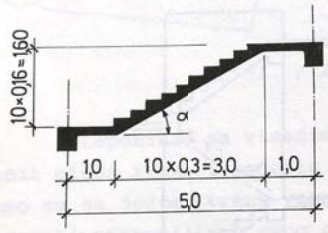
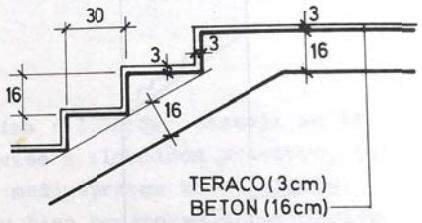
BROJNI PRIMER 23

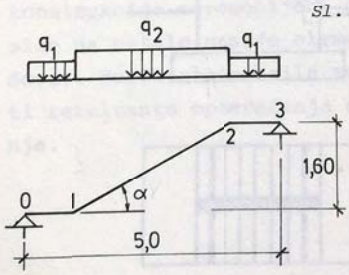
Sračunati, statičke uticaje i dimenzionisati kolenastu stepenišnu ploču prikazanu na sl. 3.42





Statička šema

Sl. 3.42



$$tg\ \alpha = \frac{16}{30} = 0,533$$

$$\cos \alpha = 0,882$$

Analiza opterećenja

na delu 0-1 i 2-3

S.T. ploče $0,16\ 25,0 = 4,00\ kN/m^2$

teraco (3 cm) $0,03\ 20,0 = 0,60$

korisno $= 3,00$

$q_1 = 7,60\ kN/m^2$

Na delu 1-2

S.T. ploče $0,16 \cdot 25/\cos\alpha = 0,16 \cdot 25,0/0,882 = 4,53\ kN/m^2$

od stepenika $(1/2) \cdot 0,16 \cdot 25,0 = 2,00$

od teraca $0,03 \cdot 20,0 + \frac{0,03 \cdot 0,16 \cdot 20,0}{0,3} = 0,92$

korisno $= 3,00$

$q_2 = 10,45\ kN/m^2$

Statički uticaji:

$R_o = R_3 = 7,60 \cdot 1,0 + 10,45 \cdot 1,5 = 23,28\ kN/m'$

$\max M = 23,28 \cdot 2,5 - 7,60 \cdot 1,0 \cdot 2,0 - 10,45 \cdot 1,5^2/2 = 31,24\ kNm/m$

Dimenzionisanje: MB 30 GA 240/360

$\max M = 31,24\ kNm/m'$

$h = d - a = 16 - 2 = 14\ cm$

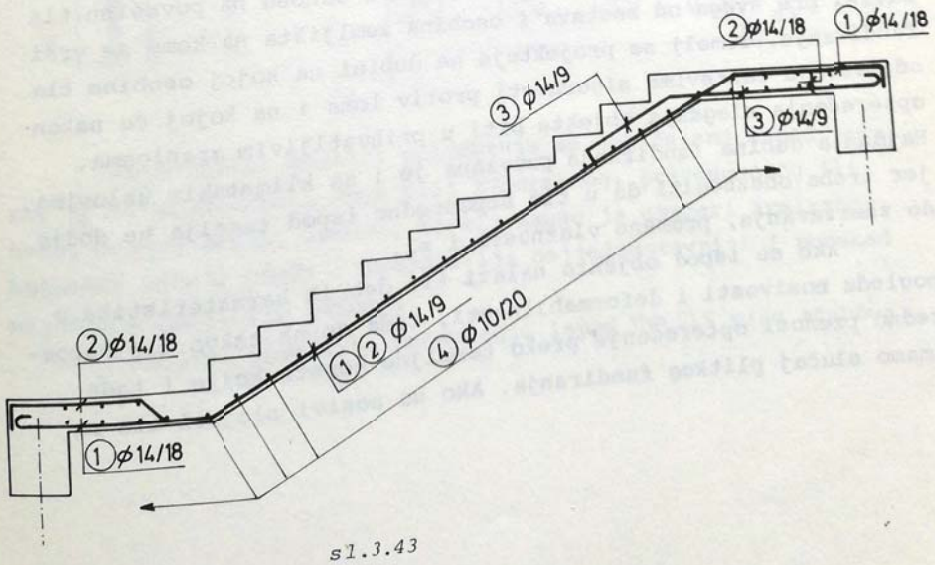
$r = 14/\sqrt{31,24} = 2,50$ $\quad \sigma_b/\sigma_a = 9,7/160\ MPa \quad \mu = 1,143\%$

$f_a = 1,143 \cdot 14 = 16,0\ cm^2/m'$

$\phi 14 \Rightarrow e = \frac{1,54 \cdot 100}{16} = 9,6\ cm \quad \Rightarrow \quad \phi\ 14/9\ (17,1\ cm^2/m')$

$f_{ap} = 0,25\ f_a = 0,25 \cdot 16 = 4,0\ cm^2/m' \Rightarrow \phi\ 10/20\ (3,95\ cm^2/m')$

Šema armiranja prikazana je na sl. 3.43



sl.3.43