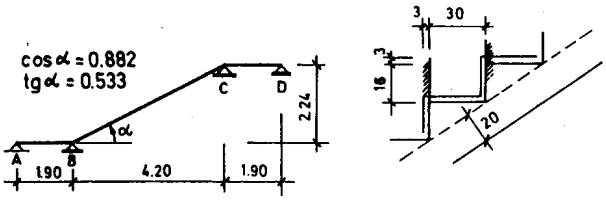
PRILOG 6.13
KOLENASTA STEPENIŠNA PLOČA

Dimenzionisati kolenastu stepenišnu ploču oslonjenu na podestne grede, prema slici.

Podaci



širina stepenica $b = 1.50$ m

$p = 5.00$ kN/m^2

MB 40

RA 400/500

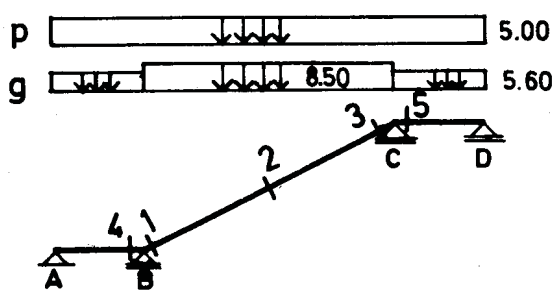
Analiza opterećenja

Delovi A – B i C – D:

s. t. ploče	0.20×25.0	$= 5.00$ kN/m^2
teraco (3cm)	0.03×20.0	$= 0.60$ kN/m^2
		$g = 5.60$ kN/m^2
korisno		$p = 5.00$ kN/m^2

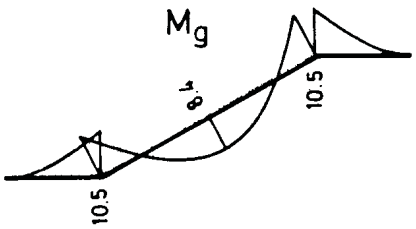
Deo B – C

s.t. ploče	$0.20 \times \frac{25.0}{0.882}$	$= 5.67$ kN/m^2
stepenice	$\frac{0.16 \times 0.30}{2 \times 0.30} \times 25.0$	$= 2.00$ kN/m^2
teraco (3 cm)	$\frac{(0.30 + 0.16) \times 0.03}{0.30} \times 20.0$	$= 0.92$ kN/m^2
		$g = 8.59$ kN/m^2
		$p = 5.00$ kN/m^2

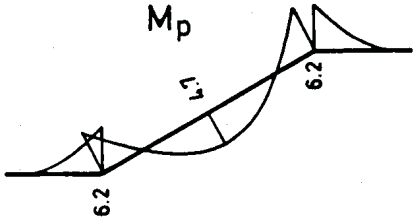


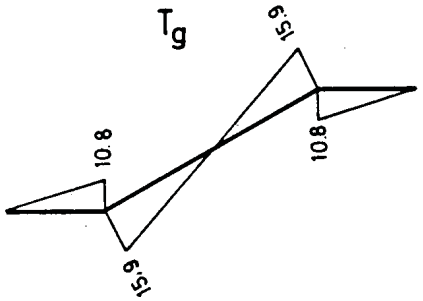
Dijagrami statičkih uticaja

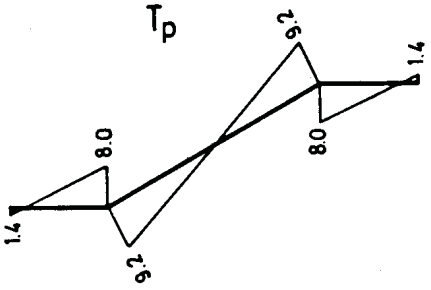
Stalno opterećenje

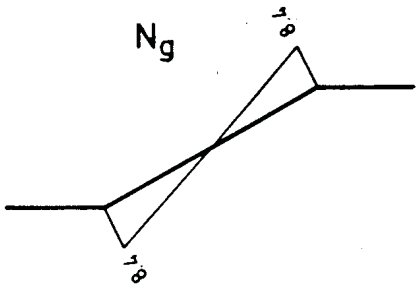


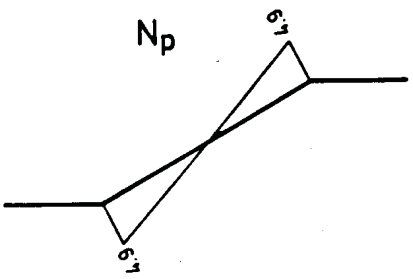
Korisno opterećenje











Dimenzionisanje

MB 40	f_B = 25.5 MPa
RA 400/500	σ_v = 400.0 MPa

Presek 1 – 1

$h = 20.0 - 1.5 - 1.2 \times 0.5 = 17.9$ cm

$M_u = 1.6 \times 10.50 + 1.8 \times 6.20 = 27.96$ kNm/m

$N_u = 1.6 \times (-8.40) + 1.8 \times (-4.9) = -22.26$ kN/m

$M_{a,u} = 27.96 + 22.26 \times (0.10 - 0.021) = 29.72$ kNm/m

$$k = \frac{17.9}{\sqrt{\frac{29.72}{25.5 \times 10^{-1}}}} = 5.243$$

$\varepsilon_{b,a} = 1.0/10\ ‰$

$\bar{\mu} = 3.788\ \%$

$$A_a = 3.788 \times 17.9 \times \frac{25.5}{400} = 4.27\ \text{cm}^2/\text{m}$$

$A_{ap} = 0.20 \times 4.27 = 0.85\ \text{cm}^2/\text{m}$

$min\ A_{ap} = 0.085 \times 20.0 = 1.70\ \text{cm}^2/\text{m}$

Usvojeno: RØ 12/20 (5.65 cm^2/m)
podeona RØ 8/20 (2.5 cm^2/m)

Presek 2 – 2

$h = 17.9$ cm

$M_u = 1.6 \times 8.4 + 1.8 \times 4.70 = 21.90$ kNm/m

$N_u = 0.0$ kN/m

$$A_a = \frac{21.90 \times 10^2}{0.9 \times 17.9 \times 400 \times 10^{-1}} = 3.40\ \text{cm}^2/\text{m}$$

Usvojeno: RØ 12/20 (5.65 cm^2/m)
podeona RØ 8/20 (2.5 cm^2/m)

Presek 3 – 3

$h = 17.9$ cm

$M_u = 1.6 \times 10.50 + 1.8 \times 6.20 = 27.96$ kNm/m

$N_u = 1.6 \times 8.40 + 1.8 \times 4.90 = 22.26$ kN/m

$M_{a,u} = 27.96 - 22.26 \times (0.10 - 0.021) = 26.20$ kNm/m

$$A_a = \frac{26.20 \times 10^2}{0.9 \times 17.9 \times 400 \times 10^{-1}} + \frac{22.26}{400 \times 10^{-1}} = 4.12\ \text{cm}^2/\text{m}$$

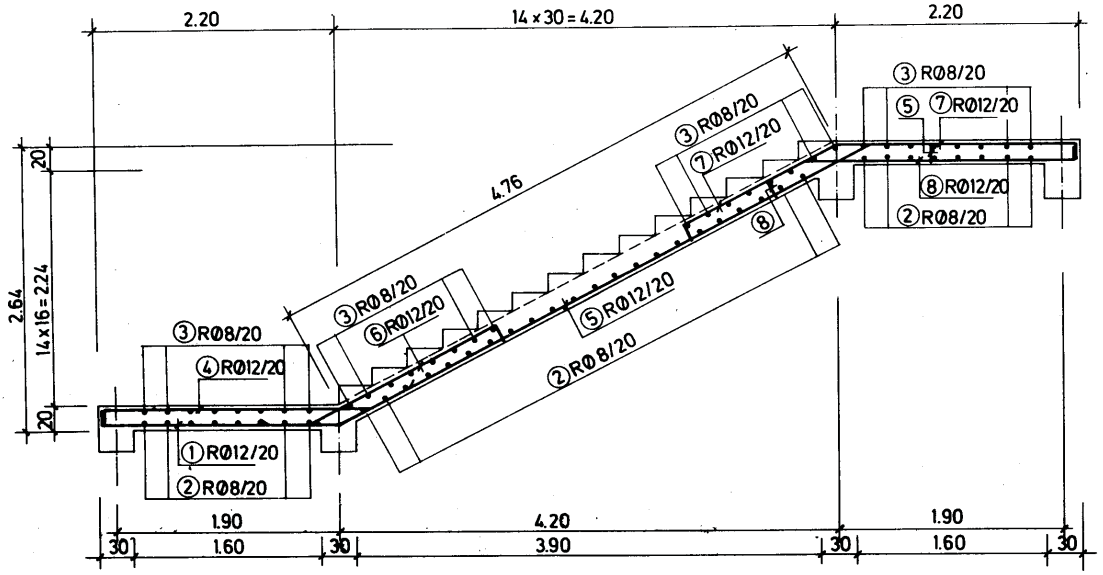
Usvojeno: RØ 12/20 (5.65 cm^2/m)
podeona RØ 8/20 (2.5 cm^2/m)

Presek 4 – 4 i presek 5 – 5

Kao presek 1 – 1

Usvojeno: RØ 12/20 (5.65 cm^2/m)
podeona RØ 8/20 (2.5 cm^2/m)

PLAN ARMATURE



641