ŽUARNI SPOJI

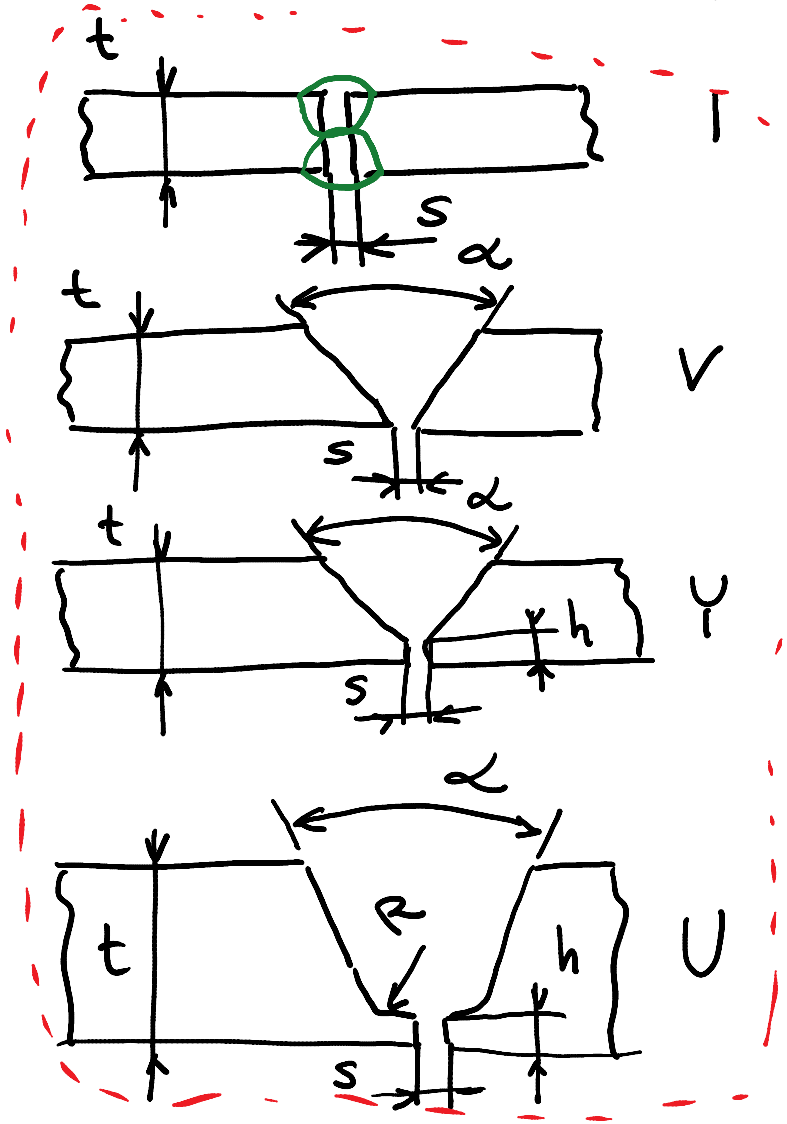
JEKLENE KONSTRUKCIJE EUROCODE 3 ✗

ŽERJAVI EUROCODE 3 ✓

SPLOŠNO STROJNIŠTVO ✗

TLAČNE POSODE / CEVOVODI IN REZERVOARJI AD 2000
DIN EN 13445-3

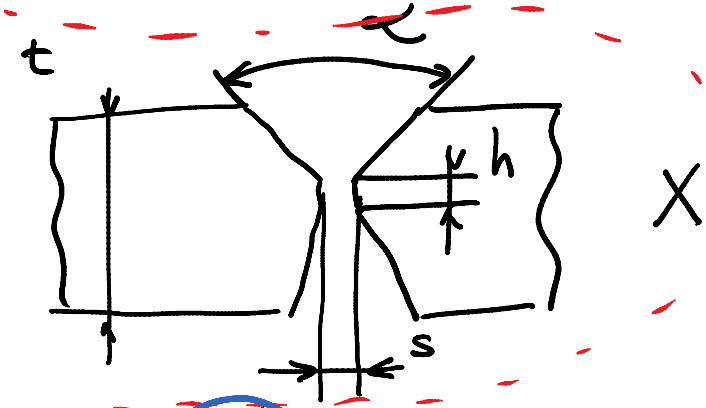
OBLIKE ŽARNIH SPOJEV GLEDE NA PRIPRAVO PLOČEVIN



ENOSTRANSKI

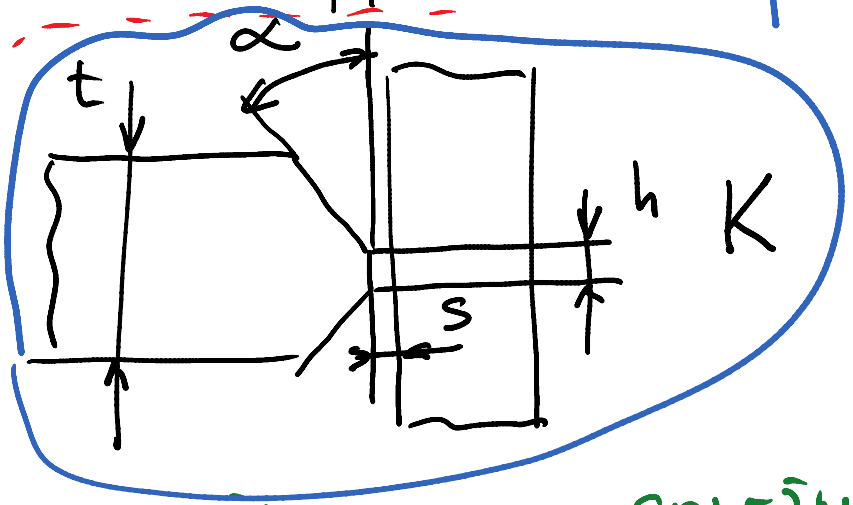
DVOSTRANSKI

ČELNI ALI SOLEŽNI ŽARNI SPOJI



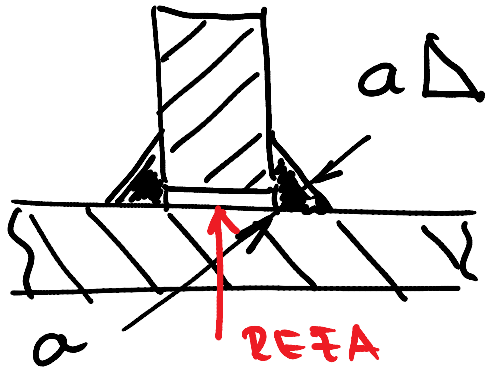
T ŽARNI SPOJ

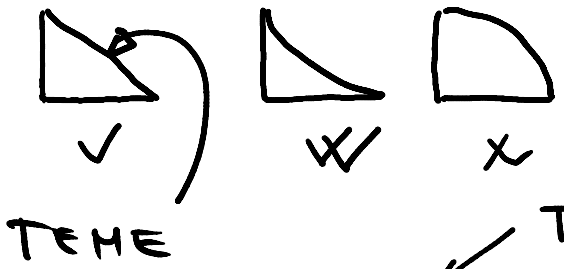
KRIŽNI ŽARNI SPOJ



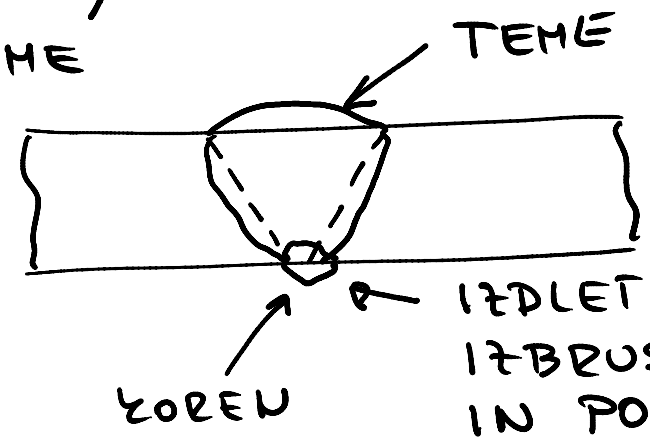
USE RAČUNAMO KOT SOLEŽNI ŽARNI SPOJ

DELITEV ŽVARNIH SPOJEV GLEDE NA VRSTO ŽVARA





PRERAČUNAVAMO KOT KOTNI ŽVARNI SPOJ

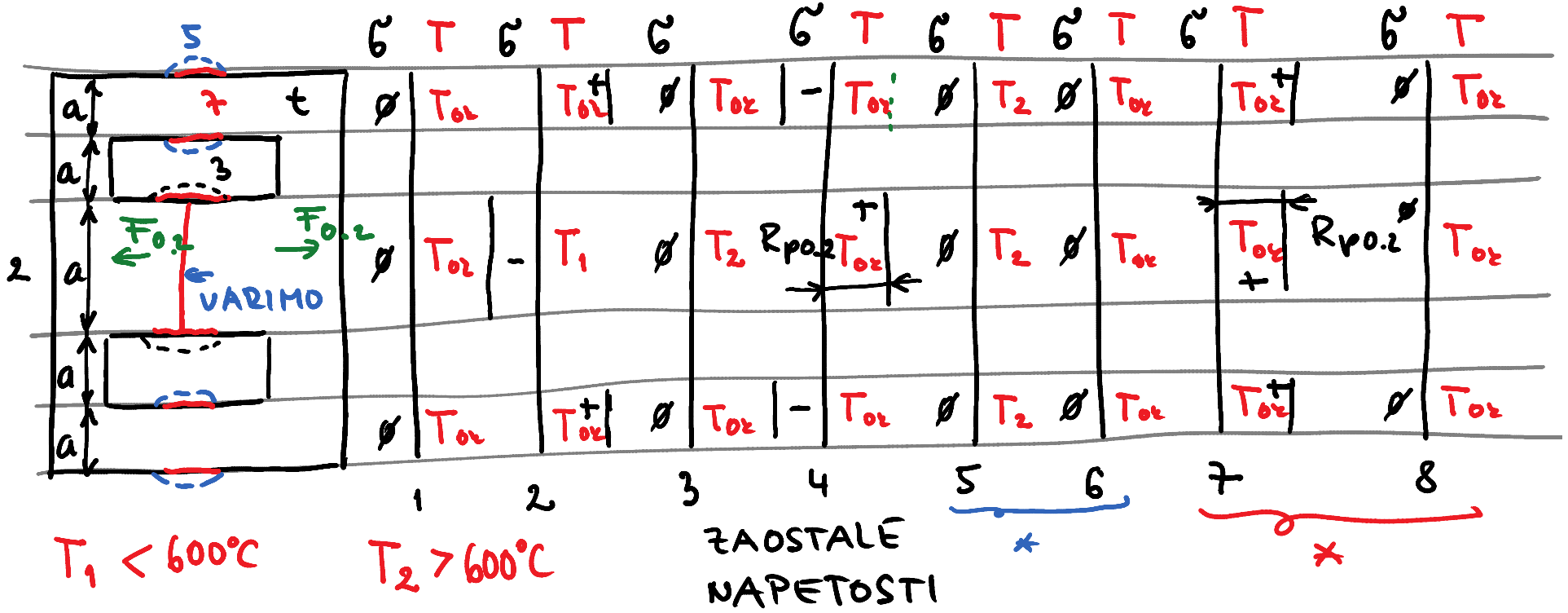


DVIG KVALITETE ŽVARNEGA SPOJA

BRUŠENJE TEMENA IN KORENA

KOTNI SOLEŽNI ŽVARNI SPOJ

NASTANEK IN ODPRAVLJANJE ZAOSTALIH NAPETOSTI PRI VARJENJU



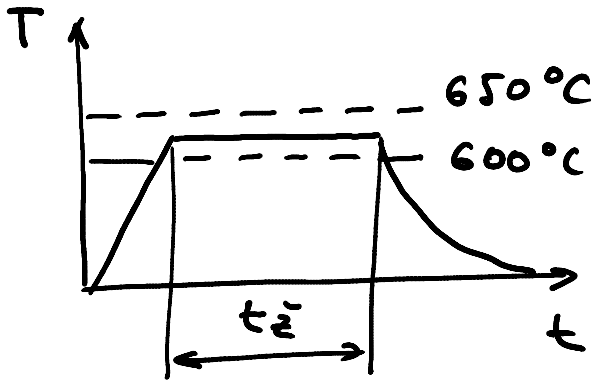
$$\varepsilon_t = \alpha \cdot \Delta T$$
$$= \alpha (T_1 - T_{0.2})$$

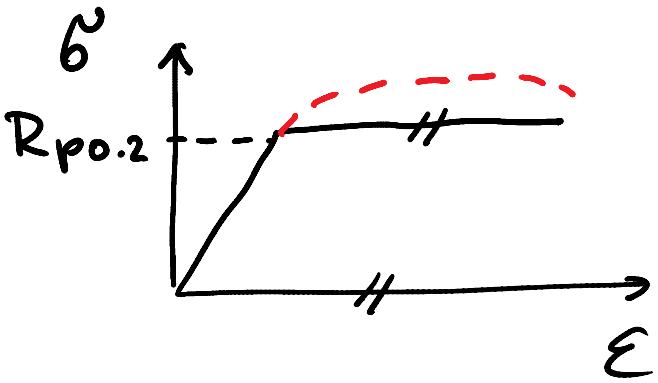
$$F_{0.2} = 4a \cdot t \cdot R_{p0.2}$$

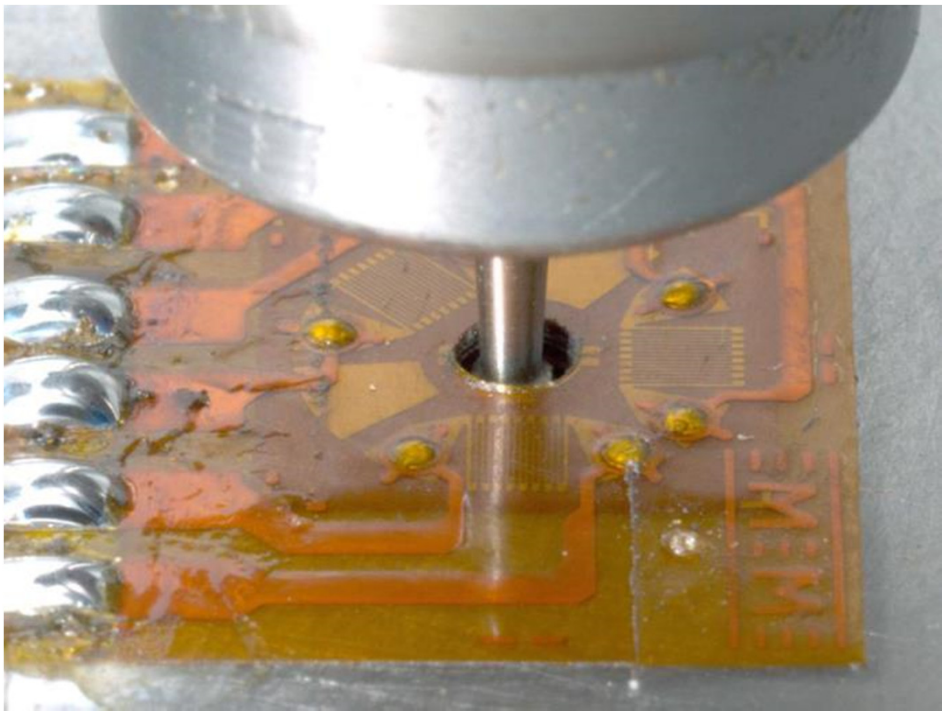
* ZARJENJE ZA ODPRAVO ZAOSTALIH NAPETOSTI

1 : 8 STANJA

* ZUNANJA OBREMENITEV ZA ODPRAVO ZAOSTALIH NAPETOSTI


T
650 °C
600 °C
tž
t


σ
Rp0.2
ε

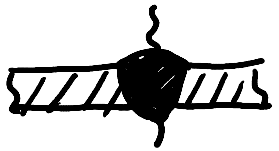


VREDNOTENJE ŽUARNIH SPOJEV

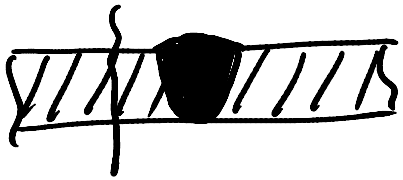
MOŽNI OBLIKI: TRENUTNI LOM
UTRUJENOSTNI LOM

2 NIVOJA

MESTO OBLIKE: NA ŽUARU
NA OSNOVNEM MATERIALU

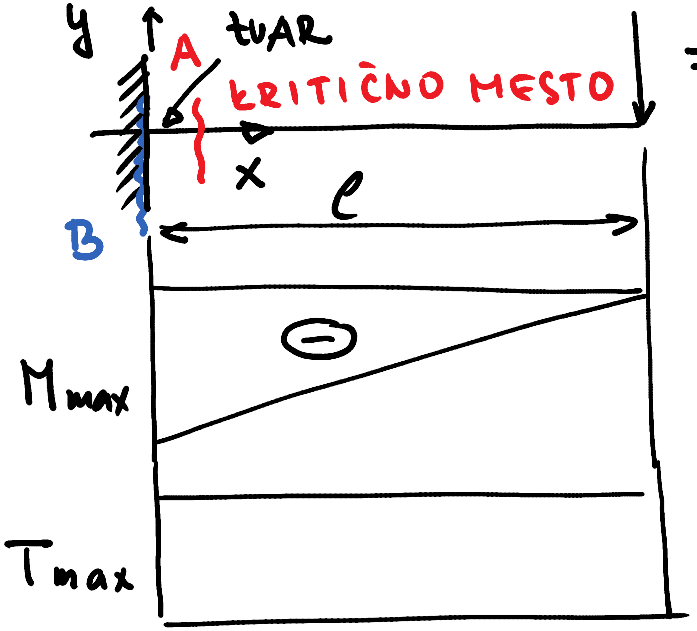


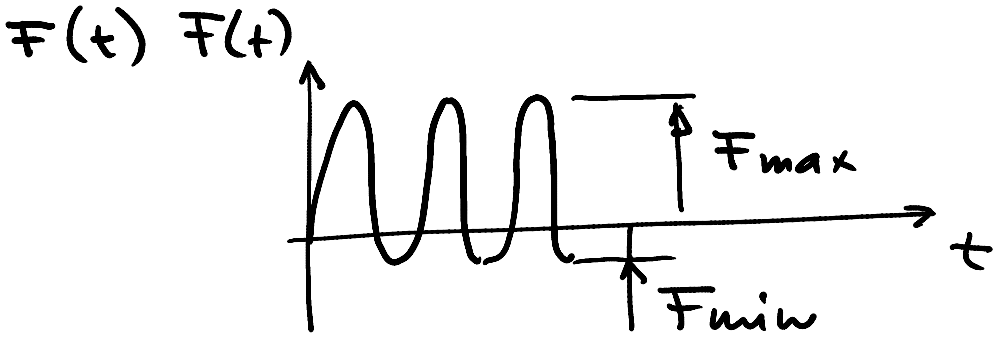
2 NIVOJA



$4 = 2 \times 2$ ŠTEVILO VREDNOTENJ

NAPETOSTI V OSNOVNEM MATERIALU

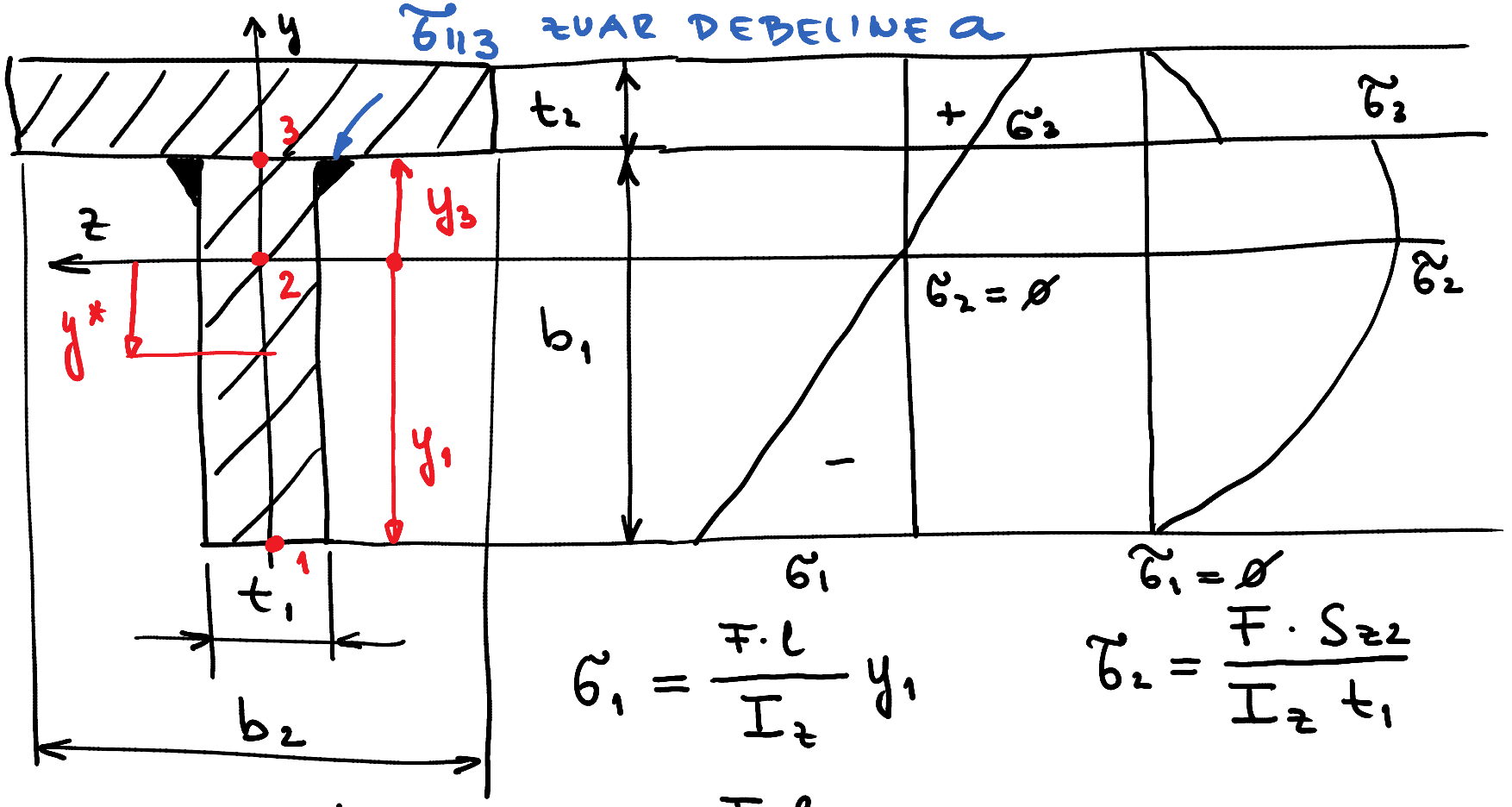




$$M_{max} = F \cdot \ell$$

$$T_{max} = F$$

A



$$\sigma_1 = \frac{F \cdot l}{I_z} y_1 \qquad \tau_2 = \frac{F \cdot S_{z2}}{I_z t_1}$$

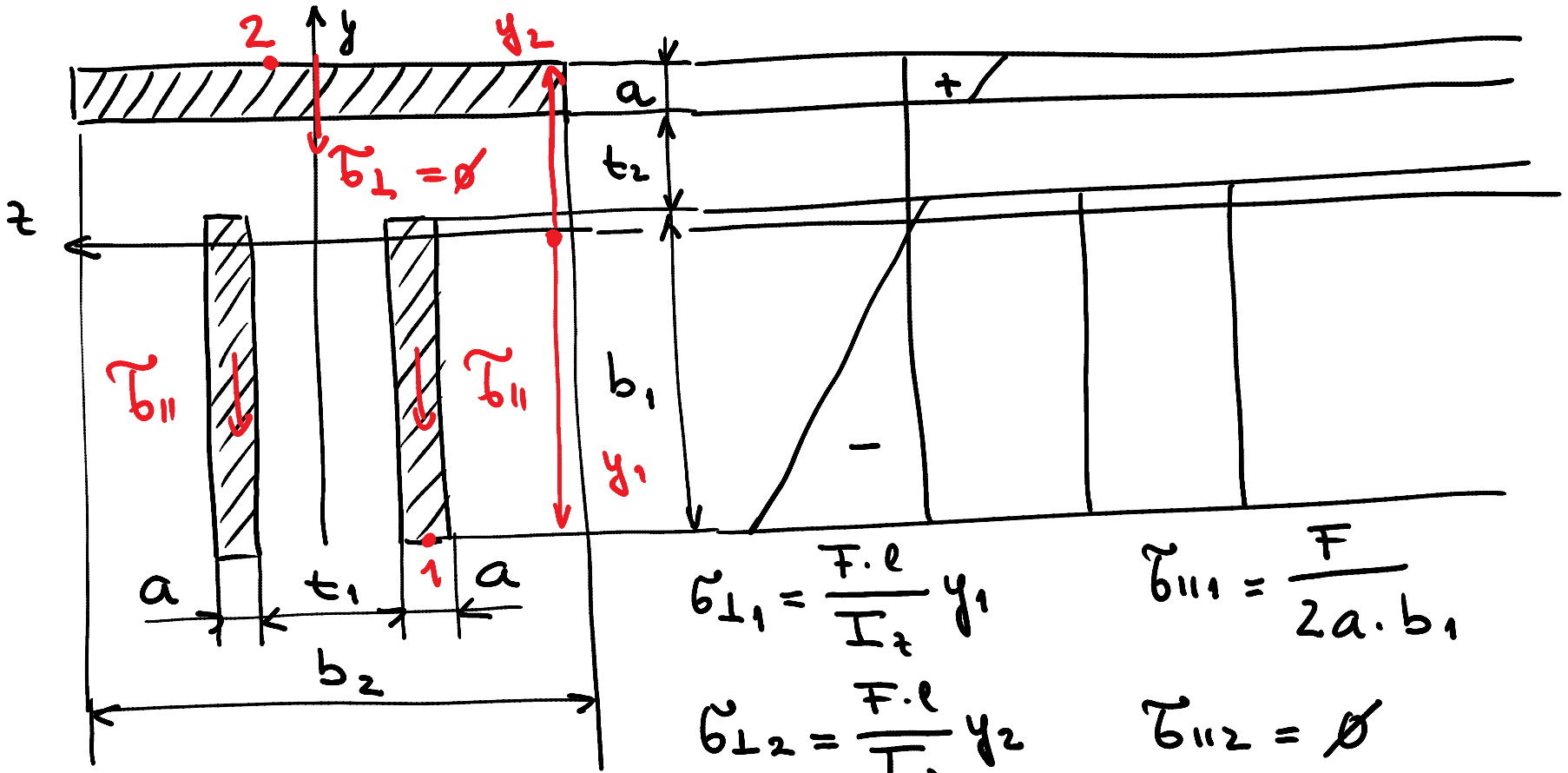
$$S_{z2} = y_1 \cdot t_1 \frac{y_1}{2}$$

$$\sigma_3 = \frac{F \cdot l}{I_z} y_3 \qquad \tau_3 = \frac{F \cdot S_{z3}}{I_z t_1}$$

$$S_{z3} = b_1 \cdot t_1 y^*$$

$$\tau_{113} = \frac{F S_{z3}}{I_z 2a}$$

NAPETOSTI V ŽUARIH



$$\sigma_{\perp 1} = \frac{F \cdot l}{I_z} y_1 \qquad \tau_{\parallel 1} = \frac{F}{2a \cdot b_1}$$

$$\sigma_{\perp 2} = \frac{F \cdot l}{I_z} y_2 \qquad \tau_{\parallel 2} = \emptyset$$

STRIŽNE NAPETOSTI PREVZAMEJO SAMO TISTI ŽUARI, KATERIH DOLŽINA JE ORIENTIRANA V SMERI PREČNE SILE $\tau_\perp = \emptyset$

UREDNOTENJE OSNOVNEGA MATERIALA NA STATIČNO NOSILNOST

$$\left(\frac{\sigma}{f_y/\gamma_{M0}}\right)^2 + 3\left(\frac{\tau}{f_y/\gamma_{M0}}\right)^2 \leq 1$$

PREVERIMO V SATRI KRITIČNA MESTA (STR 46 1)

$\gamma_{M0} = 1$ DELNI FAKTOR (STR 46 1)

$f_y = f(t, \text{MATERIAL})$ NAPETOST TEČENJA (STR 26 1)

VREDNOTENJE ZVAROV NA STATIČNO NOSILNOST

PREVERIMO
KRITIČNI MESTI
1 IN 2
PREVERIMO ŠE $\tau_{11,3}$

β_w KOREKCIJSKI FAKTOR
$\beta_w = f$ (MATERIAL, KAKOVOSTNI RAZRED MATERIALA)

$$\sqrt{\sigma_\perp^2 + 3(\tau_\perp^2 + \tau_{11}^2)} \leq \frac{f_u}{\beta_w \gamma_{M2}}$$

$$\sigma_\perp \leq 0{,}9 \frac{f_u}{\gamma_{M2}}$$

γ_{M2} DELNI FAKTOR

$f_u = f$ (t, MATERIAL) NATEZNA TRDNOST

OSNOVNEGA MATERIALA IN ŽIAROV NA DINAMIČNO NOSILNOST

- IZRAČUN USEH NAPETOSTI V OSNOVNEM MATERIALU IN ŽIARIH V MEJNIH STANJIH OBREMENITEV. PRI F_{max} IN F_{min}

  σ_{max}, σ_{min}, τ_{max}, τ_{min} V OSNOVNEM MATERIALU

  $\sigma_{\perp max}$, $\sigma_{\perp min}$, $\tau_{\parallel max}$, $\tau_{\parallel min}$ V ŽIARIH

- IZRAČUN NAPETOSTI σ_{wf} IN τ_{wf}

  $\sigma_{wf} = \sqrt{\sigma_{\perp}^2 + \tau_{\perp}^2}$ V ŽIARIH PRI F_{max} IN F_{min}

  $\tau_{wf} = \tau_{\parallel}$

  $\sigma_{wf} = \sigma$ V OSNOVNEM MATERIALU

  $\tau_{wf} = \tau$ PRI F_{max} IN F_{min}

  $\sigma_{wf max}$, $\sigma_{wf min}$, $\tau_{wf max}$, $\tau_{wf min}$

- IZRAČUN RAZLIK NAPETOSTI

$$\Delta\sigma = \sigma_{wf\,max} - \sigma_{wf\,min}$$

$$\Delta\tau = \tau_{wf\,max} - \tau_{wf\,min}$$

RAZLIKE NAPETOSTI LAHKO KORIGIRAMO IN UPOŠTEVAMO UPLIV TLAČNIH NAPETOSTI IN VELIKOSTI PREREZA. STR 179

- IZRAČUN PROJEKTNE VREDNOSTI RAZLIK NAPETOSTI

$$\Delta\sigma_{E,2}\gamma_{Ff} = \Delta\sigma \;..\; \text{FAKTORJI SO } 1$$

$$\Delta\tau_{E,2}\gamma_{Ff} = \Delta\tau \;...$$

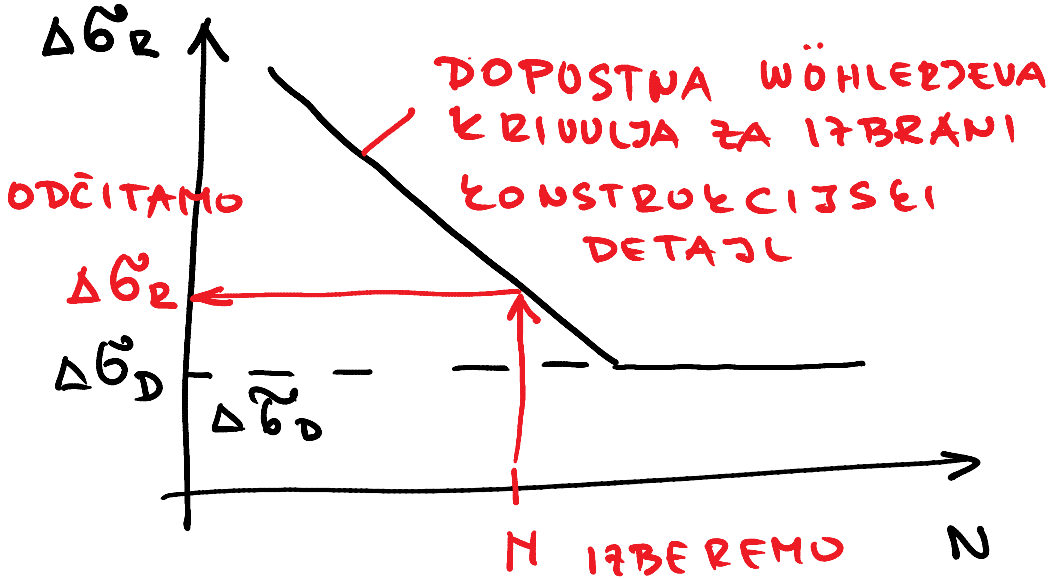
- PREVERJANJE UTRUJANJA

$$\Delta\sigma \leq 1{,}5\, f_y$$

$$\Delta\tau \leq 1{,}5\, f_y/\sqrt{3}$$

$$\frac{\gamma_{Ff}\,\Delta\sigma_{E,2}}{\Delta\sigma_R/\gamma_{Mf}} \leq 1$$

$$\frac{\gamma_{Ff}\,\Delta\tau_{E,2}}{\Delta\tau_R/\gamma_{Mf}} \leq 1$$



$$\left(\frac{\gamma_{Ff}\,\Delta\sigma_{E,2}}{\Delta\sigma_R/\gamma_{Mf}}\right)^3 + \left(\frac{\gamma_{Ff}\,\Delta\tau_{E,2}}{\Delta\tau_R/\gamma_{Mf}}\right)^5 \leq 1$$

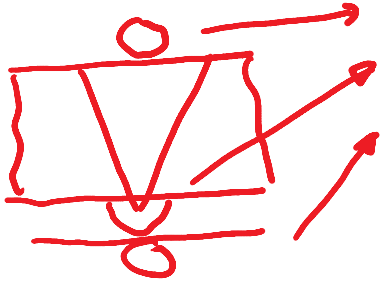
PODOBEN DIAGRAM NAM OMOGOČA ODČITATI $\Delta\tau_R$ PRI POZNANEM N

$\gamma_{Mf} = 1{,}25$

$\gamma_{Ff} = 1$

KVALITETA KVARNEGA SPOJA

SE DOLOČA GLEDE NA VRSTO KVARNEGA SPOJA (KOTNI ALI SOLEŽNI KVARNI SPOJ) IN GLEDE NA



BRUŠENO TEME
IZDLETEN IN POVARJEN KOREN
BRUŠEN KOREN
ZAČETEK IN KONEC KVARA BREZ KRATERJA
KONTROLA KVARNEGA SPOJA