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Nombre del profesor: Pedro Alberto García

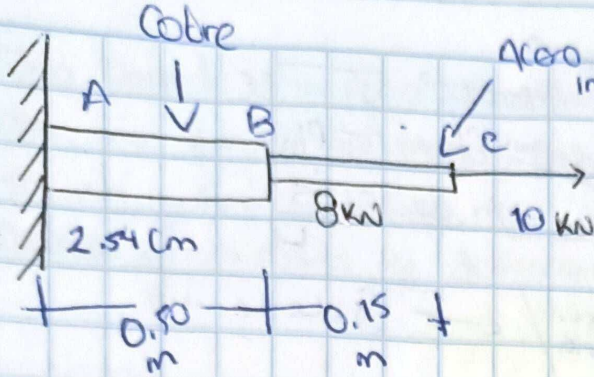
Nombre del trabajo: Esfuerzo y deformación

Materia: Resistencia de materiales de construcción

Grado: 4to Cuatrimestre

Grupo: LAR04EMC0120-A

Comitán de Domínguez Chiapas a 27 de noviembre del 2021



$S = \frac{PLF}{AE}$

$A = \frac{\pi \cdot 0.0259}{4}$

AB

P = 8 KN

A = 0.0254 m^2

Lf = 0.50 m

E = 120.76 GPa

$S = \frac{PLf}{AE}$

$S = \frac{8KN(0.50m)}{(0.0005068m^2)(1.207 \times 10^{-10})}$

$S = \frac{4}{61,170,760}$

$S = 6.539 \times 10^{-08}\ m$

$S = 0.000000065m$

$S = \frac{PLF}{AE}$

$A = \frac{\pi \cdot 189.96}{4}$

BC

P = 8 + 10 = 18 KN

A = 1.267 = 0.0001267 m^2

Lf = 0.15 m

E = 189.6 GPa = 1.896×10^{11} N/m^2

$S = \frac{18KN(0.15m)}{0.0001267m^2(1.896 \times 10^{11} N/m^2)}$

$S = \frac{2.7\ KN.m}{24,022,320\ m^2.N/m^2}$

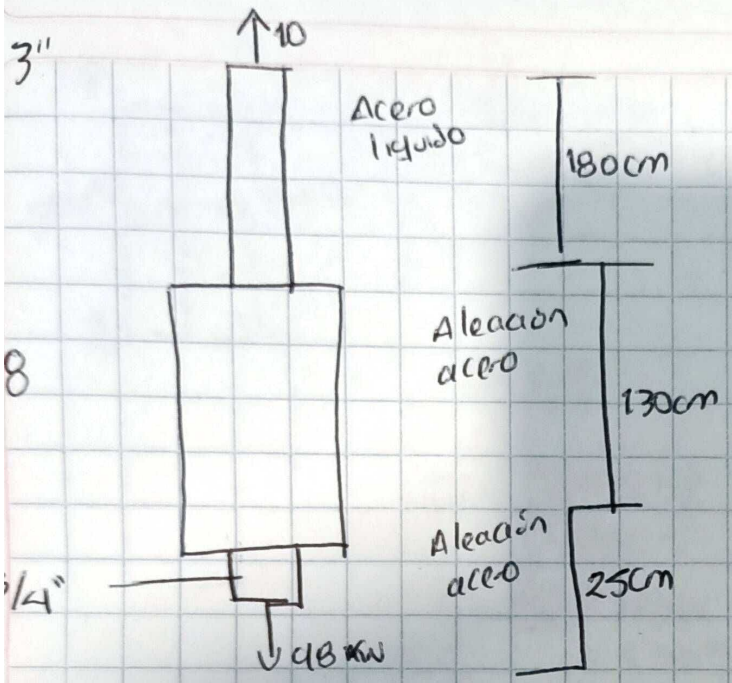
$S = 1.124 \times 10^{-07}$

S = 0.000000112 m

$S_{AB} = 0.000000065m$

$S_{BC} = 0.000000112m$

ESFUERZO Y DEFORMACIÓN



BC

$P = 10 - 60\,KN \rightarrow -50\,KN$

$A = 0.0323\,m^2$

$LF = 1.30\,m$

$E = 206.8\,GPa \rightarrow 2.068 \times 10^{11}$

$$\delta = \frac{-50\,KN(1.30\,m^2)}{0.0323\,m^2(2.068 \times 10^{11}\,N/m^2)}$$

$$\delta = \frac{-65\,KN.m}{6.679410000\,m^2.N/m^2}$$

$$\delta = -9.731 \times 10^{-9}$$

AB

$P = 10\,KN$

$A = 9.657 \times^{-03} = 0.00466\,m^2$

$LF = 1.80$

$E = 103.4\,GPa \rightarrow 1.034 \times 10^{11}$

$$\delta = \frac{P\,LF}{AE}$$

$$\delta = \frac{10\,KN(180\,cm)}{0.00466\,m^2(1.034 \times 10^{11}\,N/m^2)}$$

$$\delta = \frac{18.KN(180m)}{4.881 \times 4100\,m^2.N/m^2}$$

$$\delta = 3.735 \times 10^{-08}$$

Henry Reo Morales

CD

$P = 10KN - 60KN - 98KN - 148KN$

$A = 0.000283\ m^2$

$LF = 0.25m$

$E = 206.8GPa \rightarrow 2068 \times 10^{11}$

$$S = \frac{-148KN(0.25m)}{0.000283\ m^2 (2.068 \times 10^{11})}$$

$$S = \frac{-37\ KN.m}{5.852449\ m^2 N/m^2}$$

$$S = -6.322 \times 10^{-7}$$

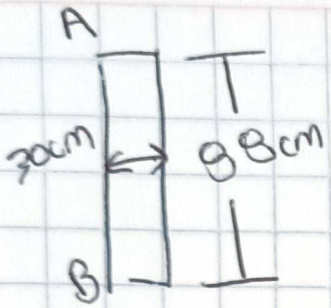
$AB = 3.735 \times 10^{-8}$

$BC = -9.731 \times 10^{-9}$

$CD = -6.322 \times 10^{-7}$

-5.85119×10^{-07}

Esfuerzo y Deformación



Concreto Armado

$P = -25\,KN$

$A = 0.070\,m^2$

$LF = 88cm \rightarrow 0.88\,m$

$E = 210\,kg/cm^2 \rightarrow 300000$

$$\delta = \frac{PLF}{AE}$$

$$\delta = \frac{-25KN\,(0.88\,m)}{0.070\,m^2\,(300000)}$$

$$\delta = \frac{-22\,KN.m}{21000}$$

$$\delta = -1.0477 \times 10^{-3}$$

Henry foo Morales.