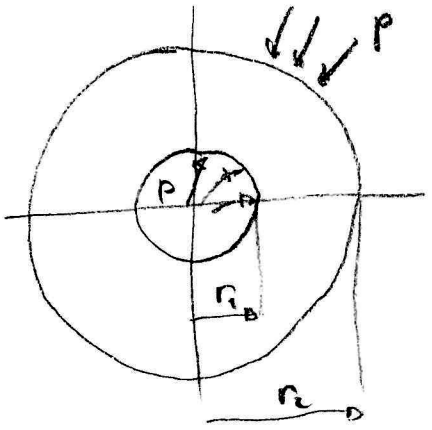
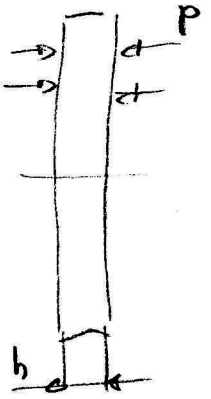
Př. Ocelová podložka na dně oceánu, určete bezpečnost k MS a změnu tloušťky.





mat.: E, ν, σ_k

okr. podmínky: $\sigma_r|_{r=r_1} = -p$

$\sigma_r|_{r=r_2} = -p$

$\sigma_z = -p$

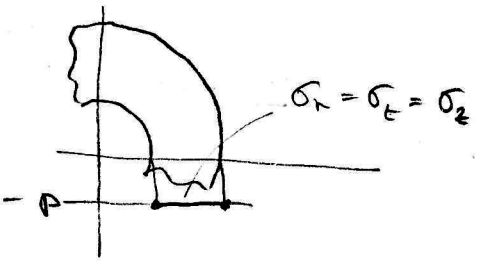
$$\sigma_r = A' - \frac{B}{r^2} \Rightarrow A' - \frac{B}{r_1^2} = -p \;,\; A' - \frac{B}{r_2^2} = -p \Rightarrow B\left(-\frac{1}{r_1^2} + \frac{1}{r_2^2}\right) = 0 \Rightarrow$$

$$\Rightarrow B = 0 \Rightarrow A' = -p$$

$\sigma_r = -p$

$\sigma_t = -p$

$\sigma_z = -p$



$$\sigma_{ekv}^{mat} = |\sigma_r - \sigma_t| = |\sigma_r - \sigma_z| =$$

$$= |\sigma_t - \sigma_z| = 0 \Rightarrow k = \infty$$

$$u = \left(\frac{1-\nu}{E}A' - \frac{\nu}{E}p_z\right)\cdot r + \frac{1+\nu}{E}\cdot\frac{B}{r} =$$

$$= \left(\frac{1-\nu}{E}\cdot(-p) + \frac{\nu}{E}(-p)\right)\cdot r = \frac{1-\nu+\nu}{E}(-p)\cdot r = -\frac{p}{E}\cdot r$$

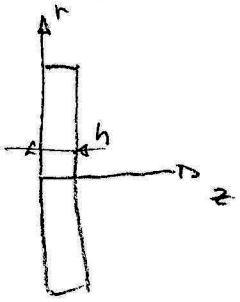
$$u(r=r_1) = -\frac{p}{E}r_1$$

$$u(r=r_2) = -\frac{p}{E}r_2$$

$$\varepsilon_z = \frac{1}{E}p_z - \frac{2\nu}{E}\cdot A' = \frac{1}{E}(-p + 2\nu p) = -\frac{1-2\nu}{E}p \Rightarrow w(z) = \int \varepsilon_z\,dz + C =$$

$$= \int -\frac{1-2\nu}{E}\cdot p\,dx + C = -\frac{1-\nu}{E}\cdot p\cdot z + C$$

Pokud zavedu osu z následovně:



$$w(z=h) = -\frac{1-\nu}{E}\cdot p\cdot h + 0 = -\frac{1-\nu}{E}ph$$