Saimaa University of Applied Sciences
Technology, Lappeenranta
Double Degree Programme in Civil and Construction Engineering

Zara Shubber

# THE DEVELOPMENT OF THE TYPICAL ROOF STRUCTURE PROJECT BASED ON TRUSSES MADE OF ROLL-WELDED RHS PIPES

Bachelor’s Thesis 2013
ABSTRACT
Zara Shubber
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The purpose of the work was to standardize the production of roof structures based on trusses maded of roll-welded RHS pipes. Serieses of trusses with 15-30 m span, 1,5, 1,8 and 2,1 m in height and with 2 different structural design types under the loads corresponding to the snow areas II – IV were examined. The work was commissioned by the company Ruukki, specialized in steel and steel construction.

The load bearing capacity and weld strength calculations were made according to the Russian regulation SP16.13330.2011using SCAD and Microsoft Excel programs. The series with the resulting structural shapes were modelled in the program Tekla Structures.  From the model the drawings of the trusses and the weight of the steel were obtained. The weight-length dependence was graphed and the inefficient elements of the series were excluded.

As a result of this work a table for the selection of standardized-shape truss member’s profiles, a table for the determination of the standardized construction’s adjusted weight per unit of cover area and drawings of shipment-sized set of details were obtained. The results can be applied to make the production of trusses faster, cheaper and easier.

Keywords: Truss, Roof Structure, RHS Pipes, Typical Project

## CONTENTS

# 1. INTRODUCTION

This work considered the development of a typical roof structure project based on Trusscon™ structures – roof trusses made of roll-welded RHS pipes for the purpose of reducing the manufacturing charges. Truss series 1,5 m, 1,8 m and 2,1 m in height, with the span 15 m, 18 m, 21 m, 24 m, 27 m and 30m and the slope 2 %, under the loads corresponding to the snow areas II, III and IV were considered. The thesis was made for the Finnish company Ruukki, which manufactures and supplies metal-based components and systems to the construction and engineering industries.

The ultimate resistance, load bearing capacity and weld strength calculations were made according to the Russian regulation SP16.13330.2011. SCAD and Microsoft Excel programs were used for the calculations. After modelling the series in the program Tekla Structures, the drawings of the constructions and the weight of the elements were obtained. After the analysis of the weight-length dependence graph, the most optimal variant of the series was chosen for further development.

## 1.1. The proposition and the actuality of the work

The proposition of the work was the standardization of the production of the roof structures Trusscon™. As the initial data the company Ruukki assigned the required slope of the trusses, their spans and the standard width and height of the standardized-shape truss members. The following tasks were assigned:

- stability analysis of several variants of standardized series of trusses with different structural designs in the program complex SCAD;
- selection of the most optimal variant of truss structural designs for further development in relation to the metal consumption of every truss;
- buckling analysis of truss elements;
- revision of the connections of the truss members to chords;

- obtainment of a table for the selection of standardized-shape truss member's profiles;
- obtainment of a table for the determination of the standardized construction's adjusted weight per unit of cover area;
- creation of drawings of shipment-sized set of details

The actuality of the work is that the company will have the possibility to make the truss production faster, easier and cheaper thanks to the following results:

- The customer will be able to immediately visualize the construction, which better responds to his requirements.
- It will be easier for the managers to calculate the cost of the construction due to the fact that the weight per unit length of each element is calculated.
- The storage of the company will always have a pool of the required design details.
- The ready typical drawings will facilitate the work of the design engineers.
- For the mechanical coating a code for each truss will be written.

## 1.2. About roof structures Trusscon$^{TM}$

The roof structure Trusscon$^{TM}$ for single- and multi-span buildings – is a ready unified floor structure, which has the possibility to rest on columns of different materials (metal, reinforced concrete, brick).

This work considered typical roof structures Trusscon$^{TM}$ for industrial and civil purpose with trusses made of roll-welded RHS pipes and with the slope 2% [2].

The characteristics of Trusscon$^{TM}$ structures:

- Truss members are made of roll-welded RHS pipes according to GOST 30245-2003.

- Slope: 2 %.
- Span: 18 m, 21 m, 24 m, 27 m and 30 m.
- Height: 1,5; 1,8; 2,1 m.
- Truss spacing: 6 m.

Design loads:

- Enclosure structure load – 65 kg/sq.m.
- Technological load – 30 kg/sq.m.
- Snow load (Table 1.1):

Table 1.1 Design loads value according to the snow area

| Snow area | II | III | IV |
|---|---|---|---|
| Design load, kg/sq.m. | 120 | 180 | 240 |

Advantages of Trusscon™ structures:

- Low metal consumption – about 15-20 kg/sq.m.
- Minimal part count in the construction.
- Minimal number of welded joints and the possibility of their high-quality accomplishment.
- Smaller surface area of the construction in comparison with similar objects, made using other type of rolled metal products, which considerably reduce the fireproof, anti-corrosive and other coating costs.

# 2. SELECTION OF THE OPTIMAL STRUCTURAL DESIGN

## 2.1. Variants of structural designs

The following variants of structural designs were given for consideration and determination of the optimal one according to the metal consumption:

1) A truss 1,5 m in height with verticals (constructional type A-1,5)

2) A truss 1,8 m in height with verticals (constructional type A-1,8)

3) A truss 2,1 m in height with verticals (constructional type A-2,1)

4) A truss 1,5 m in height without verticals (constructional type B-1,5)

5) A truss 1,8 m in height without verticals (constructional type B-1,8)

6) A truss 2,1 m in height without verticals (constructional type B-2,1)

The truss spacing is 6 m. The constructions have a roof sheeting profile cover.

The truss structural designs of the constructional types A-1,8 and B-1,8 are shown in Figure 2.1

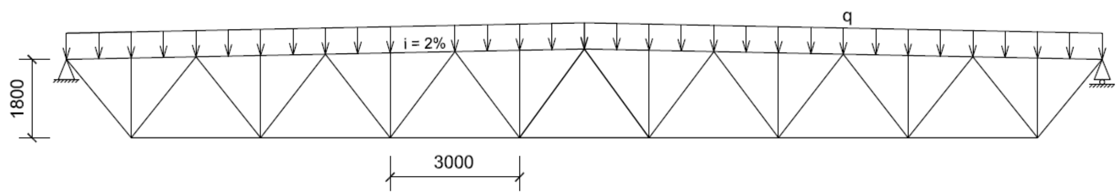



Figure 2.1 Truss structural design of the constructional type A-1,8

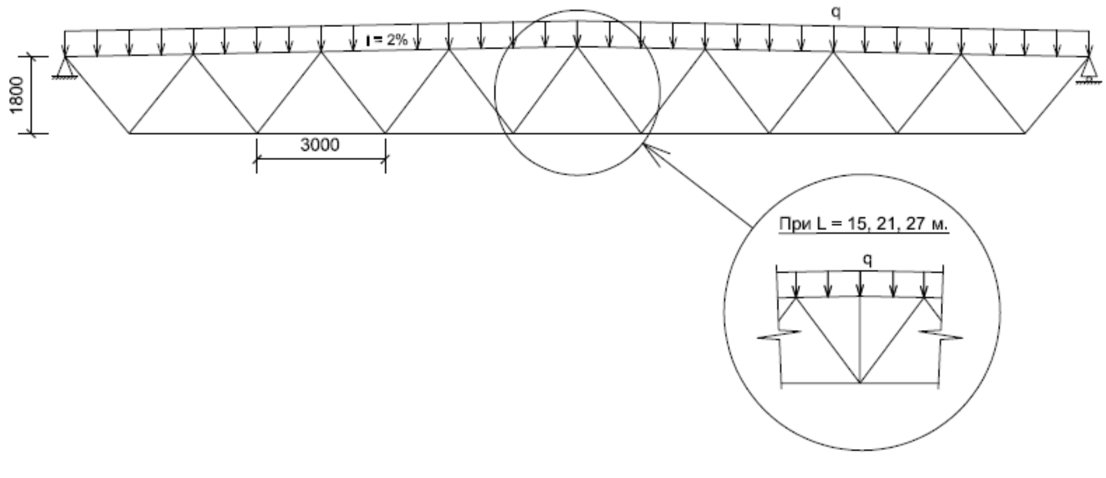



Figure 2.2 Truss structural design of the constructional type B-1,8

The truss elements were decided to be made of rectangular pipes with the following dimensions:

a) The top chord – 180x140 mm or 180x180 mm with the thickness of 5,6,7,8 or 9 mm.

b) The bottom chord – 140x140 mm with the thickness of 5, 6, 7 or 8 mm.

c) The diagonal web elements – 120x120 mm, 100x100 mm or 80x80 mm with the thickness of 4, 5 or 6 mm.

d) The verticals – 1000x100 or 60x60 mm with the thickness of 4 mm.

Steel 255 was used.

### 2.2. Calculations in the integrated software system Structure CAD Office

All the variants of the structural designs were modeled in the integrated software system Structure CAD Office. Every truss element was proportioned to provide the structural stability under the load action corresponding to the III snow area (Figure 2.3).

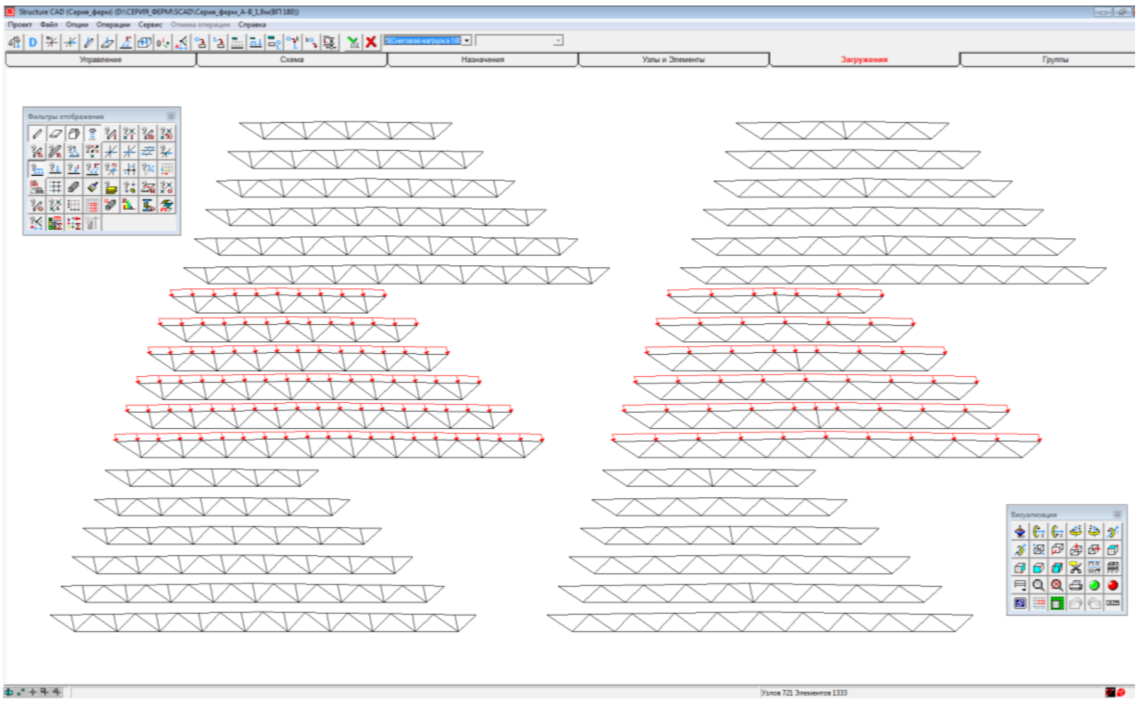


Figure 2.3 Truss modelling of the constructional types A-1,8 and B-1,8 in the integrated software system SCAD

A two dimensional hinged-trussed system was created.

The following loads were applied to the truss elements:

1) Dead load

The dead load switching-in coefficient was assumed equal to 1,3.

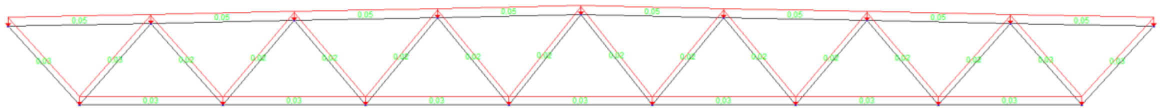


Figure 2.4 Dead load application scheme

2) Enclosure structure load (65 kg/sq.m.)

The design enclosure structure load per unit length is equal to:

65*6 = 360 kg/m = 0,39 t/m.

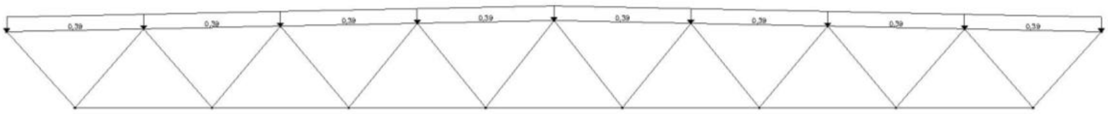


Figure 2.5 Enclosure structure load application scheme

3) Technological load (30 kg/sq.m.)

The design technological load per unit length is equal to:

30*6 = 180 kg/m = 0,18 t/m.

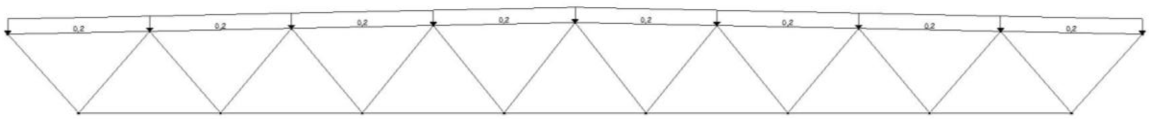


Figure 2.6 Technological load application scheme

4) Snow load:

The design snow load, corresponding to the III snow area, per unit length is equal to:

120*6 = 720 kg/m = 0,72 t/m.

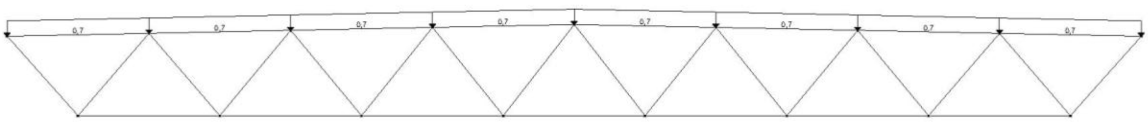


Figure 2.7 Snow load (II snow area) application scheme

The design snow load, corresponded to the III snow area, per unit length is equal to:

180*6 = 1080 kg/m = 1,08 t/m.

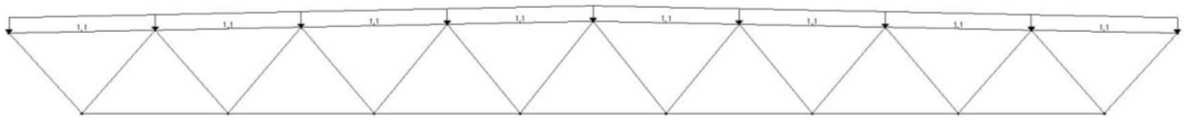



Figure 2.8 Snow load (III snow area) application scheme

The design snow load, corresponded to the IV snow area, per unit length is equal to:

$$240*6 = 1440 \text{ kg/m} = 1{,}44 \text{ t/m}.$$

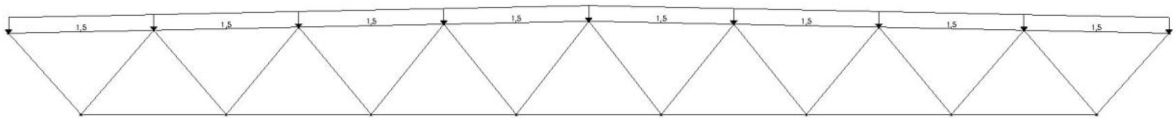



Figure 2.9 Snow load (IV snow area) application scheme

The composed load combinations are shown in Tables 2.1 – 2.3. A great number of trusses are expected to be produced according to the results of this work, so a high strength reserve should be provide. This is why the combination factor Ψ was assumed equal to 1.

Table 2.1 Load combination 1

| Load | Combination factor Ψ |
|---|---|
| Dead load | 1 |
| Enclosure structure load | 1 |
| Technological load | 1 |
| Snow load (II snow area) | 1 |

Table 2.2 Load combination 2

| Load | Combination factor Ψ |
|---|---|
| Dead load | 1 |
| Enclosure structure load | 1 |
| Technological load | 1 |
| Snow load (III snow area) | 1 |

Table 2.3 Load combination 3

| Load | Combination factor Ψ |
|---|---|
| Dead load | 1 |
| Enclosure structure load | 1 |
| Technological load | 1 |
| Snow load (IV snow area) | 1 |

To perform the stability calculation of the truss elements structural components and structural component groups were assigned.

The flexibility of the truss members in tension was assumed equal to 400, of the truss members in compression – 150.

The specific-conditions-of-use factor is equal to 0,95.

The effective length coefficient in the plane XoZ for the top chord is equal to $\frac{3}{L/2}$.

The effective length coefficient in the plane XoY for the top chord is equal to $\frac{0{,}3}{L/2}$.

The effective length coefficient in the plane XoZ for the bottom chord is equal to $\frac{3}{L-3}$.

The effective length coefficient in the plane XoY for the bottom chord is equal to $\frac{6}{L-3}$.

As the result of the modeling of the trusses in the integrated software system Structure CAD Office, all the elements were proportioned. In Figures 2.10 – 2.21 are shown the required top and bottom chord's profiles depending on the truss span.

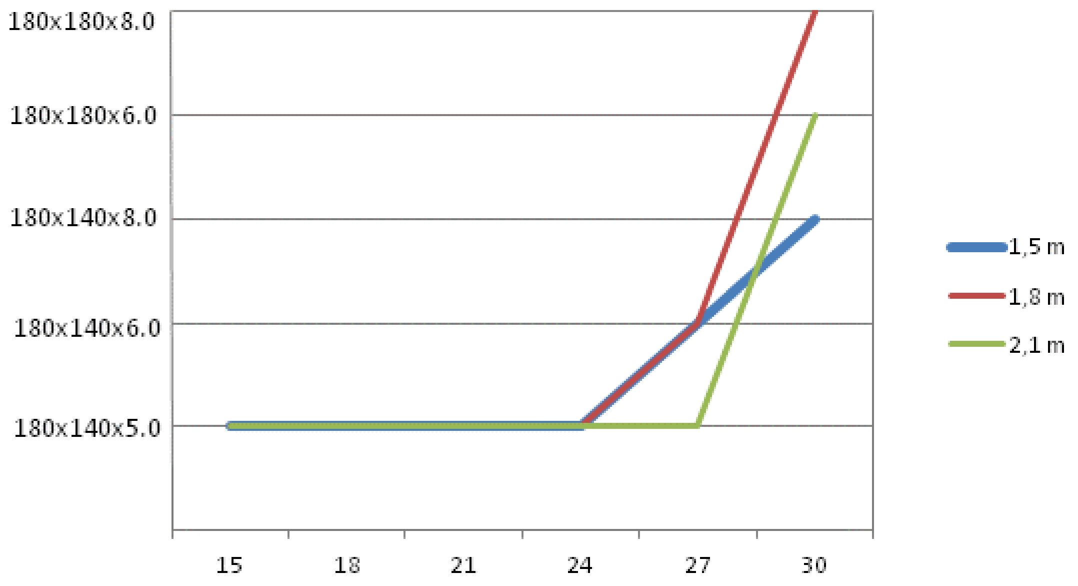



Figure 2.10 Required top chord's profiles depending on the truss span (m) for trusses under loads corresponding to the II snow area, constructional type A

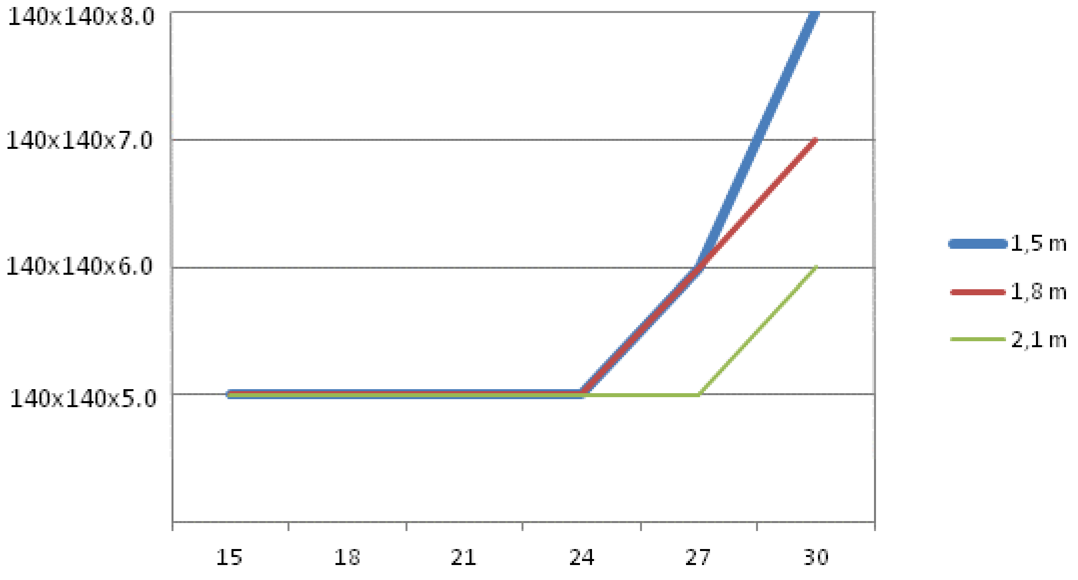



Figure 2.11 Required bottom chord's profiles depending on the truss span (m) for trusses under loads corresponding to the II snow area, constructional type A

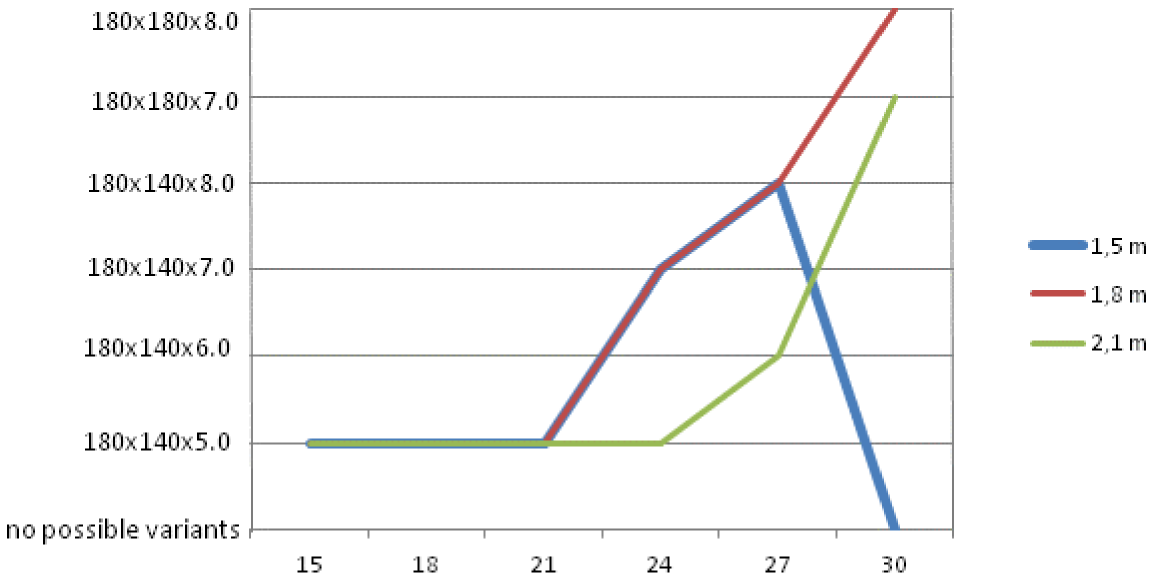



Figure 2.12 Required top chord's profiles depending on the truss span (m) for trusses under loads corresponding to the III snow area, constructional type A

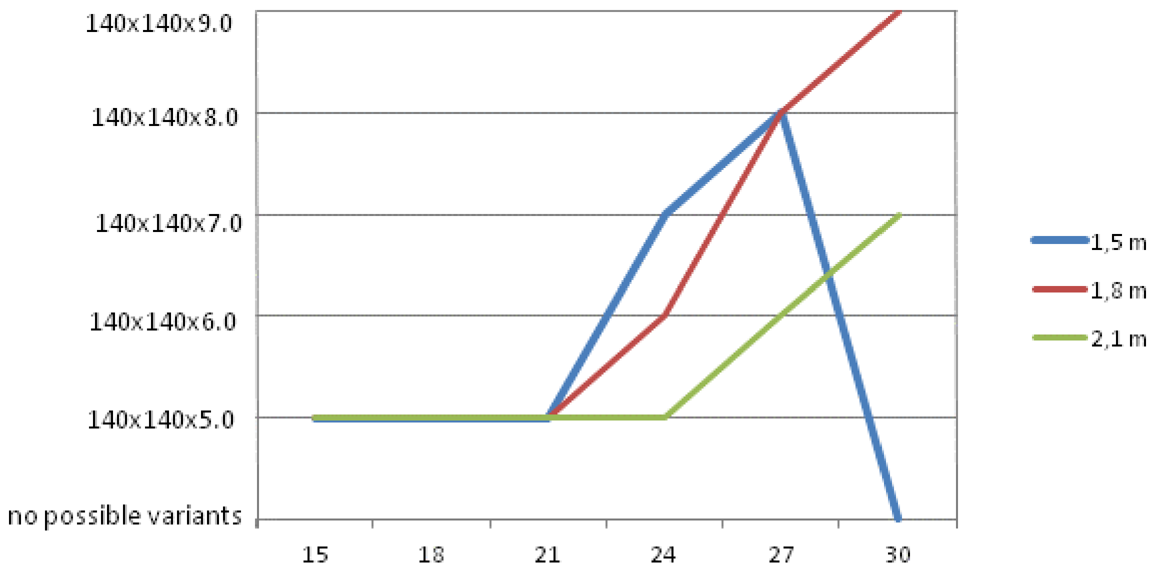



Figure 2.13 Required bottom chord's profiles depending on the truss span (m) for trusses under loads corresponding to the III snow area, constructional type A

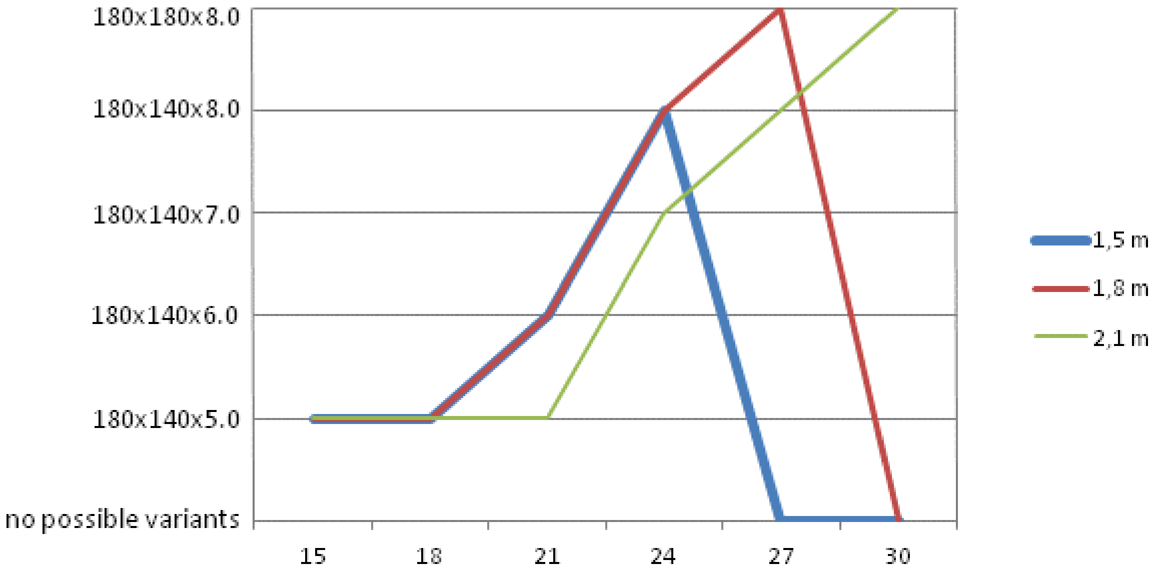



Figure 2.14 Required top chord's profiles depending on the truss span (m) for trusses under loads corresponding to the IV snow area, constructional type A

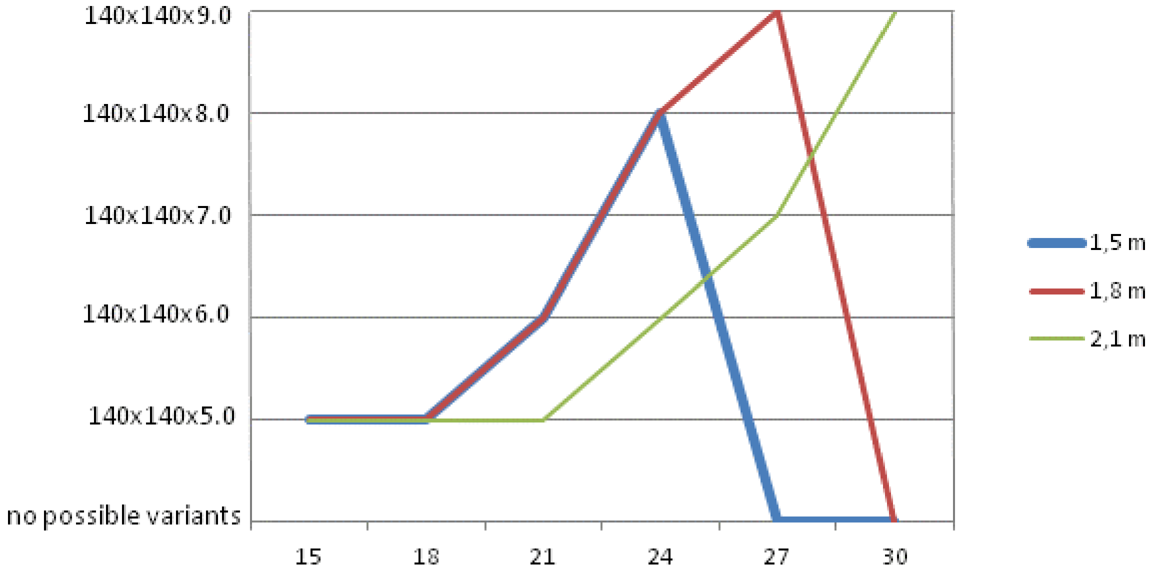



Figure 2.15 Required bottom chord's profiles depending on the truss span (m) for trusses under loads corresponding to the IV snow area, constructional type A

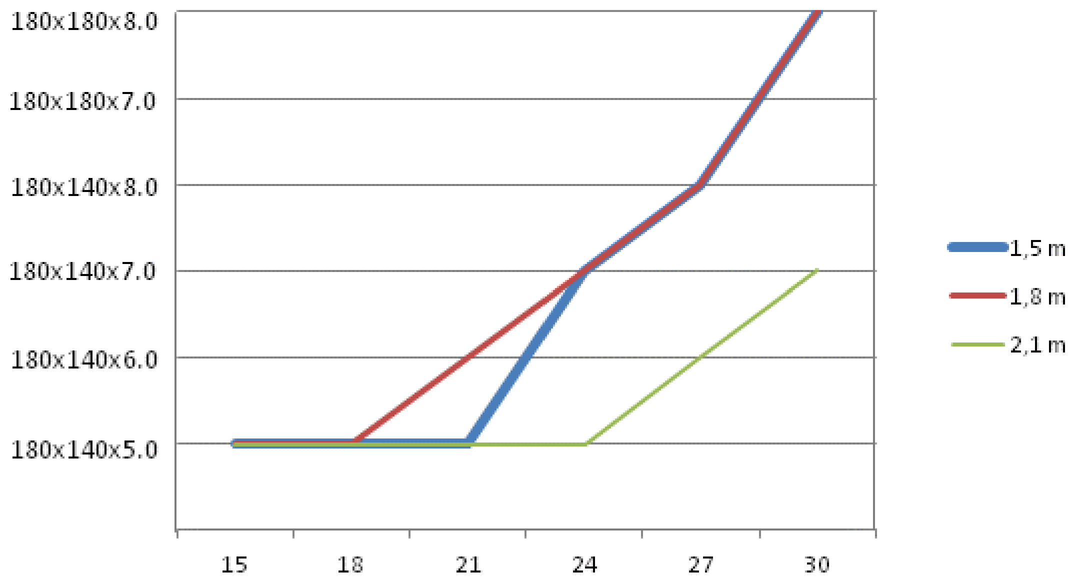



Figure 2.16 Required top chord's profiles depending on the truss span (m) for trusses under loads corresponding to the II snow area, constructional type B

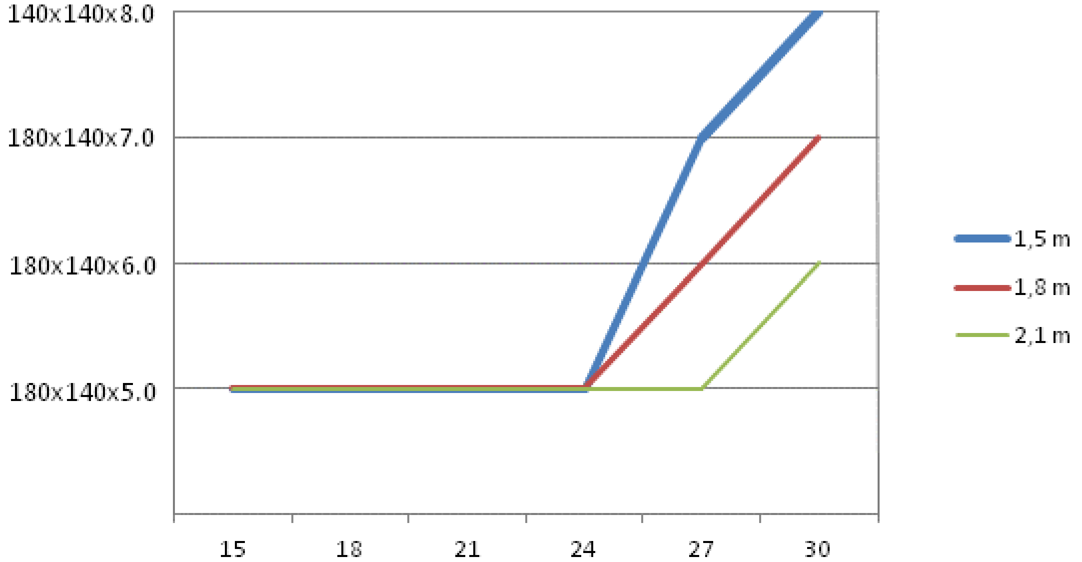



Figure 2.17 Required bottom chord's profiles depending on the truss span (m) for trusses under loads corresponding to the II snow area, constructional type B

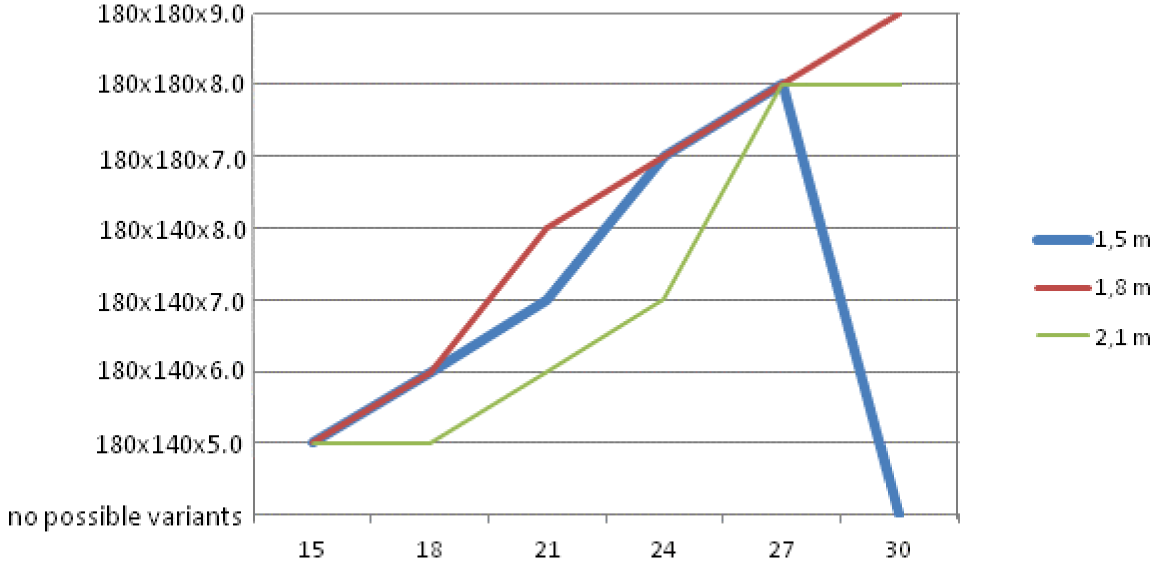



Figure 2.18 Required top chord's profiles depending on the truss span (m) for trusses under loads corresponding to the III snow area, constructional type B

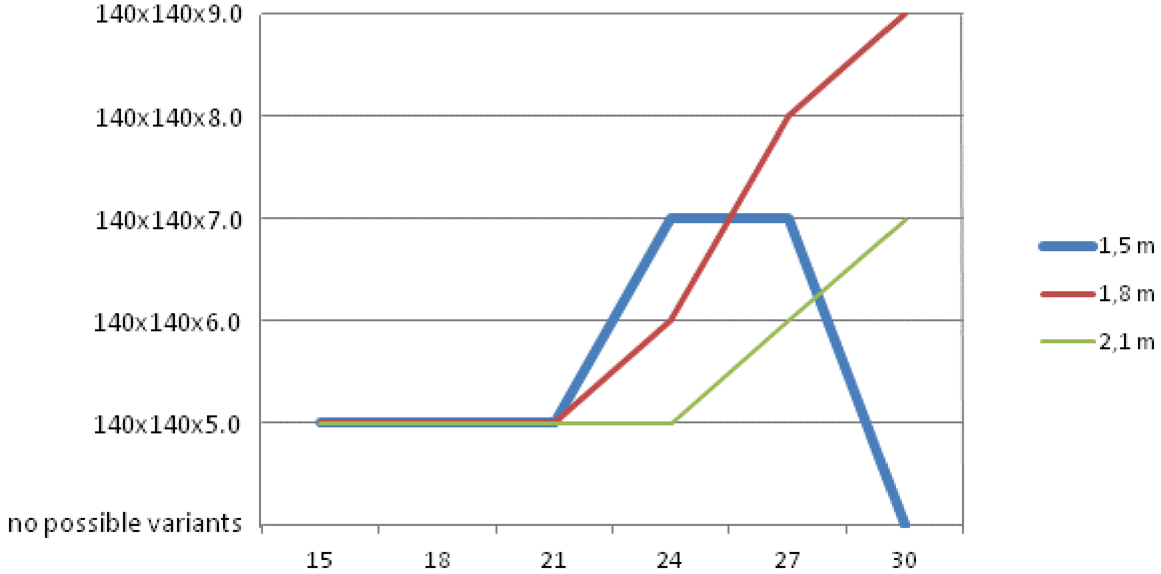



Figure 2.19 Required bottom chord's profiles depending on the truss span (m) for trusses under loads corresponding to the III snow area, constructional type B

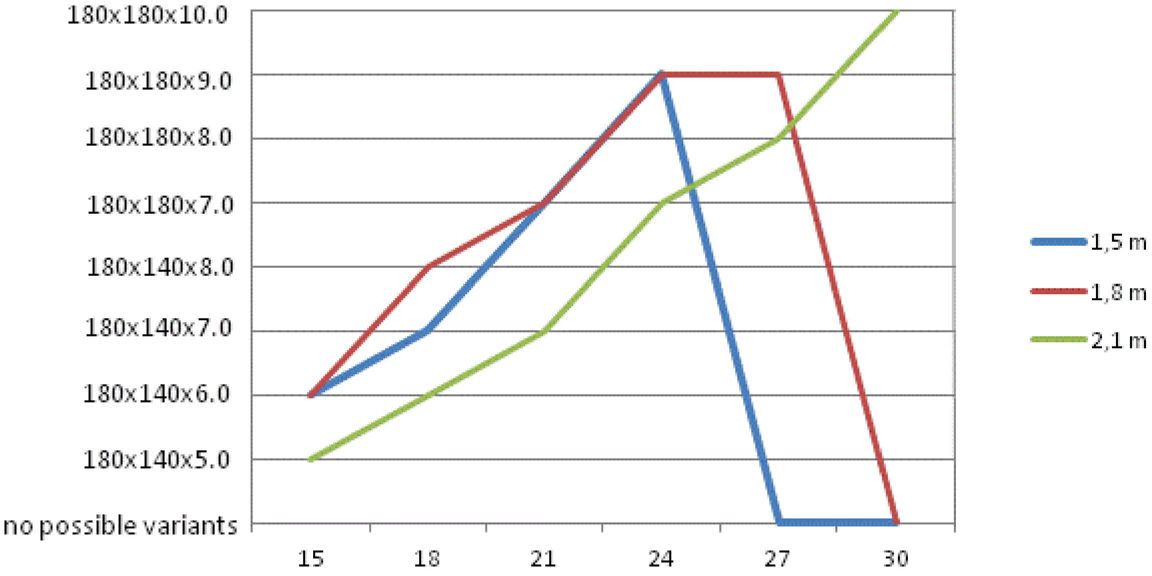



Figure 2.20 Required top chord's profiles depending on the truss span (m) for trusses under loads corresponding to the IV snow area, constructional type B

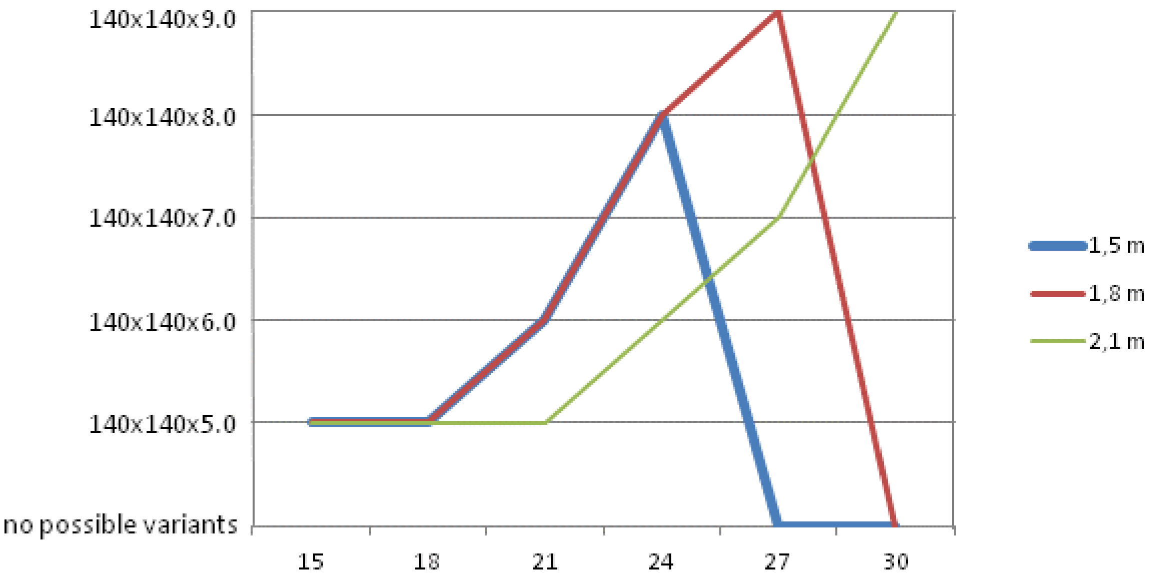



Figure 2.21 Required bottom chord's profiles depending on the truss span (m) for trusses under loads corresponding to the IV snow area, constructional type B

The truss structures with the following parameters did not pass the stability inspection:

1. High 1,5 m, span 30 m., snow area III.
2. High 1,5 m, span 27 m., snow area IV.
3. High 1,5 m, span 30 m., snow area IV.

4. High 1,8 m, span 30 m., snow area IV.

## 2.3. Modelling of the series in the BIM software Tekla Structures

100 different variants of truss structures were obtained. All the obtained variants were modeled in the BIM software Tekla Structures 18.1 (Fig. 2.22).

Tekla Structures is a Building Information Modeling (BIM) software that enables the creation and management of accurately detailed, highly constructable 3D structural models regardless of material or structural complexity. Tekla models can be used to cover the entire building process from conceptual design to fabrication, erection and construction management.

Tekla Structures, Steel Detailing is a standard configuration enhanced with relevant steel detailing functionality. Users can create detailed 3D models of any steel material and then generate corresponding fabrication and erection information shared by all project participants.

The modeling function allows users to:

- View Tekla Structures models (all materials and profiles)
- Create and modify grids
- Model parts and bolts (regardless of building material)
- Create welds
- Add loads to a model
- Create assemblies of steel parts
- Create levels of assembly hierarchy
- Create detailed steel connections
- Create automatic preset connections to multiple parts
- Create erection sequences
- View model information in 4D (simulated schedule)
- Mark/number parts automatically

The output function allows users to:

- Customize drawing title blocks and reports

- Create general arrangement drawings (plan, section, erection)
- Create single part and assembly drawings
- Print and plot drawings and reports
- Create reports (assembly lists, part lists) [3].

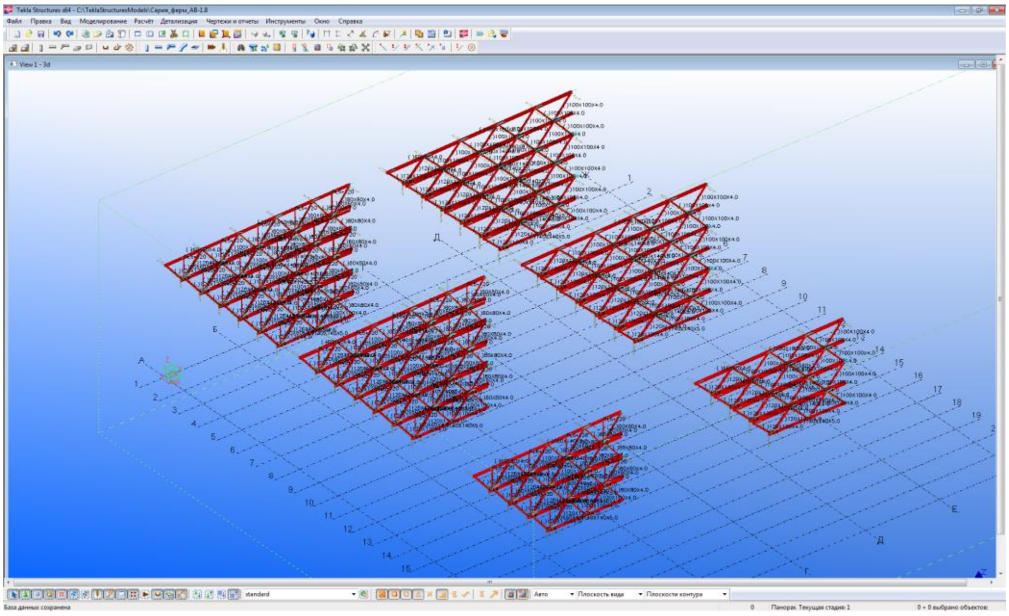


Figure 2.22 Modeling of the constructional types A-1,5 and B-1,5 in the BIM software Tekla Structures

The weight of each construction was obtained from the result model. The determination of the most optimal structural design required analyzing the adjusted weight per unit of covering area and truss span dependence. The constructions under the loads, corresponded to the III snow area, were chosen for consideration.

## 2.4. Creation of the graph of the adjusted weight per unit of covering area and the truss span dependence

The adjusted weight per unit of covering area (g) was calculated according to the formula:

$$g = \frac{G}{S} \text{ (кг/м.кв.)}, \qquad (2.1)$$

where G – truss weight (kg) with the values, shown in Table 2.4; S – covering area (sq.m.), calculated by the formula:

$$S = a*L, \qquad (2.2)$$

where L – truss span (m), a – truss spacing (a = 6 m).

The obtained g values are shown in Table 2.5.

Table 2.4 Half-truss weight values

| | G, kg | | | | | |
|---|---|---|---|---|---|---|
| L, m: | 15 | 18 | 21 | 24 | 27 | 30 |
| Constructional type A-1,5 | 434,3 | 547,8 | 634,5 | 913,8 | 1125,2 | - |
| Constructional type B-1,5 | 437,3 | 569,6 | 711,1 | 948,2 | 1158,3 | - |
| Constructional type A-1,8 | 445,0 | 566,5 | 655,2 | 852,4 | 1051,5 | 1294,6 |
| Constructional type B-1,8 | 432,8 | 563,7 | 703,9 | 899,7 | 1061,4 | 1305,0 |
| Constructional type A-2,1 | 459,4 | 589,2 | 680,0 | 785,7 | 985,4 | 1280,2 |
| Constructional type B-2,1 | 432,8 | 523,1 | 661,0 | 807,6 | 1015,8 | 1256,1 |

Table 2.5 Adjusted weight per unit of covering area values

| | g, кг/м.кв. | | | | | |
|---|---|---|---|---|---|---|
| L, м: | 15 | 18 | 21 | 24 | 27 | 30 |
| Constructional type A-1,5 | 10,0 | 10,4 | 10,3 | 13,1 | 14,3 | - |
| Constructional type B-1,5 | 10,1 | 10,8 | 11,5 | 13,6 | 14,7 | - |
| Constructional type A-1,8 | 10,2 | 10,8 | 10,6 | 12,3 | 13,4 | 14,7 |
| Constructional type B-1,8 | 10,0 | 10,7 | 11,4 | 12,9 | 13,5 | 14,8 |
| Constructional type A-2,1 | 10,5 | 11,2 | 11,0 | 11,3 | 12,5 | 14,6 |
| Constructional type B-2,1 | 10,0 | 10,0 | 10,7 | 11,6 | 12,9 | 14,3 |

The graph of the adjusted weight per unit of covering area and truss span dependence is shown in Figure 2.23.

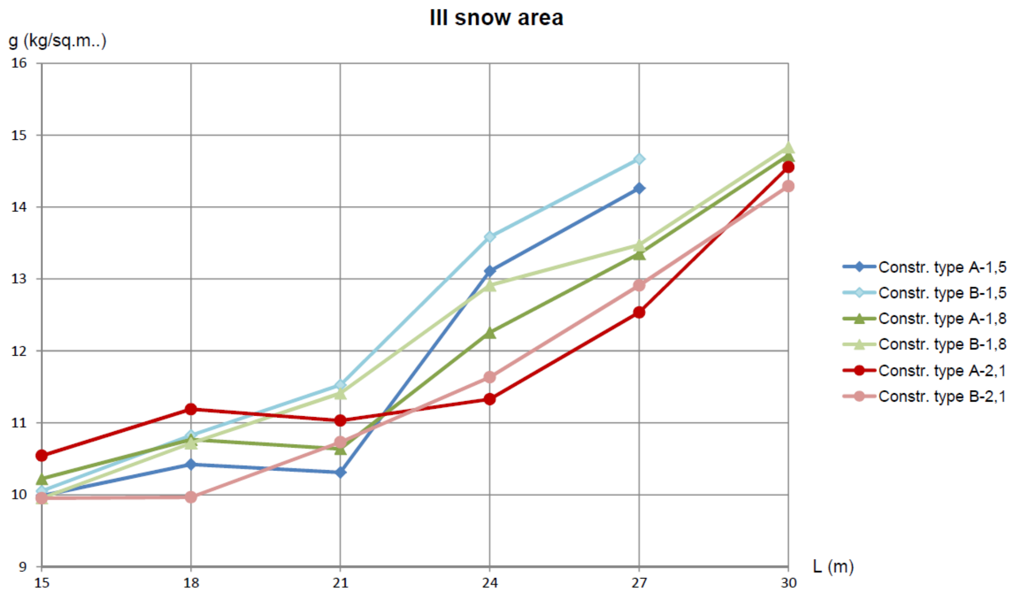



Figure 2.23 Adjusted weight per unit of covering area and truss span dependence

After analyzing the graph, shown in Figure 2.23, it was concluded that the most optimal variant for consideration is the constructional type B-1,8. It was also decided to exclude from the series the truss with the span 15 m because of the low coefficient of utilization.

For maximum standartization and according to the schedule of pipes, produced in the company's factory, it was decided to make the truss elements of rectangular pipes with the following dimensions:

- The top chord – 160x160 mm with the thickness of 5, 6, 7 or 8 mm, steel 345
- The bottom chord – 140x140 mm with the thickness of 5 or 6 mm, steel 255 or 345.
- The top chord – 180x140 mm, 180x180 mm with the thickness 5, 6, 7, 8 or 9 mm.
- The diagonal web elements – 120x120 mm, 100x100 mm or 80x80 mm with the thickness of 4, 5 or 6 mm, steel 255.
- The verticals – 80x80 mm with the thickness of 4 mm, steel 255

### 2.4.1. Truss stresses values

The values of truss stresses were obtained in the program complex SCAD for the chosen standardized series (Tables A1-A4, Appendix A).

In order to avoid mistakes in the truss member's stability analysis also the most loaded joint – the connection of the first diagonal member to the top chord (joint 1) was considered. The axial force in joint 1 was assumed equal to the axial force, which appears in the top chord in the place of its connection with the first diagonal member. The bending moment in joint 1 was determined by the formula:

$$M_{j1} = eN_{d1} + M_{TC}, \quad (2.3)$$

where $M_{j1}$ – bending moment in the joint 1 (t*m);

e – axial force eccentricity in the 1 equal to 0,036 m;

$N_{d1}$ – axial force appeared in the first diagonal member (t);

$M_{TC}$ – maximum bending moment, appeared in the top chord (t*m).

The truss stresses, appeared in joint 1 are shown in Table A.5, Appendix A.

# 3. STABILITY ANALYSIS OF TRUSS MEMBERS

In order to minimize error probability, to simplificate the proportioning procedure and to generate a clear report, it was decided to compile a table in the Microsoft Excel software for the stability analysis and the proportioning of truss members. The calculation was made according to the Russian regulation SP16.13330.2011“Steel structures” and is shown in Appendix B.

For the purpose of providing an easy method for the calculation of trusses with other characteristics, all the calculations were maximally automatized.

A stability calculation example for a truss 24 m in length under the load corresponding to the III snow area is given below.

## 3.1. Proportioning of truss members

The complied table allows making the truss members proportioning by the selection of a serial number from Table 3.1. Depending on the selected number, the profile name, the moment of inertia in truss plane, the area and height of cross section and the radius of inertia are automatically changed (Table 3.2).

Table 3.1 Profile selection table

| Number | Profile | Moment of inertia in truss plane | Area of cross section | Height of cross section | Thickness of web |
|---|---|---|---|---|---|
| | | $cm^4$ | $cm^2$ | cm | cm |
| 0 | - | 0 | 0 | 0 | |
| 1 | Profile(sq.)160X160X8.0 | 1836,9 | 48,7 | 16 | 0,8 |
| 2 | Profile(sq.)160X160X7.0 | 1640,8 | 42,8 | 16 | 0,7 |
| 3 | Profile(sq.)160X160X6.0 | 1435,1 | 36,8 | 16 | 0,6 |
| 4 | Profile(sq.)160X160X5.0 | 1214,6 | 30,7 | 16 | 0,5 |
| 11 | Profile(sq.)140X140X9.0 | 1355 | 47,16 | 14 | 0,9 |
| 12 | Profile(sq.)140X140X8.0 | 1231 | 42,24 | 14 | 0,8 |
| 13 | Profile(sq.)140X140X7.0 | 1100 | 37,24 | 14 | 0,7 |
| 14 | Profile(sq.)140X140X6.0 | 964,3 | 32,16 | 14 | 0,6 |
| 15 | Profile(sq.)140X140X5.0 | 808,4 | 26,9 | 14 | 0,5 |
| 21 | Profile(sq.)120X120X6.0 | 594,2 | 27,36 | 12 | 0,6 |
| 22 | Profile(sq.)120X120X5.0 | 507,9 | 23 | 12 | 0,5 |

| | | | | | |
|---|---|---|---|---|---|
| 23 | Profile(sq.)100X100X4.0 | 236,3 | 15,36 | 10 | 0,4 |
| 24 | Profile(sq.)80X80X4.0 | 117,3 | 12,16 | 8 | 0,4 |
| 25 | Profile(sq.)100X100X5.0 | 278,7 | 18,9 | 10 | 0,5 |

Table 3.2 Proportioning of truss elements (a fragment of the stability calculation table)

| Element | Serial number of the profile in the table | Profile | Moment of inertia in the truss plane | Area of cross section | Height of cross section | Radius of inertia | Sectional modulus |
|---|---|---|---|---|---|---|---|
| | | | I | A | h | i | $W_c$ |
| | | | $cm^4$ | $cm^2$ | cm | cm | $cm^3$ |
| Top chord | 3 | Profile(sq.)160X160X6.0 | 1435,1 | 36,8 | 16,00 | 6,2 | 179,4 |
| Bottom chord | 14 | Profile(sq.)140X140X6.0 | 964,3 | 32,2 | 14,00 | 5,5 | 137,8 |
| Diagonal member 1 | 22 | Profile(sq.)120X120X5.0 | 507,9 | 23,0 | 12,00 | 4,7 | 84,7 |
| Diagonal member 2 | 22 | Profile(sq.)120X120X5.0 | 507,9 | 23,0 | 12,00 | 4,7 | 84,7 |
| Diagonal member 3 | 23 | Profile(sq.)100X100X4.0 | 236,3 | 15,4 | 10,00 | 3,9 | 47,3 |
| Diagonal member 4 | 23 | Profile(sq.)100X100X4.0 | 236,3 | 15,4 | 10,00 | 3,9 | 47,3 |
| Diagonal member 5 | 24 | Profile(sq.)80X80X4.0 | 117,3 | 12,2 | 8,00 | 3,1 | 29,3 |
| Diagonal member 6 | 24 | Profile(sq.)80X80X4.0 | 117,3 | 12,2 | 8,00 | 3,1 | 29,3 |
| Diagonal member 7 | 24 | Profile(sq.)80X80X4.0 | 117,3 | 12,2 | 8,00 | 3,1 | 29,3 |
| Diagonal member 8 | 24 | Profile(sq.)80X80X4.0 | 117,3 | 12,2 | 8,00 | 3,1 | 29,3 |

The sectional modulus is calculated according to the formula:

$$W_c = \frac{I}{h/2}, \qquad (3.1)$$

where I – moment of inertia in truss plane, $cm^4$, h – height of the cross section, cm.
the radius of inertia is calculated as:

$$i = \frac{I}{A}, \qquad (3.2)$$

where A – area of section, $cm^2$.
Example of the calculation of the sectional modulus and the radius of inertia in the truss plane of members of the truss 24 m in length under the load corresponding to the III snow area:

a. For top chord:

$$W_c = \frac{1435{,}1}{16/2} = 179{,}4\ cm^3,$$

$$i = \frac{1435{,}1}{36{,}8} = 6{,}2\ cm.$$

b. For bottom chord:

$$W_c = \frac{964,3}{14/2} = 137,8\ cm^3,$$

$$i = \frac{964,3}{32,2} = 5,5\ cm.$$

c. For diagonal members 1 and 2:

$$W_c = \frac{507,9}{12/2} = 84,7\ cm^3,$$

$$i = \frac{507,9}{23} = 4,7\ cm.$$

d. For diagonal members 3 and 4:

$$W_c = \frac{236,3}{10/2} = 84,7\ cm^3,$$

$$i = \frac{236,3}{15,4} = 3,9\ cm.$$

e. For diagonal members 5, 6, 7 and 8:

$$W_c = \frac{117,3}{8/2} = 29,3\ cm^3,$$

$$i = \frac{117,3}{12,2} = 3,1\ cm.$$

The results of the proportioning of truss members are shown in Table 3.2.

### 3.2. Stability analysis of centrally-compressed member's webs

The stability of centrally-compressed solid-section members is taken for granted, if the conventional flexibility does not exceed the ultimate conventional flexibility value.

The conventional flexibility in truss plane is calculated as:

$$\lambda_{xoz} = \frac{l_{efxoz}}{i}, \quad (3.3)$$

where $l_{efxoz}$ – effective length in truss plan, cm.

The conventional flexibility out of truss plane is calculated as:

$$\lambda_{xoy} = \frac{l_{efxoy}}{i}, \quad (3.3)$$

where $l_{efxoy}$ – effective length out of truss plan, cm.

The ultimate flexibility of tensioned members was assumed equal to 400 [table 33, 1].

The ultimate flexibility of compressed members was calculated according to SP16.13330.2011 "Steel structures":

$$\lambda_{Max} = 180 - 60\alpha, \quad (3.4)$$

where α – coefficient, assumed not lower than 0,5 and equal to:

$$\alpha = \frac{N}{\varphi A R_y \gamma_c}, \qquad (3.5)$$

where N – member's axial force, t;

$R_y$ – steel strength resistance, assumed for steel S255 equal to 2,4 t/cm$^2$, for steel S345 – 3,35 t/cm$^2$;

$\gamma_c$ - member's coefficient of the conditions of work assumed equal to 1;

φ – stability coefficient under central compression, which value at $\bar{\lambda} \geq 0{,}4$ should be determined by formula:

$$\varphi = \frac{0{,}5(\delta - \sqrt{\delta^2 - 39{,}48\bar{\lambda}^2})}{\bar{\lambda}^2}, \qquad (3.6)$$

where $\bar{\lambda}$ – conventional flexibility of the beam, equal to:

$$\bar{\lambda} = \lambda\sqrt{\frac{R_y}{E}}, \qquad (3.7)$$

where E – elastic modulus, for steel equal to 2100 t/cm$^2$;

δ – coefficient, calculated according to formula:

$$\delta = 9{,}87\left(1 - \alpha + \beta\bar{\lambda}\right) + \bar{\lambda}^2, \qquad (3.8)$$

where α and β – coefficients, assumed: α = 0,03; β=0,06 [table7, 1].

Flexibility-in-plane use factor is defined as the flexibility in truss plane to ultimate flexibility ratio. To provide the construction's stability the coefficient should not be bigger than 1.

Flexibility-out-of-plane use factor is defined as the flexibility out of truss plane to ultimate flexibility ratio. To provide the construction's stability the coefficient should not be bigger than 1.

Example of the stability analysis of centrally-compressed member's webs of the truss 24 m in length under the load corresponding to the III snow area:

I. For top chord:

N = -66,9 t – element under compression;

$$\lambda_{xoz} = \frac{300}{6{,}2} = 53;$$

$$\lambda_{xoy} = \frac{300}{6{,}2} = 53;$$

$$\bar{\lambda} = 53\sqrt{\frac{3{,}35}{2100}} = 2{,}1;$$

$$\delta = 9{,}87(1 - 0{,}03 + 0{,}06 * 2{,}1) + 2{,}1^2 = 15{,}3;$$

$$\varphi = \frac{0{,}5(15{,}3 - \sqrt{15{,}3^2 - 39{,}48 * 2{,}1^2})}{2{,}1^2} = 0{,}863;$$

$$\alpha = \frac{66{,}9}{0{,}863 * 36{,}8 * 3{,}35 * 1} = 0{,}68;$$

$$\lambda_{Max} = 180 - 60 * 0{,}68 = 139;$$

$$\frac{\lambda_{xoz}}{\lambda_{Max}} = \frac{53}{139} = 0{,}38 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{Max}} = \frac{53}{139} = 0{,}38 < 1.$$

The stability of the top chord is provided.

II. For bottom chord:

N = 65,7 t – element under tension;

$$\lambda_{xoz} = \frac{300}{5{,}5} = 60;$$
$$\lambda_{xoy} = \frac{900}{5{,}5} = 181;$$
$$\lambda_{Max} = 400;$$
$$\frac{\lambda_{xoz}}{\lambda_{Max}} = \frac{60}{400} = 0{,}38 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{Max}} = \frac{60}{400} = 0{,}45 < 1.$$

The stability of the bottom chord is provided.

III. For diagonal member 1:

N = 24,9 t – element under tension;

$$\lambda_{xoz} = \frac{223}{4{,}7} = 52;$$
$$\lambda_{xoy} = \frac{223}{4{,}7} = 52;$$
$$\lambda_{Max} = 400;$$
$$\frac{\lambda_{xoz}}{\lambda_{Max}} = \frac{52}{400} = 0{,}13 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{Max}} = \frac{52}{400} = 0{,}13 < 1.$$

The stability of the diagonal member 1 is provided.

IV. For diagonal member 2:

N = -24,4 t – element under compression;

$$\lambda_{xoz} = \frac{227}{4{,}7} = 53;$$
$$\lambda_{xoy} = \frac{227}{4{,}7} = 53;$$
$$\bar{\lambda} = 53\sqrt{\frac{2{,}4}{2100}} = 1{,}8;$$
$$\delta = 9{,}87(1 - 0{,}03 + 0{,}06 * 1{,}8) + 1{,}8^2 = 13{,}9;$$
$$\varphi = \frac{0{,}5(13{,}9 - \sqrt{13{,}9^2 - 39{,}48 * 1{,}8^2})}{1{,}8^2} = 0{,}901;$$
$$\alpha = \frac{24{,}4}{0{,}901 * 23 * 2{,}4 * 1} = 0{,}53;$$

$$\lambda_{\text{Max}} = 180 - 60 * 0{,}53 = 148;$$
$$\frac{\lambda_{xoz}}{\lambda_{\text{Max}}} = \frac{53}{148} = 0{,}36 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{\text{Max}}} = \frac{53}{148} = 0{,}36 < 1.$$

The stability of the diagonal member 2 is provided.

V. For diagonal member 3:

N = 16,7 t – element under tension;

$$\lambda_{xoz} = \frac{227}{3{,}9} = 64;$$
$$\lambda_{xoy} = \frac{227}{3{,}9} = 64;$$
$$\lambda_{\text{Max}} = 400;$$
$$\frac{\lambda_{xoz}}{\lambda_{\text{Max}}} = \frac{64}{400} = 0{,}16 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{\text{Max}}} = \frac{64}{400} = 0{,}16 < 1.$$

The stability of the diagonal member 3 is provided.

VI. For diagonal member 4:

N = -16,3 t – element under compression;

$$\lambda_{xoz} = \frac{232}{3{,}9} = 65;$$
$$\lambda_{xoy} = \frac{232}{3{,}9} = 65;$$
$$\bar{\lambda} = 65\sqrt{\frac{2{,}4}{2100}} = 2{,}2;$$
$$\delta = 9{,}87(1 - 0{,}03 + 0{,}06 * 2{,}2) + 2{,}2^2 = 15{,}7;$$
$$\varphi = \frac{0{,}5(15{,}7 - \sqrt{15{,}7^2 - 39{,}48 * 2{,}2^2})}{2{,}2^2} = 0{,}851;$$
$$\alpha = \frac{16{,}3}{0{,}851 * 15{,}4 * 2{,}4 * 1} = 0{,}57;$$
$$\lambda_{\text{Max}} = 180 - 60 * 0{,}57 = 146;$$
$$\frac{\lambda_{xoz}}{\lambda_{\text{Max}}} = \frac{65}{146} = 0{,}45 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{\text{Max}}} = \frac{65}{146} = 0{,}45 < 1.$$

The stability of the diagonal member 4 is provided.

VII. For diagonal member 5:

N = 9,0 t – element under tension;

$$\lambda_{xoz} = \frac{232}{3{,}1} = 82;$$

$$\lambda_{xoy} = \frac{232}{3{,}1} = 82;$$
$$\lambda_{Max} = 400;$$
$$\frac{\lambda_{xoz}}{\lambda_{Max}} = \frac{82}{400} = 0{,}21 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{Max}} = \frac{82}{400} = 0{,}21 < 1.$$

The stability of the diagonal member 5 is provided.

VIII. For diagonal member 6:

N = -8,7 t – element under compression;

$$\lambda_{xoz} = \frac{237}{3{,}1} = 84;$$
$$\lambda_{xoy} = \frac{237}{3{,}1} = 84;$$
$$\bar{\lambda} = 84\sqrt{\frac{2{,}4}{2100}} = 2{,}8;$$
$$\delta = 9{,}87(1 - 0{,}03 + 0{,}06 * 2{,}8) + 2{,}8^2 = 19{,}3;$$
$$\varphi = \frac{0{,}5(19{,}3 - \sqrt{19{,}3^2 - 39{,}48 * 2{,}8^2})}{2{,}8^2} = 0{,}739;$$
$$\alpha = \frac{8{,}7}{0{,}739 * 12{,}2 * 2{,}4 * 1} = 0{,}5;$$
$$\lambda_{Max} = 180 - 60 * 0{,}5 = 150;$$
$$\frac{\lambda_{xoz}}{\lambda_{Max}} = \frac{84}{150} = 0{,}56 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{Max}} = \frac{84}{150} = 0{,}56 < 1.$$

The stability of the diagonal member 6 is provided..

IX. For diagonal member 7:

N = 1,8 t – element under tension;

$$\lambda_{xoz} = \frac{237}{3{,}1} = 84;$$
$$\lambda_{xoy} = \frac{237}{3{,}1} = 84;$$
$$\lambda_{Max} = 400;$$
$$\frac{\lambda_{xoz}}{\lambda_{Max}} = \frac{84}{400} = 0{,}21 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{Max}} = \frac{84}{400} = 0{,}21 < 1.$$

The stability of the diagonal member 7 is provided.

X. For diagonal member 8:

N = -1,6 t – element under compression;

$$\lambda_{xoz} = \frac{241}{3{,}1} = 85;$$

$$\lambda_{xoy} = \frac{241}{3,1} = 85;$$
$$\bar{\lambda} = 85\sqrt{\frac{2,4}{2100}} = 2,9;$$
$$\delta = 9,87(1 - 0,03 + 0,06 * 2,9) + 2,9^2 = 19,6;$$
$$\varphi = \frac{0,5(19,6 - \sqrt{19,6^2 - 39,48 * 2,9^2})}{2,9^2} = 0,729;$$
$$\alpha = \frac{1,6}{0,729 * 12,2 * 2,4 * 1} = 0,5;$$
$$\lambda_{\text{мах}} = 180 - 60 * 0,5 = 150;$$
$$\frac{\lambda_{xoz}}{\lambda_{\text{мах}}} = \frac{85}{150} = 0,57 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{\text{мах}}} = \frac{85}{150} = 0,57 < 1.$$

The stability of the diagonal member 8 is provided.

XI. For joint 1

N = -16,8 т– element under compression;

$$\lambda_{xoz} = \frac{300}{6,2} = 53;$$
$$\lambda_{xoy} = \frac{300}{6,2} = 53;$$
$$\bar{\lambda} = 53\sqrt{\frac{3,35}{2100}} = 2,1;$$
$$\delta = 9,87(1 - 0,03 + 0,06 * 2,1) + 2,1^2 = 15,3;$$
$$\varphi = \frac{0,5(15,3 - \sqrt{15,3^2 - 39,48 * 2,1^2})}{2,1^2} = 0,863;$$
$$\alpha = \frac{16,8}{0,863 * 36,8 * 2,1 * 1} = 0,5;$$
$$\lambda_{\text{мах}} = 180 - 60 * 0,5 = 150;$$
$$\frac{\lambda_{xoz}}{\lambda_{\text{мах}}} = \frac{53}{150} = 0,35 < 1;$$
$$\frac{\lambda_{xoy}}{\lambda_{\text{мах}}} = \frac{53}{150} = 0,35 < 1.$$

The stability of joint 1 is provided..

### 3.3. Strength calculation of members under compression (tension) and bending

The strength calculation of compressed-bending and tensed-bending members should be done according to formula:

$$\frac{N}{AR_y\gamma_c} + \frac{M_x}{c_x W_{x,min} R_y \gamma_c} \leq 1 \tag{3.9}$$

where $c_x$ – coefficient, assumed equal to 1,04 [table E.1, 1].

Example of the strength calculation of compressed-bending and tensed-bending members of the truss 24 m in length under the load corresponded to the III snow area:

a) For the top chord:

$$\frac{66,9}{36,8 * 3,35 * 1} + \frac{1,94}{1,04 * 179,4 * 3,35 * 1} = 0,54 \leq 1.$$

The strength of the top chord is provided.

b) For bottom chord:

$$\frac{65,7}{32,2 * 2,4 * 1} + \frac{0,04}{1,04 * 137,8 * 2,4 * 1} = 0,85 \leq 1.$$

The strength of the bottom chord is provided.

c) For diagonal member 1

For the strength calculation of the diagonal member 1 as the bending moment was assumed the half value of the bending moment in the 1.

$$\frac{24,9}{23 * 2,4 * 1} + \frac{0,448}{1,04 * 84,7 * 2,4 * 1} = 0,45 < 1.$$

The strength of the diagonal member 1 is provided.

d) For diagonal member 2

$$\frac{24,4}{23 * 2,4 * 1} + \frac{0}{1,04 * 84,7 * 2,4 * 1} = 0,44 < 1.$$

The strength of the diagonal member 2 is provided.

e) For diagonal member 3

$$\frac{16,7}{15,4 * 2,4 * 1} + \frac{0}{1,04 * 47,3 * 2,4 * 1} = 0,45 < 1.$$

The strength of the diagonal member 3 is provided.

f) For diagonal member 4

$$\frac{16,3}{15,4 * 2,4 * 1} + \frac{0}{1,04 * 47,3 * 2,4 * 1} = 0,44 < 1.$$

The strength of the diagonal member 4 is provided.

g) For diagonal member 5

$$\frac{9}{12,2 * 2,4 * 1} + \frac{0}{1,04 * 29,3 * 2,4 * 1} = 0,31 < 1.$$

The strength of the diagonal member 5 is provided.

h) For diagonal member 6

$$\frac{8,7}{12,2 * 2,4 * 1} + \frac{0}{1,04 * 29,3 * 2,4 * 1} = 0,30 < 1.$$

The strength of the diagonal member 6 is provided.

i) For diagonal member 7

$$\frac{1,8}{12,2 * 2,4 * 1} + \frac{0}{1,04 * 29,3 * 2,4 * 1} = 0,06 < 1.$$

The strength of the diagonal member 7 is provided.

j) For diagonal member 8

$$\frac{1,6}{12,2 * 2,4 * 1} + \frac{0}{1,04 * 29,3 * 2,4 * 1} = 0,05 < 1.$$

The strength of the diagonal member 8 is provided.

k) For joint 1

$$\frac{16,8}{36,8 * 3,35 * 1} + \frac{2,836}{1,04 * 179,4 * 3,35 * 1} = 0,14 < 1.$$

The strength of the joint 1 is provided.

### 3.4. Stability analysis of eccentrically-compressed members

The stability analysis of eccentrically-compressed uniform section members in the moment plane, coincided with the symmetry plane, should be done according to the formula:

$$\frac{N}{\varphi_e A R_y \gamma_c} \leq 1, \qquad (3.10)$$

where $\varphi_e$ – stability coefficient under compression and tension, determined according to SP16.13330.2011 depending on the conventional flexibility $\bar{\lambda}$ and the adjusted eccentricity ratio $m_{ef}$, calculated by the formula:

$$m_{ef} = \eta m, \qquad (3.10)$$

where $\eta$ – section shape influence coefficient, equal to 1 [1];

$m$– eccentricity ratio, equal to:

$$m = \frac{eA}{W_c}, \qquad (3.11)$$

где $e$ – eccentricity, calculated as:

$$e = \frac{M}{N}; \qquad (3.12)$$

$W_c$ – sectional modulus, calculated for the most compressed fibre.

Example of the stability analysis of eccentrically-compressed members of the truss 24 m in length under the load corresponding to the III snow area:

a) For top chord:

$$e = \frac{1{,}94 * 100}{66{,}9} = 2{,}9 \text{ см};$$

$$m = \frac{2{,}9 * 36{,}8}{179{,}4} = 0{,}59;$$

$$m_{ef} = 1 * 0{,}59 = 0{,}59;$$

$$\bar{\lambda} = 2{,}1;$$

$$\varphi_e = 0{,}61;$$

$$\frac{66{,}9}{0{,}61 * 36{,}8 * 3{,}35 * 1} = 0{,}88 \leq 1.$$

The stability of the top chord is provided.

b) For bottom chord:

$$e = \frac{0 * 100}{24{,}4} = 0 \text{ см};$$

$$m = \frac{0 * 23}{84{,}7} = 0;$$

$$m_{ef} = 1 * 0 = 0;$$

$$\bar{\lambda} = 1{,}8;$$

$$\varphi_e = 0{,}84;$$

$$\frac{24{,}4}{0{,}84 * 23 * 2{,}4 * 1} = 0{,}53 \leq 1.$$

The stability of the bottom chord is provided.

c) For diagonal member 1:

$$e = \frac{1{,}94 * 100}{66{,}9} = 2{,}9 \text{ см};$$
$$m = \frac{2{,}9 * 36{,}8}{179{,}4} = 0{,}59;$$
$$m_{ef} = 1 * 0{,}59 = 0{,}59;$$
$$\bar{\lambda} = 2{,}1;$$
$$\varphi_e = 0{,}61;$$
$$\frac{66{,}9}{0{,}61 * 36{,}8 * 3{,}35 * 1} = 0{,}88 \leq 1.$$

The stability of the diagonal member 1 is provided.

d) For diagonal member 2:

$$e = \frac{0 * 100}{24{,}4} = 0 \text{ см};$$
$$m = \frac{0 * 23}{84{,}7} = 0;$$
$$m_{ef} = 1 * 0 = 0;$$
$$\bar{\lambda} = 1{,}8;$$
$$\varphi_e = 0{,}84;$$
$$\frac{24{,}4}{0{,}84 * 23 * 2{,}4 * 1} = 0{,}53 \leq 1.$$

The stability of the diagonal member 2 is provided.

e) For diagonal member 4:

$$e = \frac{0 * 100}{16{,}3} = 0 \text{ см};$$
$$m = \frac{0 * 15{,}4}{47{,}3} = 0;$$
$$m_{ef} = 1 * 0 = 0;$$
$$\bar{\lambda} = 2{,}2;$$
$$\varphi_e = 0{,}78;$$
$$\frac{16{,}3}{0{,}78 * 15{,}4 * 2{,}4 * 1} = 0{,}56 \leq 1.$$

The stability of the diagonal member 4 is provided.

f) For diagonal member 6:

$$e = \frac{0 * 100}{8{,}7} = 0 \text{ см};$$
$$m = \frac{0 * 12{,}2}{29{,}3} = 0;$$

$$m_{ef} = 1 * 0 = 0;$$
$$\bar{\lambda} = 2{,}8;$$
$$\varphi_e = 0{,}69;$$
$$\frac{8{,}7}{0{,}69 * 12{,}2 * 2{,}4 * 1} = 0{,}43 \leq 1.$$

The stability of the diagonal member 6 is provided.

g) For diagonal member 8:

$$e = \frac{0 * 100}{1{,}6} = 0 \text{ см};$$
$$m = \frac{0 * 12{,}2}{29{,}3} = 0;$$
$$m_{ef} = 1 * 0 = 0;$$
$$\bar{\lambda} = 2{,}9;$$
$$\varphi_e = 0{,}68;$$
$$\frac{1{,}6}{0{,}68 * 12{,}2 * 2{,}4 * 1} = 0{,}08 \leq 1.$$

The stability of the diagonal member 8 is provided.

h) For joint 1:

$$e = \frac{2{,}836 * 100}{16{,}8} = 16{,}88 \text{ см};$$
$$m = \frac{16{,}88 * 36{,}8}{179{,}4} = 3{,}46;$$
$$m_{ef} = 1 * 3{,}46 = 3{,}46;$$
$$\bar{\lambda} = 2{,}1;$$
$$\varphi_e = 0{,}28;$$
$$\frac{16{,}8}{0{,}28 * 36{,}8 * 2{,}4 * 1} = 0{,}48 \leq 1.$$

The stability of joint 1 is provided.

# 4. INSPECTION OF THE CONNECTION OF TRUSS MEMBERS TO CHORDS

The connections of truss elements to chords according to SP16.13330.2011 should be examined:

- The load bearing capacity of the chord’s web, to which the truss member is connected;

- The load bearing capacity of the truss member near its connection to the chord;

- The strength of the weld joint.

The results of the inspection of standartized truss connections are shown in Appendix C.

In the formulas given below are denoted:

N – jointing element's stresses, t;

M – the jointing element's bending moment in truss plane in the chord web section, t*cm;

F – axial force in the chord on the part of the tensioned member, t;

A – chord's cross section area, $cm^2$;

$R_y$ – chord's web design resistance, $t/cm^2$;

t – chord's web thickness, cm;

α – member and cord's contact angle, angle degree;

$A_d$ – member's cross section area, $cm^2$;

$t_d$ - member's web thickness, cm;

$R_{yd}$ – member's web design resistance, $t/cm^2$.

### 4.1. Capacity calculation of web

1) In case of one side connection to the chord of two or more members with unlike sign stresses (see Figure 4.1, a, b) and of one element in the heel joint (see Figure 4.1, c) when d/D≤0,9 and g/b≤0,25, the web's load bearing capacity should be checked for every connected element according to formula:

$$\left(N + \frac{1{,}5M}{d_b}\right)\frac{(0{,}4 + 1{,}8g/b)f\sin\alpha}{\gamma_c\gamma_d\gamma_D R_y t^2(b + g + \sqrt{2Df})} \le 1 \quad , \qquad (4.1)$$

where $\gamma_d$ – influence coefficient of the connected element's stress sign, assumed equal 1,2 under tension and 1,0 in other cases;

$\gamma_D$ – influence coefficient of the chord's axial force, determinated under compression in the chord as:

a) if $|F|/(AR_y) >$ 0,5, by formula:

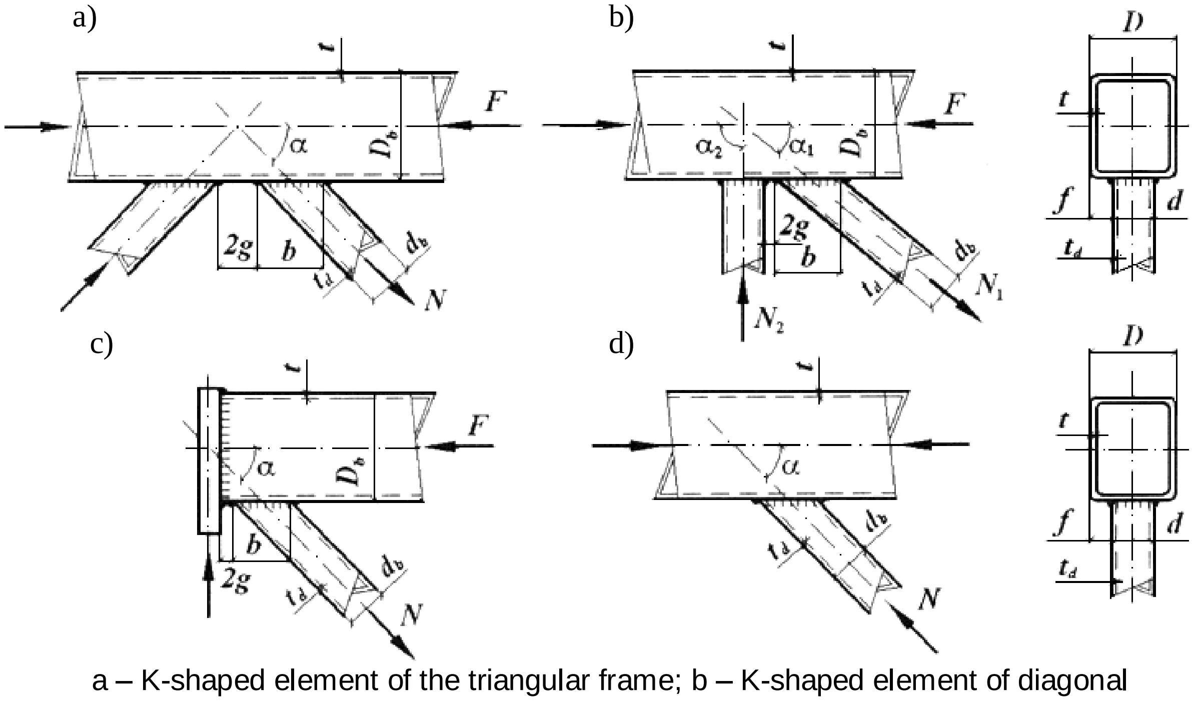
$$\gamma_D = 1{,}5 - |F|/(AR_y), \tag{4.2}$$

b) in other cases $\gamma_D =$ 1,0;

d – length of the intersecting line of the connected member to the chord's axis direction, equal to $d_b / \sin\alpha$;

g – half distance between mutual webs of neighbouring members or between member's cross web and knife edge;

$$f = (D - d)/2. \tag{4.3}$$




a – K-shaped element of the triangular frame; b – K-shaped element of diagonal member; c – support element; d – Y-shaped element

Figure 4.1. Joints of trusses made of roll-welded pipes

2) Chord's web bearing capacity in Y-shaped joints (see Figure 4.1, d) and in the joints indicated in point 1) when $g/b >$ 0,25 should be checked by formula:

$$\frac{(N + 1{,}7M/d_b) f \sin\alpha}{\gamma_c \gamma_d \gamma_D R_y t^2 (b + 2\sqrt{2Df})} \le 1. \tag{4.4}$$

3) Lateral web's bearing capacity in joint plane in the connection place of the compressed element when $d/D >$ 0,85 should be checked according to formula:

$$\frac{N \sin^2 \alpha}{2\gamma_C \gamma_t k R_y t d_b} \leq 1 \quad (4.5)$$

where $\gamma_t$ - influence coefficient of the web's thinness, assumed equal to 0,8 when , in other cases – 1,0;

$k$ - coefficient, assumed equal to:

- when $4(t/D_b)^2 - R_y/E \leq 0$ : $k = 3{,}6(t/D_b)^2 E/R_y$
- when $0 < 4(t/D_b)^2 - R_y/E < 6 \cdot 10^{-4}$ : $k = 0{,}9 + 670(t/D_b)^2 - 170R_y/E$
- in other cases $k =$ 1,0.

**4.1.1. Example of the web's capacity calculation in joint 1 of the truss 24 m in length under the load correspond to the III snow area:**

$$\frac{g}{b} = \frac{1}{17{,}9} = 0{,}08;$$

$$\frac{d}{D} = \frac{12}{16} = 0{,}75.$$

In joint 1 the connection of the diagonal member 1 to the top chord in the heel joint is observed (Figure 4.1, c), also the conditions $d/D \leq$ 0,9 и $g/b \leq$ 0,25 are satisfied, therefore it is calculated according to point 1).

$$M = eN = 3{,}6 * 25 = 89.64 \frac{\text{m}}{\text{cm}};$$

$$\gamma_c = 1{,}2;$$

$$\frac{|F|}{AR_y} = \frac{17}{36.8 * 3.35} = 0{,}1363 < 0{,}5,$$

$$\gamma_D = 1;$$

$$\text{b} = \frac{12}{\sin\left(\frac{42}{57.3}\right)} = 17{,}9 \text{ cm.}$$

The distance between mutual webs of neighbouring members or between member's cross web and knife edge was assumed equal to 20 mm:

$$\text{g} = \frac{2}{2} = 1 \text{ cm};$$

$$\text{f} = \frac{(16 - 12)}{2} = 2 \text{ cm.}$$

$$4*\left(\frac{t}{D_b}\right)^2-\frac{R_y}{E}=4*\left(\frac{0,6}{16}\right)^2-\frac{3,35}{2100}=0,004>86*10^{-6},$$

consequently, $k_{chord}=1$.

$$\left(25+\frac{1.5*89,64*25}{12}\right)*\frac{\left(0,4+1,8\frac{1}{17,9}\right)*2*\sin\left(\frac{42}{57,3}\right)}{1*1,2*1*3,35*0,6^2*(17,9+1+\sqrt{2*16*2}}=0,62<1.$$

Joint 1 passed the capacity inspection.

## 4.2. Load bearing capacity calculation of the truss member near its connection to the chord

The load bearing calculation of the truss member near its connection to the chord should be checked :

a) In the joints, indicated in point 1) by formula:

$$\frac{(N+0,5M/d_b)(1,4+0,018D/t)\sin\alpha}{\gamma_c\gamma_d kR_{yd}A_d}\leq 1 \quad , \qquad (4.6)$$

where $k$ should be determinated according to the point 3), but with the substitution of the chord's characteristics to the member's: $D_b$ to the bigger of $d$ or $d_b$, $t$ to $t_d$ and $R_y$ to $R_{yd}$.

b) In the joints, indicated in point 2) by formula:

$$\left(N+\frac{0,5M}{d_b}\right)\frac{[1+0,01(3+5d/D-0,1d_b/t_d)D/t]\sin\alpha}{\gamma_c\gamma_d kR_{yd}A_d}\leq 1 \quad . \qquad (4.7)$$

### 4.2.1. Example of the member's load bearing capacity calculation near its connection to the chord in joint 1 of the truss 24 m in length under the load correspond to the III snow area:

$$4*\left(\frac{t_d}{d_b}\right)^2-\frac{R_{yd}}{E}=4*\left(\frac{0,5}{12}\right)^2-\frac{2,4}{2100}=0,0058>86*10^{-6},$$

consequently, $k_{member}=1$.

$$\frac{\left(25+\frac{0,5*89,64}{12}\right)\left(1,4+0,018\frac{16}{0,6}\right)*sin\left(\frac{42}{57,3}\right)}{1*1,2*1*2,4*23}=0,54<1.$$

The load bearing capacity of the truss member near its connection to the chord in joint1 is enough to the required load accommodation.

### 4.3. Examination of the weld's strength

The strength of the welds, which connect truss members to chords, should be checked:

A. In the joints, indicated in point 1) by formula:

$$\left(N + \frac{0{,}5M}{d_b}\right)\frac{(1{,}06 + 0{,}014D/t]\sin\alpha}{\beta_f k_f \gamma_c R_{wf}(2d_b/\sin\alpha + d)} \le 1, \quad (4.8)$$

where $\beta_f$ - coefficient, assumed equal to 1 [table 39,1];

$k_f$ - weld leg, assumed according to the table 38 SP16.13330.2011depending on the thickness of the thickest welded element;

$R_{wf}$ - design resistance of the welded connection, assumed equal to 1,8 t/cm$^2$.

A. In the joints, indicated in point 2) by formula:

$$\left(N + \frac{0{,}5M}{d_b}\right)\frac{[1 + 0{,}01(3 + 5d/D - 0{,}1d_b/t_d)D/t]\sin\alpha}{4\beta_f k_f d_b \gamma_c R_{wf}} \le 1. \quad (4.9)$$

#### 4.3.1. Example of the strength examination of the welds, which connect truss members to chords in joint 1 of the truss 24 m in length under the load corresponding to the III snow area:

The thickest welded element has the thickness 0,6 cm, consequently the web leg was assumed equal to 0,5 cm.

The utilization factor in the weld's strength calculation is equal to:

$$\left(25 + \frac{0{,}5 * 89.64}{12}\right) * \frac{\left[1 + 0{,}01 * \left(3 + 5 * \frac{12}{16} - \frac{0{,}1*12}{0{,}5}\right) * \frac{16}{0{,}6}\right] * \sin\left(\frac{42}{57{,}3}\right)}{4 * 1 * 0{,}5 * 12 * 1 * 1{,}8} = 0{,}64 < 1.$$

The strength of the welds, which connects truss members of the joint 1 to the chord, is sufficient.

## 5. CALCULATION RESULTS

The result of the above considered calculations revealed that the elements of trusses 30 m in length under the loads corresponding to the III and IV snow areas, lose their stability and these constructions were excluded from the series.

### 5.1. A table for the selection of standardized-shape truss member's profiles

The results of standardized trusses' stability analysis and of the examination of connections of truss members to chords were the minimal required shapes of truss elements, which provide their stability and strength. The obtained data was collected in a table for easy selection of standardized-shape truss member's profiles depending on the required span and the applied load. The table for the selection of standardized-shape truss member's profiles can be found in Appendix D, table D.1.

### 5.2. A table for the determination of the standardized construction's adjusted weight per unit of cover area depending on applied load

After modelling of all the standardized trusses in accordance with the obtained standardized-shape truss member's profiles in the software TeklaStructures, the weight of every truss element was obtained. The full weight of every typical truss is shown in table D.1, Appendix D. For cost calculations of the constructions the company managers need to know the adjusted weight of used steel per unit of cover area, which is calculated according to paragraph 2.4.

The table for the determination of the standardized construction's adjusted weight per unit of cover area depending on applied load can be found in Appendix D, table D.3.

## 6. DRAWINGS OF THE SHIPMENT-SIZED SET OF DETAILS

Drawings of the shipment-sized set of details for 5 standardized constructions, of which the calculated typical trusses are composed, were created:

1) Truss TR021-2, length 12 м
2) Truss TR022-1, length 6 м
3) Truss TR023-1, length 9 м

4) Truss TR024-1, length 3 м

5) Truss TR025-1, length 10,5 м

The typical truss 18 m in length is composed of 2 standardized constructions TR023-1.
The typical truss 21 m in length is composed of 2 standardized constructions TR025-1.
The typical truss 24 m in length is composed of 2 standardized constructions TR021-2.
The typical truss 27 m in length is composed of 2 standardized constructions TR021-2 and 1 standardized construction TR024-1.
The typical truss 30 m in length is composed of 2 standardized constructions TR021-2 and 1 standardized construction TR022-1.

The drawings of shipment-sized set of details can be found in Appendix E.

## 7. CONCLUSION

In the course of the performed research 123 trusses with different characteristics were considered and the most optimal variant for further development was chosen.

The results of standardized trusses' stability analysis and of the examination of connections of truss members to chords were a table for the selection of standardized-shape truss member's profiles, a table for the determination of the standardized construction's adjusted weight per unit of cover area and drawings of shipment-sized set of details.

The performed work is an innovation in the area of truss production and designing for the company Ruukki, by means of which the company plans to decrease costs and to make the work of cost calculation and designing easier. Copies of the project were sent for evaluation to all the company's offices in Russia and to the factories in which the constructions will be produced. Preliminary positive comments were obtained.

In case of successful introduction of the considered project into the Russian market, the company plans further development of typical projects of roof structures based on trusses with smaller spans, with slope 10% and for a higher variety of applied loads.

Generally the introduction of innovative ideas and developments into the market is a difficult task due to the high bureaucratic barriers, the indisposition to change familiar activities, labor routine and to improve one's qualification for the exploitation of innovations in real life. The enormous responsibility for the developed construction's safety and its life time also play a critical part in the construction industry. Nevertheless, new technologies, successfully incorporated into the construction industry, give the possibility to increase construction's reliability, quality and life time, to make the production process faster and cheaper, and also to provide maximum comfort during the exploitation process. The company Ruukki understands the necessity of new technology development and expects high results after the exploitation beginning of the considered typical roof structure project.

At present the perfection of the standardized trusses' model is carried out before the beginning of its exploitation. The first object, projected with the application of the considered standardized trusses, is at the modeling stage. It should be the starting point for the beginning of the exploitation of the considered typical trusses in scaled-up production.

# REFERENCES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10. SNiP 2.09.03 “Industrial installations”

11. GOST 27579-88 “Rectangular formed-welded section roof trusses. Specifications”

12. GOST 27751-88 “Reliability of constructions and foundations. Principal rules of the calculations”

13. GOST 2591-2006 “Square hot-rolled steel bars. Dimensions”

# APPENDIX A

Table A.1. Maximum truss element's stress values for the constructional type B-1,8 under the loads corresponded to the II snow area

| | N, t | | | | | M, t*m | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Span length | **18** | **21** | **24** | **27** | **30** | **18** | **21** | **24** | **27** | **30** |
| **Top chord** | -29,3 | -40,3 | -52 | -66,3 | -81 | 1,49 | 1,49 | 1,50 | 1,50 | 1,51 |
| **Bottom chord** | 30,4 | 40,5 | 52,7 | 66,5 | 81,2 | 0,03 | 0,03 | 0,03 | 0,04 | 0,04 |
| **Diagonal element 1** | 13,7 | 16,4 | 19,4 | 22,3 | 25,3 | - | - | - | - | - |
| **Diagonal element 2** | -13,4 | -161 | -18,9 | -21,8 | -24,8 | - | - | - | - | - |
| **Diagonal element 3** | 7,7 | 10,3 | 13 | 15,8 | 18,6 | - | - | - | - | - |
| **Diagonal element 4** | -7,4 | -10 | -12,6 | -15,4 | -18,1 | - | - | - | - | - |
| **Diagonal element 5** | 2 | 4,4 | 7 | 9,6 | 12,2 | - | - | - | - | - |
| **Diagonal element 6** | -1,8 | -4,3 | -6,8 | -9,3 | -11,9 | - | - | - | - | - |
| **Diagonal element 7** | - | -0,3 | 1,4 | 3,9 | 6,3 | - | - | - | - | - |
| **Diagonal element 8** | - | - | -1,3 | -3,7 | -6 | - | - | - | - | - |
| **Diagonal element 9** | - | - | - | -0,3 | 0,7 | - | - | - | - | - |
| **Diagonal element 10** | - | - | - | - | -0,5 | - | - | - | - | - |
| **Vertical** | - | 0,21 | - | 0,7 | - | - | - | - | - | - |

Table A.2. Maximum truss element's stress values for the constructional type B-1,8 under the loads corresponded to the III snow area

| | N, t | | | | | M, t*m | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Span length | **18** | **21** | **24** | **27** | **30** | **18** | **21** | **24** | **27** | **30** |
| **Top chord** | -37,7 | -52,5 | -66,9 | -86,2 | -103,0 | 1,94 | 1,95 | 1,94 | 1,96 | 1,96 |
| **Bottom chord** | 39,2 | 52,6 | 65,7 | 86,4 | 103,4 | 0,03 | 0,03 | 0,04 | 0,05 | 0,04 |
| **Diagonal element 1** | 17,7 | 21,4 | 24,9 | 29,0 | 32,2 | - | - | - | - | - |
| **Diagonal element 2** | -17,3 | -20,9 | -24,4 | -28,4 | -31,6 | - | - | - | - | - |
| **Diagonal element 3** | 9,9 | 13,3 | 16,7 | 20,4 | 23,6 | - | - | - | - | - |
| **Diagonal element 4** | -9,6 | -12,9 | -16,3 | -20,0 | -23,1 | - | - | - | - | - |
| **Diagonal element 5** | 2,6 | 5,7 | 9,0 | 12,5 | 15,5 | - | - | - | - | - |
| **Diagonal element 6** | -2,4 | -5,5 | -8,7 | -12,1 | -15,2 | - | - | - | - | - |
| **Diagonal element 7** | - | -0,3 | 1,8 | 5,0 | 8,0 | - | - | - | - | - |
| **Diagonal element 8** | - | - | -1,6 | 4,7 | -7,7 | - | - | - | - | - |
| **Diagonal element 9** | - | - | - | -0,4 | 0,9 | - | - | - | - | - |
| **Diagonal element 10** | - | - | - | - | -0,7 | - | - | - | - | - |
| **Vertical** | - | 0,3 | - | 0,8 | - | - | - | - | - | - |

Table A.3. Maximum truss element's stress values for the constructional type B-1,8 under the loads corresponded to the IV snow area

| | N, t | | | | | M, t*m | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Span length | **18** | **21** | **24** | **27** | **30** | **18** | **21** | **24** | **27** | **30** |
| **Top chord** | -46,6 | -63,3 | -83,4 | -105,8 | -127,9 | 2,41 | 2,41 | 2,42 | 2,42 | 2,42 |
| **Bottom chord** | 48,4 | 63,3 | 84,6 | 106 | 128,3 | 0,03 | 0,04 | 0,05 | 0,05 | 0,05 |
| **Diagonal element 1** | 21,9 | 25,9 | 31 | 35,6 | 40 | - | - | - | - | - |
| **Diagonal element 2** | -21,4 | -25,5 | -30,4 | -34,8 | -39,2 | - | - | - | - | - |
| **Diagonal element 3** | 12,2 | 16,2 | 20,8 | 25,1 | 29,3 | - | - | - | - | - |
| **Diagonal element 4** | -11,9 | -15,7 | -20,3 | -24,5 | -28,6 | - | - | - | - | - |
| **Diagonal element 5** | 3,2 | 6,9 | 11,2 | 15,3 | 19,3 | - | - | - | - | - |
| **Diagonal element 6** | -3 | -6,6 | -10,9 | -14,9 | -18,8 | - | - | - | - | - |
| **Diagonal element 7** | - | -0,14 | 2,3 | 6,1 | 9,9 | - | - | - | - | - |
| **Diagonal element 8** | - | - | -2 | -5,8 | -9,6 | - | - | - | - | - |
| **Diagonal element 9** | - | - | - | -0,6 | 1,1 | - | - | - | - | - |
| **Diagonal element 10** | - | - | - | - | -0,9 | - | - | - | - | - |
| **Vertical** | - | 0,13 | - | 1 | - | - | - | - | - | - |

Table A.4. Axial forces in top chords of the constructional type B-1,8

| Span length | **18** | **21** | **24** | **27** | **30** |
|---|---|---|---|---|---|
| Number of section | Axial force, t | | | | |
| **II snow area** | | | | | |
| **1** | -9,3 | -11,2 | -13,1 | -15,1 | -17,1 |
| **2** | -23,2 | -28,7 | -34,1 | -39,8 | -45,6 |
| **3** | -29,3 | -38,1 | -46,8 | -56 | -65,3 |
| **4** | - | -41 | -52 | -64,3 | -76,8 |
| **5** | - | - | - | -66,3 | -81 |
| **III snow area** | | | | | |
| **1** | -12,0 | -14,4 | -16,8 | -19,6 | -21,7 |
| **2** | -29,9 | -36,9 | -43,9 | -51,8 | -58,1 |
| **3** | -37,7 | -49,0 | -60,2 | -72,7 | -83,0 |
| **4** | 0,0 | -52,5 | -66,9 | -83,6 | -97,7 |
| **5** | 0,0 | 0,0 | 0,0 | -86,2 | -103,0 |
| **IV snow area** | | | | | |
| **1** | -14,8 | -17,6 | -20,9 | -24 | -27 |
| **2** | -36,9 | -45 | -54,7 | -63,5 | -72,1 |
| **3** | -46,6 | -60 | -75,1 | -89,2 | -103,1 |
| **4** | 0 | -63,9 | -83,4 | -102,5 | -121,3 |
| **5** | 0 | 0 | 0 | -105,8 | -127,9 |

Table A.5. Axial forces in bottom chords of the constructional type B-1,8

| Span length | **18** | **21** | **24** | **27** | **30** |
|---|---|---|---|---|---|
| Number of section | Axial force, t | | | | |
| **II snow area** | | | | | |
| **1** | 18,1 | 21,8 | 25,5 | 29,4 | 33,4 |
| **2** | 27,9 | 35,1 | 42,2 | 49,7 | 57,3 |
| **3** | 30,4 | 40,7 | 51,1 | 61,8 | 72,7 |
| **4** | - | - | 52,7 | 66,5 | 80,3 |
| **5** | - | - | - | - | 81,2 |
| **III snow area** | | | | | |
| **1** | 23,3 | 28,1 | 32,8 | 38,2 | 42,5 |
| **2** | 36,0 | 45,2 | 54,3 | 64,6 | 72,9 |
| **3** | 39,2 | 52,6 | 65,7 | 80,3 | 92,6 |
| **4** | - | - | 67,8 | 86,4 | 102,4 |
| **5** | - | - | - | - | 103,4 |
| **IV snow area** | | | | | |
| **1** | 28,8 | 34,3 | 40,9 | 46,9 | 52,7 |
| **2** | 44,5 | 55,1 | 67,7 | 79,2 | 90,5 |
| **3** | 48,4 | 63,7 | 81,9 | 98,6 | 114,9 |
| **4** | - | - | 84,6 | 106 | 127,1 |
| **5** | - | - | - | - | 128,3 |

Table A.6. Maximum stresses, appeared in the joint 1 of the constructional type B-1,8

| Snow area | **II** | **III** | **IV** | **II** | **III** | **IV** |
|---|---|---|---|---|---|---|
| Span length | N, t | | | M, t*m | | |
| **18** | -9,3 | -12 | -14,8 | 1,983 | 2,577 | 3,198 |
| **21** | -11,2 | -14,4 | -17,6 | 2,080 | 2,720 | 3,342 |
| **24** | -13,1 | -16,8 | -20,9 | 2,198 | 2,836 | 3,536 |
| **27** | -15,1 | -19,6 | -24 | 2,303 | 3,004 | 3,702 |
| **30** | -17,1 | -21,7 | -27 | 2,421 | 3,119 | 3,860 |

# APPENDIX B

Table B.1. Element’s stability analysis of trusses 18 m in length under loads corresponded to the II snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X5.0 | -29,3 | 1,49 | 300 | 300 | 3,35 | 0,52 | 1,03 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 159 | 0,28 | 0,53 | 0,33 | 0,33 | **0,53** |
| Bottom chord | Profile(sq.)140X140X5.0 | 30,4 | 0,03 | 300 | 900 | 2,4 | | 0,02 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,1 | 400 | 0,46 | | 0,15 | 0,45 | **0,46** |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 13,7 | 0,25 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,24 | | 0,13 | 0,13 | **0,24** |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -13,4 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 163 | 0,24 | 0,28 | 0,33 | 0,33 | **0,33** |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 7,7 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,20 | | 0,16 | 0,16 | **0,20** |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -7,4 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 165 | 0,20 | 0,25 | 0,39 | 0,39 | **0,39** |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 2,0 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,07 | | 0,21 | 0,21 | **0,21** |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -1,8 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,9 | 174 | 0,06 | 0,09 | 0,48 | 0,48 | **0,48** |
| Joint | Profile(sq.)160X160X5.0 | -9,3 | 1,98 | 300 | 300 | 3,35 | 0,24 | 4,31 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 173 | 0,09 | 0,36 | 0,30 | 0,30 | **0,36** |

Table B.2. Element’s stability analysis of trusses 18 m in length under loads corresponded to the III snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X5.0 | -38,0 | 1,95 | 300 | 300 | 3,35 | 0,52 | 1,04 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 153 | 0,36 | 0,69 | 0,34 | 0,34 | **0,69** |
| Bottom chord | Profile(sq.)140X140X5.0 | 39,4 | 0,03 | 300 | 900 | 2,4 | | 0,02 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,1 | 400 | 0,60 | | 0,15 | 0,45 | **0,60** |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 17,8 | 0,32 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,32 | | 0,13 | 0,13 | **0,32** |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -17,4 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 158 | 0,31 | 0,37 | 0,34 | 0,34 | **0,37** |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 10,0 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,26 | | 0,16 | 0,16 | **0,26** |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -9,7 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 160 | 0,26 | 0,33 | 0,41 | 0,41 | **0,41** |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 2,6 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,09 | | 0,21 | 0,21 | **0,21** |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -2,4 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,9 | 173 | 0,08 | 0,12 | 0,49 | 0,49 | **0,49** |
| Joint 1 | Profile(sq.)160X160X5.0 | -12,1 | 2,59 | 300 | 300 | 3,35 | 0,24 | 4,35 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 171 | 0,12 | 0,47 | 0,31 | 0,31 | **0,47** |

Table B.3. Element's stability analysis of trusses 18 m in length under loads corresponded to the IV snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member's stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | t/cm$^2$ | | | cm$^4$ | cm$^2$ | cm$^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X5.0 | -46,6 | 2,41 | 300 | 300 | 3,35 | 0,51 | 1,05 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 147 | 0,44 | 0,85 | 0,36 | 0,36 | 0,85 |
| Bottom chord | Profile(sq.)140X140X5.0 | 48,4 | 0,03 | 300 | 900 | 2,4 | | 0,01 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,1 | 400 | 0,73 | | 0,15 | 0,45 | 0,73 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 21,9 | 0,39 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,39 | | 0,13 | 0,13 | 0,39 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -21,4 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 153 | 0,38 | 0,45 | 0,35 | 0,35 | 0,45 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 12,2 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,32 | | 0,16 | 0,16 | 0,32 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -11,9 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 156 | 0,32 | 0,40 | 0,42 | 0,42 | 0,42 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 3,2 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,11 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -3,0 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,9 | 171 | 0,10 | 0,15 | 0,49 | 0,49 | 0,49 |
| Joint 1 | Profile(sq.)160X160X5.0 | -14,8 | 3,20 | 300 | 300 | 3,35 | 0,24 | 4,37 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 170 | 0,15 | 0,58 | 0,31 | 0,31 | 0,58 |

Table B.4. Element's stability analysis of trusses 21 m in length under loads corresponded to the II snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member's stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | t/cm$^2$ | | | cm$^4$ | cm$^2$ | cm$^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X5.0 | -40,3 | 1,49 | 300 | 300 | 3,35 | 0,58 | 0,75 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 151 | 0,39 | 0,68 | 0,35 | 0,35 | 0,68 |
| Bottom chord | Profile(sq.)140X140X5.0 | 40,5 | 0,03 | 300 | 900 | 2,4 | | 0,02 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,0 | 400 | 0,63 | | 0,15 | 0,45 | 0,63 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 16,4 | 0,30 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,30 | | 0,13 | 0,13 | 0,30 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -161 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | -28 | 2,92 | 3,48 | -1,87 | -1,87 | 3,48 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 10,3 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,28 | | 0,16 | 0,16 | 0,28 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -10,0 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 159 | 0,27 | 0,35 | 0,41 | 0,41 | 0,41 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 4,4 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,15 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -4,3 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 167 | 0,15 | 0,21 | 0,50 | 0,50 | 0,50 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | -0,3 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 179 | 0,01 | 0,01 | 0,47 | 0,47 | 0,47 |
| Vertical | Profile(sq.)80X80X4.0 | 0,2 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,01 | | 0,21 | 0,21 | 0,21 |
| Joint 1 | Profile(sq.)160X160X5.0 | -11,2 | 2,08 | 300 | 300 | 3,35 | 0,27 | 3,76 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 172 | 0,11 | 0,41 | 0,31 | 0,31 | 0,41 |

Table B.5. Element’s stability analysis of trusses 21 m in length under loads corresponded to the III snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stabitily analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X5.0 | -52,5 | 1,95 | 300 | 300 | 3,35 | 0,58 | 0,75 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 142 | 0,51 | 0,89 | 0,37 | 0,37 | 0,89 |
| Bottom chord | Profile(sq.)140X140X5.0 | 52,6 | 0,03 | 300 | 900 | 2,4 | | 0,01 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,0 | 400 | 0,81 | | 0,15 | 0,45 | 0,81 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 21,4 | 0,39 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,39 | | 0,13 | 0,13 | 0,39 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -20,9 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 153 | 0,38 | 0,45 | 0,35 | 0,35 | 0,45 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 13,3 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,36 | | 0,16 | 0,16 | 0,36 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -12,9 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 153 | 0,35 | 0,45 | 0,42 | 0,42 | 0,45 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 5,7 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,20 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -5,5 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 163 | 0,19 | 0,27 | 0,52 | 0,52 | 0,52 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | -0,3 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 179 | 0,01 | 0,01 | 0,47 | 0,47 | 0,47 |
| Vertical | Profile(sq.)80X80X4.0 | 0,3 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,01 | | 0,21 | 0,21 | 0,21 |
| Joint 1 | Profile(sq.)160X160X5.0 | -14,4 | 2,72 | 300 | 300 | 3,35 | 0,27 | 3,82 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 170 | 0,15 | 0,53 | 0,31 | 0,31 | 0,53 |

Table B.6. Element’s stability analysis of trusses 21 m in length under loads corresponded to the IV snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stabitily analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X6.0 | -63,3 | 2,41 | 300 | 300 | 3,35 | 0,57 | 0,78 | 1435,1 | 36,8 | 179,4 | 53 | 53 | 2,1 | 142 | 0,51 | 0,91 | 0,37 | 0,37 | 0,91 |
| Bottom chord | Profile(sq.)140X140X5.0 | 63,3 | 0,04 | 300 | 900 | 2,4 | | 0,01 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,0 | 400 | 0,98 | | 0,15 | 0,45 | 0,98 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 25,9 | 0,47 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,47 | | 0,13 | 0,13 | 0,47 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -25,5 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 147 | 0,46 | 0,55 | 0,36 | 0,36 | 0,55 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 16,2 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,44 | | 0,16 | 0,16 | 0,44 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -15,7 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 147 | 0,43 | 0,54 | 0,44 | 0,44 | 0,54 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 6,9 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,24 | | 0,21 | 0,21 | 0,24 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -6,6 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 159 | 0,23 | 0,33 | 0,53 | 0,53 | 0,53 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | -0,14 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 180 | 0,00 | 0,01 | 0,47 | 0,47 | 0,47 |
| Vertical | Profile(sq.)80X80X4.0 | 0,13 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,00 | | 0,21 | 0,21 | 0,21 |
| Joint 1 | Profile(sq.)160X160X6.0 | -17,6 | 3,34 | 300 | 300 | 3,35 | 0,26 | 3,90 | 1435,1 | 36,8 | 179,4 | 53 | 53 | 2,1 | 169 | 0,15 | 0,55 | 0,31 | 0,31 | 0,55 |

Table B.7. Element's stability analysis of trusses 24 m in length under loads corresponded to the II snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member's stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | t/cm$^2$ | | | cm$^4$ | cm$^2$ | cm$^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X5.0 | -52,0 | 1,50 | 300 | 300 | 3,35 | 0,62 | 0,58 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 142 | 0,51 | 0,82 | 0,37 | 0,37 | 0,82 |
| Bottom chord | Profile(sq.)140X140X5.0 | 52,7 | 0,03 | 300 | 900 | 2,4 | | 0,01 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,0 | 400 | 0,82 | | 0,15 | 0,45 | 0,82 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 19,4 | 0,35 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,35 | | 0,13 | 0,13 | 0,35 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -18,9 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 156 | 0,34 | 0,41 | 0,34 | 0,34 | 0,41 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 13,0 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,35 | | 0,16 | 0,16 | 0,35 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -12,6 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 154 | 0,34 | 0,44 | 0,42 | 0,42 | 0,44 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 7,0 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,24 | | 0,21 | 0,21 | 0,24 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -6,8 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 159 | 0,23 | 0,34 | 0,53 | 0,53 | 0,53 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 1,4 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,05 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | -1,3 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 176 | 0,04 | 0,07 | 0,49 | 0,49 | 0,49 |
| Joint 1 | Profile(sq.)160X160X5.0 | -13,1 | 2,20 | 300 | 300 | 3,35 | 0,29 | 3,39 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 171 | 0,13 | 0,44 | 0,31 | 0,31 | 0,44 |

Table B.8. Element's stability analysis of trusses 24 m in length under loads corresponded to the III snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member's stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | t/cm$^2$ | | | cm$^4$ | cm$^2$ | cm$^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X6.0 | -66,9 | 1,94 | 300 | 300 | 3,35 | 0,61 | 0,59 | 1435,1 | 36,8 | 179,4 | 53 | 53 | 2,1 | 139 | 0,54 | 0,88 | 0,38 | 0,38 | 0,88 |
| Bottom chord | Profile(sq.)140X140X6.0 | 65,7 | 0,04 | 300 | 900 | 2,4 | | 0,01 | 964,3 | 32,2 | 137,8 | 60 | 181 | 2,0 | 400 | 0,85 | | 0,15 | 0,45 | 0,85 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 24,9 | 0,45 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,45 | | 0,13 | 0,13 | 0,45 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -24,4 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 148 | 0,44 | 0,53 | 0,36 | 0,36 | 0,53 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 16,7 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,45 | | 0,16 | 0,16 | 0,45 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -16,3 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 146 | 0,44 | 0,56 | 0,45 | 0,45 | 0,56 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 9,0 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,31 | | 0,21 | 0,21 | 0,31 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -8,7 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 153 | 0,30 | 0,43 | 0,55 | 0,55 | 0,55 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 1,8 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,06 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | -1,6 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 175 | 0,05 | 0,08 | 0,49 | 0,49 | 0,49 |
| Joint 1 | Profile(sq.)160X160X6.0 | -16,8 | 2,84 | 300 | 300 | 3,35 | 0,28 | 3,46 | 1435,1 | 36,8 | 179,4 | 53 | 53 | 2,1 | 170 | 0,14 | 0,48 | 0,31 | 0,31 | 0,48 |

Table B.9. Element’s stability analysis of trusses 24 m in length under loads corresponded to the IV snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | t/cm$^2$ | | | cm$^4$ | cm$^2$ | cm$^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X7.0 | -83,4 | 2,42 | 300 | 300 | 3,35 | 0,61 | 0,61 | 1640,8 | 42,8 | 205,1 | 53 | 53 | 2,1 | 136 | 0,58 | 0,96 | 0,39 | 0,39 | 0,96 |
| Bottom chord | Profile(sq.)140X140X5.0 | 84,6 | 0,05 | 300 | 900 | 3,35 | | 0,01 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,4 | 400 | 0,94 | | 0,15 | 0,45 | 0,94 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 31,0 | 0,56 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,56 | | 0,13 | 0,13 | 0,56 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -30,4 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 141 | 0,55 | 0,66 | 0,38 | 0,38 | 0,66 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 20,8 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,56 | | 0,16 | 0,16 | 0,56 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -20,3 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 138 | 0,55 | 0,70 | 0,47 | 0,47 | 0,70 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 11,2 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,38 | | 0,21 | 0,21 | 0,38 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -10,9 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 146 | 0,37 | 0,54 | 0,57 | 0,57 | 0,57 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 2,3 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,08 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | -2,0 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 174 | 0,07 | 0,10 | 0,49 | 0,49 | 0,49 |
| Joint 1 | Profile(sq.)160X160X7.0 | -20,9 | 3,54 | 300 | 300 | 3,35 | 0,28 | 3,53 | 1640,8 | 42,8 | 205,1 | 53 | 53 | 2,1 | 169 | 0,15 | 0,52 | 0,32 | 0,32 | 0,52 |

Table B.10. Element’s stability analysis of trusses 27 m in length under loads corresponded to the II snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | t/cm$^2$ | | | cm$^4$ | cm$^2$ | cm$^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X5.0 | -66,3 | 1,50 | 300 | 300 | 3,35 | 0,66 | 0,46 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 132 | 0,64 | 0,98 | 0,40 | 0,40 | 0,98 |
| Bottom chord | Profile(sq.)140X140X6.0 | 66,5 | 0,04 | 300 | 900 | 2,4 | | 0,01 | 964,3 | 32,2 | 137,8 | 60 | 181 | 2,0 | 400 | 0,86 | | 0,15 | 0,45 | 0,86 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 22,3 | 0,40 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,41 | | 0,13 | 0,13 | 0,41 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -21,8 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 152 | 0,39 | 0,47 | 0,35 | 0,35 | 0,47 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 15,8 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,43 | | 0,16 | 0,16 | 0,43 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -15,4 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 148 | 0,42 | 0,53 | 0,44 | 0,44 | 0,53 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 9,6 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,33 | | 0,21 | 0,21 | 0,33 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -9,3 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 151 | 0,32 | 0,46 | 0,56 | 0,56 | 0,56 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 3,9 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,13 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | -3,7 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 168 | 0,13 | 0,19 | 0,51 | 0,51 | 0,51 |
| Diagonal member 9 | Profile(sq.)80X80X4.0 | -0,3 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 179 | 0,01 | 0,02 | 0,48 | 0,48 | 0,48 |
| Vertical | Profile(sq.)80X80X4.0 | 0,7 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,02 | | 0,21 | 0,21 | 0,21 |
| Joint 1 | Profile(sq.)160X160X5.0 | -15,1 | 2,30 | 300 | 300 | 3,35 | 0,30 | 3,08 | 1214,6 | 30,7 | 151,8 | 52 | 52 | 2,1 | 169 | 0,15 | 0,48 | 0,31 | 0,31 | 0,48 |

Table B.11. Element’s stability analysis of trusses 27 m in length under loads corresponded to the III snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X7.0 | -86,2 | 1,96 | 300 | 300 | 3,35 | 0,64 | 0,47 | 1640,8 | 42,8 | 205,1 | 53 | 53 | 2,1 | 135 | 0,60 | 0,93 | 0,39 | 0,39 | 0,93 |
| Bottom chord | Profile(sq.)140X140X5.0 | 86,4 | 0,05 | 300 | 900 | 3,35 | | 0,01 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,4 | 400 | 0,96 | | 0,15 | 0,45 | 0,96 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 29,0 | 0,52 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,53 | | 0,13 | 0,13 | 0,53 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -28,4 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 143 | 0,51 | 0,61 | 0,37 | 0,37 | 0,61 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 20,4 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,55 | | 0,16 | 0,16 | 0,55 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -20 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 138 | 0,54 | 0,69 | 0,47 | 0,47 | 0,69 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 12,5 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,43 | | 0,21 | 0,21 | 0,43 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -12,1 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 142 | 0,41 | 0,60 | 0,59 | 0,59 | 0,60 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 5,0 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,17 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | 4,7 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,16 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 9 | Profile(sq.)80X80X4.0 | -0,4 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 179 | 0,01 | 0,02 | 0,48 | 0,48 | 0,48 |
| Vertical | Profile(sq.)80X80X4.0 | 0,8 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,03 | | 0,21 | 0,21 | 0,21 |
| Joint 1 | Profile(sq.)160X160X7.0 | -19,6 | 3,00 | 300 | 300 | 3,35 | 0,30 | 3,20 | 1640,8 | 42,8 | 205,1 | 53 | 53 | 2,1 | 170 | 0,14 | 0,46 | 0,31 | 0,31 | 0,46 |

Table B.12. Element’s stability analysis of trusses 27 m in length under loads corresponded to the IV snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X8.0 | -105,8 | 2,42 | 300 | 300 | 3,35 | 0,64 | 0,49 | 1836,9 | 48,7 | 229,6 | 54 | 54 | 2,1 | 131 | 0,65 | 1,01 | 0,41 | 0,41 | 1,01 |
| Bottom chord | Profile(sq.)140X140X6.0 | 106,0 | 0,05 | 300 | 900 | 3,35 | | 0,01 | 964,3 | 32,2 | 137,8 | 60 | 181 | 2,4 | 400 | 0,98 | | 0,15 | 0,45 | 0,98 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 35,6 | 0,64 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,65 | | 0,13 | 0,13 | 0,65 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -34,8 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 135 | 0,63 | 0,75 | 0,39 | 0,39 | 0,75 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 25,1 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,68 | | 0,16 | 0,16 | 0,68 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -24,5 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 129 | 0,66 | 0,85 | 0,50 | 0,50 | 0,85 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 15,3 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,52 | | 0,21 | 0,21 | 0,52 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -14,9 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 134 | 0,51 | 0,74 | 0,63 | 0,63 | 0,74 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 6,1 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,21 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | -5,8 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 162 | 0,20 | 0,29 | 0,53 | 0,53 | 0,53 |
| Diagonal member 9 | Profile(sq.)80X80X4.0 | -0,6 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 178 | 0,02 | 0,03 | 0,48 | 0,48 | 0,48 |
| Vertical | Profile(sq.)80X80X4.0 | 1,0 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,03 | | 0,21 | 0,21 | 0,21 |
| Joint 1 | Profile(sq.)160X160X8.0 | -24 | 3,70 | 300 | 300 | 3,35 | 0,29 | 3,27 | 1836,9 | 48,7 | 229,6 | 54 | 54 | 2,1 | 169 | 0,15 | 0,50 | 0,32 | 0,32 | 0,50 |

Table B.13. Element’s stability analysis of trusses 30 m in length under loads corresponded to the II snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member's stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X7.0 | -81,0 | 1,51 | 300 | 300 | 3,35 | 0,68 | 0,39 | 1640,8 | 42,8 | 205,1 | 53 | 53 | 2,1 | 138 | 0,56 | 0,84 | 0,39 | 0,39 | 0,84 |
| Bottom chord | Profile(sq.)140X140X5.0 | 81,2 | 0,04 | 300 | 900 | 3,35 | | 0,01 | 808,4 | 26,9 | 115,5 | 60 | 181 | 2,4 | 400 | 0,90 | | 0,15 | 0,45 | 0,90 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 25,3 | 0,46 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,46 | | 0,13 | 0,13 | 0,46 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -24,8 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 148 | 0,45 | 0,54 | 0,36 | 0,36 | 0,54 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 18,6 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,50 | | 0,16 | 0,16 | 0,50 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -18,1 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 142 | 0,49 | 0,63 | 0,46 | 0,46 | 0,63 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 12,2 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,42 | | 0,21 | 0,21 | 0,42 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -11,9 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 143 | 0,41 | 0,59 | 0,59 | 0,59 | 0,59 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 6,3 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,22 | | 0,21 | 0,21 | 0,22 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | -6,0 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 161 | 0,21 | 0,30 | 0,53 | 0,53 | 0,53 |
| Diagonal member 9 | Profile(sq.)80X80X4.0 | 0,7 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,02 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 10 | Profile(sq.)80X80X4.0 | -0,5 | 0 | 246 | 246 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 87 | 87 | 2,9 | 178 | 0,02 | 0,03 | 0,49 | 0,49 | 0,49 |
| Joint 1 | Profile(sq.)160X160X7.0 | -17,1 | 2,421 | 300 | 300 | 3,35 | 0,68 | 2,95 | 1640,8 | 42,8 | 205,1 | 53 | 53 | 2,1 | 150 | 0,12 | 0,18 | 0,36 | 0,36 | 0,36 |

Table B.14. Element’s stability analysis of trusses 30 m in length under loads corresponded to the III snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member's stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X8.0 | -103,0 | 1,96 | 300 | 300 | 3,35 | 0,67 | 0,40 | 1836,9 | 48,7 | 229,6 | 54 | 54 | 2,1 | 133 | 0,63 | 0,95 | 0,41 | 0,41 | 0,95 |
| Bottom chord | Profile(sq.)140X140X6.0 | 103,4 | 0,04 | 300 | 900 | 3,35 | | 0,01 | 964,3 | 32,2 | 137,8 | 60 | 181 | 2,4 | 400 | 0,96 | | 0,15 | 0,45 | 0,96 |
| Diagonal member 1 | Profile(sq.)120X120X6.0 | 32,2 | 0,58 | 223 | 223 | 2,4 | | 0,50 | 594,2 | 27,4 | 99,0 | 53 | 53 | 1,8 | 400 | 0,49 | | 0,13 | 0,13 | 0,49 |
| Diagonal member 2 | Profile(sq.)120X120X6.0 | -31,6 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 594,2 | 27,4 | 99,0 | 54 | 54 | 1,8 | 146 | 0,48 | 0,58 | 0,37 | 0,37 | 0,58 |
| Diagonal member 3 | Profile(sq.)100X100X5.0 | 23,6 | 0 | 227 | 227 | 2,4 | | 0,00 | 278,7 | 18,9 | 55,7 | 65 | 65 | 2,2 | 400 | 0,52 | | 0,16 | 0,16 | 0,52 |
| Diagonal member 4 | Profile(sq.)100X100X5.0 | -23,1 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 278,7 | 18,9 | 55,7 | 66 | 66 | 2,2 | 141 | 0,51 | 0,65 | 0,47 | 0,47 | 0,65 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 15,5 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,53 | | 0,21 | 0,21 | 0,53 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -15,2 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 133 | 0,52 | 0,75 | 0,63 | 0,63 | 0,75 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 8,0 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,27 | | 0,21 | 0,21 | 0,27 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | -7,7 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 156 | 0,26 | 0,39 | 0,55 | 0,55 | 0,55 |
| Diagonal member 9 | Profile(sq.)80X80X4.0 | 0,9 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,03 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 10 | Profile(sq.)80X80X4.0 | -0,7 | 0 | 246 | 246 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 87 | 87 | 2,9 | 178 | 0,02 | 0,04 | 0,49 | 0,49 | 0,49 |
| Joint 1 | Profile(sq.)160X160X8.0 | -21,7 | 3,119 | 300 | 300 | 3,35 | 0,30 | 3,05 | 1836,9 | 48,7 | 229,6 | 54 | 54 | 2,1 | 150 | 0,14 | 0,44 | 0,36 | 0,36 | 0,44 |

Table B.15. Element’s stability analysis of trusses 30 m in length under loads corresponded to the IV snow area

| Element | Profile | Axial force | Bending moment | Effective length in truss plan | Effective length out of truss plan | Strength resistance | Stability coefficient under compression and tension | Adjusted eccentricity ratio | Moment of inertia in truss plane | Area of section | Sectional modulus | Conventional flexibility in truss plane | Conventional flexibility out of truss plane | Conventional flexibility | Ultimate flexibility | Compression (tension) and bending use factor | Eccentrically-compressed member’s stability analysis use factor | Flexibility-in-plane use factor | Flexibility-out-of-plane use factor | **Max. coeff.** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | M | $l_{efxoz}$ | $l_{efxoy}$ | Ry | $\varphi_e$ | $m_{ef}$ | I | A | $W_c$ | $\lambda_{xoz}$ | $\lambda_{xoy}$ | $\lambda_{усл}$ | $\lambda_{мах}$ | | | | | |
| | | t | t*м | cm | cm | $t/cm^2$ | | | $cm^4$ | $cm^2$ | $cm^3$ | | | | | | | | | |
| Top chord | Profile(sq.)160X160X8.0 | -127,9 | 2,42 | 300 | 300 | 3,35 | 0,67 | 0,40 | 1836,9 | 48,7 | 229,6 | 54 | 54 | 2,1 | 121 | 0,78 | 1,17 | 0,44 | 0,44 | 1,17 |
| Bottom chord | Profile(sq.)140X140X6.0 | 128,3 | 0,05 | 300 | 900 | 3,35 | | 0,01 | 964,3 | 32,2 | 137,8 | 60 | 181 | 2,4 | 400 | 1,19 | | 0,15 | 0,45 | 1,19 |
| Diagonal member 1 | Profile(sq.)120X120X5.0 | 40,0 | 0,72 | 223 | 223 | 2,4 | | 0,49 | 507,9 | 23,0 | 84,7 | 52 | 52 | 1,8 | 400 | 0,73 | | 0,13 | 0,13 | 0,73 |
| Diagonal member 2 | Profile(sq.)120X120X5.0 | -39,2 | 0 | 227 | 227 | 2,4 | 0,84 | 0,00 | 507,9 | 23,0 | 84,7 | 53 | 53 | 1,8 | 129 | 0,71 | 0,85 | 0,41 | 0,41 | 0,85 |
| Diagonal member 3 | Profile(sq.)100X100X4.0 | 29,3 | 0 | 227 | 227 | 2,4 | | 0,00 | 236,3 | 15,4 | 47,3 | 64 | 64 | 2,2 | 400 | 0,79 | | 0,16 | 0,16 | 0,79 |
| Diagonal member 4 | Profile(sq.)100X100X4.0 | -28,6 | 0 | 232 | 232 | 2,4 | 0,78 | 0,00 | 236,3 | 15,4 | 47,3 | 65 | 65 | 2,2 | 121 | 0,78 | 0,99 | 0,54 | 0,54 | 0,99 |
| Diagonal member 5 | Profile(sq.)80X80X4.0 | 19,3 | 0 | 232 | 232 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 82 | 82 | 2,8 | 400 | 0,66 | | 0,21 | 0,21 | 0,66 |
| Diagonal member 6 | Profile(sq.)80X80X4.0 | -18,8 | 0 | 237 | 237 | 2,4 | 0,69 | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 122 | 0,64 | 0,93 | 0,69 | 0,69 | 0,93 |
| Diagonal member 7 | Profile(sq.)80X80X4.0 | 9,9 | 0 | 237 | 237 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 84 | 84 | 2,8 | 400 | 0,34 | | 0,21 | 0,21 | 0,34 |
| Diagonal member 8 | Profile(sq.)80X80X4.0 | -9,6 | 0 | 241 | 241 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 150 | 0,33 | 0,48 | 0,57 | 0,57 | 0,57 |
| Diagonal member 9 | Profile(sq.)80X80X4.0 | 1,1 | 0 | 241 | 241 | 2,4 | | 0,00 | 117,3 | 12,2 | 29,3 | 85 | 85 | 2,9 | 400 | 0,04 | | 0,21 | 0,21 | 0,21 |
| Diagonal member 10 | Profile(sq.)80X80X4.0 | -0,9 | 0 | 246 | 246 | 2,4 | 0,68 | 0,00 | 117,3 | 12,2 | 29,3 | 87 | 87 | 2,9 | 177 | 0,03 | 0,05 | 0,49 | 0,49 | 0,49 |
| Joint 1 | Profile(sq.)160X160X8.0 | -27 | 3,86 | 300 | 300 | 3,35 | 0,31 | 3,03 | 1836,9 | 48,7 | 229,6 | 54 | 54 | 2,1 | 150 | 0,17 | 0,54 | 0,36 | 0,36 | 0,54 |

# APPENDIX C

Table C.1. Inspection of the connections of truss members to chords for trusses 18 m in length under loads corresponded to the II snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 49,32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 14 | 14 | 13 | 13 | 8 | 8 | 7 | 7 | 2 | 2 | 2 | 2 |
| **F** | T | -9 | 18 | 18 | -9 | -23 | 18 | 28 | -23 | -29 | 28 | 30 | -29 |
| **$R_y$** | $T/cm^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **$D_b$** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| **$\alpha$** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| **$R_{yd}$** | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$\beta_f$** | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$R_{wf}$** | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\gamma d$ | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| $\gamma t$ | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| $k_f$ | cm | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,49 | 0,40 | 0,39 | 0,33 | 0,31 | 0,32 | 0,31 | 0,30 | 0,12 | 0,14 | 0,12 | 0,11 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,31 | 0,26 | 0,26 | 0,27 | 0,23 | 0,22 | 0,21 | 0,22 | 0,08 | 0,07 | 0,07 | 0,07 |
| **Strength analysis use factor of the weld joint** | | 0,46 | 0,39 | 0,38 | 0,39 | 0,27 | 0,26 | 0,25 | 0,26 | 0,09 | 0,08 | 0,08 | 0,08 |

Table C.2. Inspection of the connections of truss members to chords for trusses 18 m in length under loads corresponded to the III snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 63,72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 18 | 18 | 17 | 17 | 10 | 10 | 10 | 10 | 3 | 3 | 2 | 2 |
| **F** | T | -12 | 23 | 23 | -12 | -30 | 23 | 36 | -30 | -38 | 36 | 39 | -38 |
| $\mathbf{R_y}$ | $T/cm^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $\mathbf{D_b}$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| $\mathbf{R_{yd}}$ | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\mathbf{\beta_f}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\mathbf{R_{wf}}$ | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| γt | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| $k_f$ | cm | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,63 | 0,51 | 0,50 | 0,43 | 0,40 | 0,41 | 0,40 | 0,39 | 0,16 | 0,18 | 0,17 | 0,14 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,41 | 0,34 | 0,33 | 0,35 | 0,30 | 0,29 | 0,28 | 0,29 | 0,10 | 0,09 | 0,09 | 0,09 |
| **Strength analysis use factor of the weld joint** | | 0,60 | 0,50 | 0,49 | 0,51 | 0,35 | 0,33 | 0,32 | 0,34 | 0,11 | 0,11 | 0,10 | 0,11 |

Table C.3. Inspection of the connections of truss members to chords for trusses 18 m in length under loads corresponded to the IV snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 78,84 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 22 | 22 | 21 | 21 | 12 | 12 | 12 | 12 | 3 | 3 | 3 | 3 |
| **F** | T | -15 | 29 | 29 | -15 | -37 | 29 | 45 | -37 | -47 | 45 | 48 | -47 |
| $\mathbf{R_y}$ | T/cm$^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | T/cm$^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | cm$^2$ | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $\mathbf{D_b}$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| $\mathbf{R_{yd}}$ | T/cm$^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | cm$^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\boldsymbol{\beta_f}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\mathbf{R_{wf}}$ | T/cm$^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| γt | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| $k_f$ | cm | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,79 | 0,64 | 0,62 | 0,53 | 0,49 | 0,50 | 0,49 | 0,48 | 0,19 | 0,22 | 0,21 | 0,18 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,50 | 0,42 | 0,41 | 0,43 | 0,36 | 0,35 | 0,34 | 0,36 | 0,12 | 0,12 | 0,11 | 0,11 |
| **Strength analysis use factor of the weld joint** | | 0,74 | 0,62 | 0,60 | 0,63 | 0,43 | 0,41 | 0,40 | 0,42 | 0,14 | 0,14 | 0,13 | 0,13 |

Table C.4. Inspection of the connections of truss members to chords for trusses 21 m in length under loads corresponded to the II snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** | **CB** (рис. 4.1.г) | **CH** (рис. 4.1.б) | **7B (img. 4.1,a)** | **7T (img. 4.1,a)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 59,04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 16,4 | 16,4 | 161,0 | 161,0 | 10,3 | 10,3 | 10,0 | 10,0 | 4,4 | 4,4 | 4,3 | 4,3 | 0,2 | 0,2 | 0,3 | 0,3 |
| **F** | T | -11 | 22 | 22 | -11 | -29 | 22 | 35 | -29 | -38 | 35 | 41 | -38 | -41 | 41 | 41 | -41 |
| $R_y$ | T/cm$^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | T/cm$^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | cm$^2$ | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $D_b$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 90 | 90 | 42 | 42 |
| $R_{yd}$ | T/cm$^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | cm$^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\beta_f$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $R_{wf}$ | T/cm$^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 8,0 | 8,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 |
| γt | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| $k_f$ | cm | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,59 | 0,48 | 4,68 | 3,98 | 0,42 | 0,43 | 0,41 | 0,40 | 0,27 | 0,31 | 0,30 | 0,26 | 0,03 | 0,03 | 0,02 | 0,02 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,38 | 0,32 | 3,10 | 3,21 | 0,31 | 0,30 | 0,29 | 0,30 | 0,17 | 0,16 | 0,16 | 0,16 | 0,01 | 0,01 | 0,01 | 0,01 |
| **Strength analysis use factor of the weld joint** | | 0,55 | 0,46 | 4,54 | 4,71 | 0,36 | 0,35 | 0,34 | 0,35 | 0,19 | 0,19 | 0,18 | 0,19 | 0,02 | 0,02 | 0,01 | 0,01 |

Table C.5. Inspection of the connections of truss members to chords for trusses 21 m in length under loads corresponded to the III snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** | **CB** (рис. 4.1.г) | **CH** (рис. 4.1.б) | **7B (img. 4.1,a)** | **7T (img. 4.1,a)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 77,04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 21,4 | 21,4 | 20,9 | 20,9 | 13,3 | 13,3 | 12,9 | 12,9 | 5,7 | 5,7 | 5,5 | 5,5 | 0,3 | 0,3 | 0,3 | 0,3 |
| **F** | T | -14 | 28 | 28 | -14 | -37 | 28 | 45 | -37 | -49 | 45 | 53 | -49 | -53 | 53 | 53 | -53 |
| **$R_y$** | $T/cm^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **$D_b$** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 90 | 90 | 42 | 42 |
| **$R_{yd}$** | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$β_f$** | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$R_{wf}$** | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 8,0 | 8,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $γ_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $γ_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,99 | 1,00 | 1,00 | 0,99 |
| γt | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| $k_f$ | cm | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,77 | 0,62 | 0,61 | 0,52 | 0,54 | 0,55 | 0,53 | 0,52 | 0,34 | 0,40 | 0,38 | 0,33 | 0,04 | 0,04 | 0,02 | 0,02 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,49 | 0,41 | 0,40 | 0,42 | 0,40 | 0,38 | 0,37 | 0,39 | 0,22 | 0,21 | 0,20 | 0,21 | 0,02 | 0,02 | 0,01 | 0,01 |
| **Strength analysis use factor of the weld joint** | | 0,72 | 0,60 | 0,59 | 0,61 | 0,47 | 0,45 | 0,44 | 0,45 | 0,25 | 0,24 | 0,23 | 0,24 | 0,03 | 0,03 | 0,01 | 0,01 |

Table C.6. Inspection of the connections of truss members to chords for trusses 21 m in length under loads corresponded to the IV snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** | **CB** (рис. 4.1.г) | **CH** (рис. 4.1.б) | **7B (img. 4.1,a)** | **7T (img. 4.1,a)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 93,24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 25,9 | 25,9 | 25,5 | 25,5 | 16,2 | 16,2 | 15,7 | 15,7 | 6,9 | 6,9 | 6,6 | 6,6 | 0,1 | 0,1 | 0,1 | 0,1 |
| **F** | T | -18 | 34 | 34 | -18 | -45 | 34 | 55 | -45 | -60 | 55 | 64 | -60 | -64 | 64 | 64 | -64 |
| **$R_y$** | $T/cm^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 36,8 | 26,9 | 26,9 | 36,8 | 36,8 | 26,9 | 26,9 | 36,8 | 36,8 | 26,9 | 26,9 | 36,8 | 36,8 | 26,9 | 26,9 | 36,8 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **$D_b$** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,6 | 0,5 | 0,5 | 0,6 | 0,6 | 0,5 | 0,5 | 0,6 | 0,6 | 0,5 | 0,5 | 0,6 | 0,6 | 0,5 | 0,5 | 0,6 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 90 | 90 | 42 | 42 |
| **$R_{yd}$** | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$\beta_f$** | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$R_{wf}$** | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 8,0 | 8,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,98 | 1,00 | 1,00 | 0,98 |
| γt | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| $k_f$ | cm | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,65 | 0,75 | 0,74 | 0,44 | 0,45 | 0,67 | 0,65 | 0,44 | 0,29 | 0,48 | 0,46 | 0,28 | 0,01 | 0,02 | 0,01 | 0,01 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,57 | 0,50 | 0,49 | 0,48 | 0,46 | 0,47 | 0,45 | 0,45 | 0,25 | 0,25 | 0,24 | 0,24 | 0,01 | 0,01 | 0,01 | 0,01 |
| **Strength analysis use factor of the weld joint** | | 0,66 | 0,73 | 0,72 | 0,57 | 0,43 | 0,55 | 0,53 | 0,42 | 0,23 | 0,29 | 0,28 | 0,22 | 0,01 | 0,01 | 0,01 | 0,00 |

Table C.7. Inspection of the connections of truss members to chords for trusses 24 m in length under loads corresponded to the II snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** | **7T (img. 4.1,a)** | **7B (img. 4.1,a)** | **8B (img. 4.1,a)** | **8T (img. 4.1,a)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 69,84 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 19 | 19 | 19 | 19 | 13 | 13 | 13 | 13 | 7 | 7 | 7 | 7 | 1 | 1 | 1 | 1 |
| **F** | T | -13 | 26 | 26 | -13 | -34 | 26 | 42 | -34 | -47 | 42 | 51 | -47 | -52 | 51 | 53 | -52 |
| **$R_y$** | T/cm$^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | T/cm$^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | cm$^2$ | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 | 30,7 | 26,9 | 26,9 | 30,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **$D_b$** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| **$R_{yd}$** | T/cm$^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | cm$^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$\beta_f$** | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$R_{wf}$** | T/cm$^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,99 | 1,00 | 1,00 | 0,99 |
| γt | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| $k_f$ | cm | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,70 | 0,56 | 0,55 | 0,47 | 0,52 | 0,54 | 0,52 | 0,51 | 0,42 | 0,49 | 0,47 | 0,41 | 0,09 | 0,10 | 0,09 | 0,08 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,45 | 0,37 | 0,36 | 0,38 | 0,39 | 0,37 | 0,36 | 0,38 | 0,26 | 0,25 | 0,25 | 0,26 | 0,05 | 0,05 | 0,05 | 0,05 |
| **Strength analysis use factor of the weld joint** | | 0,65 | 0,55 | 0,53 | 0,55 | 0,46 | 0,44 | 0,43 | 0,44 | 0,31 | 0,30 | 0,29 | 0,30 | 0,06 | 0,06 | 0,05 | 0,06 |

Table C.8. Inspection of the connections of truss members to chords for trusses 24 m in length under loads corresponded to the III snow area

| Number of element | | 1T (img. 4.1,c) | 1B (img. 4.1,a) | 2B (img. 4.1,a) | 2T (img. 4.1,a) | 3T (img. 4.1,a) | 3B (img. 4.1,a) | 4B (img. 4.1,a) | 4T (img. 4.1,a) | 5T (img. 4.1,a) | 5B (img. 4.1,a) | 6B (img. 4.1,a) | 6T (img. 4.1,a) | 7T (img. 4.1,a) | 7B (img. 4.1,a) | 8B (img. 4.1,a) | 8T (img. 4.1,a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 89,64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 25 | 25 | 24 | 24 | 17 | 17 | 16 | 16 | 9 | 9 | 9 | 9 | 2 | 2 | 2 | 2 |
| **F** | T | -17 | 33 | 33 | -17 | -44 | 33 | 54 | -44 | -60 | 54 | 66 | -60 | -67 | 66 | 68 | -67 |
| **$R_y$** | $T/cm^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 36,8 | 32,2 | 32,2 | 36,8 | 36,8 | 32,2 | 32,2 | 36,8 | 36,8 | 32,2 | 32,2 | 36,8 | 36,8 | 32,2 | 32,2 | 36,8 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **$D_b$** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| **$R_{yd}$** | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$\beta_f$** | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$R_{wf}$** | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,96 | 1,00 | 1,00 | 0,96 |
| γt | | 1 | 1 | 1 | 1 | 1 | 1 | 0,7965 | 1 | 1 | 0,7965 | 0,6488 | 1 | 0,9573 | 0,6488 | 0,6216 | 0,9573 |
| $k_f$ | cm | 0,136 | 0,425 | 0,425 | 0,1363 | 0,3561 | 0,425 | 0,7035 | 0,3561 | 0,4883 | 0,7035 | 0,8512 | 0,4883 | 0,5427 | 0,8512 | 0,8784 | 0,5427 |
| $k_{chord}$ | | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 |
| $k_{member}$ | | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,62 | 0,48 | 0,47 | 0,42 | 0,47 | 0,48 | 0,47 | 0,46 | 0,38 | 0,43 | 0,42 | 0,36 | 0,08 | 0,09 | 0,08 | 0,07 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,54 | 0,46 | 0,45 | 0,46 | 0,47 | 0,46 | 0,45 | 0,46 | 0,32 | 0,31 | 0,30 | 0,31 | 0,06 | 0,06 | 0,06 | 0,06 |
| **Strength analysis use factor of the weld joint** | | 0,64 | 0,54 | 0,53 | 0,54 | 0,45 | 0,43 | 0,42 | 0,44 | 0,30 | 0,29 | 0,28 | 0,29 | 0,06 | 0,06 | 0,05 | 0,05 |

Table C.9. Inspection of the connections of truss members to chords for trusses 24 m in length under loads corresponded to the IV snow area

| Number of element | | 1T (img. 4.1,c) | 1B (img. 4.1,a) | 2B (img. 4.1,a) | 2T (img. 4.1,a) | 3T (img. 4.1,a) | 3B (img. 4.1,a) | 4B (img. 4.1,a) | 4T (img. 4.1,a) | 5T (img. 4.1,a) | 5B (img. 4.1,a) | 6B (img. 4.1,a) | 6T (img. 4.1,a) | 7T (img. 4.1,a) | 7B (img. 4.1,a) | 8B (img. 4.1,a) | 8T (img. 4.1,a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 111,60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 31 | 31 | 30 | 30 | 21 | 21 | 20 | 20 | 11 | 11 | 11 | 11 | 2 | 2 | 2 | 2 |
| **F** | T | -21 | 41 | 41 | -21 | -55 | 41 | 68 | -55 | -75 | 68 | 82 | -75 | -83 | 82 | 85 | -83 |
| $R_y$ | $T/cm^2$ | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $D_b$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| $R_{yd}$ | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\beta_f$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $R_{wf}$ | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,98 | 1,00 | 1,00 | 0,98 | 0,92 | 1,00 | 1,00 | 0,92 |
| γt | | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 |
| $k_f$ | cm | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,57 | 0,64 | 0,63 | 0,38 | 0,43 | 0,62 | 0,60 | 0,42 | 0,35 | 0,56 | 0,54 | 0,34 | 0,08 | 0,11 | 0,10 | 0,07 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,65 | 0,60 | 0,58 | 0,56 | 0,57 | 0,60 | 0,58 | 0,56 | 0,39 | 0,41 | 0,40 | 0,38 | 0,08 | 0,08 | 0,07 | 0,07 |
| **Strength analysis use factor of the weld joint** | | 0,76 | 0,87 | 0,86 | 0,65 | 0,53 | 0,70 | 0,69 | 0,52 | 0,36 | 0,47 | 0,46 | 0,35 | 0,07 | 0,10 | 0,08 | 0,06 |

Table C.10. Inspection of the connections of truss members to chords for trusses 27 m in length under loads corresponded to the II snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** | **7T (img. 4.1,a)** | **7B (img. 4.1,a)** | **8B (img. 4.1,a)** | **8T (img. 4.1,a)** | **9T (img. 4.1,a)** | **9H** (рис. 4.1.б) | **CH** (рис. 4.1.б) | **CB** (рис. 4.1.г) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 80,28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 22,3 | 22,3 | 21,8 | 21,8 | 15,8 | 15,8 | 15,4 | 15,4 | 9,6 | 9,6 | 9,3 | 9,3 | 3,9 | 3,9 | 3,7 | 3,7 | 0,3 | 0,3 | 3,9 | 3,9 |
| **F** | T | -15 | 29 | 29 | -15 | -40 | 29 | 50 | -40 | -56 | 50 | 62 | -56 | -64 | 62 | 67 | -64 | -66 | 67 | 67 | -66 |
| $R_y$ | T/cm$^2$ | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 | 3,35 | 2,4 | 2,4 | 3,35 |
| **E** | T/cm$^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | cm$^2$ | 30,7 | 32,2 | 32,2 | 30,7 | 30,7 | 32,2 | 32,2 | 30,7 | 30,7 | 32,2 | 32,2 | 30,7 | 30,7 | 32,2 | 32,2 | 30,7 | 30,7 | 32,2 | 32,2 | 30,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $D_b$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,5 | 0,6 | 0,6 | 0,5 | 0,5 | 0,6 | 0,6 | 0,5 | 0,5 | 0,6 | 0,6 | 0,5 | 0,5 | 0,6 | 0,6 | 0,5 | 0,5 | 0,6 | 0,6 | 0,5 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 90 | 90 |
| $R_{yd}$ | T/cm$^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | cm$^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\beta_f$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $R_{wf}$ | T/cm$^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 8,0 | 8,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,96 | 1,00 | 1,00 | 0,96 | 0,87 | 1,00 | 1,00 | 0,87 | 0,86 | 1,00 | 1,00 | 0,86 |
| γt | | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 |
| $k_f$ | cm | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,80 | 0,43 | 0,42 | 0,54 | 0,64 | 0,45 | 0,44 | 0,62 | 0,61 | 0,46 | 0,45 | 0,59 | 0,27 | 0,19 | 0,09 | 0,09 | 0,01 | 0,00 | 0,06 | 0,08 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,51 | 0,41 | 0,40 | 0,44 | 0,47 | 0,43 | 0,42 | 0,46 | 0,36 | 0,33 | 0,32 | 0,35 | 0,15 | 0,14 | 0,06 | 0,05 | 0,00 | 0,00 | 0,03 | 0,03 |
| **Strength analysis use factor of the weld joint** | | 0,75 | 0,48 | 0,47 | 0,64 | 0,56 | 0,41 | 0,40 | 0,54 | 0,42 | 0,31 | 0,30 | 0,41 | 0,17 | 0,13 | 0,06 | 0,05 | 0,00 | 0,00 | 0,04 | 0,05 |

Table C.11. Inspection of the connections of truss members to chords for trusses 27 m in length under loads corresponded to the III snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** | **7T (img. 4.1,a)** | **7B (img. 4.1,a)** | **8B (img. 4.1,a)** | **8T (img. 4.1,a)** | **9T (img. 4.1,a)** | **9H** (рис. 4.1.б) | **CH** (рис. 4.1.б) | **CB** (рис. 4.1.г) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 104,40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 29,0 | 29,0 | 28,4 | 28,4 | 20,4 | 20,4 | 20,0 | 20,0 | 12,5 | 12,5 | 12,1 | 12,1 | 5,0 | 5,0 | 4,7 | 4,7 | 0,4 | 0,4 | 5,0 | 5,0 |
| **F** | T | -20 | 38 | 38 | -20 | -52 | 38 | 65 | -52 | -73 | 65 | 80 | -73 | -84 | 80 | 86 | -84 | -86 | 86 | 86 | -86 |
| $\mathbf{R_y}$ | T/cm$^2$ | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 |
| **E** | T/cm$^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | cm$^2$ | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $\mathbf{D_b}$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 90 | 90 |
| $\mathbf{R_{yd}}$ | T/cm$^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | cm$^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\mathbf{\beta_f}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\mathbf{R_{wf}}$ | T/cm$^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 8,0 | 8,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,99 | 1,00 | 1,00 | 0,99 | 0,92 | 1,00 | 1,00 | 0,92 | 0,90 | 1,00 | 1,00 | 0,90 |
| γt | | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 |
| $k_f$ | cm | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,53 | 0,60 | 0,59 | 0,36 | 0,42 | 0,60 | 0,59 | 0,41 | 0,39 | 0,62 | 0,60 | 0,38 | 0,17 | 0,25 | 0,12 | 0,05 | 0,00 | 0,00 | 0,09 | 0,05 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,61 | 0,56 | 0,55 | 0,52 | 0,56 | 0,59 | 0,58 | 0,55 | 0,43 | 0,45 | 0,44 | 0,42 | 0,17 | 0,18 | 0,09 | 0,05 | 0,00 | 0,00 | 0,05 | 0,04 |
| **Strength analysis use factor of the weld joint** | | 0,71 | 0,82 | 0,80 | 0,61 | 0,52 | 0,69 | 0,68 | 0,51 | 0,40 | 0,53 | 0,51 | 0,39 | 0,16 | 0,21 | 0,10 | 0,05 | 0,00 | 0,00 | 0,07 | 0,04 |

Table C.12. Inspection of the connections of truss members to chords for trusses 27 m in length under loads corresponded to the IV snow area

| Number of element | | **1T (img. 4.1,c)** | **1B (img. 4.1,a)** | **2B (img. 4.1,a)** | **2T (img. 4.1,a)** | **3T (img. 4.1,a)** | **3B (img. 4.1,a)** | **4B (img. 4.1,a)** | **4T (img. 4.1,a)** | **5T (img. 4.1,a)** | **5B (img. 4.1,a)** | **6B (img. 4.1,a)** | **6T (img. 4.1,a)** | **7T (img. 4.1,a)** | **7B (img. 4.1,a)** | **8B (img. 4.1,a)** | **8T (img. 4.1,a)** | **9T (img. 4.1,a)** | **9H** (рис. 4.1.б) | **CH** (рис. 4.1.б) | **CB** (рис. 4.1.г) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 128,16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 35,6 | 35,6 | 34,8 | 34,8 | 25,1 | 25,1 | 24,5 | 24,5 | 15,3 | 15,3 | 14,9 | 14,9 | 6,1 | 6,1 | 5,8 | 5,8 | 0,6 | 0,6 | 6,1 | 6,1 |
| **F** | T | -24 | 47 | 47 | -24 | -64 | 47 | 79 | -64 | -89 | 79 | 99 | -89 | -103 | 99 | 106 | -103 | -106 | 106 | 106 | -106 |
| $R_y$ | $T/cm^2$ | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $D_b$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 90 | 90 |
| $R_{yd}$ | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $β_f$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $R_{wf}$ | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 8,0 | 8,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $γ_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $γ_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,95 | 1,00 | 1,00 | 0,95 | 0,87 | 1,00 | 1,00 | 0,87 | 0,85 | 1,00 | 1,00 | 0,85 |
| γt | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_f$ | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,50 | 0,49 | 0,48 | 0,34 | 0,40 | 0,52 | 0,50 | 0,39 | 0,38 | 0,53 | 0,51 | 0,37 | 0,17 | 0,21 | 0,10 | 0,05 | 0,00 | 0,00 | 0,07 | 0,05 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,73 | 0,65 | 0,64 | 0,62 | 0,67 | 0,69 | 0,67 | 0,65 | 0,51 | 0,53 | 0,52 | 0,50 | 0,21 | 0,21 | 0,10 | 0,07 | 0,01 | 0,00 | 0,05 | 0,04 |
| **Strength analysis use factor of the weld joint** | | 0,85 | 0,77 | 0,75 | 0,72 | 0,63 | 0,65 | 0,63 | 0,61 | 0,48 | 0,49 | 0,48 | 0,47 | 0,19 | 0,20 | 0,09 | 0,06 | 0,00 | 0,00 | 0,07 | 0,05 |

Table C.13. Inspection of the connections of truss members to chords for trusses 30m in length under loads corresponded to the II snow area

| Number of element | | 1T (img. 4.1,c) | 1B (img. 4.1,a) | 2B (img. 4.1,a) | 2T (img. 4.1,a) | 3T (img. 4.1,a) | 3B (img. 4.1,a) | 4B (img. 4.1,a) | 4T (img. 4.1,a) | 5T (img. 4.1,a) | 5B (img. 4.1,a) | 6B (img. 4.1,a) | 6T (img. 4.1,a) | 7T (img. 4.1,a) | 7B (img. 4.1,a) | 8B (img. 4.1,a) | 8T (img. 4.1,a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 25 | 25 | 25 | 25 | 19 | 19 | 18 | 18 | 12 | 12 | 12 | 12 | 6 | 6 | 6 | 6 |
| **F** | T | -17 | 33 | 33 | -17 | -46 | 33 | 57 | -46 | -65 | 57 | 73 | -65 | -77 | 73 | 80 | -77 |
| $R_y$ | $T/cm^2$ | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 | 42,8 | 26,9 | 26,9 | 42,8 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $D_b$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 | 0,7 | 0,5 | 0,5 | 0,7 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| $R_{yd}$ | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\beta_f$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $R_{wf}$ | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,96 | 1,00 | 1,00 | 0,96 |
| γt | | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 | 1 | 0,8 | 0,8 | 1 |
| $k_f$ | cm | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 | 0,5 | 0,4 | 0,4 | 0,5 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,46 | 0,53 | 0,52 | 0,31 | 0,38 | 0,55 | 0,54 | 0,37 | 0,38 | 0,61 | 0,59 | 0,37 | 0,20 | 0,31 | 0,30 | 0,19 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,53 | 0,49 | 0,48 | 0,45 | 0,51 | 0,54 | 0,52 | 0,50 | 0,42 | 0,44 | 0,43 | 0,41 | 0,22 | 0,23 | 0,22 | 0,21 |
| **Strength analysis use factor of the weld joint** | | 0,62 | 0,71 | 0,70 | 0,53 | 0,48 | 0,63 | 0,61 | 0,47 | 0,39 | 0,52 | 0,50 | 0,38 | 0,20 | 0,27 | 0,25 | 0,19 |

Table C.14. Inspection of the connections of truss members to chords for trusses 30m in length under loads corresponded to the III snow area

| Number of element | | 1T (img. 4.1,c) | 1B (img. 4.1,a) | 2B (img. 4.1,a) | 2T (img. 4.1,a) | 3T (img. 4.1,a) | 3B (img. 4.1,a) | 4B (img. 4.1,a) | 4T (img. 4.1,a) | 5T (img. 4.1,a) | 5B (img. 4.1,a) | 6B (img. 4.1,a) | 6T (img. 4.1,a) | 7T (img. 4.1,a) | 7B (img. 4.1,a) | 8B (img. 4.1,a) | 8T (img. 4.1,a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 115,92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 32 | 32 | 32 | 32 | 24 | 24 | 23 | 23 | 16 | 16 | 15 | 15 | 8 | 8 | 8 | 8 |
| **F** | T | -22 | 43 | 43 | -22 | -58 | 43 | 73 | -58 | -83 | 73 | 93 | -83 | -98 | 93 | 102 | -98 |
| $\mathbf{R_y}$ | $T/cm^2$ | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| $\mathbf{D_b}$ | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| $\mathbf{R_{yd}}$ | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 27,4 | 27,4 | 27,4 | 27,4 | 18,9 | 18,9 | 18,9 | 18,9 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,6 | 0,6 | 0,6 | 0,6 | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\mathbf{\beta_f}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $\mathbf{R_{wf}}$ | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $\gamma_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $\gamma_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,99 | 1,00 | 1,00 | 0,99 | 0,90 | 1,00 | 1,00 | 0,90 |
| γt | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_f$ | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,45 | 0,45 | 0,44 | 0,31 | 0,37 | 0,48 | 0,47 | 0,36 | 0,37 | 0,54 | 0,52 | 0,36 | 0,21 | 0,28 | 0,27 | 0,20 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,55 | 0,50 | 0,49 | 0,47 | 0,51 | 0,53 | 0,52 | 0,50 | 0,52 | 0,54 | 0,53 | 0,51 | 0,27 | 0,28 | 0,27 | 0,26 |
| **Strength analysis use factor of the weld joint** | | 0,77 | 0,69 | 0,68 | 0,66 | 0,59 | 0,61 | 0,60 | 0,58 | 0,48 | 0,50 | 0,49 | 0,47 | 0,25 | 0,26 | 0,25 | 0,24 |

Table C.15. Inspection of the connections of truss members to chords for trusses 30m in length under loads corresponded to the IV snow area

| Number of element | | 1T (img. 4.1,c) | 1B (img. 4.1,a) | 2B (img. 4.1,a) | 2T (img. 4.1,a) | 3T (img. 4.1,a) | 3B (img. 4.1,a) | 4B (img. 4.1,a) | 4T (img. 4.1,a) | 5T (img. 4.1,a) | 5B (img. 4.1,a) | 6B (img. 4.1,a) | 6T (img. 4.1,a) | 7T (img. 4.1,a) | 7B (img. 4.1,a) | 8B (img. 4.1,a) | 8T (img. 4.1,a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M** | T*cm | 144,00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **N** | T | 40 | 40 | 39 | 39 | 29 | 29 | 29 | 29 | 19 | 19 | 19 | 19 | 10 | 10 | 10 | 10 |
| **F** | T | -27 | 53 | 53 | -27 | -72 | 53 | 91 | -72 | -103 | 91 | 115 | -103 | -121 | 115 | 127 | -121 |
| **$R_y$** | $T/cm^2$ | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 | 3,35 |
| **E** | $T/cm^2$ | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| **A** | $cm^2$ | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 | 48,7 | 32,2 | 32,2 | 48,7 |
| **D** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **$D_b$** | cm | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 | 16 | 14 | 14 | 16 |
| **t** | cm | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 | 0,8 | 0,6 | 0,6 | 0,8 |
| **α** | angle degree | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 |
| **$R_{yd}$** | $T/cm^2$ | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 |
| **Ad** | $cm^2$ | 23,0 | 23,0 | 23,0 | 23,0 | 15,4 | 15,4 | 15,4 | 15,4 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 | 12,2 |
| **d** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **db** | cm | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **td** | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 | 0,4 |
| **g** | cm | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$β_f$** | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **$R_{wf}$** | $T/cm^2$ | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 | 1,8 |
| b | cm | 17,9 | 17,9 | 17,9 | 17,9 | 14,9 | 14,9 | 14,9 | 14,9 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 | 12,0 |
| f | cm | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 |
| d/D | | 0,75 | 0,86 | 0,86 | 0,75 | 0,63 | 0,71 | 0,71 | 0,63 | 0,50 | 0,57 | 0,57 | 0,50 | 0,50 | 0,57 | 0,57 | 0,50 |
| g/d | | 0,08 | 0,08 | 0,08 | 0,08 | 0,10 | 0,10 | 0,10 | 0,10 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 | 0,13 |
| $γ_c$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| γd | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| $γ_D$ | | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 1,00 | 0,87 | 1,00 | 1,00 | 0,87 | 0,76 | 1,00 | 1,00 | 0,76 |
| γt | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_f$ | cm | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| $k_{chord}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| $k_{member}$ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Load bearing capacity of chord's web calculation use factor** | | 0,56 | 0,55 | 0,54 | 0,38 | 0,46 | 0,60 | 0,59 | 0,45 | 0,52 | 0,67 | 0,65 | 0,51 | 0,31 | 0,34 | 0,33 | 0,30 |
| **Load bearing capacity calculation use factor of a truss member near it's connection to the chord** | | 0,82 | 0,74 | 0,72 | 0,70 | 0,78 | 0,81 | 0,79 | 0,76 | 0,65 | 0,67 | 0,65 | 0,63 | 0,33 | 0,34 | 0,33 | 0,32 |
| **Strength analysis use factor of the weld joint** | | 0,96 | 0,86 | 0,84 | 0,82 | 0,73 | 0,76 | 0,74 | 0,71 | 0,60 | 0,62 | 0,61 | 0,59 | 0,31 | 0,32 | 0,31 | 0,30 |

# APPENDIX D

Table D.1. Table for the selection of standardized-shape truss member's profiles

| Span length, m | Element | Snow area | | | | | |
|---|---|---|---|---|---|---|---|
| | | II | | III | | IV | |
| | | Profile | Steel | Profile | Steel | Profile | Steel |
| 18 | Top chord | Profile(sq.)160X160X5.0 | C345 | Profile(sq.)160X160X5.0 | C345 | Profile(sq.)160X160X5.0 | C345 |
| | Bottom chord | Profile(sq.)140X140X5.0 | C255 | Profile(sq.)140X140X5.0 | C255 | Profile(sq.)140X140X5.0 | C255 |
| | Diagonal member 1 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 |
| | Diagonal member 2 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 |
| | Diagonal member 3 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 |
| | Diagonal member 4 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 |
| | Diagonal member 5 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| | Diagonal member 6 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| 21 | Top chord | Profile(sq.)160X160X5.0 | C345 | Profile(sq.)160X160X5.0 | C345 | Profile(sq.)160X160X6.0 | C345 |
| | Bottom chord | Profile(sq.)140X140X5.0 | C255 | Profile(sq.)140X140X5.0 | C255 | Profile(sq.)140X140X5.0 | C255 |
| | Diagonal member 1 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 |
| | Diagonal member 2 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 |
| | Diagonal member 3 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 |
| | Diagonal member 4 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 |
| | Diagonal member 5 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| | Diagonal member 6 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| | Diagonal member 7 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| | Vertical | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| 24 | Top chord | Profile(sq.)160X160X5.0 | C345 | Profile(sq.)160X160X6.0 | C345 | Profile(sq.)160X160X7.0 | C345 |
| | Bottom chord | Profile(sq.)140X140X5.0 | C255 | Profile(sq.)140X140X6.0 | C255 | Profile(sq.)140X140X5.0 | C345 |
| | Diagonal member 1 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 |
| | Diagonal member 2 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 |
| | Diagonal member 3 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 |
| | Diagonal member 4 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 |
| | Diagonal member 5 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| | Diagonal member 6 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| | Diagonal member 7 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| | Diagonal member 8 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 |
| 27 | Top chord | Profile(sq.)160X160X5.0 | C345 | Profile(sq.)160X160X7.0 | C345 | - | - |
| | Bottom chord | Profile(sq.)140X140X6.0 | C255 | Profile(sq.)140X140X5.0 | C345 | - | - |
| | Diagonal member 1 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 | - | - |
| | Diagonal member 2 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X5.0 | C255 | - | - |
| | Diagonal member 3 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 | - | - |
| | Diagonal member 4 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X4.0 | C255 | - | - |
| | Diagonal member 5 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |
| | Diagonal member 6 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |
| | Diagonal member 7 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |
| | Diagonal member 8 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |
| | Diagonal member 9 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |
| | Vertical | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |

Table D.1. Table for the selection of standardized-shape truss member's profiles (continuation)

| Span length, m | Element | Snow area | | | | | |
|---|---|---|---|---|---|---|---|
| | | **II** | | **III** | | **IV** | |
| | | Profile | Steel | Profile | Steel | Profile | Steel |
| **30** | Top chord | Profile(sq.)160X160X7.0 | C345 | Profile(sq.)160X160X8.0 | C345 | - | - |
| | Bottom chord | Profile(sq.)140X140X5.0 | C345 | Profile(sq.)140X140X6.0 | C345 | - | - |
| | Diagonal member 1 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X6.0 | C255 | - | - |
| | Diagonal member 2 | Profile(sq.)120X120X5.0 | C255 | Profile(sq.)120X120X6.0 | C255 | - | - |
| | Diagonal member 3 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X5.0 | C255 | - | - |
| | Diagonal member 4 | Profile(sq.)100X100X4.0 | C255 | Profile(sq.)100X100X5.0 | C255 | - | - |
| | Diagonal member 5 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |
| | Diagonal member 6 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |
| | Diagonal member 7 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |
| | Diagonal member 8 | Profile(sq.)80X80X4.0 | C255 | Profile(sq.)80X80X4.0 | C255 | - | - |

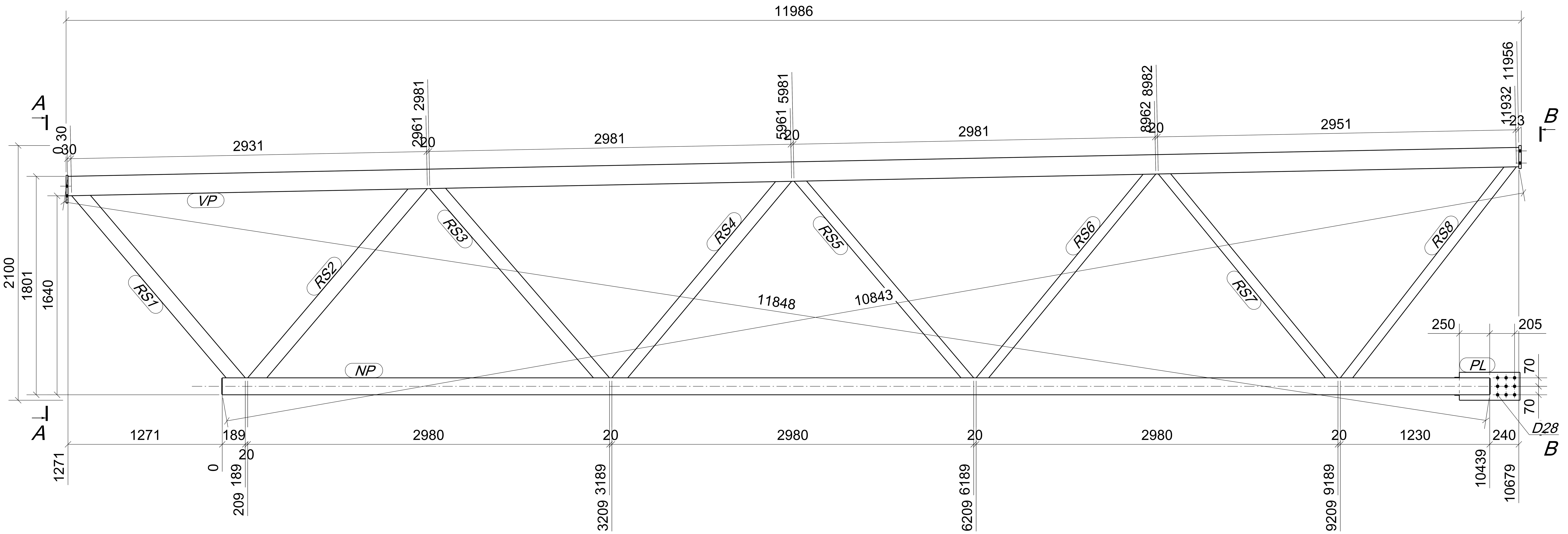
Table D.2. Weight of standardized truss elements TR02 (kg)

| Span length, m | Snow area | | |
|---|---|---|---|
| | **II** | **II** | **II** |
| **18** | 1134,5 | 1134,5 | 1134,5 |
| **24** | 1500,9 | 1690,0 | 1706,7 |
| **30** | 2191,6 | 2469,3 | - |

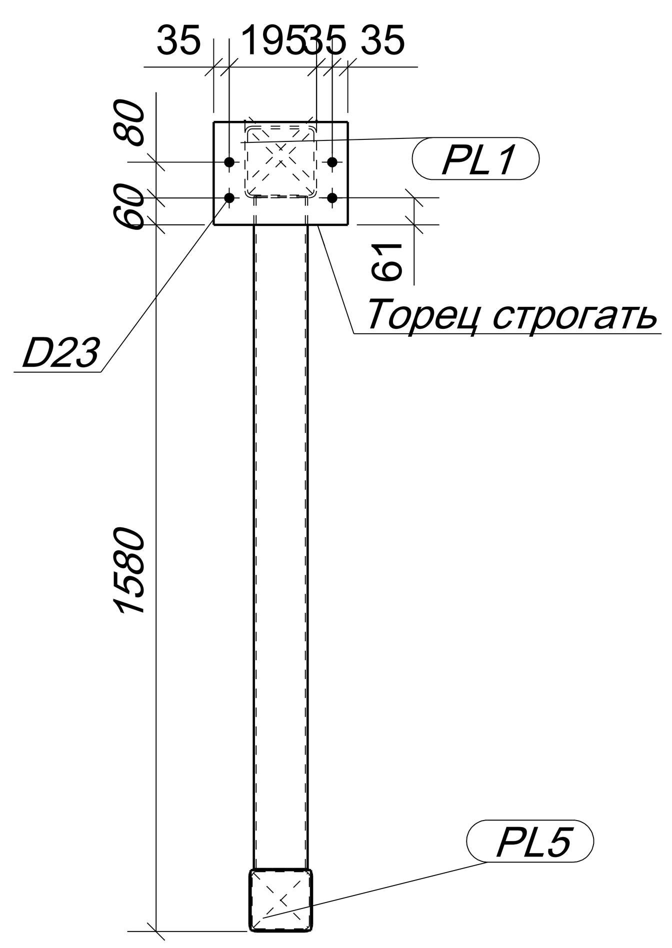
Table D.3. Table for the determination of the standardized construction's adjusted weight per unit of cover area (kg/m$^2$)

| Span length, m | Snow area | | | | | |
|---|---|---|---|---|---|---|
| | **II** | | **III** | | **IV** | |
| | g, kg/m$^2$ | | g, kg/m$^2$ | | g, kg/m$^2$ | |
| | C255 | C345 | C255 | C345 | C255 | C345 |
| **18** | 10,5 | | 10,5 | | 10,5 | |
| | 6,2 | 4,3 | 6,2 | 4,3 | 6,2 | 4,3 |
| **24** | 10,4 | | 11,7 | | 11,9 | |
| | 6,0 | 4,4 | 6,6 | 5,1 | 3,0 | 8,9 |
| **30** | 12,2 | | 13,7 | | - | |
| | 2,9 | 9,3 | 3,1 | 10,6 | - | - |

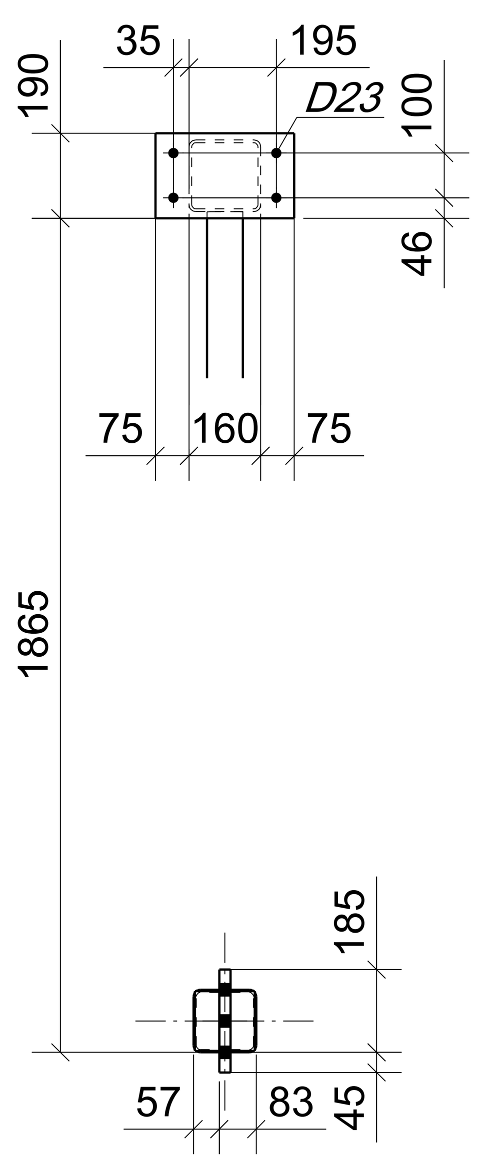
# APPENDIX E




## A - A




## B - B




Список деталей отправочной марки стандартизированной конструкции TR021-2 *

| Марка | Название | Кол-во | Профиль | Материал | Длина, мм | Масса ед., кг | Масса по поз., кг |
|---|---|---|---|---|---|---|---|
| | ПЛАСТИНА | 1 | — (BL)190x310x20.0 | C255 | 190 | 9.40000 | 9.40000 |
| NP | Нижний пояс | 1 | По TR02 | По TR02 | 10439 | По TR02 | По TR02 |
| PL | Фасонка | 1 | — (BL)500x230x25.0 | C345 | 500 | 22.9000 | 22.9000 |
| PL | Заглушка | 4 | — (BL)134x54x4.0 | C255 | 134 | 0.20000 | 0.20000 |
| PL1 | Пластина | 1 | — (BL)230x300x16.0 | C255 | 230 | 8.80000 | 8.80000 |
| PL5 | Заглушка | 1 | — (BL)135x135x4.0 | C255 | 135 | 0.60000 | 0.60000 |
| RS1 | Раскос 1 | 1 | По TR02 | По TR02 | 2070 | По TR02 | По TR02 |
| RS2 | Раскос 2 | 1 | По TR02 | По TR02 | 2147 | По TR02 | По TR02 |
| RS3 | Раскос 3 | 1 | По TR02 | По TR02 | 2148 | По TR02 | По TR02 |
| RS4 | Раскос 4 | 1 | По TR02 | По TR02 | 2192 | По TR02 | По TR02 |
| RS5 | Раскос 5 | 1 | По TR02 | По TR02 | 2193 | По TR02 | По TR02 |
| RS6 | Раскос 6 | 1 | По TR02 | По TR02 | 2237 | По TR02 | По TR02 |
| RS7 | Раскос 7 | 1 | По TR02 | По TR02 | 2238 | По TR02 | По TR02 |
| RS8 | Раскос 8 | 1 | По TR02 | По TR02 | 2263 | По TR02 | По TR02 |
| VP | Верхний пояс | 1 | По TR02 | По TR02 | 11956 | По TR02 | По TR02 |

Общая масса (кг): По TR02

Габаритные размеры (ВхШхД): 2100 х 310 х 11986

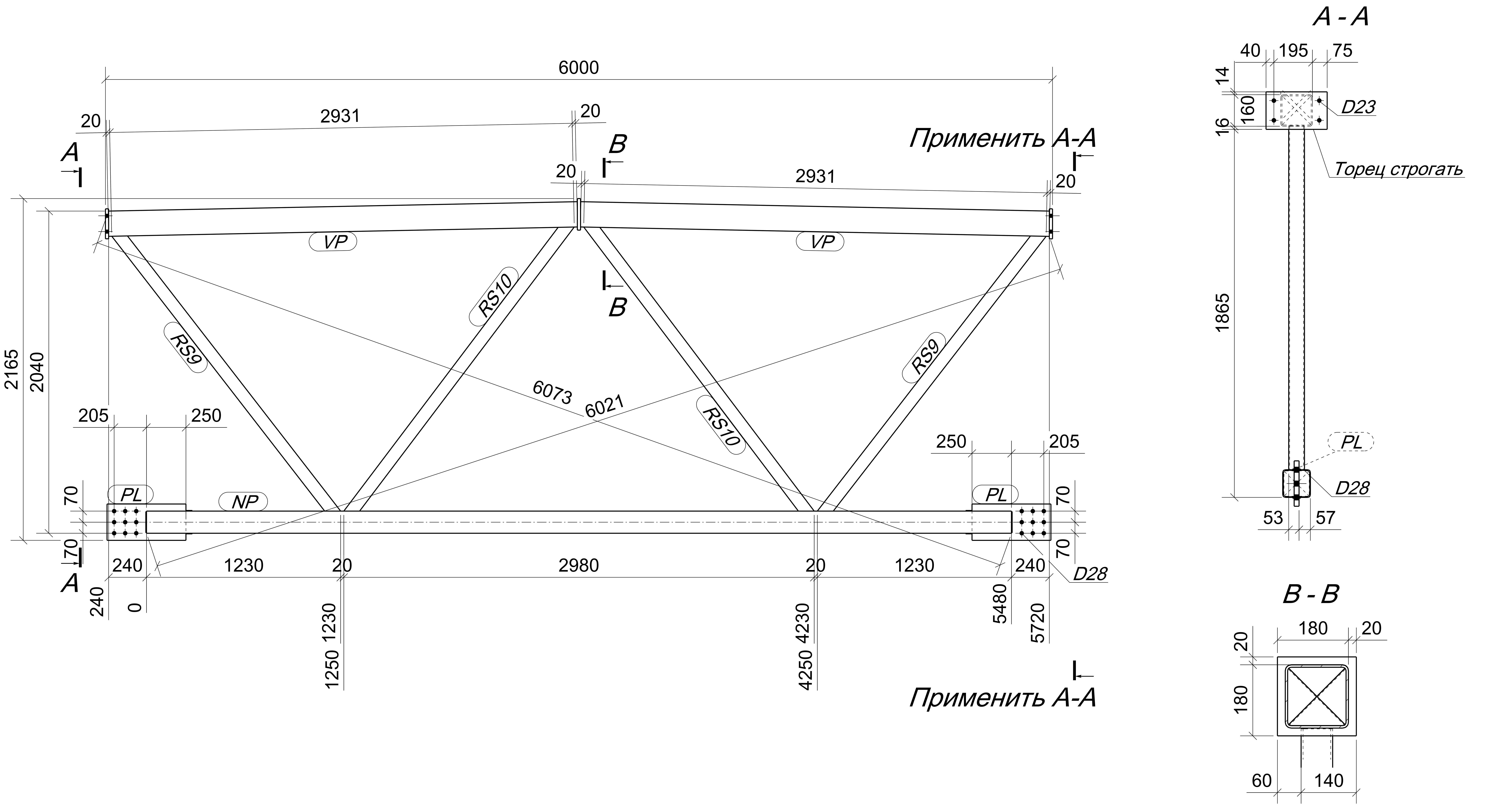
1. Сварные швы по ГОСТ 14771-76, 23518-79.
2. Неуказанные сварные соединения выполнить по СТП 01.01.2009.
3. * - в "TR02XX-Y": TR02 - "серия конструкций многократного применения", XX - пролёт фермы, Y - номер типа секции в составе фермы.

| | | | | | | |
|---|---|---|---|---|---|---|
| Ф02.01.TR021-2-КМДИ | | | | | | |
| Изм. | Кол.уч. | Лист | №док. | Подп. | Дата | |
| Разработал | | | | | | Ферма TR021-2 |
| Проверил | | | | | | Стадия / Масса / Масштаб |
| Н. контр. | | | | | | Лист 1 Листов |
| Утв. | | | | | | ruukki — ООО "РУУККИ РУС" 2012 г. |

Взам.инв. №

Подп. и дата

Инв. № подл.




1. Сварные швы по ГОСТ 14771-76, 23518-79.
2. Неуказанные сварные соединения выполнить по СТП 01.01.2009.

Список деталей отправочной марки стандартизированной конструкции TR022-1 *

| Марка | Название | Кол-во | Профиль | Материал | Длина, мм | Масса ед., кг | Масса по поз., кг |
|---|---|---|---|---|---|---|---|
| | ПЛАСТИНА | 3 | — (BL)200x200x20.0 | C255 | 200 | 6.40000 | 6.40000 |
| NP | Нижний пояс | 1 | По TR02 | По TR02 | 5480 | По TR02 | По TR02 |
| PL | Фасонка | 2 | — (BL)500x230x25.0 | C345 | 500 | 22.9000 | 22.9000 |
| PL | Заглушка | 8 | — (BL)134x54x4.0 | C255 | 134 | 0.20000 | 0.20000 |
| RS9 | Раскос 9 | 2 | По TR02 | По TR02 | 2264 | По TR02 | По TR02 |
| RS10 | Раскос 10 | 2 | По TR02 | По TR02 | 2316 | По TR02 | По TR02 |
| VP | Верхний пояс | 2 | По TR02 | По TR02 | 2974 | По TR02 | По TR02 |

Общая масса (кг): По TR02

Габаритные размеры (ВхШхД): 2165 x 310 x 6000

| Изм. | Кол.уч. | Лист | №док. | Подп. | Дата |
|---|---|---|---|---|---|
| Разработал | | | | | |
| Проверил | | | | | |
| | | | | | |
| Н. контр. | | | | | |
| Утв. | | | | | |

Ф02.01.TR022-1-КМДИ

Ферма
TR022-1

| Стадия | Масса | Масштаб |
|---|---|---|
| | | |

Лист 1 Листов

RUUKKI

ООО "РУУККИ РУС" 2012 г.

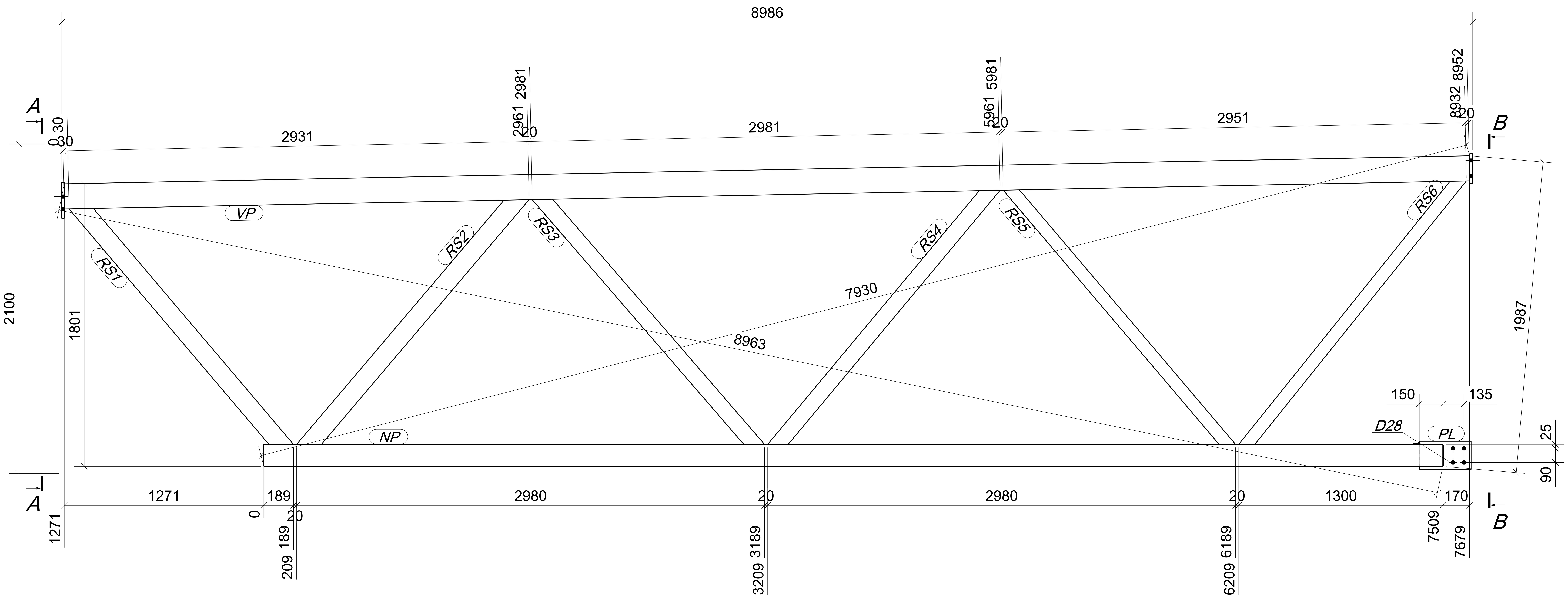
Формат А3

Взам.инв. №

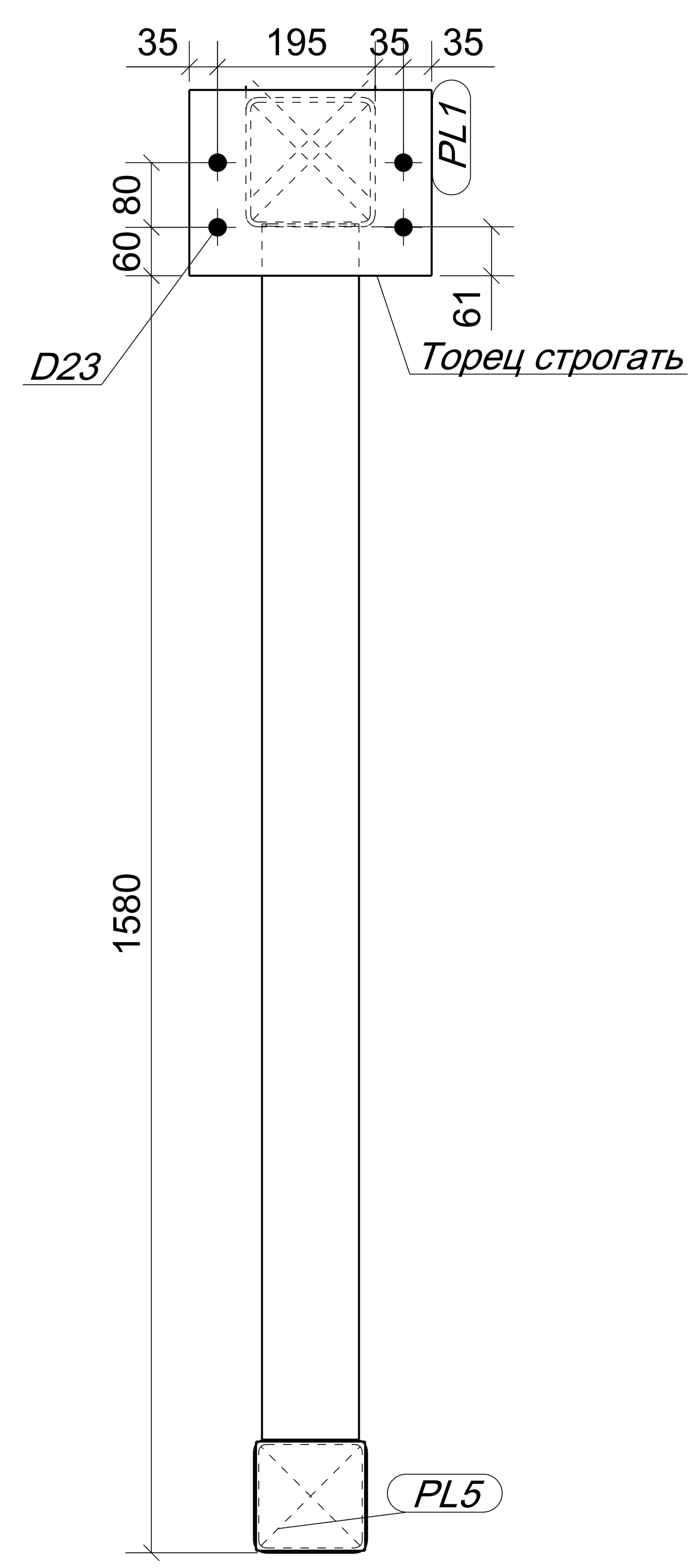
Подп. и дата

Инв. № подп.

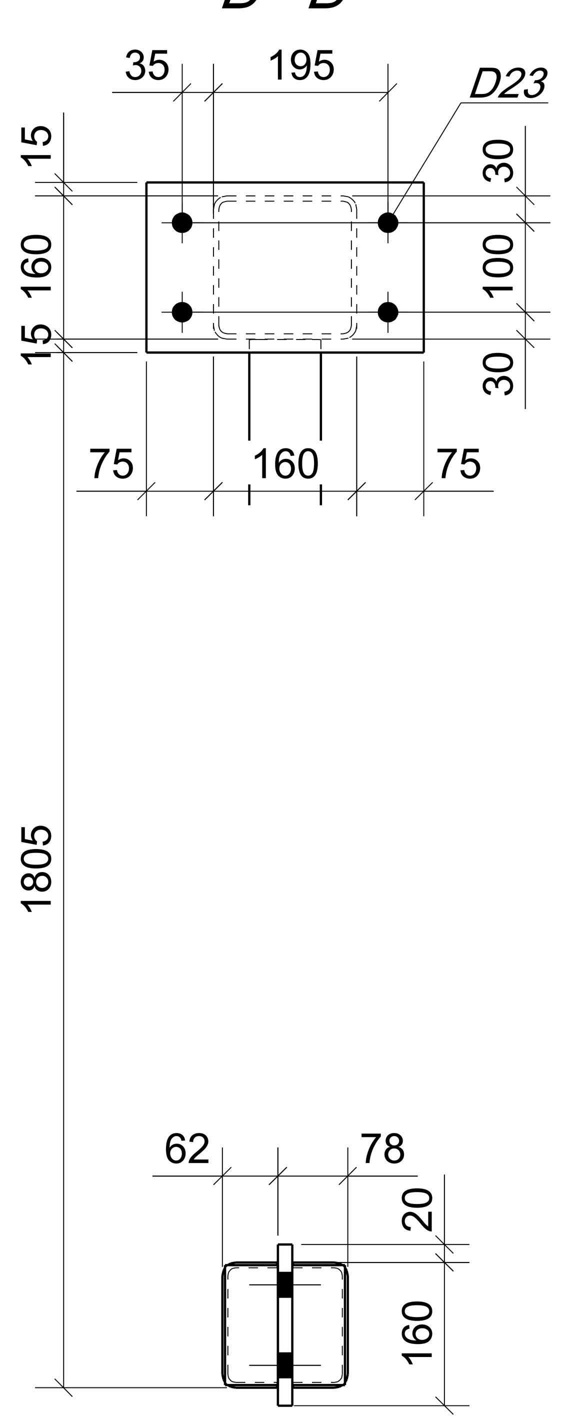
Tekla Structures




A - A




B - B




Список деталей отправочной марки стандартизированной конструкции TR023-1 *

| Марка | Название | Кол-во | Профиль | Материал | Длина, мм | Масса ед., кг | Масса по поз., кг |
|---|---|---|---|---|---|---|---|
| | ПЛАСТИНА | 1 | — (BL)190x310x20.0 | C255 | 190 | 9.40000 | 9.40000 |
| NP | Нижний пояс | 1 | По TR02 | По TR02 | 7509 | По TR02 | По TR02 |
| PL | Фасонка | 1 | — (BL)330x180x16.0 | C345 | 330 | 7.60000 | 7.60000 |
| PL | Заглушка | 4 | — (BL)134x59x4.0 | C255 | 134 | 0.30000 | 0.30000 |
| PL1 | Пластина | 1 | — (BL)230x300x16.0 | C255 | 230 | 8.80000 | 8.80000 |
| PL5 | Заглушка | 1 | — (BL)135x135x4.0 | C255 | 135 | 0.60000 | 0.60000 |
| RS1 | Раскос 1 | 1 | По TR02 | По TR02 | 2070 | По TR02 | По TR02 |
| RS2 | Раскос 2 | 1 | По TR02 | По TR02 | 2147 | По TR02 | По TR02 |
| RS3 | Раскос 3 | 1 | По TR02 | По TR02 | 2148 | По TR02 | По TR02 |
| RS4 | Раскос 4 | 1 | По TR02 | По TR02 | 2192 | По TR02 | По TR02 |
| RS5 | Раскос 5 | 1 | По TR02 | По TR02 | 2193 | По TR02 | По TR02 |
| RS6 | Раскос 6 | 1 | По TR02 | По TR02 | 2217 | По TR02 | По TR02 |
| VP | Верхний пояс | 1 | По TR02 | По TR02 | 8955 | По TR02 | По TR02 |

Общая масса (кг): По TR02

Габаритные размеры (ВхШхД): 2015 x 310 x 8986

Взам.инв. №

Подп. и дата

Инв. № подп.

1. Сварные швы по ГОСТ 14771-76, 23518-79.
2. Неуказанные сварные соединения выполнить по СТП 01.01.2009.
3. * - в "TR02XX-Y": TR02 - "серия конструкций многократного применения", XX - пролёт фермы, Y - номер типа секции в составе фермы.

Ф02.01.TR023-1-КМДИ

| Изм. | Кол.уч. | Лист | №док. | Подп. | Дата |
|---|---|---|---|---|---|
| Разработал | | | | | |
| Проверил | | | | | |
| Н. контр. | | | | | |
| Утв. | | | | | |

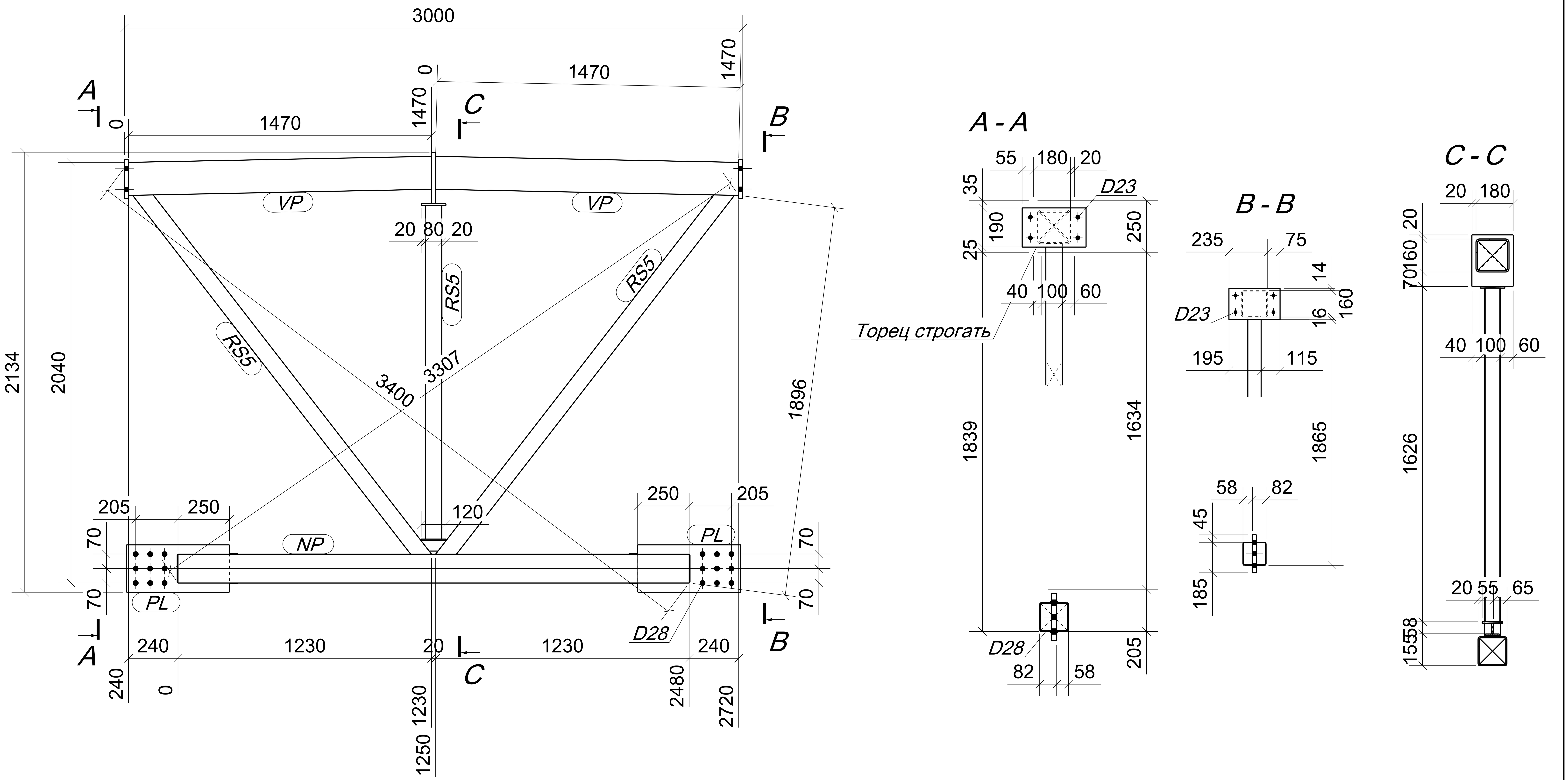
Ферма
TR023-1

| Стадия | Масса | Масштаб |
|---|---|---|
| | | |

Лист 1 Листов

ООО "РУУККИ РУС" 2012 г.

Формат А2




Список деталей отправочной марки стандартизированной конструкции TR024-1 *

| Марка | Название | Кол-во | Профиль | Материал | Длина, мм | Масса ед., кг | Масса по поз., кг |
|---|---|---|---|---|---|---|---|
| | Пластина | 1 | — (BL)121x50x10.0 | C255 | 121 | 0.30000 | 0.30000 |
| | Балка | 2 | — (BL)120x120x8.0 | C255 | 120 | 0.90000 | 0.90000 |
| | ПЛАСТИНА | 3 | — (BL)200x250x20.0 | C255 | 200 | 8 | 8 |
| NP | Нижний пояс | 1 | По TR02 | По TR02 | 2480 | По TR02 | По TR02 |
| PL | Фасонка | 2 | — (BL)500x230x25.0 | C345 | 500 | 22.9000 | 22.9000 |
| PL | Заглушка | 8 | — (BL)40x40x4.0 | C255 | 40 | 0.10000 | 0.10000 |
| RS5 | Стойка | 1 | По TR02 | По TR02 | 1618 | По TR02 | По TR02 |
| RS5 | Раскос 5 | 2 | По TR02 | По TR02 | 2264 | По TR02 | По TR02 |
| VP | Верхний пояс | 2 | По TR02 | По TR02 | 1474 | По TR02 | По TR02 |

Общая масса (кг): По TR02

Габаритные размеры (ВхШхД): 2134 x 310 x 3000

1. Сварные швы по ГОСТ 14771-76, 23518-79.
2. Неуказанные сварные соединения выполнить по СТП 01.01.2009.

Ф02.01.TR024-1-КМДИ

| Изм. | Кол.уч. | Лист | №док. | Подп. | Дата |
|---|---|---|---|---|---|
| Разработал | | | | | |
| Проверил | | | | | |
| Н. контр. | | | | | |
| Утв. | | | | | |

Нижний пояс TR024-1

| Стадия | Масса | Масштаб |
|---|---|---|
| | | |

Лист 1 Листов

ООО "РУУККИ РУС" 2012 г.

Взам.инв. №

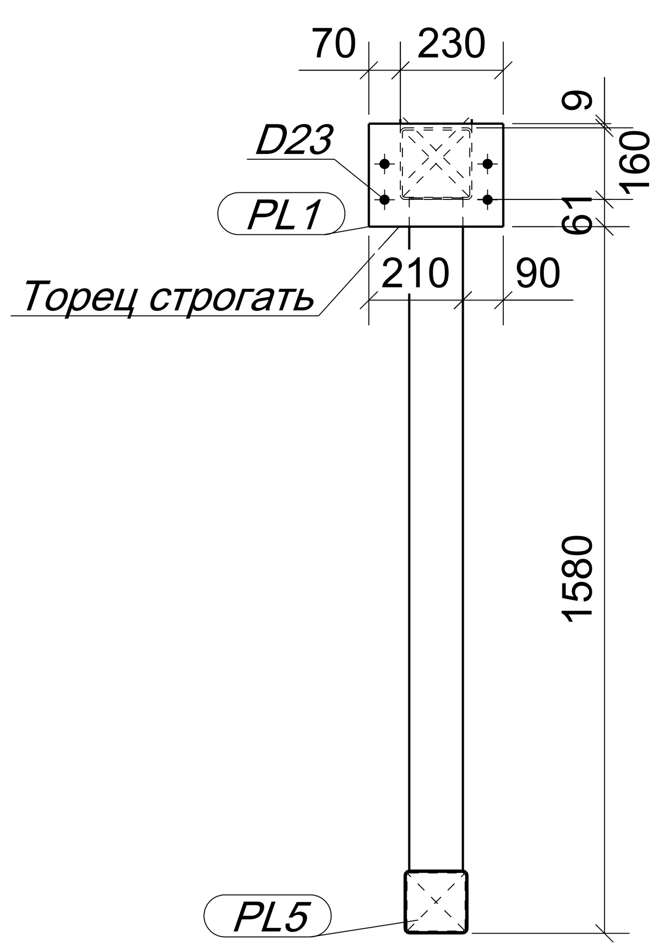
Подп. и дата

Инв. № подл.

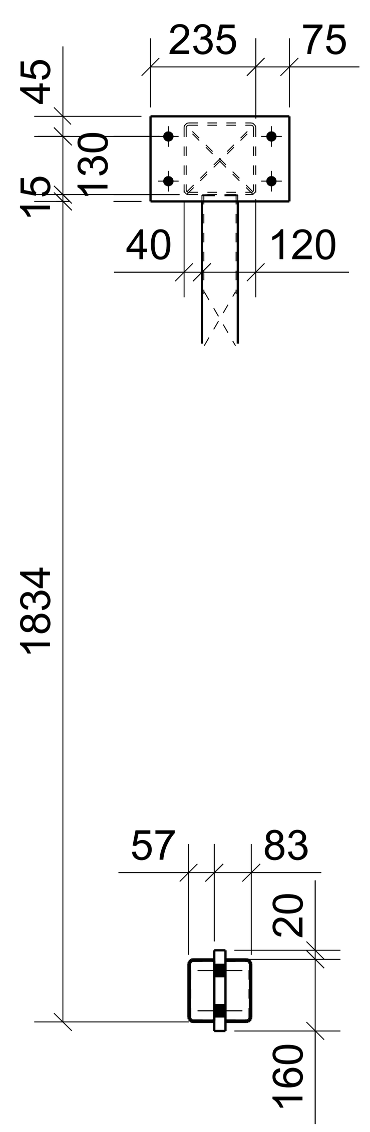
Tekla Structures

Формат А3


A - A




B - B




Список деталей отправочной марки стандартизированной конструкции **TR025-1** *

| Марка | Название | Кол-во | Профиль | Материал | Длина, мм | Масса ед., кг | Масса по поз., кг |
|---|---|---|---|---|---|---|---|
| | ПЛАСТИНА | 1 | — (BL)190x310x20.0 | C255 | 190 | 9.40000 | 9.40000 |
| NP | Нижний пояс | 1 | По TR02 | По TR02 | 8895 | По TR02 | По TR02 |
| PL | Фасонка | 1 | — (BL)500x180x25.0 | C345 | 500 | 17.9000 | 17.9000 |
| PL | Заглушка | 4 | — (BL)134x55x4.0 | C255 | 134 | 0.20000 | 0.20000 |
| PL1 | Пластина | 1 | — (BL)230x300x16.0 | C255 | 230 | 8.80000 | 8.80000 |
| PL5 | Заглушка | 1 | — (BL)135x135x4.0 | C255 | 135 | 0.60000 | 0.60000 |
| RS1 | Раскос 1 | 1 | По TR02 | По TR02 | 2070 | По TR02 | По TR02 |
| RS2 | Раскос 2 | 1 | По TR02 | По TR02 | 2147 | По TR02 | По TR02 |
| RS3 | Раскос 4 | 1 | По TR02 | По TR02 | 2148 | По TR02 | По TR02 |
| RS4 | Раскос 4 | 1 | По TR02 | По TR02 | 2192 | По TR02 | По TR02 |
| RS5 | Раскос 5 | 1 | По TR02 | По TR02 | 2193 | По TR02 | По TR02 |
| RS6 | Раскос 5 | 1 | По TR02 | По TR02 | 2237 | По TR02 | По TR02 |
| RS7 | Стойка | 1 | По TR02 | По TR02 | 1682 | По TR02 | По TR02 |
| RS8 | Раскос 5 | 1 | По TR02 | По TR02 | 2149 | По TR02 | По TR02 |
| VP | Верхний пояс | 1 | По TR02 | По TR02 | 10411 | По TR02 | По TR02 |

Общая масса (кг): По TR02

Габаритные размеры (ВхШхД): 2044 x 310 x 10442

1. Сварные швы по ГОСТ 14771-76, 23518-79.
2. Неуказанные сварные соединения выполнить по СТП 01.01.2009.

| | |
|---|---|
| Ф02.01.TR025-1-КМДИ | |
| Изм. / Кол.уч. / Лист / №док. / Подп. / Дата | Стадия / Масса / Масштаб |
| Разработал | Ферма TR025-1 |
| Проверил | Лист 1 / Листов |
| Н. контр. | RUUKKI |
| Утв. | ООО "РУУККИ РУС" 2012 г. |

Взам.инв. №
Подп. и дата
Инв. № подп.