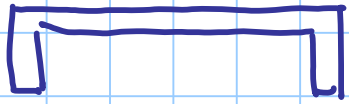
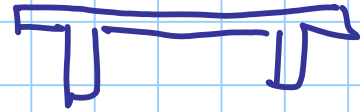


①

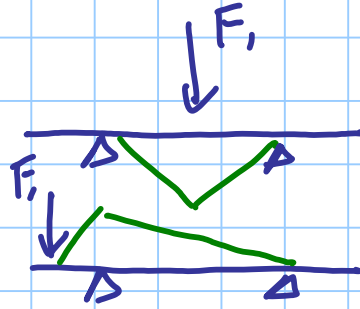
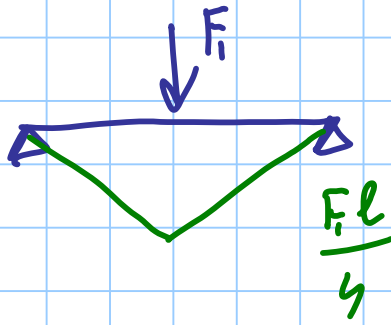


A



B

②



$F_l l / 4$

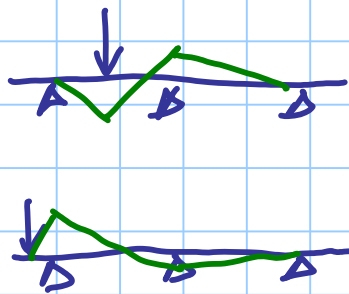
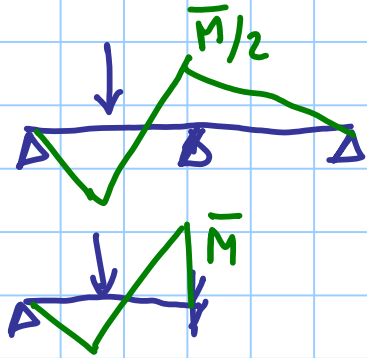
$F_l l / 4$



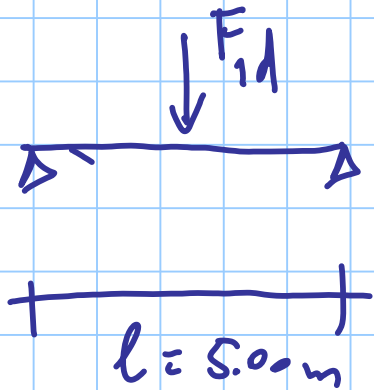
C



D



Lo schema peggiore è A, ma è stato scelto dalla maggior parte degli studenti. Per questo lo usiamo anche nell'esempio.



$$F_{id} = 200 \times 1.5 = 300 \text{ kN}$$

$$M_{max} = \frac{F l}{4} = 375 \text{ kNm}$$

potrei considerare meno,
da assa a assa

$$d = r' \sqrt{\frac{M}{b}}$$

$$\eta = \frac{1}{\sqrt{\dots f_{ca}}}$$

$$C25/30 \\ f_{ca} = 14.2 \text{ MPa} \quad \eta = 0.0197$$

$$f_{ca} = 0.85 \times \frac{20}{1.5} = 11.3 \text{ MPa} \quad C20/25$$

$$\rightarrow \eta = 0.022$$

$$\eta' = 0.02$$

$$d = 0.02 \sqrt{\frac{375}{1.00}} = 0.387 \text{ m}$$

$$h = 44 \text{ cm}$$

$$f_{yd} = \frac{400}{1.15} = 347.8 \text{ MPa}$$

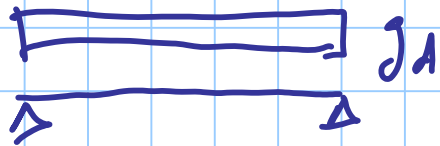
3

$$\text{r.p. } g_n = 1 \times 0.44 \times 25 = 11 \text{ kN/m}^2$$

assume, included alt.

$$g_k = 12 \text{ kN/m}^2$$

$$g_d = 12 \times 1.3 = 15.6 \text{ kN/m}^2$$



$$M = \frac{g_d l^2}{8} = 48.8 \text{ kNm}$$

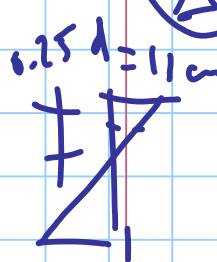
$$M_{\text{max}} = 375 + 49 = 424 \text{ kNm}$$

④ Armutur < flexion

$$A_s = \frac{M}{0.9 d f_{y1}} = 33.9 \text{ cm}^2 \quad 11 \phi 20 \quad \text{in } 1 \text{ m}$$

$$M_{Rd}(A'_s=0) = \frac{b d^2}{\gamma^2} = \frac{1.00 \times 0.40^2}{0.022^2} = 330.6$$

$\Delta M = 93 \text{ kNm}$



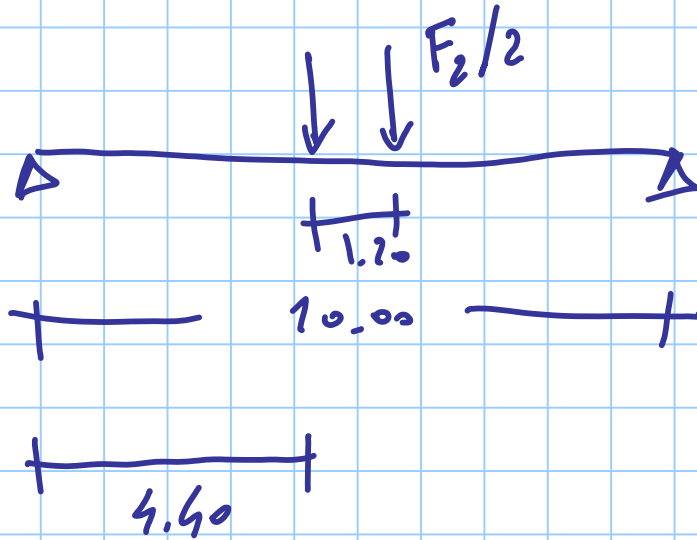
$\sigma_s \approx f_{y1}$

$$A'_s = \frac{\Delta M}{(d-c) \sigma'_s} \quad \mu = 0.25$$

10 $\phi 14$

(aggiungere tagli.)

5

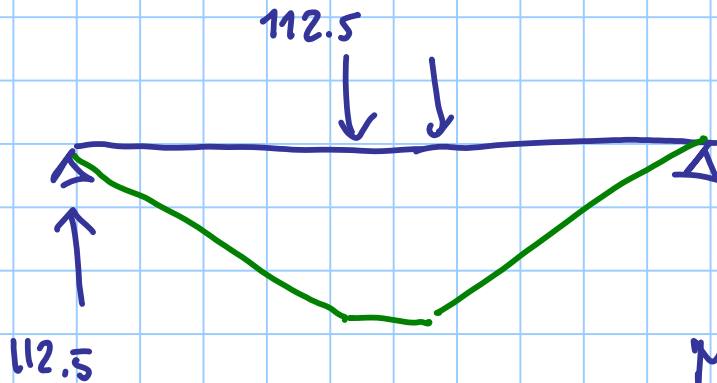


le travi sono 2
(per A e B)

$$F_{2n} = 150 \text{ kN}$$

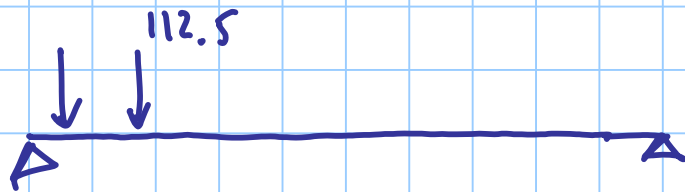
$$F_{2A} = 150 \times 1.5 = 225 \text{ kN}$$

$$F_{2d/2} = 112.5 \text{ kN}$$



$$M = 112.5 \times 4.40 = 495 \text{ kNm}$$

per area V_{max}



$$V_{max} \approx 2 \times 112.5 = 225 \text{ kN}$$

(un p' mer.)

dimension per M

$$d = z' \sqrt{\frac{M}{b}} = 0.02 \sqrt{\frac{435}{0.40}} = 0.70 \text{ m} \quad h = 90 \text{ cm}$$

$$\text{per} : 0.40 \times 0.90 \times 25 = 9 \text{ kN/m} \times 1.3 = 11.7 \text{ kN/m}$$

⑥

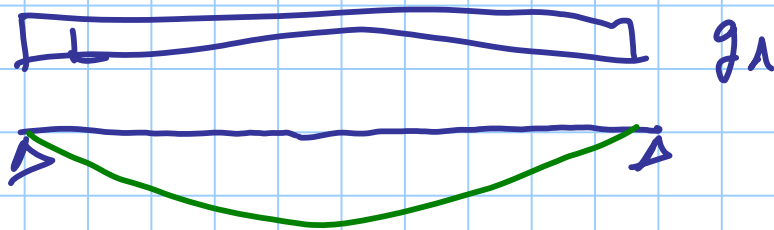
carichi permanenti:

$$\text{soletta} \quad 2.50 \text{ m} \times 15.6 = 39.0 \text{ kN/m} \\ + \text{alt.}$$

prop. Travi

11.7

$$\sim \frac{51}{51} \text{ kN/m}$$



$$V = \frac{q_1 l}{2} = 250 \text{ kN}$$

$$M = \frac{q_1 l^2}{8} = 637 \text{ kNm}$$

$$M_{max} = 495 + 637 = 1132 \text{ kNm}$$

$$d = z' \sqrt{\frac{M}{b}} = 0.02 \sqrt{\frac{1132}{0.6}} = 1.06$$

$$\text{con } b = 50 \text{ cm}$$

$$d = 0.95$$

$$h = 100 \text{ cm}$$

con questa sezione calcol

A_s A'_s

→ Tefle