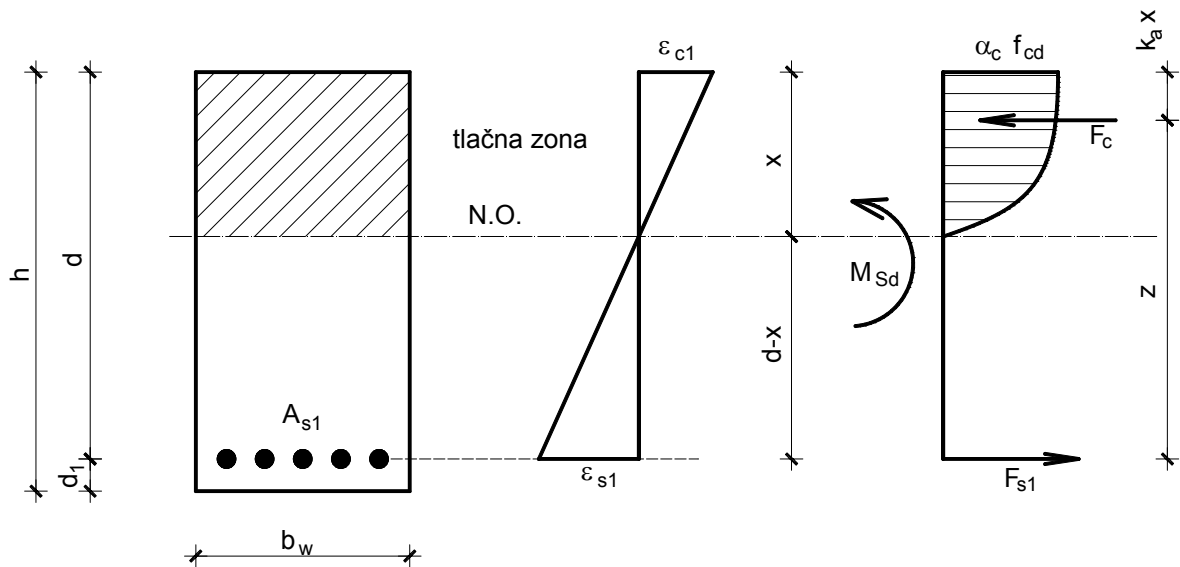


PRAVOKUTNI PRESJEK – JEDNOSTRUKO ARMIRANJE

Djelovanje momenta savijanja

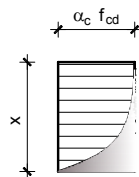
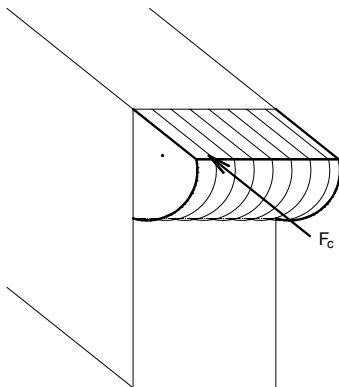


Uvjeti ravnoteže:

1. suma momenata jednaka nuli: $M_{Sd} = M_{Rd}$
2. suma horizontalnih sile jednaka nuli: $F_c = F_{s1}$

Sila u betonu: $F_c = \alpha_c f_{cd} \alpha_v x b$

- koeficijent punoće:



$$\alpha_v = \frac{\varepsilon_{c2}}{12} (6 - \varepsilon_{c2}) \text{ za } |\varepsilon_{c2}| \leq 2\text{‰}$$

$$\alpha_v = \frac{3\varepsilon_{c2} - 2}{3\varepsilon_{c2}} \text{ za } 2\text{‰} < |\varepsilon_{c2}| \leq 3,5\text{‰}$$

- položaj neutralne osi iz linearnog odnosa deformacija:

$$-\varepsilon_{c2} : (-\varepsilon_{c2} + \varepsilon_{s1}) = x : d \Rightarrow x = \frac{-\varepsilon_{c2}}{(-\varepsilon_{c2} + \varepsilon_{s1})} d$$

$$\xi = \frac{-\varepsilon_{c2}}{(-\varepsilon_{c2} + \varepsilon_{s1})} \Rightarrow x = \xi d$$

- položaj tlačne sile:

$$k_a = \frac{8 - \varepsilon_{c2}}{4(6 - \varepsilon_{c2})} \text{ za } |\varepsilon_{c2}| \leq 2\text{‰}$$

$$k_a = \frac{\varepsilon_{c2}(3\varepsilon_{c2} - 4) + 2}{2\varepsilon_{c2}(3\varepsilon_{c2} - 2)} \text{ za } 2\text{‰} < |\varepsilon_{c2}| \leq 3,5\text{‰}$$

Sila u armaturi: $F_{s1} = A_{s1}\sigma_{s1}$, $\sigma_{s1} = \varepsilon_{s1}E_s \leq f_{yd}$

- krak unutarnjih sila: $z = d - k_a x = d - k_a \xi d = d(1 - k_a \xi)$
 $\zeta = (1 - k_a \xi) \Rightarrow z = \zeta d$

- moment otpornosti presjeka: $M_{Rd} = F_c z = F_{s1} z$
 $= \alpha_c f_{cd} \alpha_v \xi d b \zeta d$

Jednadžba ravnoteže momenata: $M_{Sd} = \alpha_c f_{cd} \alpha_v \xi d b \zeta d$, $\mu_{Rd} = \alpha_c \alpha_v \xi \zeta = \mu_{Sd}$

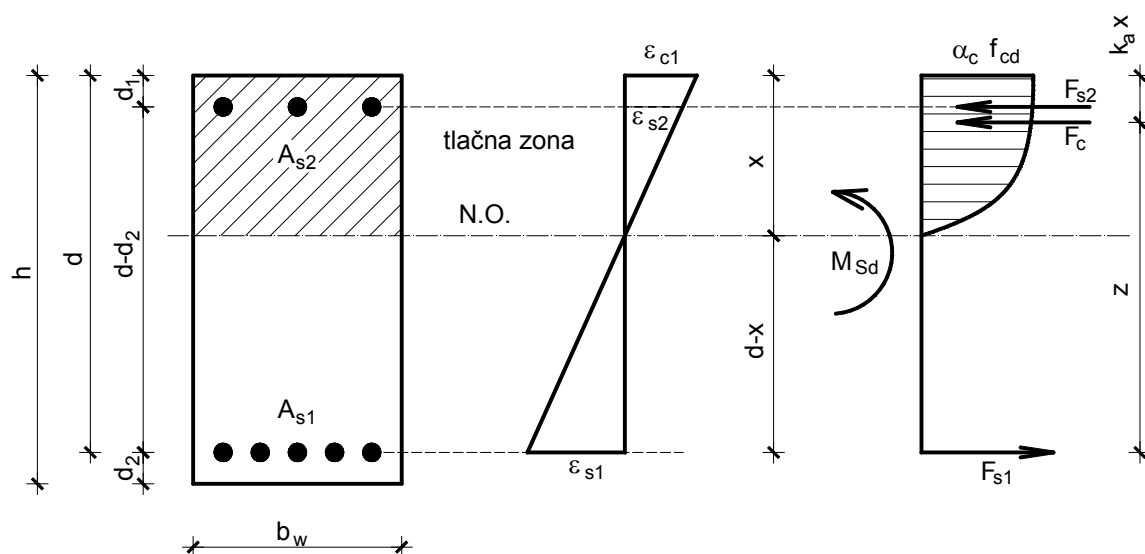
$$M_{Sd} = \mu_{Sd} b d^2 f_{cd} \Rightarrow \mu_{Sd} = \frac{M_{Sd}}{b d^2 f_{cd}}$$

Potrebna armatura: $M_{Sd} = F_{s1} z = A_{s1} \sigma_{s1} \zeta d$, $\sigma_{s1} = f_{yd}$

$$A_{s1} = \frac{M_{Sd}}{f_{yd} \zeta d}$$

PRAVOKUTNI PRESJEK – DVOSTRUKO ARMIRANJE

Djelovanje momenta savijanja



PRAVOKUTNI PRESJEK – DVOSTRUKO ARMIRANJE

Djelovanje momenta savijanja i uzdužne sile

