

1 1 1
STWALIC STROP WAD 2. KP

Technische Zeichnung	150/180 mm	1/100 m
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2017 školski konkurs

Nobodine' vāta' (obytva' phras)

$$1,50 \text{ kN/m}^2$$

still - prickly skin (oddly)

7,00 KO /u

- podoba 01.03.75

0123

1. Polka

0170

—
Zaklop

0170

—
Fraser

0175

- Podhif

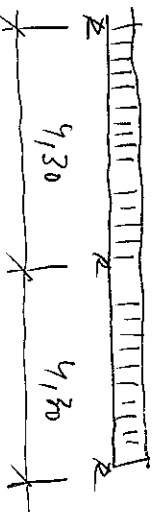
0110

- podhled SDK

020

static 7,88 kcal/m²

Teovrhida' uot'pet' pol' trauu' je 4,30 m, p'usodi' p'revot'u' jako
spojitij' uosuk' o dnuu' pol'ek.

$$T_{\text{flow}} = 160/180 \text{ min}$$
$$I = 7.77 \cdot 10^{-5} \text{ m}$$
$$\overline{w_{ud}} = 0,8 \frac{24}{7,30} = 19,177 \text{ MPa}$$


Max. Choukhu. 7.7
 $q_k = 1.50 + 1.08 = 3.38 \text{ kN/m}$

$$q_1 = 1.50 \cdot 1.50 + 1.88 \cdot 1.15 = 4.97 \text{ kJ/m}^2$$

Max. obzbojny' nauf na fuvuu

$$H_{eduar} = \frac{1}{9} \cdot 4,130^2 \cdot 4,199 = 9,06 \text{ kN/m}$$

Nauf vuvuvuv' fuvuu

$$H_{red} = 8,69 \cdot 10^{-9} \cdot 11,77 \cdot 10^3 = 12,76 \text{ kN/m} > H_{eduar} \quad \underline{\text{vyhov!}}$$

Pu'kly

$$q_{max} = \frac{1 \cdot 4,130^4 \cdot 1,6 \cdot 10^{-3}}{192 \cdot 1,1 \cdot 10^4 \cdot 7,77 \cdot 10^5} \left(2,35 + 0,3 \cdot 1,50 \right) = 0,00931$$

$$= \frac{4,130}{460} \quad \underline{\text{vyhov!}}$$

Stavop' stavop' fuvuu vuvuvuv' puo zavh'uv' sloupku kuvuu.

Orlov zavh'uv' sloupku kuvuu

Orlov stavop' 470 $\text{cm}^{-1} \cdot \text{m} = 1,47$

zef. na 1m² poduvuv' stavop' :

$$- \text{sv'k} \quad 0,397 \cdot 2,10 \quad 0,839 \text{ kN/m}^2$$

$$- \text{sv'k} - \text{stavop' na stavop' } 0,40 \cdot 1,47 = 0,579 \text{ kN/m}^2$$

$$- \text{stavop' } 0,20 \cdot 1,47 = 0,29$$

$$- \text{kuv} \quad 0,15$$

$$- \text{svk podk'ed } 0,20 \cdot 1,47 \quad 0,29$$

$$\underline{\text{stav'k } 1,32 \text{ kN/m}^2}$$

Zavh'uvuv' stavop' kuvuu je av'

$$3,35 \times 3,10 = 10,40 \text{ m}^2$$

Kouvara veika na stoupek knou i

$$P_d = 10,40 (1,50 \cdot 0,69 + 1,15 \cdot 1,32) = 26,55 \text{ ku}$$

Olybyj' unant od stoupe knou i p'otou

$$H_{ed} = 0,25 \cdot 4,30 \cdot 26,55 = 28,57 \text{ ku}$$

Puohie $\underline{\text{E 160}}$ pu' jojist'uu klopu' (pu'suou soouu ke stoupuu
dava $W_{pe} = 137 \cdot 10^{-6} \text{ u}^3$ trauu)

$$H_{red} = \frac{235000}{710} \cdot 137 \cdot 10^{-6} = 32,20 \text{ ku} > H_{ed}$$

Ukrou'

ke konteu' shouuu trauu | g'f'ruuu stoupe knou |
jode pu'dau olapu' j'edu puoh' $\underline{\text{E 160}}$.

СТАВНИЦИ СТРОП НАД 1. КР

leduoduchy' ducuw' trawu' stop | traw' 180/240 u u a 1,05 u

zohru' stopu' koushuka

kladie' uita' (olyt u u ploska) 1,50 kN/u²

stak' - pichy sk (odklad) 1,00 kN/u²

- podloka 0,20

- osh desk 0,030. 7,15 0,23

- troba 0,20

- zoklop 0,10

- podbity 0,10

- stopu' traw 0,22

- podklad sk 0,30

stak' 2,35 kN/u²

Maxima lu' sorke' vorpeth' stopu' ho traw' ja 4,10 u

Teorichki' vorpeth' l = 1,05 · 4,10 = 4,30 u

stopu' traw 180/240 u u a 1,05 u.

W = 1,728 · 10⁻³ u³

I = 7,074 · 10⁻⁴ u⁴

Maxima lu' chavetishiki' zaftru' traw' ja

q_k = 1,05 (1,50 + 2,35) = 4,04 kN/u

Maxima lu' uovkov' zaftru'

q_d = 1,05 (1,50 · 1,15 + 2,35 · 1,15) = 5,20 kN/u

Obshchaya' usloviya'

$$M_{sq max} = 0,1125 \cdot 4,30^2 \cdot 5,100 = 12,01 \text{ kNm}$$

Proverka' usloviya'

$$\text{Derevo C24} \quad f_{wd} = \frac{24}{1,3} \cdot 0,18 = 14,177 \text{ MPa}$$

$$M_{pd} = 1,728 \cdot 10^{-3} \cdot 44,77 \cdot 10^{+3} = 25,152 \text{ kNm} > M_{ed}$$

Uklyon' bezpeku

Prilozheniye

$$\eta_{max} = \frac{5 \cdot 4,30^4 \cdot 10^{-3}}{384 \cdot 11 \cdot 10^4 \cdot 2,074 \cdot 10^{-4}} \left(2,47 \cdot 1,6 + 1,57 \cdot 0,3 \cdot 1,6 \right) =$$

$$= 0,0092 \text{ m} \approx \frac{1,30}{468} \quad \text{Uklyon' bezpeku}$$

Poslednyaya' prikladnaya' usloviya' 1.04 a 1.08

Stavim' bol'shoy' privlek, ustoynchivost' u usloviya' 1
Sostavim' 3,50 m, tozhe sda' ustoynchivost' 1,05 \cdot 3,50 = 3,675 m

Zatrem' usloviya'

$$\begin{aligned} - \text{usloviye 1} & \quad 0,625 \cdot 6,50 \cdot 1,50 = 6,109 \text{ kNm} \\ - \text{stavka 1} & \quad 0,625 \cdot 6,50 \cdot 2,35 = 9,155 \text{ kNm} \end{aligned}$$

$$\text{Reaktivnaya' zat. privlek} \quad 6,109 + 9,155 + 0,30 = 15,194 \text{ kNm}$$
$$\text{Krovnyaya' zatrem' privlek} \quad 6,109 \cdot 1,50 + (9,155 + 0,30) \cdot 1,15 = 20,46 \text{ kNm}$$

Max. obshchaya' usloviya'

$$M_{sq max} = 0,1125 \cdot 3,675^2 \cdot 20,46 = 34,154 \text{ kNm}$$

Howaf quosush' pro IPN 200

$$W = 294 \cdot 10^{-8} \text{ m}^3 \quad \rho = 0,65$$

$$I = 29,4 \cdot 10^{-6} \text{ m}^4 \quad \lambda = 102 \Rightarrow \varphi_0 = 0,82$$

$$M_{pd} = 294 \cdot 10^{-6} \cdot \frac{235000}{1,15} \cdot 0,182 = 35186 \text{ kPa} > M_{pd} = 34,54 \text{ kPa}$$

Uylovu'

Pravda

$$q_{max} = \frac{5 \cdot 3,675^4 \cdot 15194 \cdot 10^{-3}}{384 \cdot 2,1 \cdot 10^5 \cdot 29,4 \cdot 10^{-6}} = 0,00892 \text{ m} = \frac{3,675}{436}$$

Uylovu'

Uylovu' pravda IPN 200

STAVAJICI STROP KAD 1. PP

347720 shopu! kusstake

Neurodile' utica' (obytua' florida)

 $7,50 \text{ kU/m}^2$

Shall - Picking SK (Oakland)

 $1,00 \text{ kN/m}^2$

— das Kopan verhe 70 was

0210

- ceuuf. potu 6/035. 23

0187

- Leporello

7/20

- heretofore 0/10.25

2,50

1- Kaba 09. 15

7135

Our H₂O 0.015. 78

0127

- IPU 200

0126

7,59 kN/m²

Maximilian Street 10357 Shopwaka Wosaka 9100 W

Teouchick' vorpft $\ell = 1,05 \cdot 4,0 = 4,20 \text{ u}$

Stopa! uosuky a 730 by

Horizantel kvaakvishide zaftra wasuka

$$q_E = 1,30 (1,50 + 7,59) = 11,82 \text{ kN/m}$$

Box. saw hole rat.

$$q_{cl} = 1_{1,30} [1_{1,50} \cdot 1_{1,05} + 7_{7,53} \cdot 1_{1,35}] = 15_{1,37} \text{ kN/m}$$

Pseudoinverse

IPN	200
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$W_e = 274 \cdot 10^{-6} \text{ u}^3$

$I = 27,7 \cdot 10^{-6} \text{ u}^4$

Obyslov' na ust

$$H_{d \max} = 0,115 \cdot 4,120^2 \cdot 15,37 = 33,89 \text{ kN}$$

$$H_{rd} = 244 \cdot 10^{-6} \cdot \frac{235000}{1,15} \cdot 1,0 = 43,73 \text{ kN} > H_{sd \max} = 33,89 \text{ kN}$$

(klopov' registruv' betonu vni klovu vni poziciji)

vykrov' bezpecu

Priklad

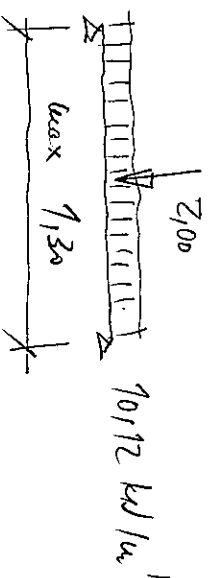
$$f_{wac} = \frac{5 \cdot 4,120^4 \cdot 11,82 \cdot 10^{-3}}{384 \cdot 2,1 \cdot 10^5 \cdot 27,9 \cdot 10^{-6}} = 0,0106 \text{ m} \approx \frac{4,20}{394}$$

vykrov'

Pocuvu' zvl. def. desky k. 100 mm vni stav. klesku

$$\begin{aligned} z_{f_{\text{max}}} - w_{\text{bnd}} &= 1,50 \cdot 1,05 = 1,58 \text{ kN/m} \\ - \text{stale} &= 6,33 \cdot 1,35 = \frac{8,54 \text{ kN/m}}{10,12 \text{ kN/m}} \end{aligned}$$

$$- p_{\text{pucka}} = 1,35 \cdot 0,50 \cdot 3,0 = 2,00 \text{ kN}$$



$$H_{d \max} = 0,115 \cdot 1,30^2 \cdot 10,12 + 0,175 \cdot 1,30 \cdot 2,0 = 2,78 \text{ kN}$$

$$\text{Decka } C20/25 \text{ k. } 100 \text{ mm, } 1 \text{ vyztuha } \phi 6/100 \text{ mm } A_{st} = 2,03 \cdot 10^{-4}$$

$$f_{cd} = 13,33 \text{ MPa} \quad f_{yd} = 420 \text{ MPa} \quad d = 0,071$$

$$x = 0,0111 \quad H_{rd} = 7,91 \text{ kN} > H_{ed} = 2,78 \text{ kN}$$

vykrov' bezpecu