

# BEŤKO - PUF

PROJEKTOVÁ A INŽINIERSKA ČINNOSŤ V STAVEBNÍCTVE  
A. Bernoláka 38, 034 01 Ružomberok

## STATICKÝ VÝPOČET



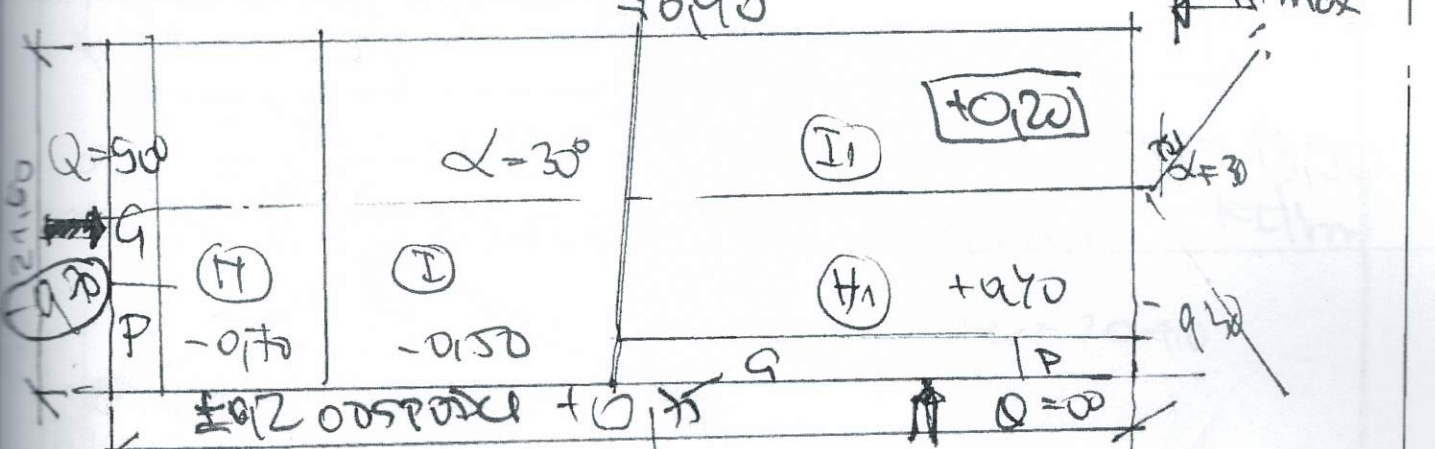
NÁZOV STAVBY : KRAVÍN SO 02  
MIESTO STAVBY : Želobudza  
INVESTOR : AGROSEV spol. s.r.o., Bottova 1, 962 12 Detva  
STUPEŇ : Realizačný projekt  
PROFESIA : Statika  
ZODP. PROJEKTANT : Ing. Ľudovít Beťko, autorizovaný statik  
REG. Č. PROJEKTANTA : 0057\*13  
Zákazka č. : 23\_83\_PUF  
DÁTUM : február 2023

SADA

: 1

NÁZOV STAVBY:	KRAVIN 02	12
MIESTO STAVBY:	ZELO BO DZA	
INVESTOR:	AGROSEXPOL SRO BOTODKA 1 DEVA	
ZATAŽENIE	$\Delta$	$\text{kg/m}^2$
STRESNÝ PANEĽ		0,150
NETSEO		0,105
OSV. VLT		0,103
SUMY $A=400$ $\alpha=30^\circ$	OBVAST 2 $b=705$	$\Sigma$ STRESY
	$Q=0,475$	0,123
	$Q_E=0,80(0,475 + \frac{100}{505})$	0,94
		1,15
		1,46
		0,25
		1,35
		0,33

2. ZATAŽENIE VETROU 11,00



OBVAST III  $U_{Bo} = 24 \text{ m/s}$   $\gamma_a = 1,15$   $H_{max} = 11,00 \text{ m}$

$q_{w5} = 0,480 \text{ (kN/m}^2)$   $q_{w5} = 0,62$   $+0,20$   
 $q_{w10} = 0,816$   $q_{w10} = 0,64$   $0,20$   
 $q_{w11} = 0,620$   $q_{w10} = 0,65$   $0,20$   
 $0,33$   
 $0,37$

2. POSUVENIE VÄZKOC









DEFORMACE PO ZATIZENICH

Akce : RAM11 22. 1. '23 10:29

ZYSLA HANUBNE STATU 75

Subor : DEFORMA.DEF

Stav : 1

Nazev :

Stycnik	Posuv X	Posuv Y	Otoceni
1	0.00000E+00	0.00000E+00	0.00000E+00
2	<del>-1.13245E-02</del>	-2.85823E-04	-1.20497E-04
3	-9.78378E-03	-3.67134E-04	-2.03459E-03
4	-7.25080E-03	-4.94121E-03	-3.71618E-03
5	1.13442E-03	<del>-2.04493E-02</del>	4.83592E-04
6	9.05478E-04	<del>-2.01381E-02</del>	8.55024E-05
7	7.75722E-04	-2.02783E-02	-3.12587E-04
8	9.37443E-03	-4.21165E-03	3.39552E-03
9	-1.16117E-02	-3.67134E-04	1.70224E-03
10	1.26539E-02	-2.85823E-04	-2.11851E-04
11	0.00000E+00	0.00000E+00	0.00000E+00

(A)

SILY PO ZATIZENICH

Akce : RAM11 22. 1. '23 10:29

Subor : SILY.DEF

Stav : 1

Nazev :

Prut	Stycnik	Podelna	Pricna	Moment
1	Zac : 1	1.32050E+02	-2.70794E+01	0.00000E+00
	Kon : 2	-1.32050E+02	2.70794E+01	-1.08317E+02
2	Zac : 2	1.32050E+02	-2.70794E+01	1.08317E+02
	Kon : 3	<del>-1.32050E+02</del>	<del>2.70794E+01</del>	<del>-1.48937E+02</del>
3	Zac : 3	1.51044E+02	6.50478E+01	1.48937E+02
	Kon : 4	<del>-1.40583E+02</del>	<del>-4.70119E+01</del>	<del>-5.17784E+01</del>
4	Zac : 4	1.40533E+02	4.71623E+01	5.17784E+01
	Kon : 5	-9.18059E+01	3.70574E+01	-1.09184E+01
5	Zac : 5	<del>9.17662E+01</del>	-3.71556E+01	1.09184E+01
	Kon : 6	-8.47923E+01	4.91795E+01	<del>-6.08213E+01</del>
6	Zac : 6	8.47923E+01	4.91795E+01	6.08213E+01
	Kon : 7	-9.17662E+01	-3.71556E+01	-1.09184E+01
7	Zac : 7	9.19868E+01	3.66060E+01	1.09184E+01
	Kon : 8	-1.40852E+02	4.88172E+01	-6.07188E+01
8	Zac : 8	1.42257E+02	-4.45581E+01	6.07188E+01
	Kon : 9	-1.52568E+02	6.13885E+01	-1.48937E+02
9	Zac : 9	<del>1.32050E+02</del>	-2.70794E+01	1.48937E+02
	Kon : 10	-1.32050E+02	2.70794E+01	-1.08317E+02
10	Zac : 10	1.32050E+02	-2.70794E+01	1.08317E+02
	Kon : 11	-1.32050E+02	2.70794E+01	0.00000E+00
11	Zac : 3	-7.09429E+01	0.00000E+00	0.00000E+00
	Kon : 9	7.09429E+01	-0.00000E+00	0.00000E+00

REAKCE PO ZATIZENICH

Akce : RAM11 22. 1. '23 10:29

Subor : REAKCE.DEF

Stav : 1

Nazev :

Stycnik	Sila X	Sila Y	Moment
1	2.70794E+01	1.32050E+02	0.00000E+00
11	-2.70794E+01	1.32050E+02	0.00000E+00

REAKCE PO ZATIZENICH

Akce : RAM11 22. 1. '23 10:29

Subor : REAKCE.DEF

Stav : 1

Nazev :

Stycnik	Sila X	Sila Y	Moment
1	2.70794E+01	1.32050E+02	0.00000E+00
11	-2.70794E+01	1.32050E+02	0.00000E+00



SILY VIETOR SAME KONT STATION (8)

DEFORMACE PO ZATIZENICH

Akce : RAM11

22. 1.'23 11:06

Soubor : DEFORMA.DEF

Mat. stav : 1

Nazev :

STATION

Stycnik	Posuv X	Posuv Y	Otoceni
1	0.00000E+00	0.00000E+00	0.00000E+00
2	1.88748E-02	1.10144E-04	-2.48849E-03
3	2.17043E-02	1.41478E-04	-1.24713E-03
4	2.22686E-02	-7.63633E-04	-1.15812E-04
5	1.96519E-02	4.17638E-03	9.13995E-04
6	1.90422E-02	5.27277E-03	1.30081E-03
7	1.99310E-02	6.76383E-03	1.64226E-03
8	1.89241E-02	4.61326E-03	-3.09363E-03
9	1.62065E-02	1.19478E-04	-3.12579E-03
10	1.16480E-02	9.30165E-05	-2.97531E-03
11	0.00000E+00	0.00000E+00	0.00000E+00

SILY PO ZATIZENICH

Akce : RAM11

22. 1.'23 11:06

Soubor : SILY.DEF

Mat. stav : 1

Nazev :

Prut	Stycnik	Podelna	Pricna	Moment
1	Zac : 1	-5.08864E+01	2.53209E+01	0.00000E+00
	Kon : 2	5.08864E+01	-1.23609E+01	7.53636E+01
2	Zac : 2	-5.08864E+01	1.23609E+01	-7.53636E+01
	Kon : 3	5.08864E+01	-7.50091E+00	9.02600E+01
3	Zac : 3	-4.77882E+01	-3.11089E+01	-9.02600E+01
	Kon : 4	4.77882E+01	2.25428E+01	4.37429E+01
4	Zac : 4	-4.77640E+01	-2.25939E+01	-4.37429E+01
	Kon : 5	4.77640E+01	-1.73568E+01	2.25665E+01
5	Zac : 5	-4.77455E+01	1.74079E+01	-2.25665E+01
	Kon : 6	4.77455E+01	-2.31187E+01	4.59914E+01
6	Zac : 6	-4.37755E+01	-2.99635E+01	-4.59914E+01
	Kon : 7	4.37755E+01	2.42527E+01	1.46537E+01
7	Zac : 7	-4.39198E+01	-2.39904E+01	-1.46537E+01
	Kon : 8	4.39198E+01	-1.63028E+01	-1.66983E+01
8	Zac : 8	-4.43903E+01	1.49743E+01	1.66983E+01
	Kon : 9	4.43903E+01	-2.32010E+01	1.50888E+01
9	Zac : 9	-4.29736E+01	7.50091E+00	-1.50888E+01
	Kon : 10	4.29736E+01	-4.90591E+00	5.78364E+00
10	Zac : 10	-4.29736E+01	4.90591E+00	-5.78364E+00
	Kon : 11	4.29736E+01	2.01409E+00	0.00000E+00
11	Zac : 3	1.82295E+01	0.00000E+00	0.00000E+00
	Kon : 9	-1.82295E+01	-0.00000E+00	0.00000E+00

REAKCE PO ZATIZENICH

Akce : RAM11

22. 1.'23 11:06

Soubor : REAKCE.DEF

Mat. stav : 1

Nazev :

Stycnik	Sila X	Sila Y	Moment
1	-2.53209E+01	-5.08864E+01	0.00000E+00
11	-2.01409E+00	-4.29736E+01	0.00000E+00

REAKCE PO ZATIZENICH

Akce : RAM11

22. 1.'23 11:06

Soubor : REAKCE.DEF

Mat. stav : 1

Nazev :

Stycnik	Sila X	Sila Y	Moment
1	-2.53209E+01	-5.08864E+01	0.00000E+00
11	-2.01409E+00	-4.29736E+01	0.00000E+00



OP UVEDS

VVVV TRAKT #

ACE PO ZATIZENICH Akce : RAM11 22. 1.'23 11:15

Subor : DEFORMA.DEF

Mat. stav : 1

Nazev :

STATUM (B)

Stycnik	Posuv X	Posuv Y	Otoceni
1	0.00000E+00	0.00000E+00	0.00000E+00
2	3.14498E-02	-3.65946E-05	-6.46591E-03
3	4.06295E-02	-4.70051E-05	-5.76519E-03
4	4.52317E-02	-8.00081E-03	-4.78928E-03
5	4.38522E-02	-5.73395E-03	3.81941E-03
6	4.16439E-02	-1.93918E-03	3.72665E-03
7	4.37214E-02	1.66900E-03	3.47387E-03
8	4.61248E-02	6.11848E-03	-3.69375E-03
9	4.23112E-02	-6.92100E-05	-5.08593E-03
10	3.37087E-02	-5.38816E-05	-6.33356E-03
11	0.00000E+00	0.00000E+00	0.00000E+00

SILY PO ZATIZENICH Akce : RAM11 22. 1.'23 11:16

Subor : SILY.DEF

Mat. stav : 1

Nazev :

Prut	Stycnik	Podelna	Pricna	Moment
1	Zac : 1	1.69067E+01	1.76724E+01	0.00000E+00
	Kon : 2	-1.69067E+01	-4.71238E+00	4.47695E+01
2	Zac : 2	1.69067E+01	4.71238E+00	-4.47695E+01
	Kon : 3	-1.69067E+01	1.47622E-01	4.81931E+01
3	Zac : 3	1.34335E+01	1.17532E+01	-4.81931E+01
	Kon : 4	-1.34335E+01	-6.03087E+00	6.36122E+01
4	Zac : 4	1.34270E+01	6.04523E+00	-6.36122E+01
	Kon : 5	-1.34270E+01	2.06425E+01	4.58699E+00
5	Zac : 5	1.34049E+01	-2.06568E+01	-4.58699E+00
	Kon : 6	-1.34049E+01	2.44717E+01	-2.14979E+01
6	Zac : 6	2.78979E+01	-5.16083E-01	2.14979E+01
	Kon : 7	-2.78979E+01	1.78771E+00	-2.28295E+01
7	Zac : 7	2.78867E+01	-1.95455E+00	2.28295E+01
	Kon : 8	-2.78867E+01	1.09267E+01	-7.53628E+01
8	Zac : 8	2.82027E+01	-1.00829E+01	7.53628E+01
	Kon : 9	-2.82027E+01	1.19148E+01	-9.36794E+01
9	Zac : 9	2.48933E+01	-1.22476E+01	9.36794E+01
	Kon : 10	-2.48933E+01	1.48576E+01	-7.33505E+01
10	Zac : 10	2.48933E+01	-1.48576E+01	7.33505E+01
	Kon : 11	-2.48933E+01	2.18176E+01	0.00000E+00
11	Zac : 3	-5.57597E+00	0.00000E+00	0.00000E+00
	Kon : 9	5.57597E+00	-0.00000E+00	0.00000E+00

REAKCE PO ZATIZENICH Akce : RAM11 22. 1.'23 11:16

Subor : REAKCE.DEF

Mat. stav : 1

Nazev :

Stycnik	Sila X	Sila Y	Moment
1	-1.76724E+01	1.69067E+01	0.00000E+00
11	-2.18176E+01	2.48933E+01	0.00000E+00

REAKCE PO ZATIZENICH Akce : RAM11 22. 1.'23 11:16

Subor : REAKCE.DEF

Mat. stav : 1

Nazev :

Stycnik	Sila X	Sila Y	Moment
1	-1.76724E+01	1.69067E+01	0.00000E+00
11	-2.18176E+01	2.48933E+01	0.00000E+00

POSLEDNIE PREDPOROX - STANOV

8

1.1. XROVA PREDPORA:

$M_{max}^{(1)} = 55 \cdot 69 = \frac{124,00}{125,70} \text{ kNm}$       $W_{POR} = 536,0 \text{ cm}^3$   
 $N_{max}^{(2)} = 51 + 75,0 = 126,0$

$N_{max}^{(3)} = -74,0 - 27,0 - - 169,0 \text{ kN}$   
 $z_0 = 11,0$

$y_{max}^{(1)} = \frac{0,0284}{1,45} + \frac{-0,0057}{1,15} = 0,018$

$y_{max}^{(2)} = -\frac{0,01}{1,45} = -0,0069$

$y_{x,max}^{(3)} = \frac{0,016}{1,45} = \frac{0,0423}{1,15}$

$\frac{0,5100}{1,15} = 0,443$

$0,034 \text{ m} = \frac{5,50}{1,50}$

$\lambda_{PR} = \frac{19,0}{250} = 0,076$

$\lambda_{PR} = 0,035 \text{ m}$

WHAUSE IPE 400 | A = 85,10 cm<sup>2</sup>

$W_{xy} = 1160$

$I_{xy} = 2330 \cdot 10^6 \text{ cm}^4$

$i_x = 3194 \text{ cm}$

$i_y = 1616 \text{ cm}$

STUP:

$M_{max} = 1080 + 730 = 174,0 \text{ kNm}$

$N_{max} = 132 + 5,0 + 24,0 = 161,0 \text{ kN}$

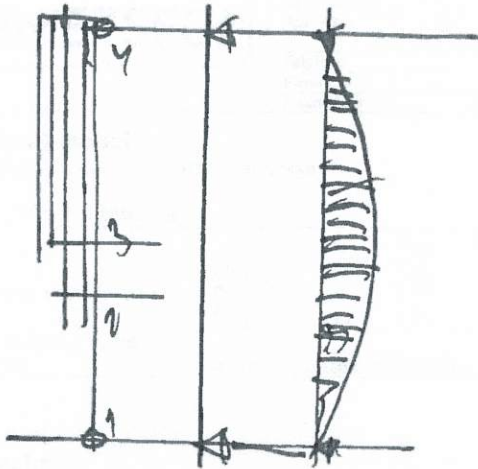
$\lambda = \frac{3,45 \times 5,50}{114,0} = 1,64$       $\varphi = 445$

$\sigma_{max} = \frac{0,166}{0,177} + \frac{0,167}{0,45 \times 0,0085} = 1920 \text{ kN} = 235$

WHAUSE IPE 400



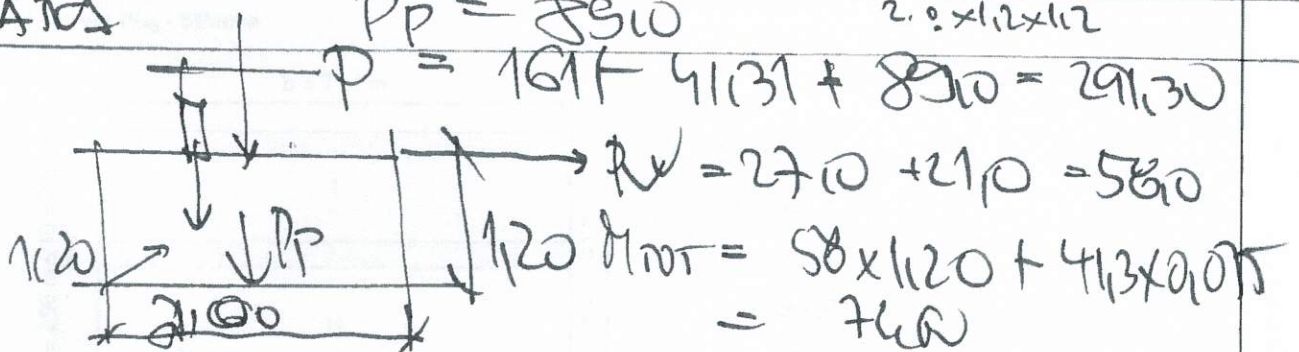
# SILOVA STEVA



PATRA

$$P_p = 8910$$

$$2.0 \times 1.2 \times 1.2$$



$$P = 1611 + 41.31 + 8910 = 291.30$$

$$R_1 = 2710 + 2110 = 5820$$

$$M_{TOT} = 58 \times 1.20 + 41.3 \times 2.10 = 760$$

$$e = \frac{7260}{291.30} = 2.50$$

$$9.24 \times \frac{291}{1.20 \times (1.80 - 0.50)} = 159$$

PATRA 140 x 200  
 AUFTR 180 x 200



**Profilform DESIGNER**

Projektant:		Název akce:	-
Společnost:		Místo stavby:	-
Adresa:		Číslo projektu:	-
Telefon:		Název souboru:	-
E-mail:		Datum	31.01.2023
Poznámka:			

**Větrový modul**

Použité EC normy: Slovenská republika

**Sumarizační tabulka**

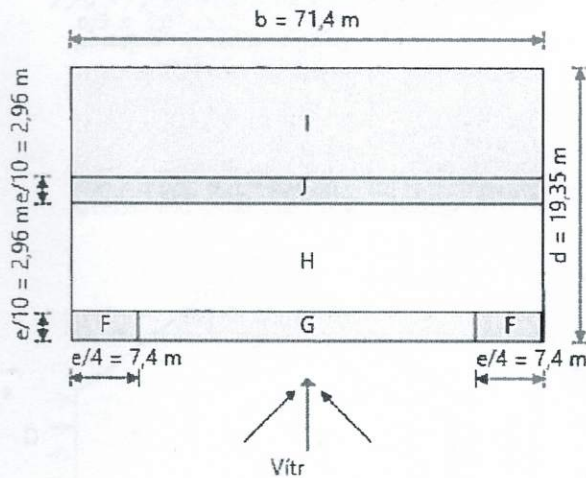
		$z_e$	$C_{dir}$	$C_{season}$	$v_{b,0}$	$v_b$	$c_{r(z)}$	$c_{0(z)}$	$k_r$	$v_m(z)$	$I_v(z)$	$q_p(z)$
Referenční výška [m]	Střecha	14,8	1,00	1,00	24,00	24,00	0,84	1,00	0,22	20,15	0,26	0,710
	Stěny	5,5	1,00	1,00	24,00	24,00	0,63	1,00	0,22	15,04	0,34	0,481
	Štíty	14,8	1,00	1,00	24,00	24,00	0,84	1,00	0,22	20,15	0,26	0,710
Nadmořská výška	410 m.n.m											
Terén	terén III. - oblasti rovnoměrně pokryté vegetací nebo budovami (vesnice, předměstský terén, souvislý les)											

**Střecha**

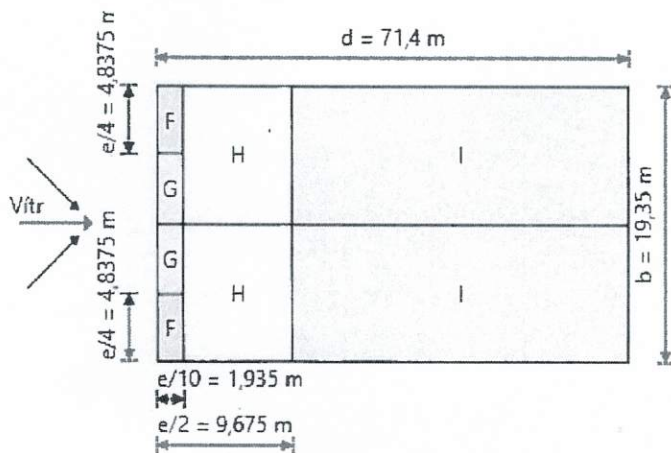
**Sedlová střecha**

Jednolodní objekt

**Zatížení větrem  $W_{10}$  - Střecha**



- $W_{10}$
- F = -0,497 kN/m<sup>2</sup>
  - + F = 0,710 kN/m<sup>2</sup>
  - G = -0,497 kN/m<sup>2</sup>
  - + G = 0,710 kN/m<sup>2</sup>
  - H = -0,284 kN/m<sup>2</sup>
  - + H = 0,497 kN/m<sup>2</sup>
  - I = -0,426 kN/m<sup>2</sup>
  - + I = 0,213 kN/m<sup>2</sup>
  - J = -0,497 kN/m<sup>2</sup>
  - + J = 0,213 kN/m<sup>2</sup>



- $W_{10}$
- F = -0,923 kN/m<sup>2</sup>
  - + F = 0,213 kN/m<sup>2</sup>
  - G = -1,135 kN/m<sup>2</sup>
  - + G = 0,213 kN/m<sup>2</sup>
  - H = -0,710 kN/m<sup>2</sup>
  - + H = 0,213 kN/m<sup>2</sup>
  - I = -0,497 kN/m<sup>2</sup>
  - + I = 0,213 kN/m<sup>2</sup>





**Profilform DESIGNER**

Projektant:		Název akce:	-
Společnost:		Místo stavby:	-
Adresa:		Číslo projektu:	-
Telefon:		Název souboru:	-
E-mail:		Datum	31.01.2023
Poznámka:			

**Stěna**  
Zatížení větrem  $W_{10}$  - Stěny

