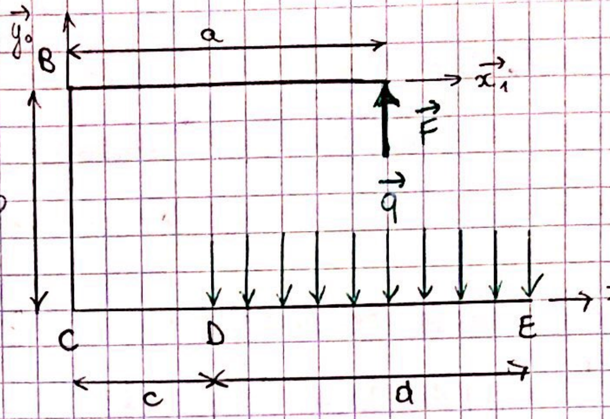
Application n°2 :

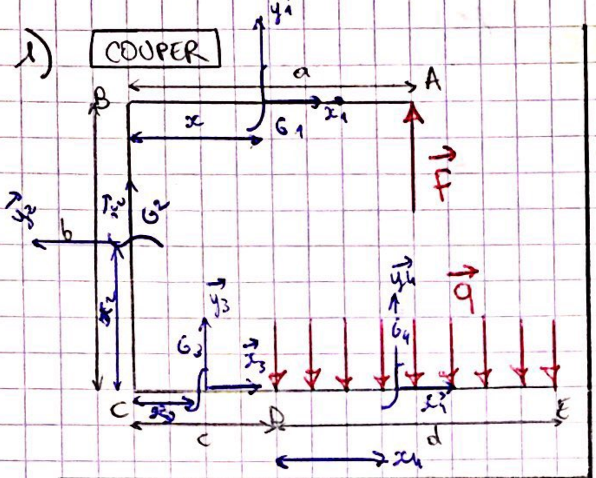
$\|\vec{F}\| = F = 100\ kN$

$Re = 355\ MPa$

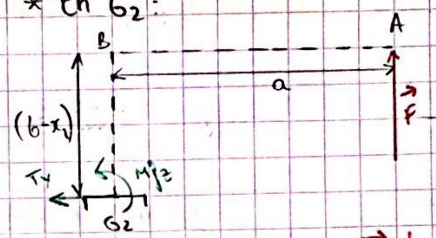
$Cs_{mini} = 4$



1) COUPER

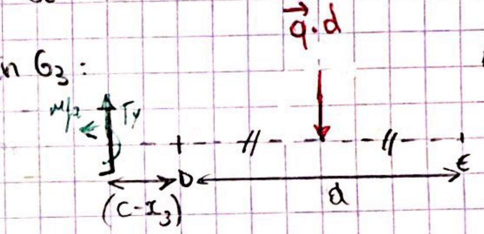


* En G_2 :



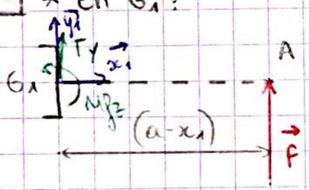
Effet à distance :
$T_y = ?$
$Mf_z = ?$

* En G_3 :

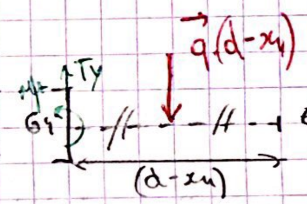


Effort à distance :
$T_y = ?$
$Mf_z = ?$

ISOLER * En G_1 :



* En G_4 :



→ Effet à distance

$T_y = ?$
$Mf_z = ?$

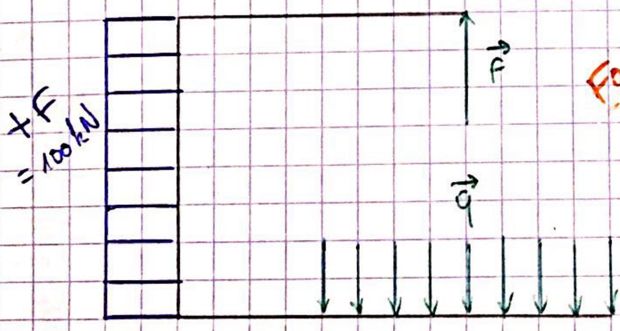
Effet à distance

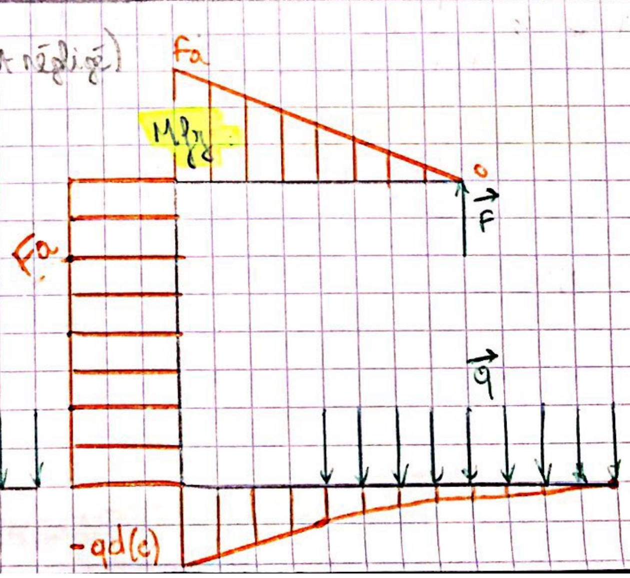
$T_y = ?$
$Mf_z = ?$

TRANSPORTER * En G_1 :	* En G_2	* En G_3 :	* En G_4 :
$(T_y = +F)$	$N = +F$	$(T_y = -q.d)$	$(T_y = -q(d-x_4))$
$Mf_z = +F(a-x)$	$Mf_z = +Fa$	$Mf_z = -qd(c-x_3)$	$Mf_z = -q(d-x_4)\left(\frac{d-x_4}{2}\right)$

Diagrammes : (Effort tranchant négligé)

N





2) En négligeant les concentrations de contraintes dans les angles et en admettant que les efforts tranchants sont négligeables, on se rend compte que la section critique se trouve entre B et C.

3) • Effort normal $(N = +F) \rightarrow$ traction
• Moment de flexion $(Mf_z = +Fa)$
} Entre B et C

On a donc $\sigma_N + \sigma_{Mf_z} = \sigma_{total}$ (superposition)

$$\sigma_N = \frac{N}{S} \qquad \sigma_{Mf_z} = \frac{+Mf_z}{I_{Gz}} \cdot y \qquad \rightarrow \sigma_{Total\,max} \leq \frac{Re}{Cs}$$

D'où $\sigma_{Total\,max} = \frac{|N|_{max}}{S} + \frac{|Mf_z|_{max}}{I_{Gz}} \cdot |y|_{max}$ avec $h = 25$ cm

$$= \frac{F}{e \times h} + \frac{Fa}{\frac{eh^3}{12}} \cdot \frac{h}{2}$$

$$\Rightarrow \frac{F}{e \times h} + \frac{Fa}{\frac{eh^3}{12}} \cdot \frac{h}{2} \leq \frac{Re}{Cs}$$

$$\Leftrightarrow \frac{F}{e \times h} + \frac{12\,Fa}{eh^3} \cdot \frac{h}{2} \leq \frac{Re}{Cs}$$

$$\Leftrightarrow \frac{100\,000}{250 \times e} + \frac{100\,000 \cdot 800}{\frac{e \cdot 250^3}{12}} \times 125 \leq \frac{355}{4}$$

$$\Leftrightarrow \frac{100\,000 \cdot 4}{250 \times 355}\left(1 + \frac{6 \cdot 800}{250}\right)$$

$\Rightarrow e \geq 91$ mm

$\Rightarrow e \geq 9{,}1$ cm