Projeto Integrado

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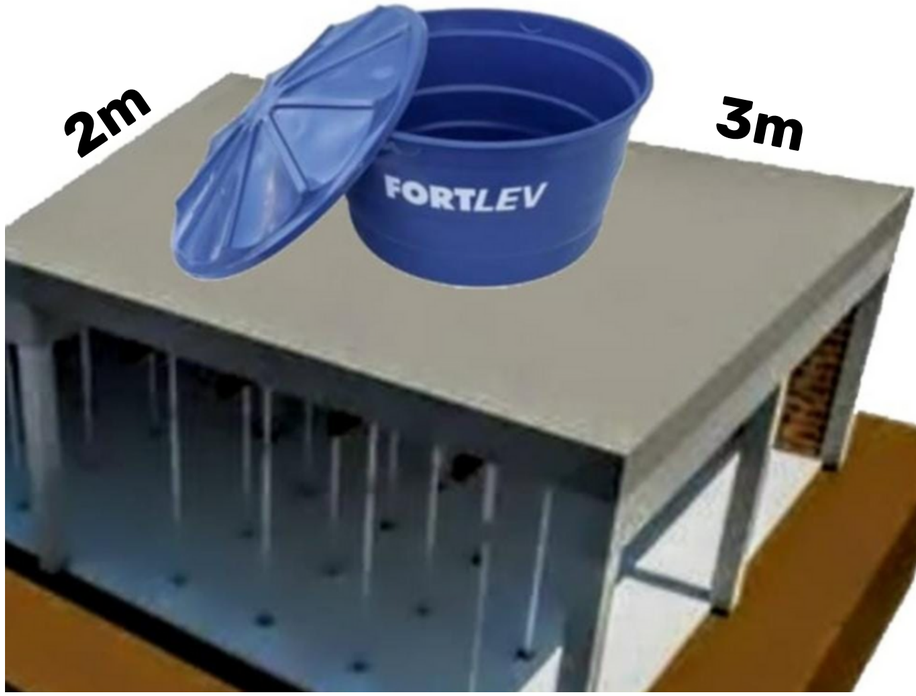
Visão Geral

Em nosso caso temos uma caixa d'água que está sobre uma laje, e ambas se encontram sobre vigas. Então a partir dessas informações, vamos somar os pesos (água, laje e vigas) e assim teremos o total, que será dividido sobre cada viga que está recebendo essa carga.



PESOS

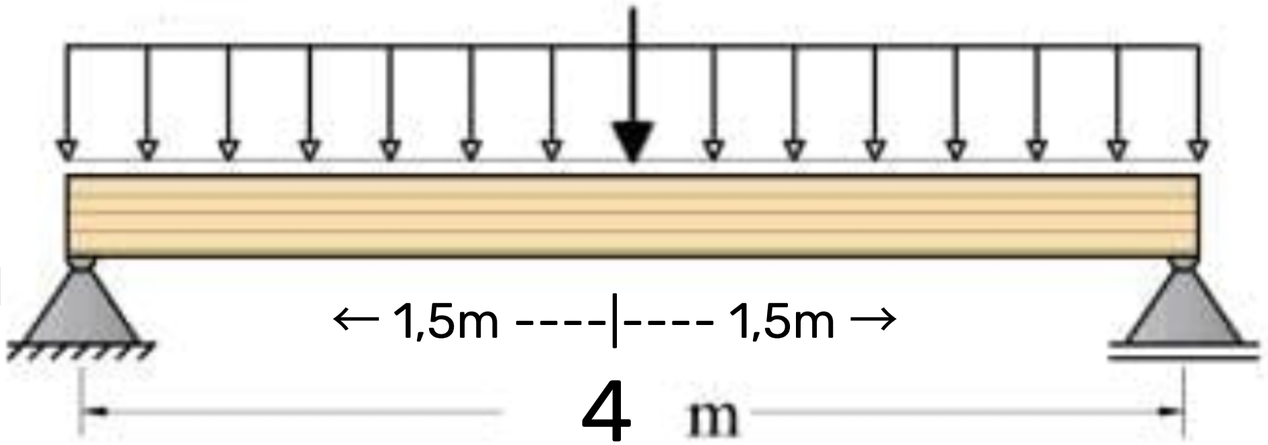
- Caixa d'água 500kg
- Laje 216kg
- Viga 574,2kg

- Total(kg) 1290,2

1290,2kg × (9,81m/s²) kg em N = 12656 × 862N ÷ 1000N em KN = 10 × 65KN ÷ (3m) KN em Kn/m = 4,22 KN/m ÷ 2 Para duas vigas

$\overrightarrow{HA} = C$

RA ↑ = 3,165KN



2,11 KN/m × 3m = 6,33 KN

6,33KN → Carga distribuída em 3m

RB ↑ 3,165 KN

1°Eq$\sum$ x = 0

HA = 0

2°Eq$\sum$ y = 0

RA = 6,33 KN + RB = 0

3°Eq$\sum$m = 0 M = Fdx

$\sum$ma = 0

-6,33 KN × (1,5M) + RB × (3m) = 0

-9 495 KN + 3 RB KN × M = 0

3 × RB (KN) ~~m~~ = 9495KN × ~~m~~

RB = 9495KN ÷ 3

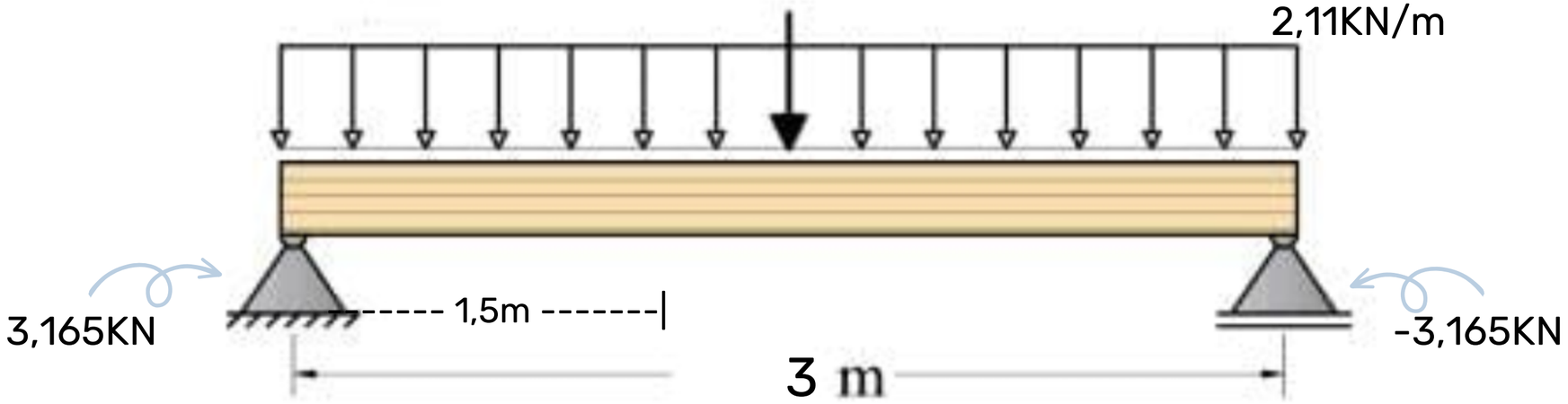
RB = 3,165KN

3°Eq em 2°Eq

RA - 6,33KN + 3,165KN = 0

RA = 3,165KN

Cortante Momento Fletor



$$2{,}11\text{KN} \times \frac{3\text{m}}{\text{m}} = 6{,}35\text{KN} \div 2 \text{ (apoios)} = 3{,}165\text{KN}$$

$V(x)S\ -2{,}11dx$

$V(x) = -2{,}11x + C$

$V(x) = -2{,}11x + 3{,}165$

$V(x) = -2{,}11 \times 0 + C$

$3{,}165 = C$

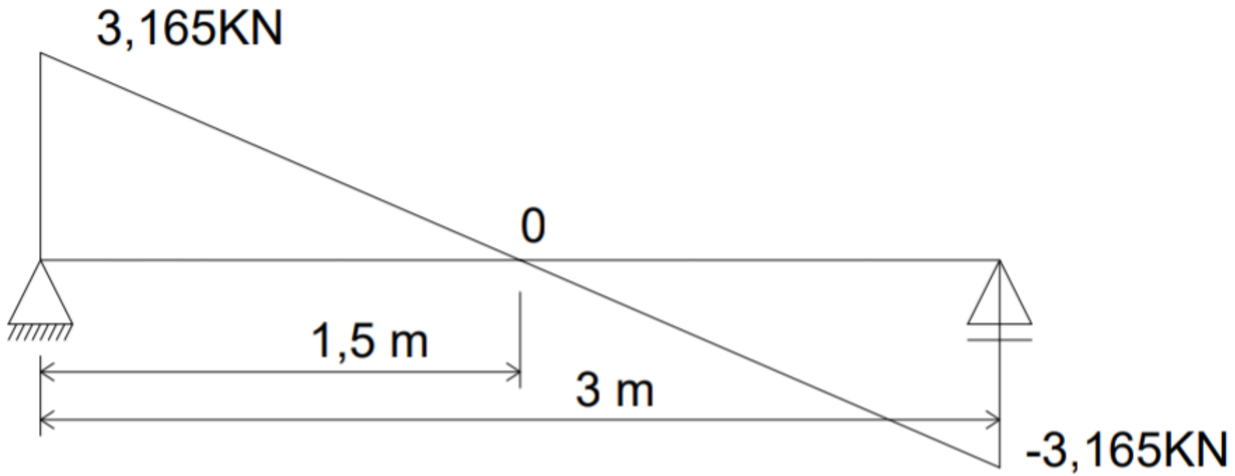
$C = 3{,}165$

$V(1{,}5)\ -2{,}11 \times 1{,}5 + 3{,}165$

$V(1{,}5)\ -3{,}165 + 3{,}165$

$V(1{,}5) = 0$

Cortante Momento Fletor

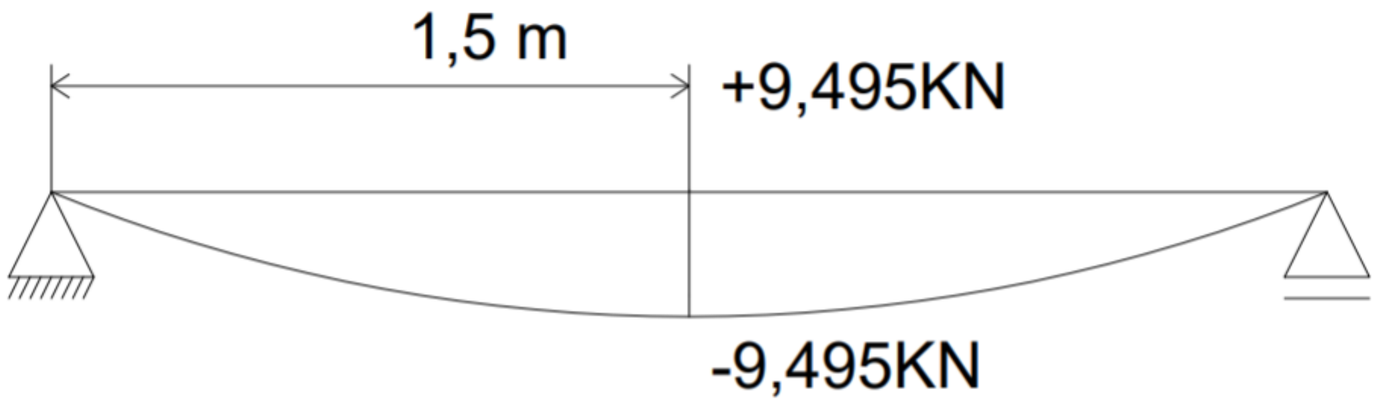


$$V(3) = -2{,}11 \times 3 + 3{,}165$$
$$V(3) = -6{,}33 + 3{,}165$$
$$V(3) = -3{,}165$$

$$M(x) - S(-2{,}11x^1 + 3{,}165)\,dx$$
$$M(x) = \frac{-2{,}11x^2}{2} + 3{,}165x + C$$
$$M(x) = \frac{-2{,}11x^2}{2} + 3{,}165x$$

$$V(1{,}5)\ \frac{-2{,}11}{2} - 15^2 + 3{,}165 - 1{,}5$$
$$V(1{,}5) = \frac{-2{,}11}{2} \times 2{,}25 + 4{,}75$$
$$V(1{,}5) = -2{,}11 \times 1{,}125 + 4{,}75$$
$$V(1{,}5)\ -2{,}37 + 4{,}75$$
$$V(1{,}5)\ 7{,}124KN \times m$$

Cortante Momento Fletor



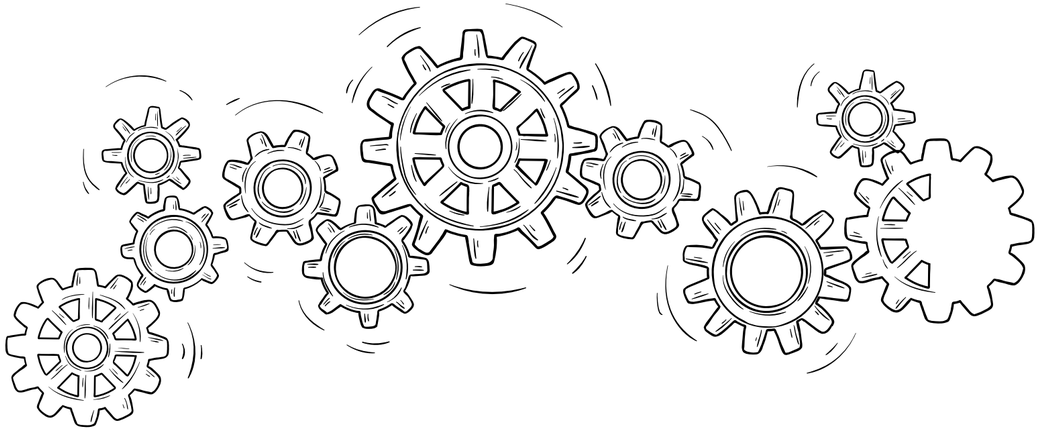
$$M3 = \frac{-2,11}{2} + 3^2 + 3,165 - 3$$

$$M3 = \frac{-2,11}{2} + 9,495$$

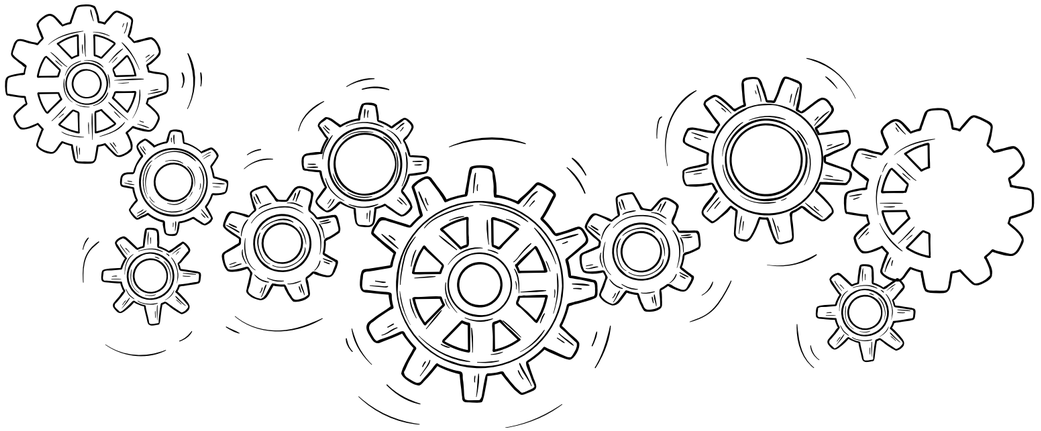
$$M3 = -2,11 \times 4,5 + 9,495$$

$$M3 = -9,495 + 9,495$$

$$M3 = 0$$



Nosso projeto



Obrigado a todos!

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