

2D problem

Plane Stress:

It is the state of stress in which normal stress σ & the shear stress τ directed \perp to plane are assumed to be zero.

$$\sigma_z = \tau_{xz} = \tau_{yz} = 0$$

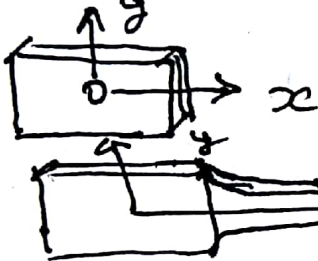


plate with hole

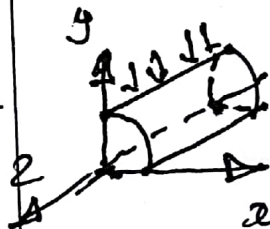
plate with fillet

$$D = \frac{E}{1-\nu^2} \begin{bmatrix} 1 & \nu & 0 \\ \nu & 1 & 0 \\ 0 & 0 & \frac{1-\nu}{2} \end{bmatrix}$$

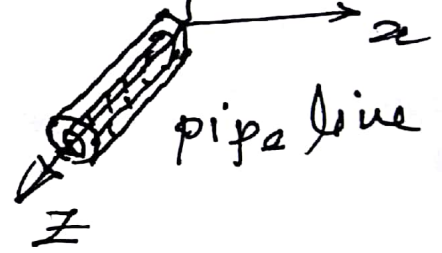
Plane Strain

It is a state of strain in which strain normal to the plane & shear strain are assumed to be zero.

$$\epsilon_z = \gamma_{xz} = \gamma_{yz} = 0$$



Dam



pipe line

$$D = \frac{E}{(1-\nu)(1-2\nu)} \begin{bmatrix} 1-\nu & \nu & 0 \\ \nu & 1-\nu & 0 \\ 0 & 0 & \frac{1-\nu}{2} \end{bmatrix}$$