

|                               |                                                                                              |                             |            |                                                                                                                                                                                                  |                |
|-------------------------------|----------------------------------------------------------------------------------------------|-----------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| vypracoval: Ing. Hádek Martin |                                                                                              | schválil: Ing. Hádek Martin |            | <b>KUTNOHORSKÁ<br/>STAVEBNÍ</b><br> PROJEKCE<br>Ing. Martin Hádek<br>284 01 Kutná Hora<br>tel.: 723 576 741 |                |
| SÚ:                           | Kutná Hora                                                                                   | obec:                       | Kutná Hora |                                                                                                                                                                                                  |                |
| investor:                     | Město Kutná Hora, Havlíčkovo náměstí 552/1, Kutná Hora<br>Kutná Hora – Vnitřní Město, 284 24 |                             |            |                                                                                                                                                                                                  |                |
| stavba:                       | <b>ZIMNÍ STADION KUTNÁ HORA<br/>- ZÁZEMÍ PRO NÁVŠTĚVNÍKY</b>                                 |                             |            | datum:                                                                                                                                                                                           | červen 2019    |
| část:                         | <b>STAVEBNĚ KONSTRUKČNÍ ŘEŠENÍ</b>                                                           |                             |            | stupeň:                                                                                                                                                                                          | Projekt stavby |
|                               |                                                                                              |                             |            | zak. číslo:                                                                                                                                                                                      | <b>19 703</b>  |
| obsah:                        | <b>STATICKE POSOUZENÍ</b>                                                                    |                             |            | <b>D.1.2</b>                                                                                                                                                                                     |                |

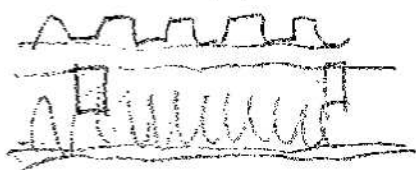
## **OBSAH:**

1.     **ZATÍŽENÍ**
  - 1.1.   **STÁLÉ**
  - 1.2.   **NAHODILÉ**
2.     **VAZNICE**
3.     **PRŮVLAK**
4.     **ZTUŽIDLO**
5.     **SLOUP**
6.     **PATKA**

# 1. ZATÍŽENÍ

## 1.1. STÁLE

STŘECHA



|                | $q$  | $d$ | $g_k$ $\text{N/m}^2$ |
|----------------|------|-----|----------------------|
| PŮV. KONT. A   |      |     | 0,1                  |
| OBEC. KOB      |      |     | 0,2                  |
| TEP. IZOLACE   | 0,05 | 0,3 | 0,15                 |
| POPHLED. ŠAPR. |      |     | 0,20                 |

$$g_k = 0,65 \text{ N/m}^2$$

$$g_d = 1,35 \cdot 0,65 = 0,88 \text{ N/m}^2$$

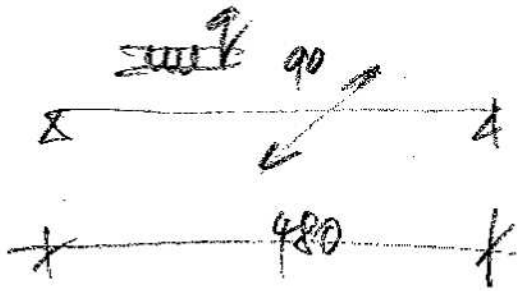
## 1.2. NÁHODNÉ

UŽITNÉ

$$p_k = 0,45 \text{ N/m}^2 \quad p_d = 1,5 \cdot 0,75 = 1,13 \text{ N/m}^2$$

2. VAZNIČE

2.1.  $L = 480$



105V S 235  $f_y = 235 \text{ MPa}$

$E = 210 \cdot 10^3 \text{ MPa}$

$$q_k = (0,65 + 0,75) \cdot 0,9 = 1,26 \text{ kN/m}$$

$$q_d = (0,88 + 1,15) \cdot 0,9 = 1,81 \text{ kN/m}$$

$$S_1 = \frac{1}{8} \cdot 1,81 \cdot 4,8^2 = 5,2 \text{ kNm}$$

$$W_{\text{nut}} = \frac{S_1}{f_y} = \frac{5200}{235} = 22,2 \text{ cm}^3$$

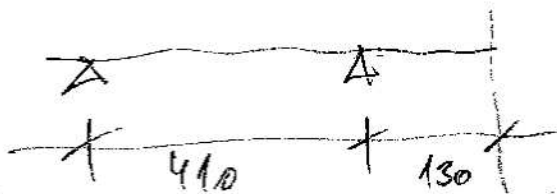
$$y_{\text{nut}} \quad y = \frac{5}{384} \cdot \frac{q_k L^4}{E I} < \frac{L}{200}$$

$$y_{\text{nut}} = \frac{1000}{384} \cdot \frac{1,26 \cdot 4,8^3 \cdot 10^3}{210 \cdot 10^9} = 143 \mu\text{m}$$

$$k_{\text{opt}} = \frac{24}{W} = \frac{245,6}{22,2} = 11 \text{ cm}$$

$$\Rightarrow \phi 120/60/3 \quad D = 189 \quad W = 316 \text{ cm}^3$$

2.2.  $L = 410 + 130$

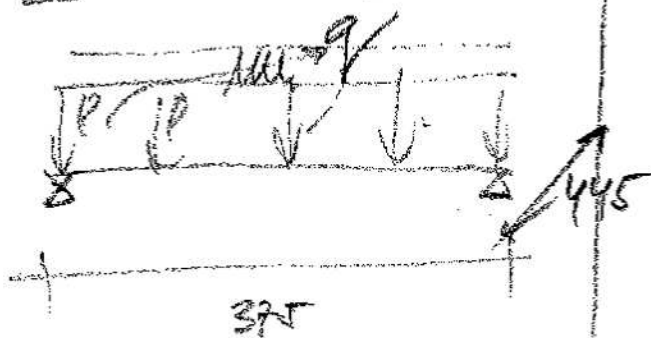


$$M_k = \frac{1}{2} \cdot 1,81 \cdot 1,3^2 = 1,52 \text{ kNm} < 5,2$$

DITTO

$$\Rightarrow 120/60/3$$

### 3. PRŮVLAK



$$q_k = (0,65 + 0,75) \cdot 4,45 = 6,238 \text{ kN/m}$$

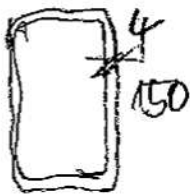
$$q_d = 2,01 \cdot 4,45 = 8,9595 \text{ kN/m}$$

$$M = \frac{1}{8} \cdot 8,95 \cdot 3,75^2 = 15,72 \text{ kNm}$$

$$W_{\text{nut}} = 67 \text{ cm}^3$$

$$y_{\text{nut}} = \frac{1250}{384} \cdot \frac{6,23 \cdot 3,75^3 \cdot 10^3}{210 \cdot 10^9} = 509 \text{ cm}$$

$$\mu_{\text{opt}} = \frac{2 \cdot 509}{67} = 15 \text{ cm}$$



100

$$G = 14,5$$

$$F = 18,95$$

$$y = 594,6$$

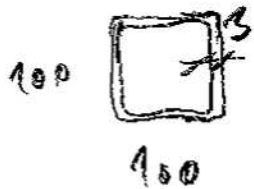
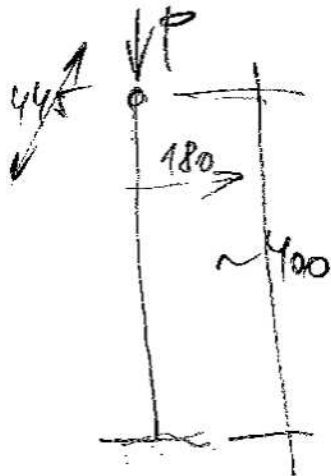
$$W = 49,8$$

$$y = 594,6 > 509 \quad W = 49,8 > 67$$

### 4. ZAVĚŠENÍ

OTTO PRŮVLAK

## 5. stoup



$$A = 11,295$$

$$G = 8,95$$

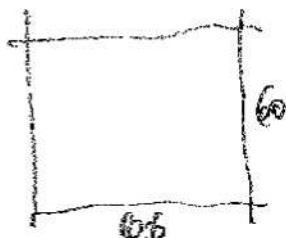
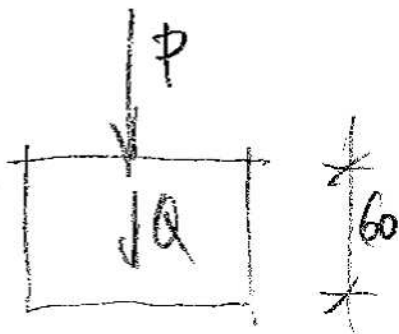
$$Y = 174,5$$

$$W = 31,91$$

$$\lambda_x = 39,3$$

005035

## 6. PATKA



$$P_Q = 4,45 \times 1,8 \times 1,4 = 11,2 \text{ kN}$$

$$P_d = 4,45 \times 1,8 \times 2,01 = 16,12 \text{ kN}$$

$$\sigma = \frac{P_d}{A}$$

$$\lambda = \frac{l}{i} = \frac{4000}{39,3} = 102$$

$$\sigma = \frac{16,1 \cdot 10^3}{0,59 \cdot 11,295 \cdot 10^{-4}} = 0,59$$

$$\sigma = 24,16 \text{ MPa} < f_y = 235$$

$$Q_f = 0,6 \cdot 0,6 \cdot 0,6 \cdot 25 \cdot 1,35 = 7,395$$

$$\Sigma N = P + Q_d = 16,1 + 7,35 = 23,45 \text{ kN}$$

$$\sigma = \frac{\Sigma N}{A} = \frac{23,45 \cdot 10^3}{0,36} = 0,065 \text{ MPa}$$

$$< 0,1 \text{ MPa OK}$$