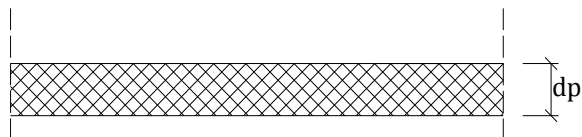


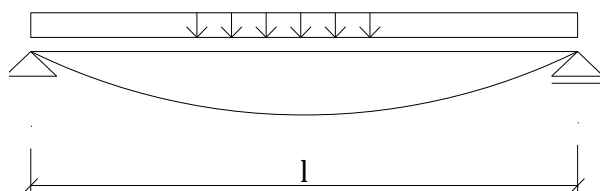
MEĐUSPRATNA TAVANICA – AB PLOČA

l_o – razmak između nultih tačaka momentnog dijagrama



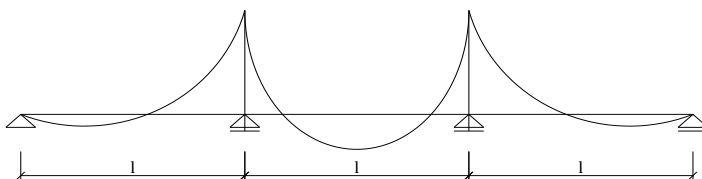
$$\min h = \frac{l_o}{35}$$

SLOBODNO OSLONJENA PLOČA PREKO JEDNOG POLJA



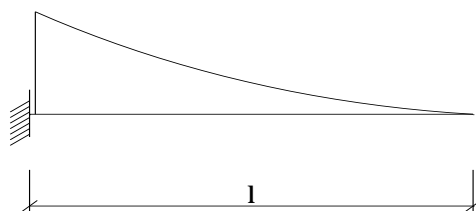
$$l_o = l$$

KONTINUALNA PLOČA PREKO VIŠE POLJA



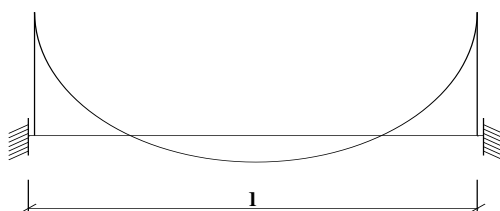
$$l_o = 0.80l$$

KONZOLNA PLOČA



$$l_o = 2l$$

OBOSTRANO UKLJEŠTENA PLOČA

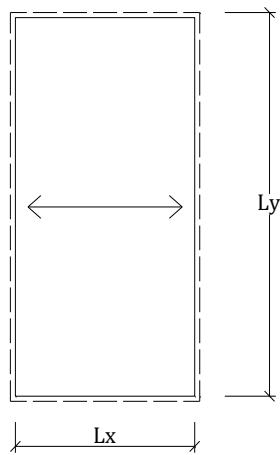


$$l = 0,50l_o$$

NAPOMENA: Usvojiti svuda istu debljinu ploče.

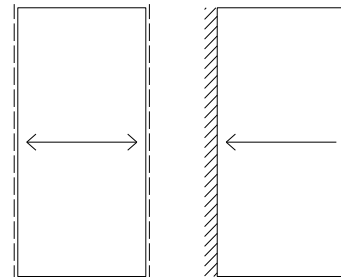
- VRSTE PLOČA U ZAVISNOSTI OD NAČINA PRENOSA OPTEREĆENJA

1. Ploče koje prenose opterećenje u jednom pravcu

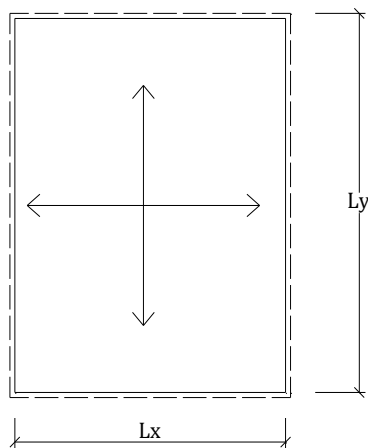


$$\frac{L_y}{L_x} > 2$$

Napomena:



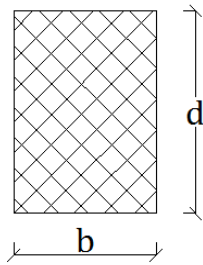
2. Ploče koje prenose opterećenje u dva pravca



$$\frac{L_y}{L_x} < 2$$

Pozicioniranje ploče

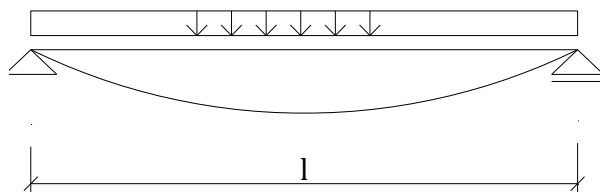
GREDE



$$b/h = 2:1$$

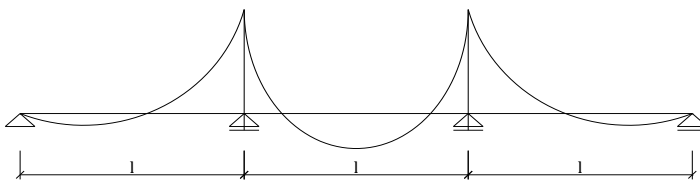
$$h = \frac{l_o}{10} \div \frac{l_o}{12} \quad (l_o - \text{razmak između nultih tačaka momentnog dijagrama})$$

PROSTA GREDA



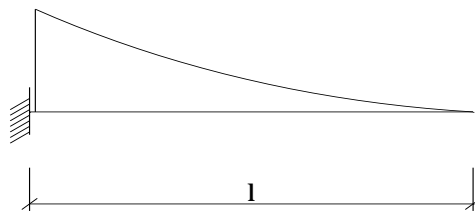
$$l_o = l$$

KONTINUALNA GREDA



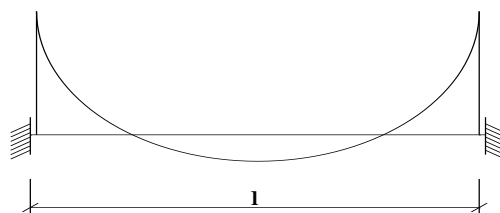
$$l_o = 0.80l$$

KONZOLA



$$l_o = 2l$$

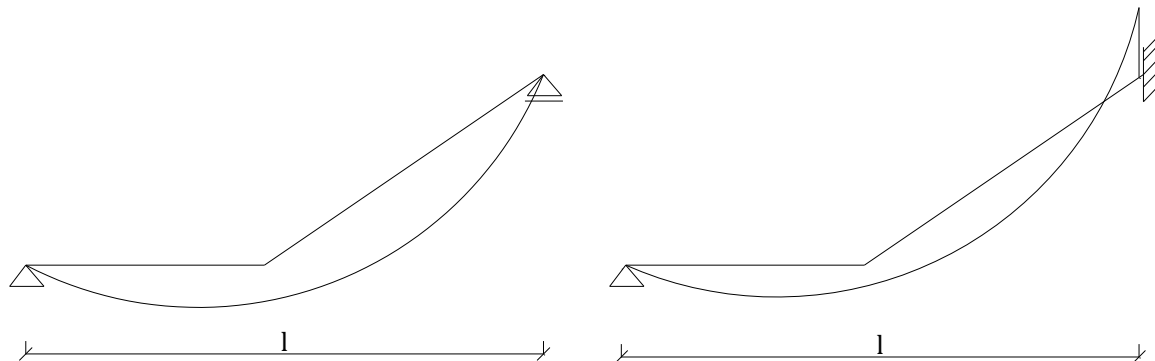
OBOSTRANO UKLJEŠTENA GREDA



$$l = 0,50l_o$$

STEPENIŠTE

Nosivi dio stepeništa je koljenasta (kosa) ploča.



$$\min h = \frac{l}{35}$$

$$\min h = \frac{0,80 \cdot l}{35}$$

STUB

Dimenzije stubova određuju se iz uslova definisanog članom 61 pravilnika PIOVS'81.

$$\sigma_o = \frac{N}{A} \leq 0.35 \cdot \beta_B$$

$$\beta_B = 0.7 \cdot f_{ck, cube}$$

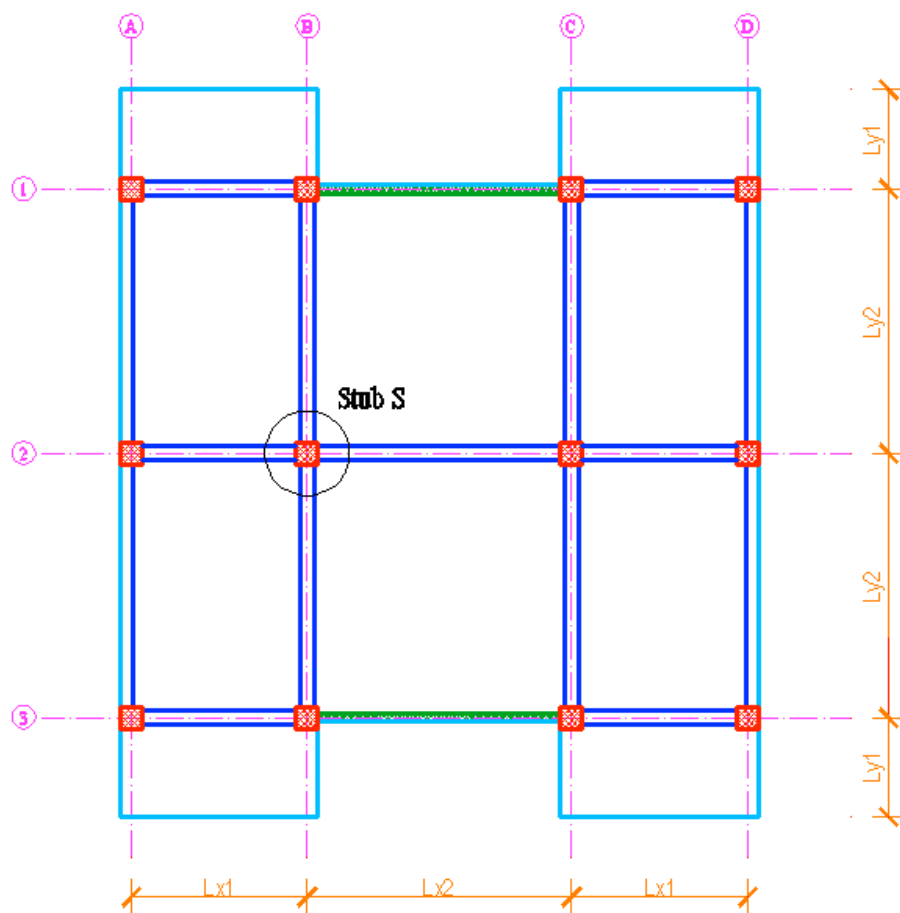
N – normalna sila pritiska od gravitacionog opterećenja

A- površina presjeka stuba

Napomena: Zbog obezbjeđenja zahtjevane duktilnosti presjeka stuba ograničava se iznos aksijelnog naprezanja stubova usled gravitacionog opterećenja.

Primjer određivanja dimenzija stuba

Osnova objekta



$$L_{x1} = L_{x2} = L_{y2} = 5.0 \text{ m}$$

Marka betona MB 30, zapreminska masa betona $\gamma = 25 \text{ kN/m}^3$

$n=8$ spratova
 Debljina ploče $d_p=12\text{cm}$
 Grede $b/d=25/50\text{cm}$
 Dodatno stalno opterećenje na ploči $g_{ds}=3.0\text{kN/m}^2$
 Korisno opterećenje $q=2.0\text{kN/m}^2$

Određivanje dimenzija stuba S

Približno sračunavanje normalne sile

$$A_{\text{prip}} = \left(\frac{5}{2} + \frac{5}{2}\right) \cdot \left(\frac{5}{2} + \frac{5}{2}\right) = 25\text{m}^2$$

$$N_{\text{prib}} = N_g + N_q = \underbrace{[0.12 \cdot 25 \cdot 25] + [3.0 \cdot 25] + [0.25 \cdot 0.50 \cdot 25 \cdot (5+5)]}_{\text{stalno opterećenje}} \cdot 8 + \underbrace{[0.5 \cdot 2.0 \cdot 25]}_{\text{korisno opt}} \cdot 8 = 1650\text{kN}$$

$$\sigma_o = \frac{N}{A} = \frac{1650}{A} \leq 0.35 \cdot \beta_B = 0.35 \cdot 0.7 \cdot 30 = 0.735\text{kN/cm}^2$$

$$A_{\text{stuba}} \geq \frac{1650}{0.735} = 2245\text{cm}^2$$

$$A_{\text{stuba}} = a^2 \geq 2245\text{cm}^2$$

$$a \geq 47.4\text{cm}$$

Usvojeno $a=50\text{cm}$ $b/h=50/50\text{cm}$

ZIDNO PLATNO

Debljina zidnog platna određuju se iz uslova definisanog članom 73 pravilnika PIOVS'81.

$$\sigma_o = \frac{N}{A} \leq 0.20 \cdot \beta_B$$

$$\beta_B = 0.7 \cdot f_{ck, cube}$$

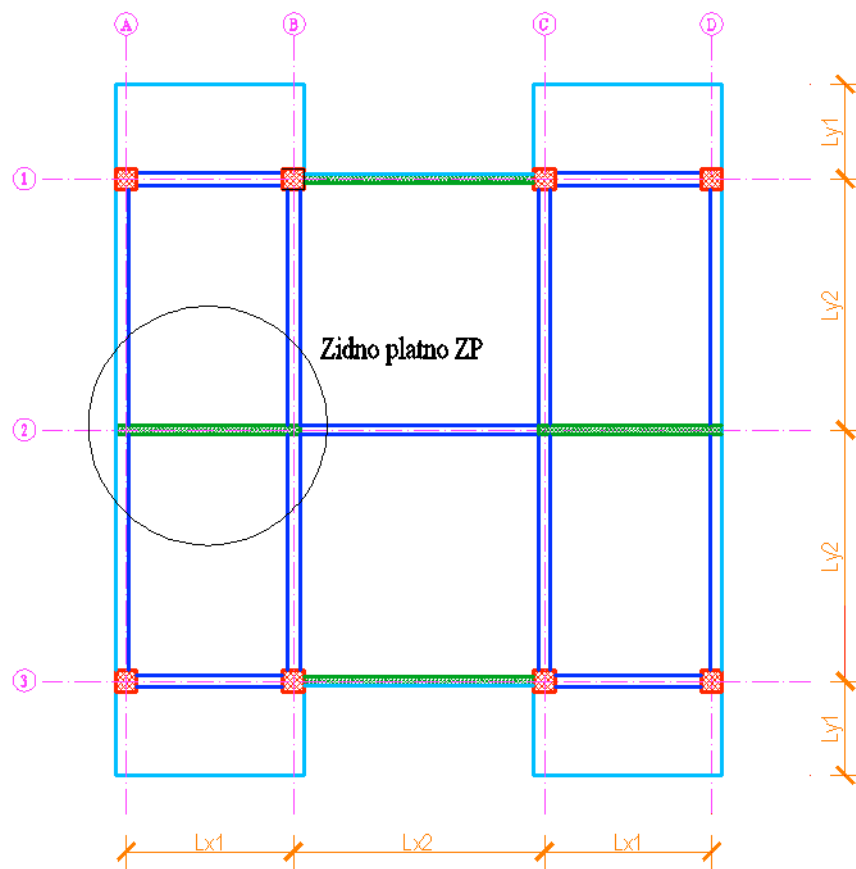
$$\min h_{zp} = 15 \text{ cm}$$

N – normalna sila pritiska od gravitacionog opterećenja
A- površina presjeka stuba

Napomena: Zbog obezbjeđenja zahtjevane duktilnosti presjeka zidnog platna ograničava se iznos aksijelnog naprezanja zidnih platana usled gravitacionog opterećenja.

Primjer određivanja debljine zidnog platna

Osnova objekta



$$Lx1=Lx2=Ly2=5.0\text{m}$$

Marka betona MB 30, zapreminska masa betona $\gamma=25\text{kN/m}^3$

n=8 spratova

Debljina ploče $d_p=12\text{cm}$

Grede $b/d=25/50\text{cm}$

Dodatno stalno opterećenje na ploči $g_d=3.0\text{kN/m}^2$

Korisno opterećenje $p=2.0\text{kN/m}^2$

Određivanje debljine zidnog platna ZP

Približno sračunavanje normalne sile

$$A_{\text{prip}} = \left(\frac{5}{2} + \frac{5}{2}\right) \cdot \left(5 + \frac{5}{2}\right) = 37.5\text{m}^2$$

$$N_{\text{prib}} = N_g + N_q = \left\{ \underbrace{[0.12 \cdot 25 \cdot 37.5] + [3.0 \cdot 37.5] + \left[0.25 \cdot 0.50 \cdot 25 \cdot \left(\frac{5}{2} + 5 \cdot 2\right)\right]}_{\text{stalno opterećenje}} \right\} \cdot 8 + \underbrace{[0.5 \cdot 2.0 \cdot 37.5]}_{\text{korisno opt}} \cdot 8 = 2412.5\text{kN}$$

$$\sigma_o = \frac{N}{A} = \frac{2412.5}{A} \leq 0.20 \cdot \beta_B = 0.20 \cdot 0.7 \cdot 30 = 0.42\text{kN/cm}^2$$

$$A_{\text{zidpl}} \geq \frac{2412.5}{0.42} = 5744\text{cm}^2$$

$$A_{\text{zidpl}} = h_z \cdot L_z = h_z \cdot 500 \geq 5744\text{cm}^2$$

$$h_z \geq 11.5\text{cm}$$

Usvojeno $h_z=20\text{cm}$