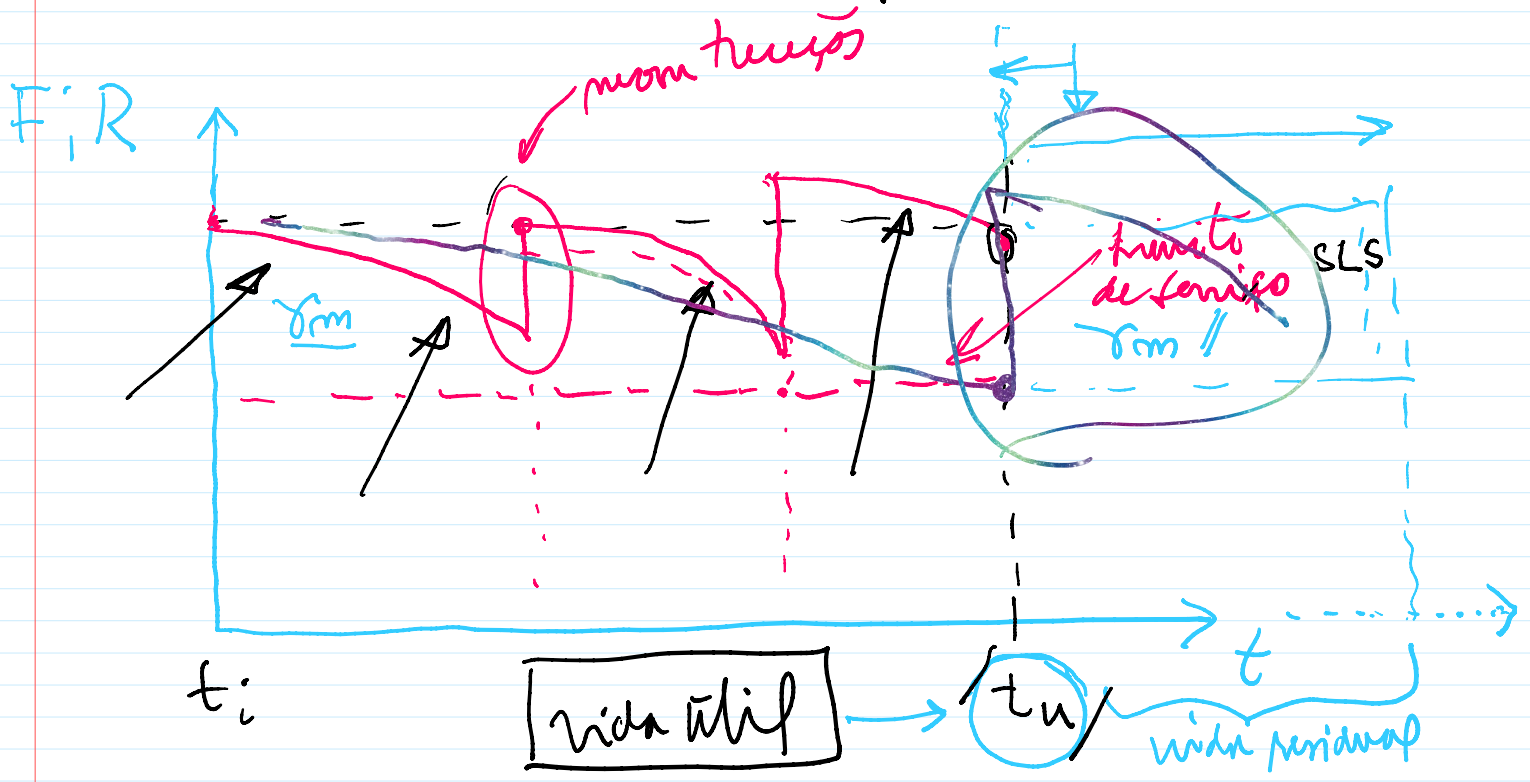
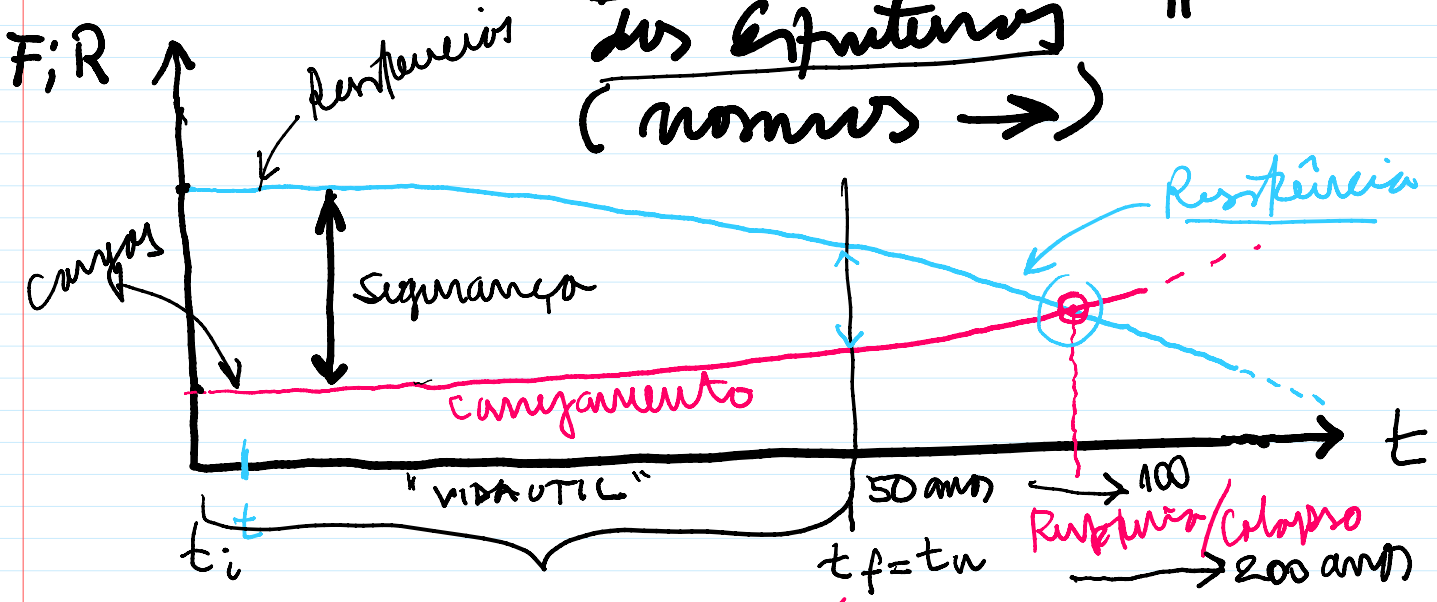


PROJETO → "Estruturas Esféricas"
 "Teoria de Segurança das Estruturas"
 (nomos →)



Ações → força de vento → pesos → Condição - σ
 $\frac{\sigma}{M, V, T, N}$

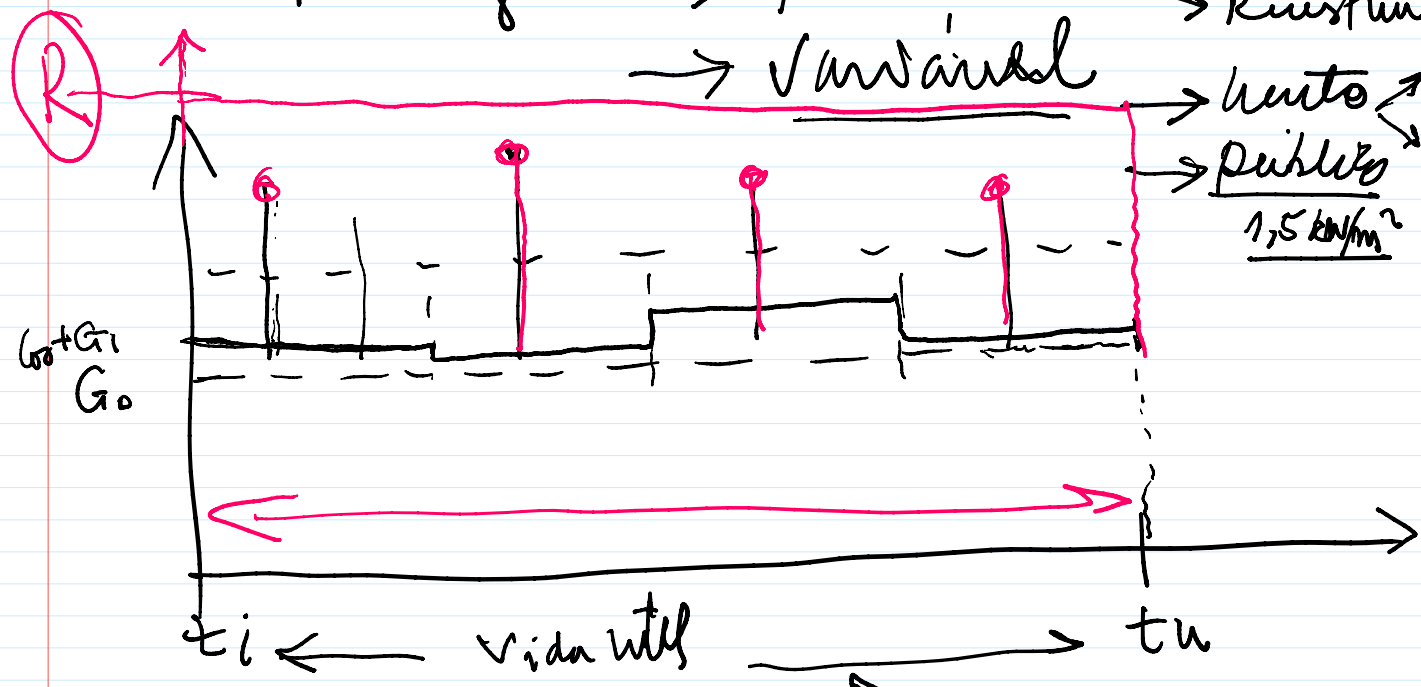
Vento →

Temperatura → Ações → $\Delta L = \Delta t \cdot \alpha \cdot L$
 aumento }
 alonga } $F \rightarrow \left(\begin{matrix} N \\ M \\ T \\ V \end{matrix} \right)$ peso



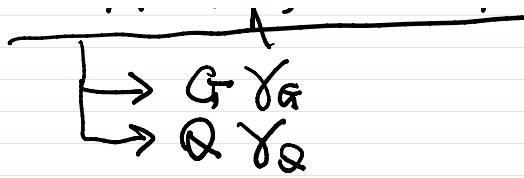
Publicos →

Natureza → Permanente → peso próprio
 → Ruínas
 → Variável → vento → max
 → Publicos → perguntas
 1,5 kN/m²



Carregamento → contribuições da ações
 $G + \gamma_G$

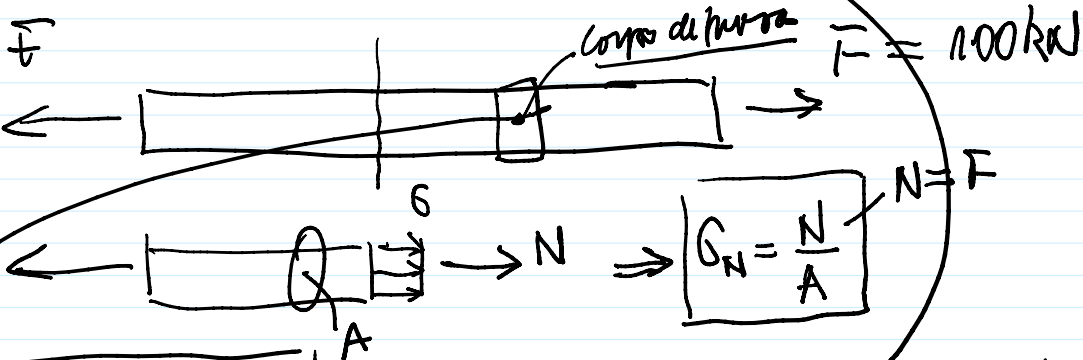
Curva tensão-deformação



Método de projeto

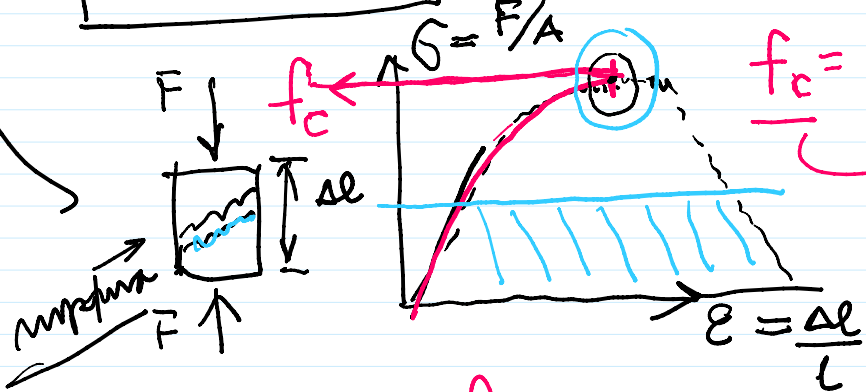
$$\sigma_{act} \leq \frac{\sigma_{adm}}{\gamma}$$

Frequência de segurança



$$\sigma_{act} = \sigma_N$$

Qual é a tensão Admissível



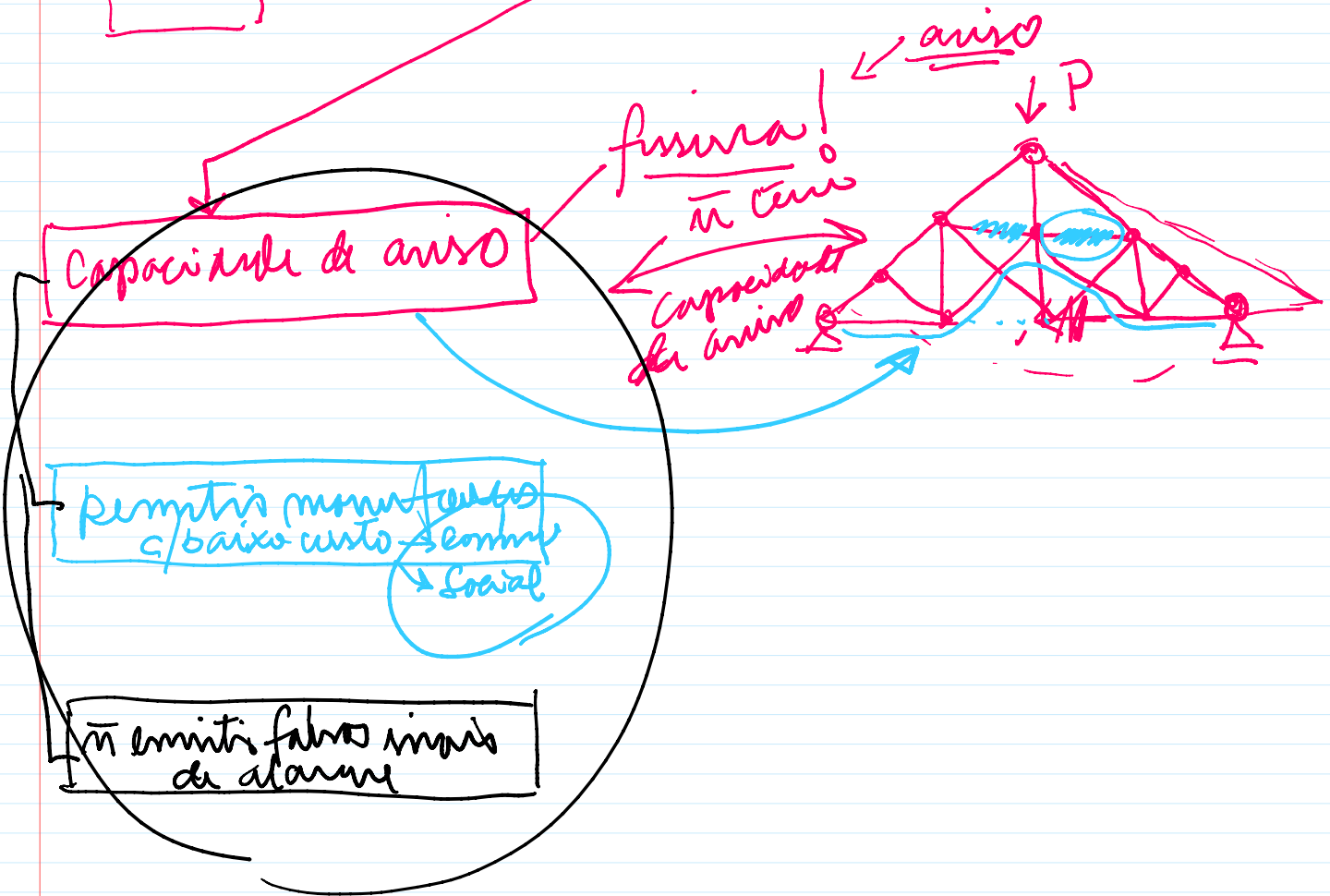
$f_c = \sigma_{máx}$ medida no ensaio
restrição à compressão

$$\sigma_{adm} = \frac{f_c}{\gamma}$$

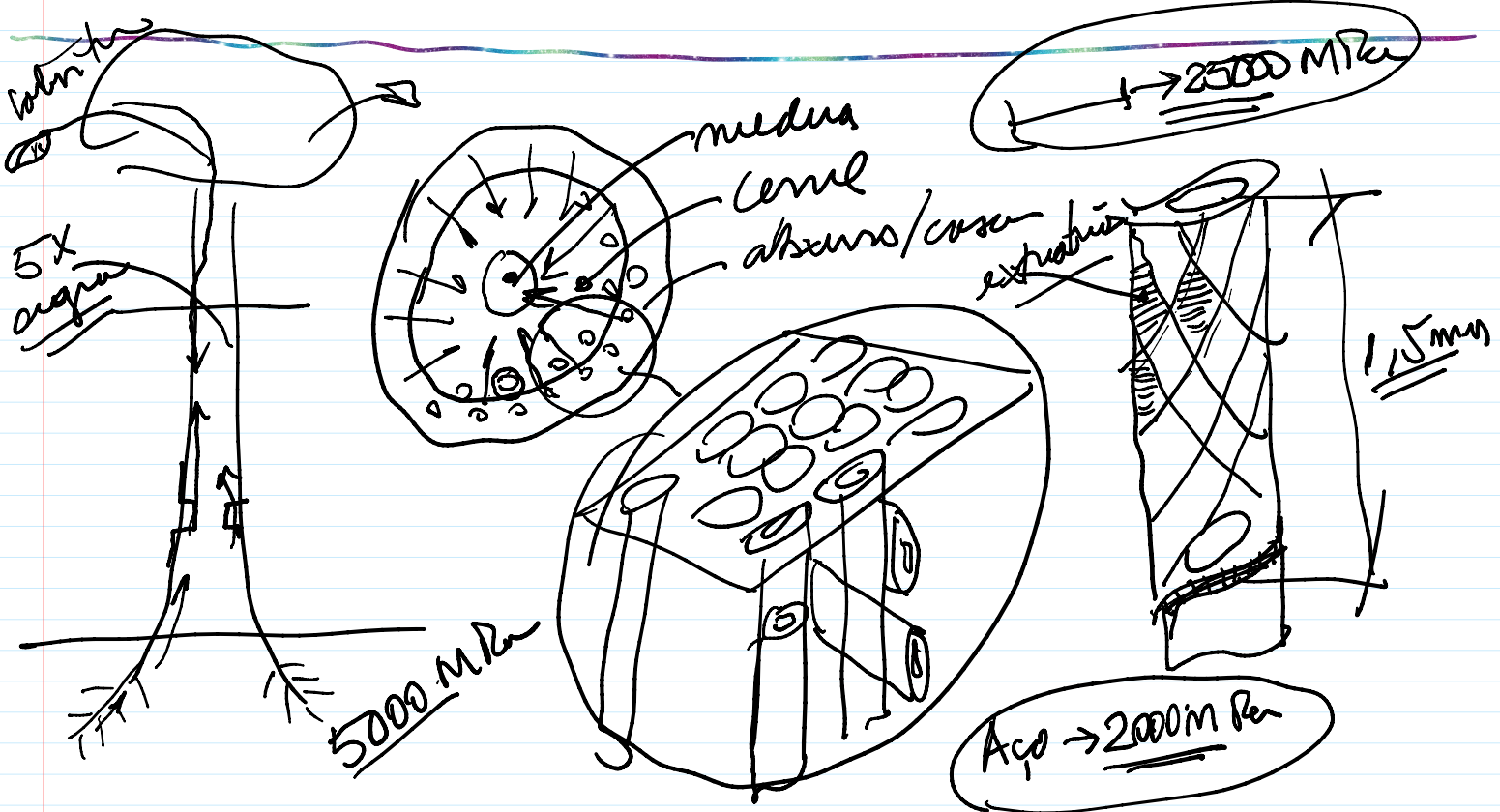
γ : coef. de segurança
método de dimensionamento

$\sigma_{act} \leq \sigma_{adm}$ ← método de farrasagem de projetos. até' década de 70

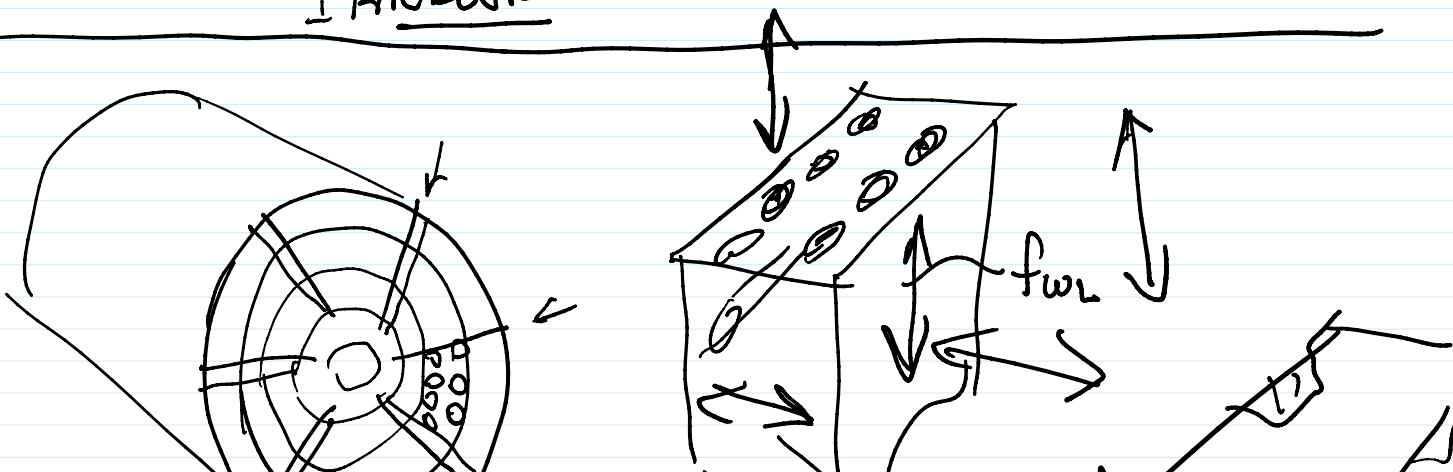
após 1950 → método probabilístico de projeto → métodos dos Estados limites

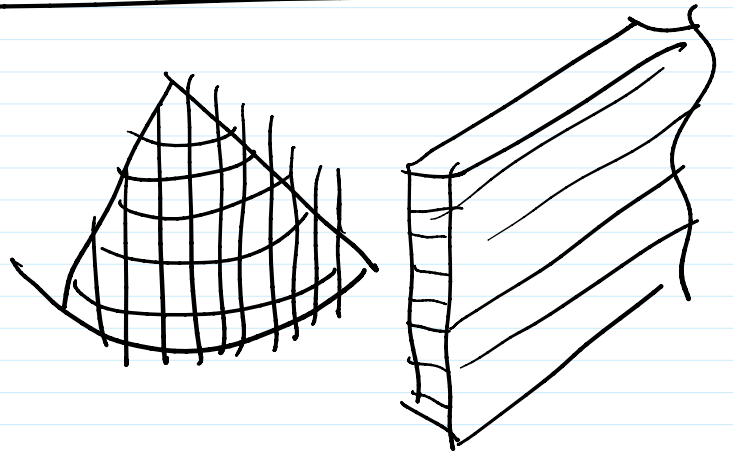
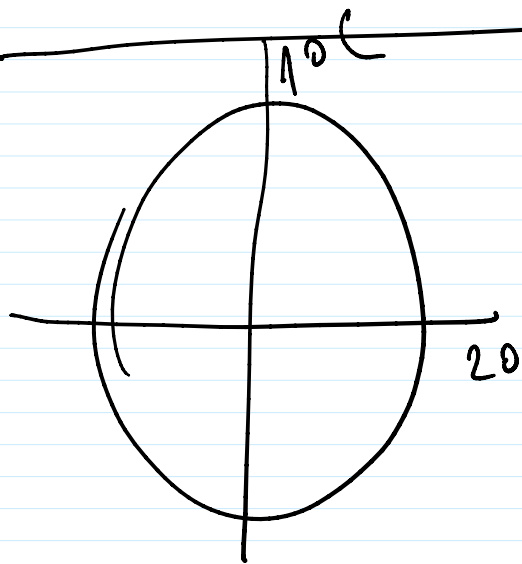
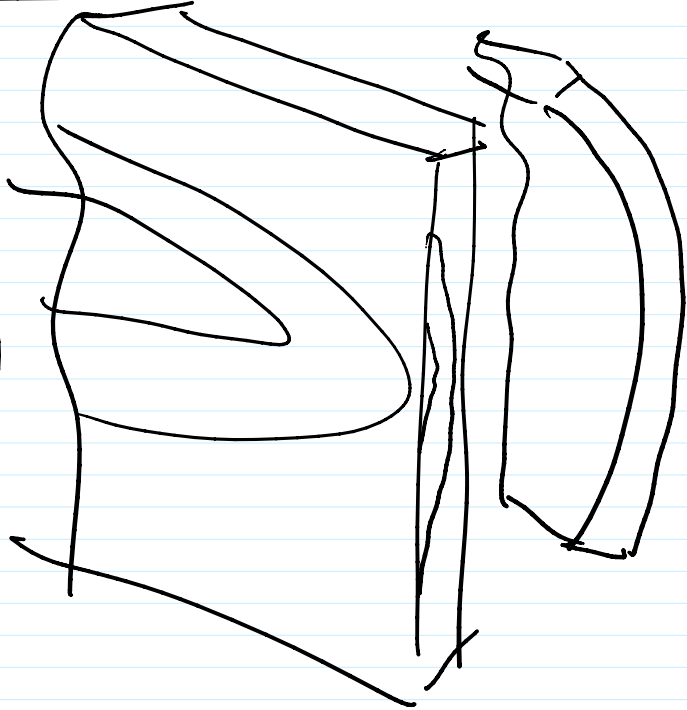
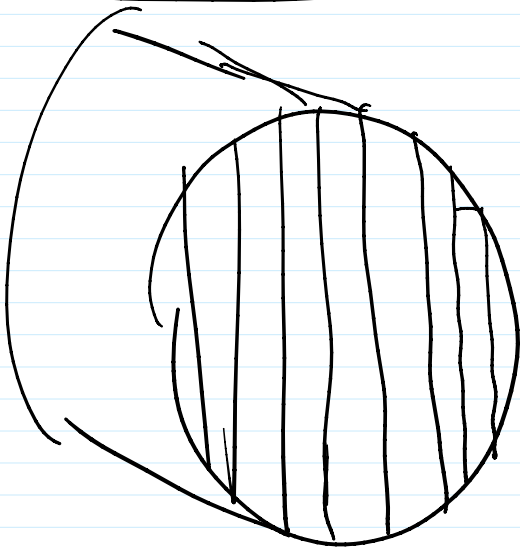
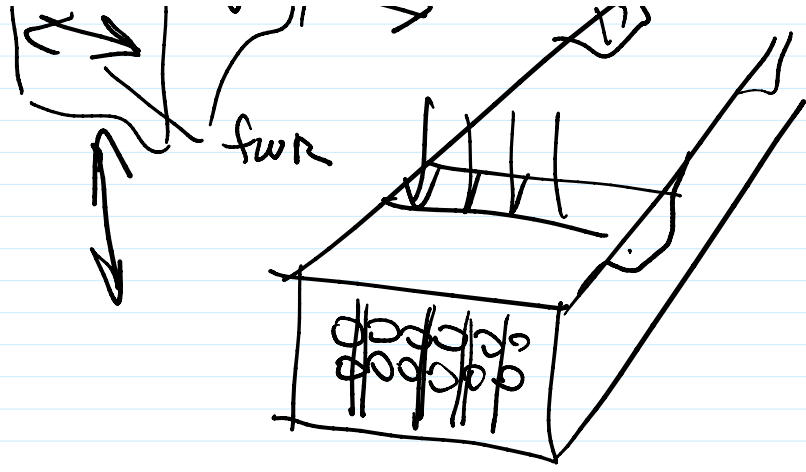


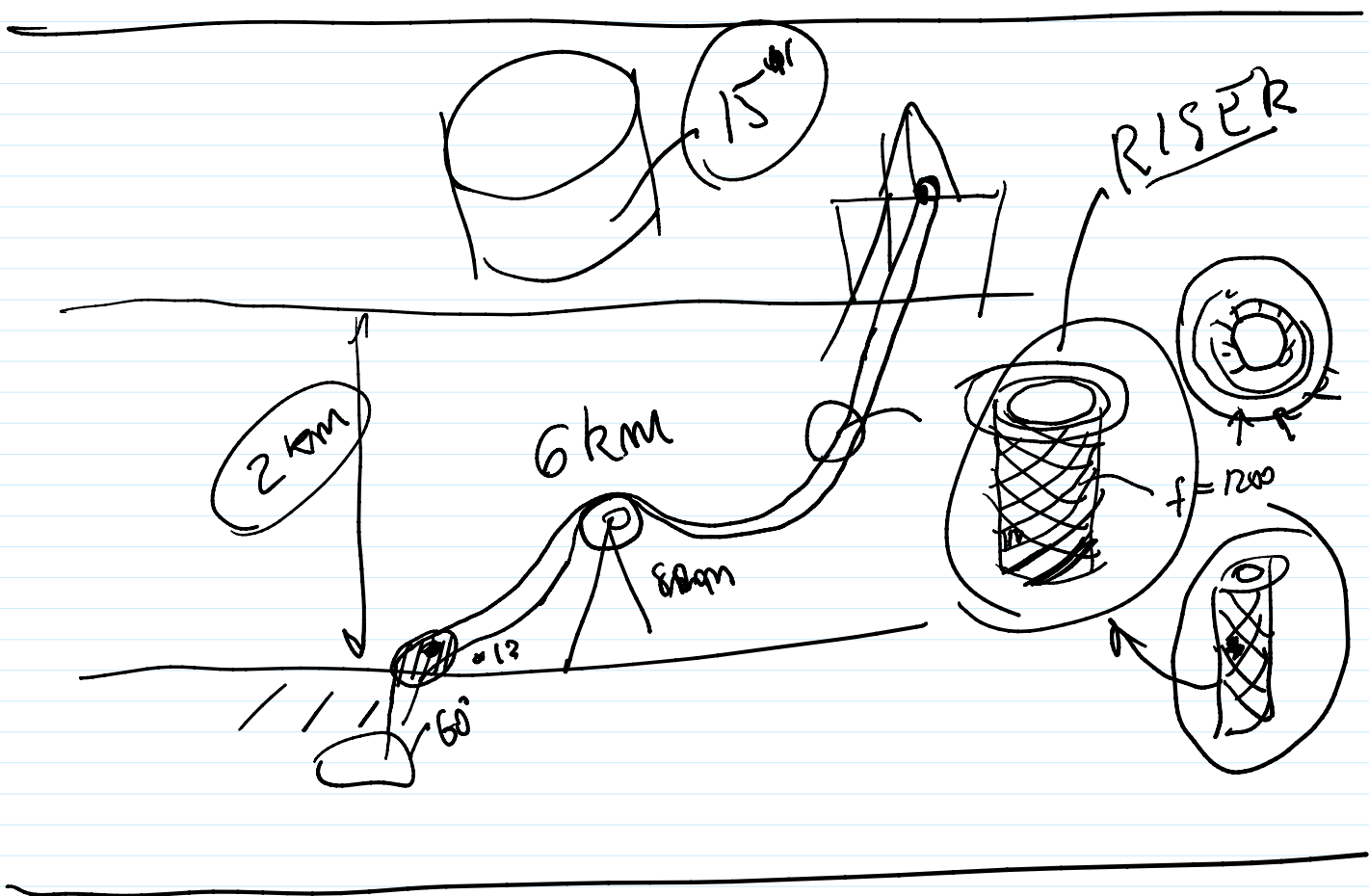
10/15



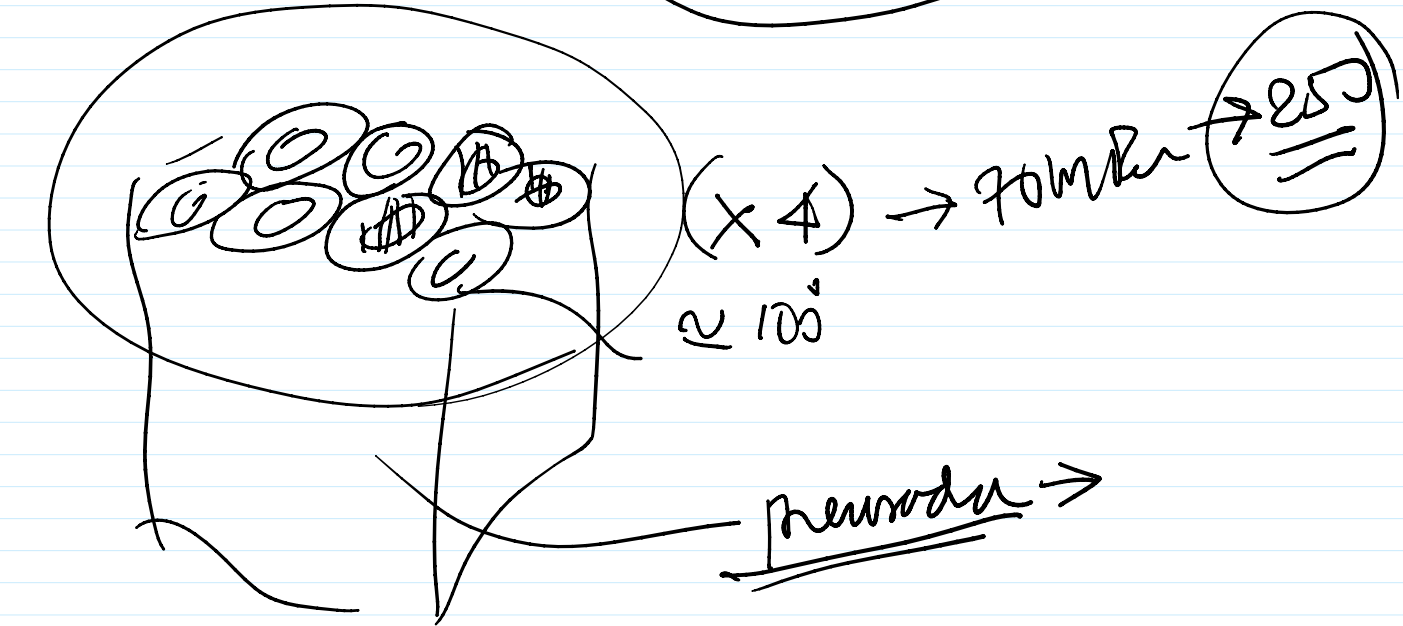
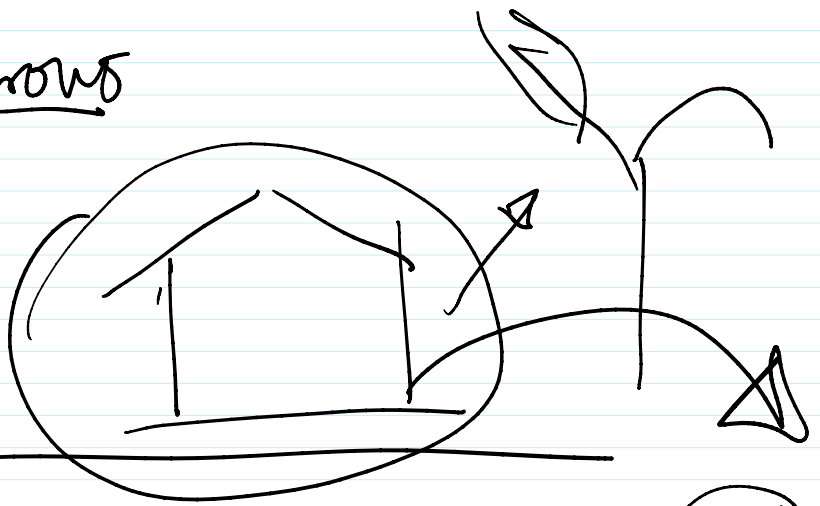
IRRADIATION







$1\text{m}^3 \rightarrow 500\text{kg}$ currows



20%

NBR concreto

$a_{10} \rightarrow f_{ty} = 250 \text{ MPa}$
 $\rightarrow E_s = 200 \text{ GPa}$
 $\rightarrow \gamma = 7.85 \text{ kN/m}^3$
 $\rightarrow \nu = 0.3$

f_c
 E_c
 $\gamma = 2.5 \text{ t/m}^3$
 $\nu = 0.1$

NBR \rightarrow 10

f_{wc}
 f_{wt}
 f_{vt}
 E_{w90}
 E_{n90}

9 momentos

1x
~~NBR 988~~
7190