SAVIJANJE KRUZNE CILINDRICNE
LJUSKE PRI ROTACIONO SIMETRICNOM
OPTERECENJU

-uslovi ravnoteze-

$(1) dM - Tx = 0$

$(2) \frac{Nj}{a} + \frac{dT}{dx} + Z = 0$

$DJ : \frac{d^4 w}{dx^4} + 4b^4 w = \frac{Z}{K}$

-deformacija-

$exz = -\frac{d^2 w}{dx^2} z + \frac{du}{dx}$

imamo sile: Mx, Tx, Nj, Mj

$Njx = Tj = Nj = Mj$

$ej z = -\frac{w}{a}$

$Mx = -K \frac{d^2 w}{dx^2}; Nj = -Eh \frac{w}{a}$

$Tx = \frac{dMx}{dx}$

$w = w_0 + e^{bx}(C1\cos bx + C2\sin bx) + e^{-bx}(C3\cos bx + C4\sin bx)$

-duga cilindricna ljuska-($\beta \cdot l >= 5$)

$b = \sqrt[4]{\frac{3(1-u^2)}{a^2 h^a}}$

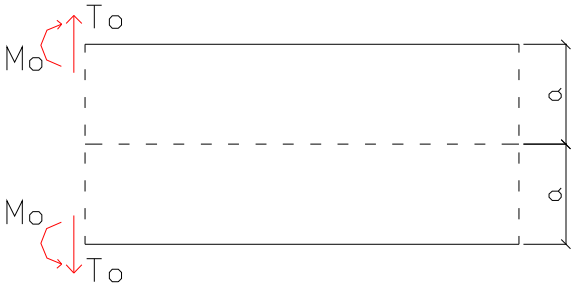
$w = w_0 - \frac{1}{2b^3 K} e^{-bx}[(To + Mob)\cos bx - Mo\sin bx]$

$\frac{dw}{dx} = \frac{1}{2b^2 K} e^{-bx}[2bMo\cos bx + To(\cos bx + \sin bx)]$

$\frac{d^2 w}{dx^2} = -\frac{1}{bK} e^{-bx}[bMo(\cos bx + \sin bx) + To\sin bx]$

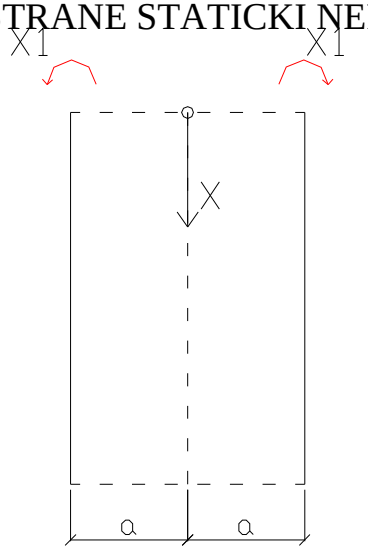
$\frac{d^3 w}{dx^3} = \frac{1}{K} e^{-bx}[2bMo\sin bx - To(\cos bx - \sin bx)]$

$w_0 = -\frac{Z(x)a^2}{Eh}$



<KOORDINATA X SE MERI SA STRANE STATICKI NEPOZNATIH Xi

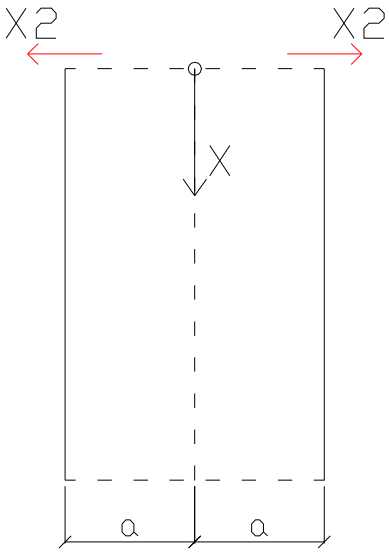
STANJE X1=1(moment):



$$Ed_{11} = E\left(\frac{dw}{dx}\right)_{(x=0)} = E\frac{1}{bK}$$

$$Ed_{21} = Ew_{(x=0)} = E\frac{1}{2b^2K}$$

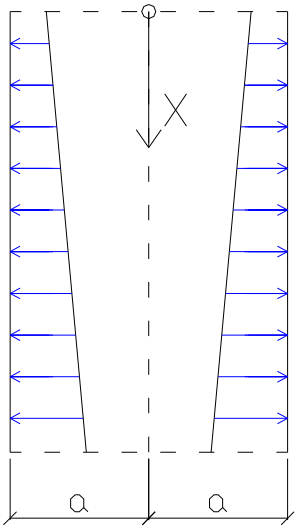
STANJE X2=1(sila):



$$Ed_{22} = Ew_{(x=0)} = E\frac{1}{2b^3K}$$

$$Ed_{12} = E\left(\frac{dw}{dx}\right)_{(x=0)} = E\frac{1}{2b^2K}$$

STANJE X1=X2=0:
(od „vode“)



$$Z(x) = \ldots$$

$$Nj = -Z \cdot a$$

$$w = a \cdot e_j = \frac{a}{Eh}(Nj - u \cdot Nx)(Nx = 0 uglavnom)$$

$$Ed_{10} = E \cdot \left(\frac{dw}{dx}\right)_{(x=0)}$$

$$Ed_{22} = E \cdot w_{(x=0)}$$