm	Influence=5970 mm3	Wplz=5970 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 0.84 kN	My,Ed = 0.02 kN*m	Mz,Ed = -0.01 kN*m	Vy,Ed = -0.01 kN
Nc,Rd = 101.99 kN	My,Ed,max = 0.02 kN*m	Mz,Ed,max = -0.01 kN*m	Vy,T,Rd = 29.35 kN
Nb,Rd = 26.94 kN	My,c,Rd = 1.40 kN*m	Mz,c,Rd = 1.40 kN*m	Vz,Ed = -0.04 kN
	MN,y,Rd = 1.40 kN*m	MN,z,Rd = 1.40 kN*m	Vz,T,Rd = 29.35 kN
			Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 5.14 m	Lam_y = 1.82	Lz = 5.14 m	Lam_z = 1.82
Lcr,y = 2.57 m	Xy = 0.26	Lcr,z = 2.57 m	Xz = 0.26
Llamas in Llamas = 171.20	kyy = 0.92	Lamz in Lamz = 171.20	kyz = 0.55

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.02 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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 = 171.20 < Lambda,max = 215.00 Lambda,z = 171.20 < Lambda,max = 215.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.05 < 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) = 0.05 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM): *Not analyzed*



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 17 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
vy = 1 mm < vy max = L/300.00 = 17 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:

mgr in 5.1, 2, e
projektant
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

MEMBER: 119 bars choinki_119 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:

Governing Load Case: 32 SGN/8=1*1.35 + 2*1.35 + 20*0.75 + 24*1.50 (1+2)*1.35+20*0.75+24*1.50

MATERIAL:

S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHSH 40x40x3

h=40 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=217 mm2	Az=217 mm2	Ax=434 mm2
tw=3 mm	Iy=97800 mm4	Iz=97800 mm4	Ix=153291 mm4
tf=3 mm	Influence=5970 mm3	Wplz=5970 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 1.14 kN	My,Ed = 0.04 kN*m	Mz,Ed = -0.01 kN*m	Vy,Ed = -0.01 kN
Nc,Rd = 101.99 kN	My,Ed,max = 0.04 kN*m	Mz,Ed,max = 0.01 kN*m	Vy,T,Rd = 29.36 kN
Nb,Rd = 26.94 kN	My,c,Rd = 1.40 kN*m	Mz,c,Rd = 1.40 kN*m	Vz,Ed = -0.05 kN
	MN,y,Rd = 1.40 kN*m	MN,z,Rd = 1.40 kN*m	Vz,T,Rd = 29.36 kN
			Tt,Ed = 0.00 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:



About y axis:

Ly = 5.14 m	Lam_y = 1.82	Lz = 5.14 m	Lam_z = 1.82
Lcr,y = 2.57 m	Xy = 0.26	Lcr,z = 2.57 m	Xz = 0.26
Llamas in Llamas = 171.20	kyy = 0.93	Lamz in Lamz = 171.20	kyz = 0.56



About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.03 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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 = 171.20 < Lambda,max = 215.00 Lambda,z = 171.20 < Lambda,max = 215.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.07 < 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) = 0.07 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM): *Not analyzed*



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 17 mm Verified
Governing Load Case: 61 SGU:CHR/9=1*1.00 + 2*1.00 + 24*1.00 (1+2+24)*1.00
vy = 0 mm < vy max = L/300.00 = 17 mm Verified
Governing Load Case: 60 SGU:CHR/8=1*1.00 + 2*1.00 + 20*0.50 + 24*1.00 (1+2+24)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 118 bars choinki_118 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa



SECTION PARAMETERS: SHSH 40x40x3

h=40 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=217 mm2	Az=217 mm2	Ax=434 mm2
tw=3 mm	Iy=97800 mm4	Iz=97800 mm4	Ix=153291 mm4
tf=3 mm	Influence=5970 mm3	Wplz=5970 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 1.15 kN	My,Ed = 0.04 kN*m	Mz,Ed = 0.01 kN*m	Vy,Ed = 0.01 kN
Nc,Rd = 101.99 kN	My,Ed,max = 0.04 kN*m	Mz,Ed,max = -0.01 kN*m	Vy,T,Rd = 29.35 kN
Nb,Rd = 26.94 kN	My,c,Rd = 1.40 kN*m	Mz,c,Rd = 1.40 kN*m	Vz,Ed = -0.05 kN
	MN,y,Rd = 1.40 kN*m	MN,z,Rd = 1.40 kN*m	Vz,T,Rd = 29.35 kN
			Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

Ly = 5.14 m	Lam_y = 1.82	Lz = 5.14 m	Lam_z = 1.82
Lcr,y = 2.57 m	Xy = 0.26	Lcr,z = 2.57 m	Xz = 0.26
Llamas in Llamas = 171.20	kyy = 0.93	Lamz in Lamz = 171.20	kyz = 0.56

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.03 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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 = 171.20 < Lambda,max = 215.00 Lambda,z = 171.20 < Lambda,max = 215.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.07 < 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) = 0.07 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

mgr in: 5.1, 2, e
projektant
tel.: 662-165-812, e-mail: 5.1, 2, e gmail.com

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 17 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
vy = 0 mm < vy max = L/300.00 = 17 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 122 bars choinki_122 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 32 SGN/8=1*1.35 + 2*1.35 + 20*0.75 + 24*1.50 (1+2)*1.35+20*0.75+24*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHSH 40x40x3

h=40 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=217 mm2	Az=217 mm2	Ax=434 mm2
tw=3 mm	Iy=97800 mm4	Iz=97800 mm4	Ix=153291 mm4
tf=3 mm	Influence=5970 mm3	Wplz=5970 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 2.05 kN	My,Ed = 0.02 kN*m	Mz,Ed = -0.04 kN*m	Vy,Ed = -0.03 kN
Nc,Rd = 101.99 kN	My,Ed,max = 0.02 kN*m	Mz,Ed,max = -0.04 kN*m	Vy,T,Rd = 29.44 kN
Nb,Rd = 26.94 kN	My,c,Rd = 1.40 kN*m	Mz,c,Rd = 1.40 kN*m	Vz,Ed = -0.03 kN
	MN,y,Rd = 1.40 kN*m	MN,z,Rd = 1.40 kN*m	Vz,T,Rd = 29.44 kN
			Tt,Ed = -0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

Ly = 5.14 m	Lam_y = 1.82	Lz = 5.14 m	Lam_z = 1.82
Lcr,y = 2.57 m	Xy = 0.26	Lcr,z = 2.57 m	Xz = 0.26
Llamas in Llamas = 171.20	kzy = 0.57	Lamz in Lamz = 171.20	KZZ in 0.95

VERIFICATION FORMULAS:
Section strength check:
N,Ed/Nc,Rd = 0.02 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.03 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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 = 171.20 < Lambda,max = 215.00 Lambda,z = 171.20 < Lambda,max = 215.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.10 < 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) = 0.11 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):
vx = 0 mm < vx max = L/300.00 = 17 mm Verified
Governing Load Case: 61 SGU:CHR/9=1*1.00 + 2*1.00 + 24*1.00 (1+2+24)*1.00
vy = 0 mm < vy max = L/300.00 = 17 mm Verified
Governing Load Case: 60 SGU:CHR/8=1*1.00 + 2*1.00 + 20*0.50 + 24*1.00 (1+2+24)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 123 bars choinki_123 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:
Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:
S 235 (S 235) fy = 235.00 MPa

SECTION PARAMETERS: SHSH 40x40x3

h=40 mm	gM0=1.00	gM1=1.00	
b=40 mm	Ay=217 mm2	Az=217 mm2	Ax=434 mm2
tw=3 mm	Iy=97800 mm4	Iz=97800 mm4	Ix=153291 mm4
tf=3 mm	Influence=5970 mm3	Wplz=5970 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 2.06 kN	My,Ed = 0.02 kN*m	Mz,Ed = 0.04 kN*m	Vy,Ed = 0.03 kN
Nc,Rd = 101.99 kN	My,Ed,max = 0.02 kN*m	Mz,Ed,max = 0.04 kN*m	Vy,T,Rd = 29.44 kN
Nb,Rd = 26.94 kN	My,c,Rd = 1.40 kN*m	Mz,c,Rd = 1.40 kN*m	Vz,Ed = -0.03 kN
	MN,y,Rd = 1.40 kN*m	MN,z,Rd = 1.40 kN*m	Vz,T,Rd = 29.44 kN
			Tt,Ed = 0.00 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

Ly = 5.14 m	Lam_y = 1.82	Lz = 5.14 m	Lam_z = 1.82
Lcr,y = 2.57 m	Xy = 0.26	Lcr,z = 2.57 m	Xz = 0.26
Llamas in Llamas = 171.20	kzy = 0.57	Lamz in Lamz = 171.20	kzz in 0.96

---

mgr in 5.1, 2, e
projektant
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.02 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.03 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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 = 171.20 < Lambda,max = 215.00 Lambda,z = 171.20 < Lambda,max = 215.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.11 < 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) = 0.11 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 17 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
vy = 0 mm < vy max = L/300.00 = 17 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 116 bars choinki_116 **POINT:** **COORDINATE:** x = 0.00 L = 0.00 m

---

LOADS:

Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:

S 355 (S 355) fy = 355.00 MPa

SECTION PARAMETERS: SHSC 70x70x3

h=70 mm	gM0=1.00	gM1=1.00	
b=70 mm	Ay=391 mm2	Az=391 mm2	Ax=781 mm2
tw=3 mm	Iy=575000 mm4	Iz=575000 mm4	Ix=904701 mm4
tf=3 mm	Influence=19400 mm3	Wplz=19400 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 2.21 kN	My,Ed = -0.00 kN*m	Mz,Ed = 0.07 kN*m	Vy,Ed = 0.03 kN
Nc,Rd = 277.25 kN	My,Ed,max = 0.04 kN*m	Mz,Ed,max = -0.11 kN*m	Vy,T,Rd = 77.55 kN
Nb,Rd = 140.16 kN	My,c,Rd = 6.89 kN*m	Mz,c,Rd = 6.89 kN*m	Vz,Ed = 0.05 kN
	MN,y,Rd = 6.89 kN*m	MN,z,Rd = 6.89 kN*m	Vz,T,Rd = 77.55 kN
			Tt,Ed = -0.17 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

BUCKLING PARAMETERS:

About y axis: About with axis:

Ly = 5.14 m	Lam_y = 1.24	Lz = 5.14 m	Lam_z = 1.24
Lcr,y = 2.57 m	Xy = 0.51	Lcr,z = 2.57 m	Xz = 0.51
Llamas = 94.72	kzy = 0.55	Lamz in Lamz = 94.72	KZZ = 0.91

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.01 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.03 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.03 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 94.72 < Lambda,max = 215.00 Lambda,z = 94.72 < Lambda,max = 215.00 STABLE
N,Ed/(Xy*N,Rk/gM1) + kyy*My,Ed,max/(XLT*My,Rk/gM1) + kyz*Mz,Ed,max/(Mz,Rk/gM1) = 0.03 < 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) = 0.03 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM): *Not analyzed*

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 17 mm Verified
Governing Load Case: 57 SGU:CHR/5=1*1.00 + 2*1.00 + 22*1.00 (1+2+22)*1.00
vy = 0 mm < vy max = L/300.00 = 17 mm Verified
Governing Load Case: 60 SGU:CHR/8=1*1.00 + 2*1.00 + 20*0.50 + 24*1.00 (1+2+24)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 387 super G **POINT:** **COORDINATE:** x = 0.50 L = 4.01 m

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LOADS:
Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:
S 355 (S 355) fy = 355.00 MPa

SECTION PARAMETERS: SHSC 70x70x3

h=70 mm	gM0=1.00	gM1=1.00	
b=70 mm	Ay=391 mm2	Az=391 mm2	Ax=781 mm2
tw=3 mm	Iy=575000 mm4	Iz=575000 mm4	Ix=904701 mm4
tf=3 mm	Influence=19400 mm3	Wplz=19400 mm3	

mgr in. 5.1, 2, e
projektant - branży konstrukcyjnej
tel.: 662-165-812, e-mail 5.1, 2, e gmail.com

INTERNAL FORCES AND CAPACITIES:

N,Ed = -1.83 kN	My,Ed = -0.04 kN*m	Mz,Ed = 0.25 kN*m	Vy,Ed = 0.04 kN
Nt,Rd = 277.25 kN	My,pl,Rd = 6.89 kN*m	Mz,pl,Rd = 6.89 kN*m	Vy,T,Rd = 79.88 kN
	My,c,Rd = 6.89 kN*m	Mz,c,Rd = 6.89 kN*m	Vz,Ed = 0.22 kN
	MN,y,Rd = 6.89 kN*m	MN,z,Rd = 6.89 kN*m	Vz,T,Rd = 79.88 kN
	Mb,Rd = 6.89 kN*m		Tt,Ed = -0.01 kN*m
			Class of section = 1

LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 41.16 kN*m	Curve,LT - d	XLT = 0.99
Lcr,low=8.02 m	Lam_LT = 0.41	fi,LT = 0.57	XLT, mod = 1.00

BUCKLING PARAMETERS:

About y axis: About with axis:

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nt,Rd = 0.01 < 1.00 (6.2.3.(1))
My,Ed/MN,y,Rd = 0.01 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.04 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 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:

My,ed/mb,Rd = 0.01 < 1.00 (6.3.2.1.(1))

LIMIT DISPLACEMENTS

Deflections (LOCAL SYSTEM):

uy = 9 mm < uy max = L/200.00 = 40 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
uz = 0 mm < uz max = L/200.00 = 40 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
u inst,y = 0 mm < u inst,max,y = L/200.00 = 40 mm Verified
Governing Load Case:
u inst,z = 0 mm < u inst,max,z = L/200.00 = 40 mm Verified
Governing Load Case:

Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 27 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
vy = 0 mm < vy max = L/300.00 = 27 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!

STEEL DESIGN

CODE: *BS-EN 1993-1:2005/NA:2008/A1:2014, Eurocode 3: Design of steel structures.*
ANALYSIS TYPE: Member Verification

CODE GROUP:
MEMBER: 386 super G **POINT:** **COORDINATE:** x = 0.40 L = 3.29 m

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LOADS:

Governing Load Case: 28 SGN/4=1*1.35 + 2*1.35 + 20*0.75 + 22*1.50 (1+2)*1.35+20*0.75+22*1.50

MATERIAL:

S 355 (S 355) fy = 355.00 MPa



SECTION PARAMETERS: SHSC 70x70x3

h=70 mm	gM0=1.00	gM1=1.00	
b=70 mm	Ay=391 mm2	Az=391 mm2	Ax=781 mm2
tw=3 mm	Iy=575000 mm4	Iz=575000 mm4	Ix=904701 mm4
tf=3 mm	Influence=19400 mm3	Wplz=19400 mm3	

INTERNAL FORCES AND CAPACITIES:

N,Ed = 1.89 kN	My,Ed = 0.01 kN*m	Mz,Ed = 0.28 kN*m	Vy,Ed = -0.05 kN
Nc,Rd = 277.25 kN	My,Ed,max = 0.03 kN*m	Mz,Ed,max = 0.28 kN*m	Vy,T,Rd = 79.45 kN
NB,Rd = 33.34 kN	My,c,Rd = 6.89 kN*m	Mz,c,Rd = 6.89 kN*m	Vz,Ed = -0.07 kN
	MN,y,Rd = 6.89 kN*m	MN,z,Rd = 6.89 kN*m	Vz,T,Rd = 79.45 kN
	Mb,Rd = 6.89 kN*m		Tt,Ed = 0.04 kN*m
			Class of section = 1



LATERAL BUCKLING PARAMETERS:

z = 1.00	Mcr = 40.15 kN*m	Curve,LT - d	XLT = 0.99
Lcr,upp=8.22 m	Lam_LT = 0.41	fi,LT = 0.57	XLT, mod = 1.00

BUCKLING PARAMETERS:



About y axis:



About with axis:

Ly = 8.22 m	Lam_y = 0.54	Lz = 8.22 m	Lam_z in 2.78
Lcr,y = 1.12 m	Xy = 0.91	Lcr,z = 5.75 m	Xz = 0.12
Llamas in = 41.31	kzy = 0.99	Lamz in Lamz = 212.04	kzz in 0.94

VERIFICATION FORMULAS:

Section strength check:

N,Ed/Nc,Rd = 0.01 < 1.00 (6.2.4.(1))
My,Ed/MN,y,Rd = 0.00 < 1.00 (6.2.9.1.(2))
Mz,Ed/MN,z,Rd = 0.04 < 1.00 (6.2.9.1.(2))
(My,Ed/MN,y,Rd)^ 1.66 + (Mz,Ed/MN,z,Rd)^1.66 = 0.00 < 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 = 0.00 < 1.00 (6.2.6-7)
Tau,ty,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)
Tau,tz,Ed/(fy/(sqrt(3)*gM0)) = 0.01 < 1.00 (6.2.6)

Global stability check of member:

Lambda,y = 41.31 < Lambda,max = 215.00 Lambda,z = 212.04 < Lambda,max = 215.00 STABLE
My,Ed,max/Mb,Rd = 0.00 < 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) = 0.03 < 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) = 0.10 < 1.00 (6.3.3.(4))

LIMIT DISPLACEMENTS



Deflections (LOCAL SYSTEM):

uy = 12 mm < uy max = L/200.00 = 41 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
uz = 0 mm < uz max = L/200.00 = 41 mm Verified
Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50
u inst,y = 0 mm < u inst,max,y = L/200.00 = 41 mm Verified
Governing Load Case:

u inst,z = 0 mm < u inst,max,z = L/200.00 = 41 mm Verified

Governing Load Case:



Displacements (GLOBAL SYSTEM):

vx = 0 mm < vx max = L/300.00 = 27 mm Verified

Governing Load Case: 64 SGU:CHR/12=1*1.00 + 2*1.00 + 20*1.00 + 22*0.50 (1+2+20)*1.00+22*0.50

vy = 0 mm < vy max = L/300.00 = 27 mm Verified

Governing Load Case: 56 SGU:CHR/4=1*1.00 + 2*1.00 + 20*0.50 + 22*1.00 (1+2+22)*1.00+20*0.50

Section OK !!!