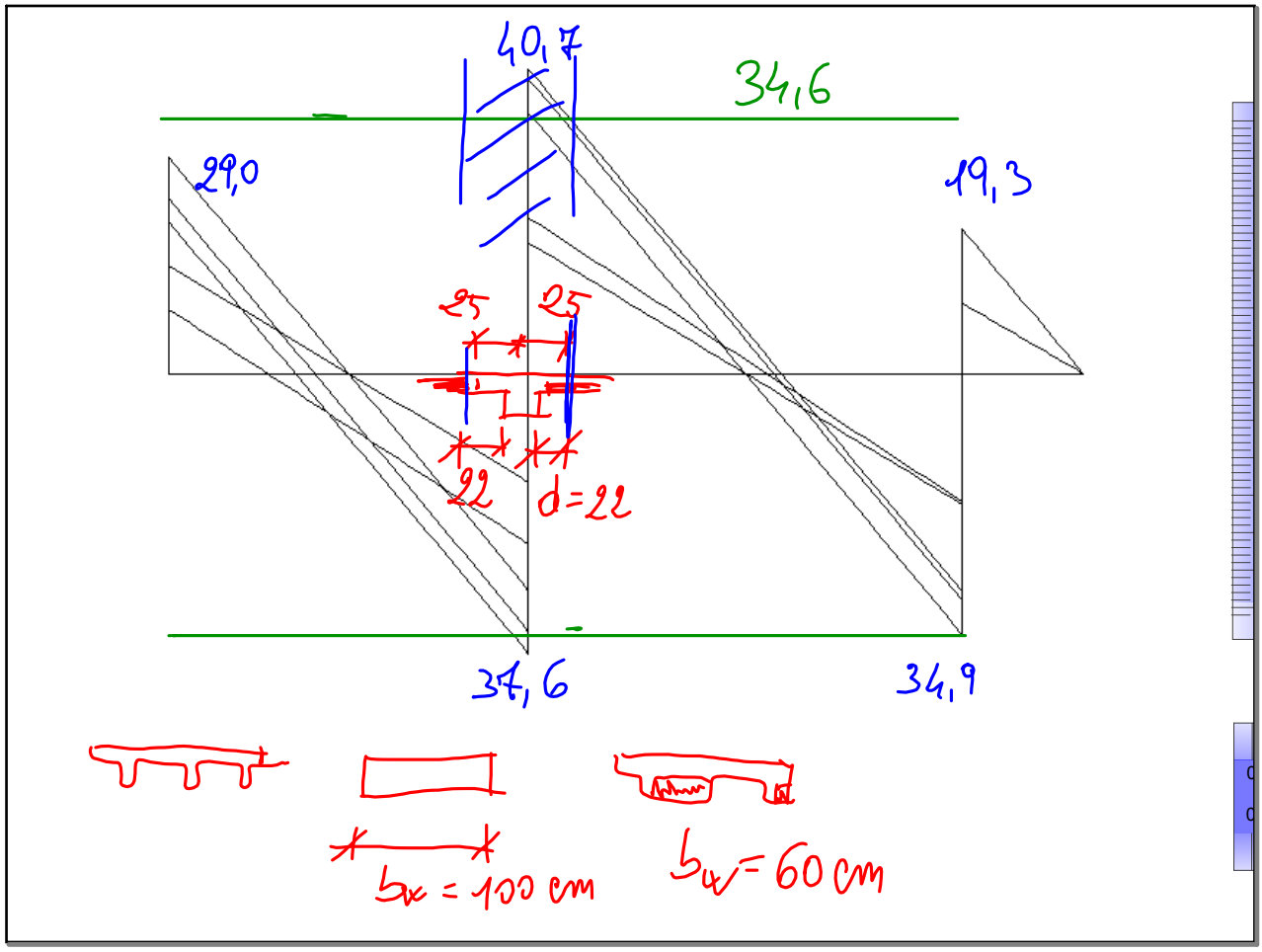
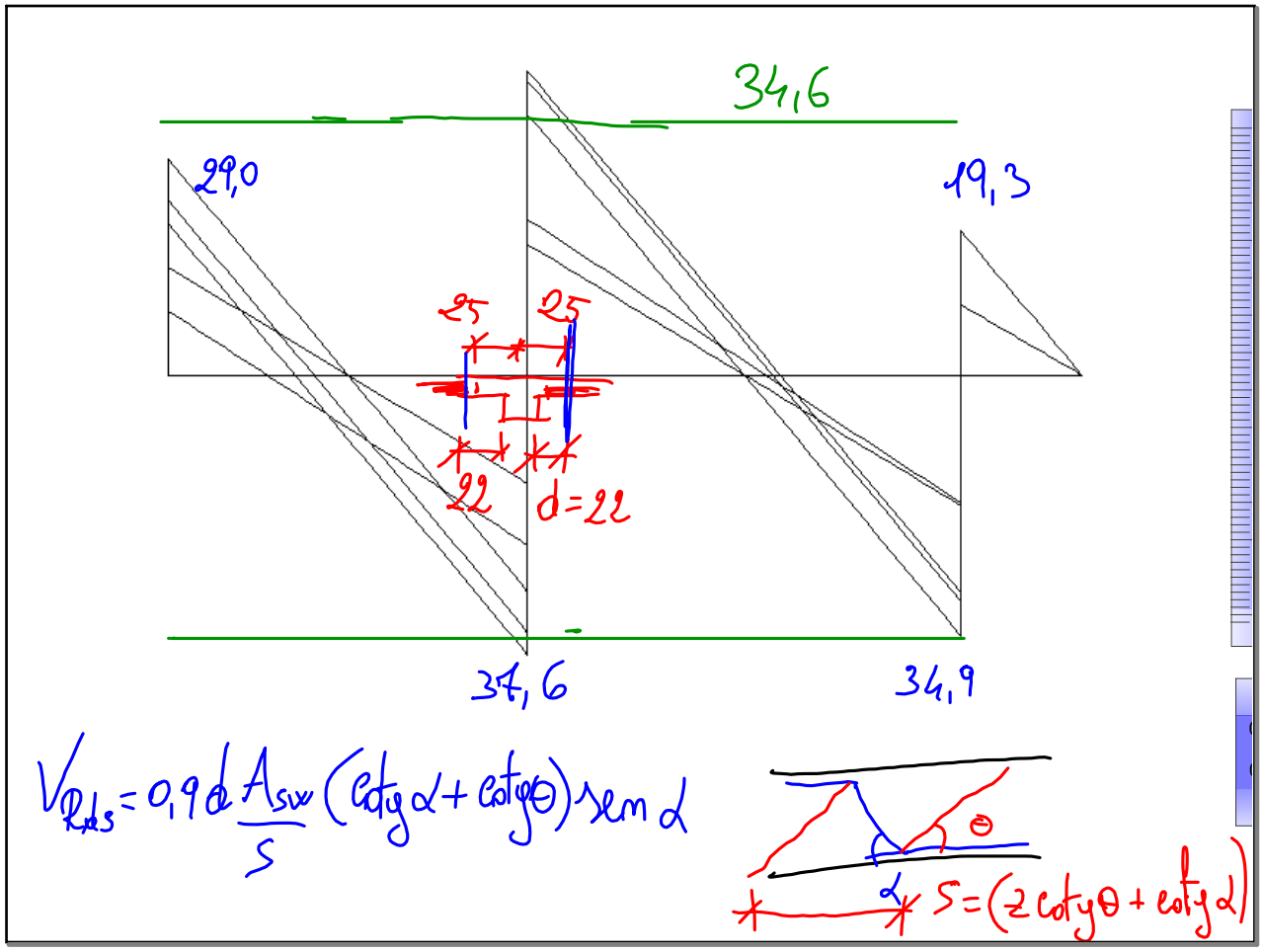

40,7
34,6
29,0
19,3
25
25
22
d=22
34,6
34,9
b_w = 100 cm
b_w = 60 cm


34,6
29,0
19,3
25
25
22
d=22
34,6
34,9
$V_{Rds} = 0{,}9 d \frac{A_{sw}}{s} (\cot g\alpha + \cot g\theta) \operatorname{sen}\alpha$
$s = (2\cot g\theta + \cot g\alpha)$

$$V_{Rd,c} = \left(\frac{0,18\, k \sqrt[3]{100\, \rho_l\, f_{ck}}}{\gamma_c} + 0,15\, \sigma_{cp} \right) b_w\, d$$

$$\geq \left(0,035 \sqrt{k^3\, f_{ck}} + 0,15\, \sigma_{cp} \right) b_w\, d$$

$$\rho_l = \frac{A_s}{b_w d} \leq 0,02$$

$$k = 1 + \sqrt{\frac{200}{d}} \leq 2$$

2 ϕ 10 a tranutto

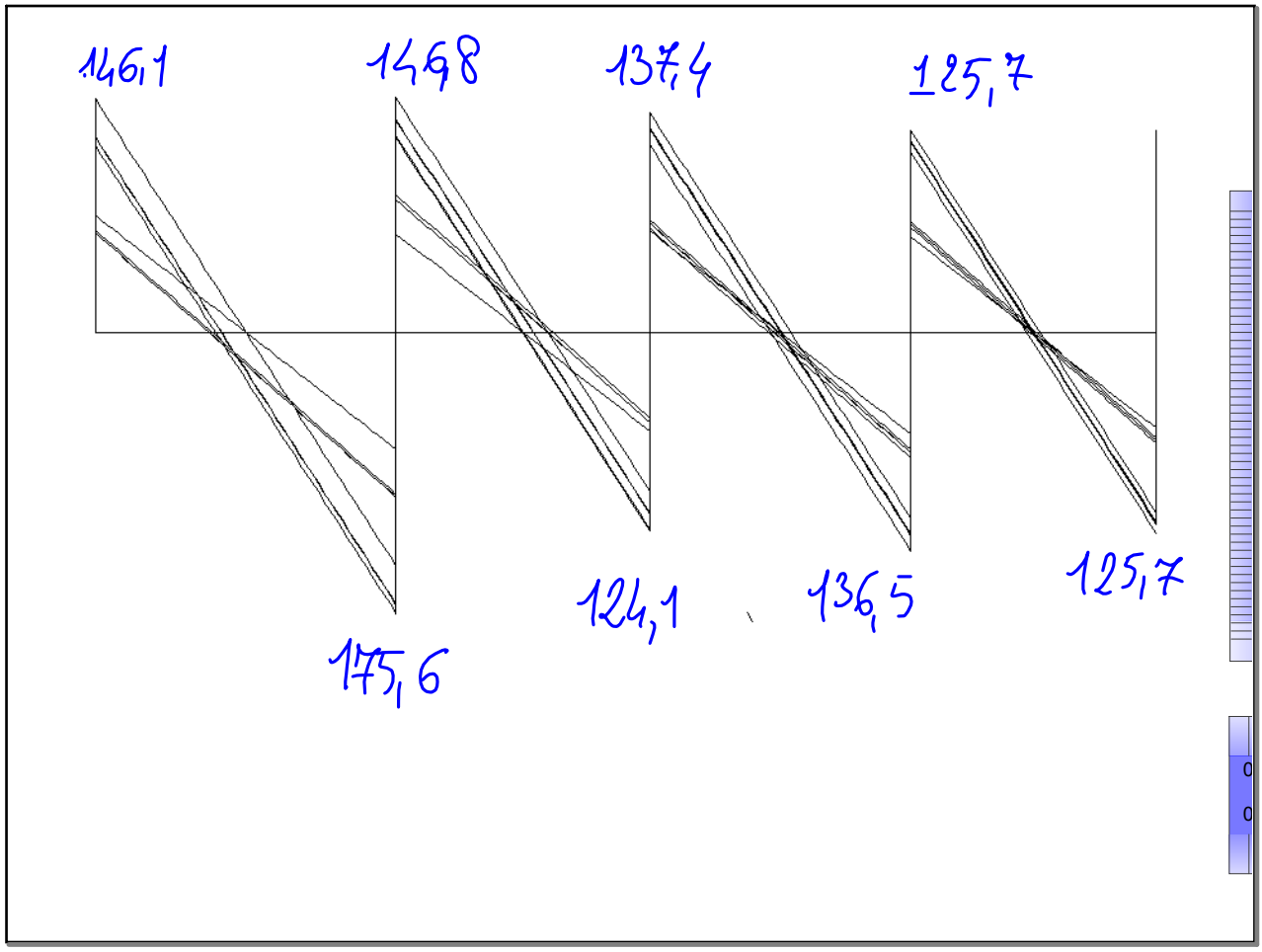
$$\rho_l = \frac{3 \times (2 \times 0,78)}{24 \times 22} = 0,0088$$

$$k = 1 + \sqrt{\frac{200}{220}} = 1,95$$

$$V_{Rd,c} = \frac{0,18 \times 1,95 \times \sqrt[3]{100 \times 0,0088 \times 25}}{1,5} \times \frac{24 \times 22}{10}$$

$$= \boxed{34,6\ KN}$$

$$\geq \left(0,035 \times \sqrt{1,95^3 \times 25}\right) \times \frac{24 \times 22}{10} = 25,2\ KN$$



$$V_{Rd,max} = 0{,}9\, d\, b_w\, f'_c\, \frac{\cot g\,\theta}{1+\cot g^2\theta}$$

$$V_{Rd,s} = 0{,}9\, d\, \frac{A_{sw}}{s}\, f_{yd}\, \cot g\,\theta$$

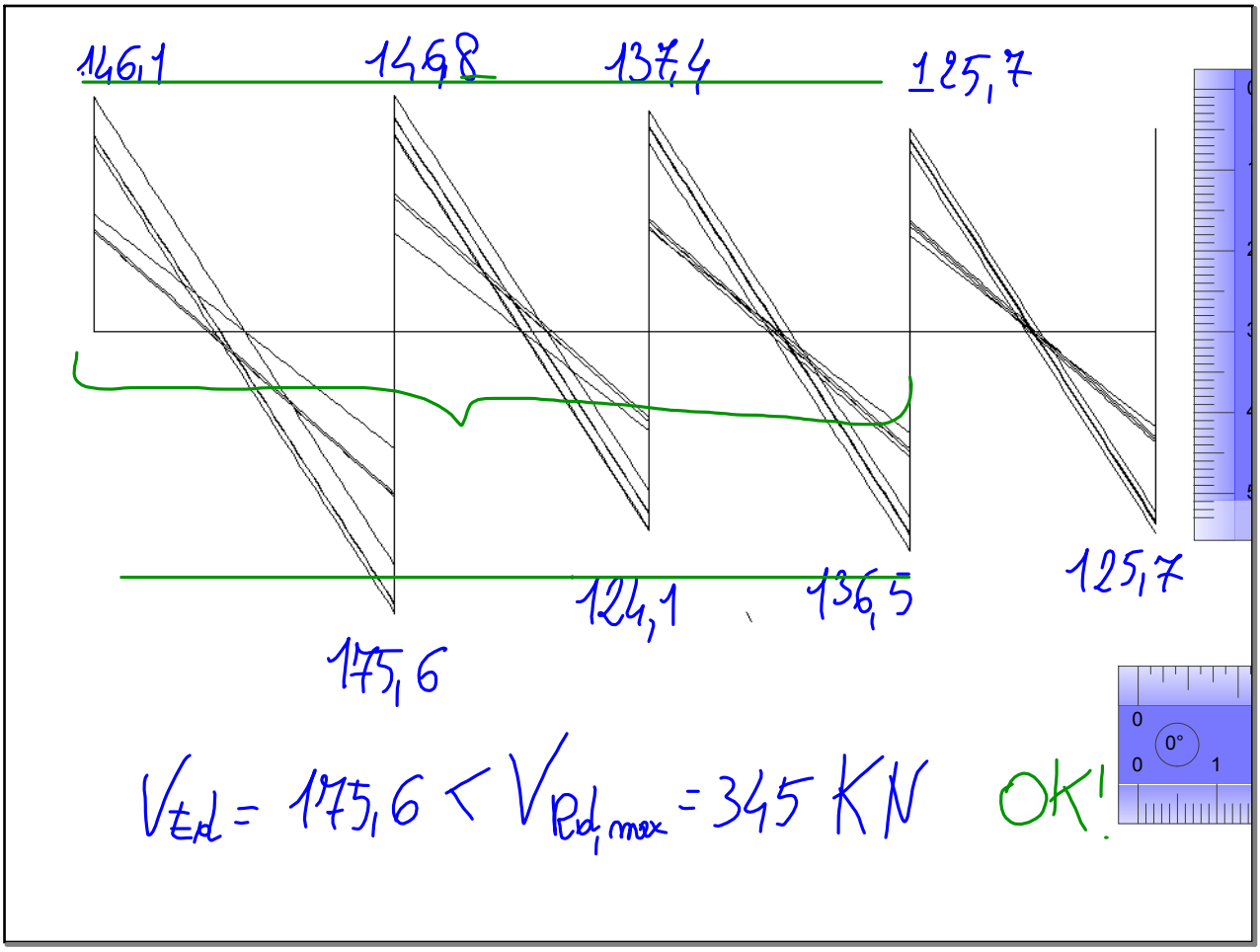
30×50

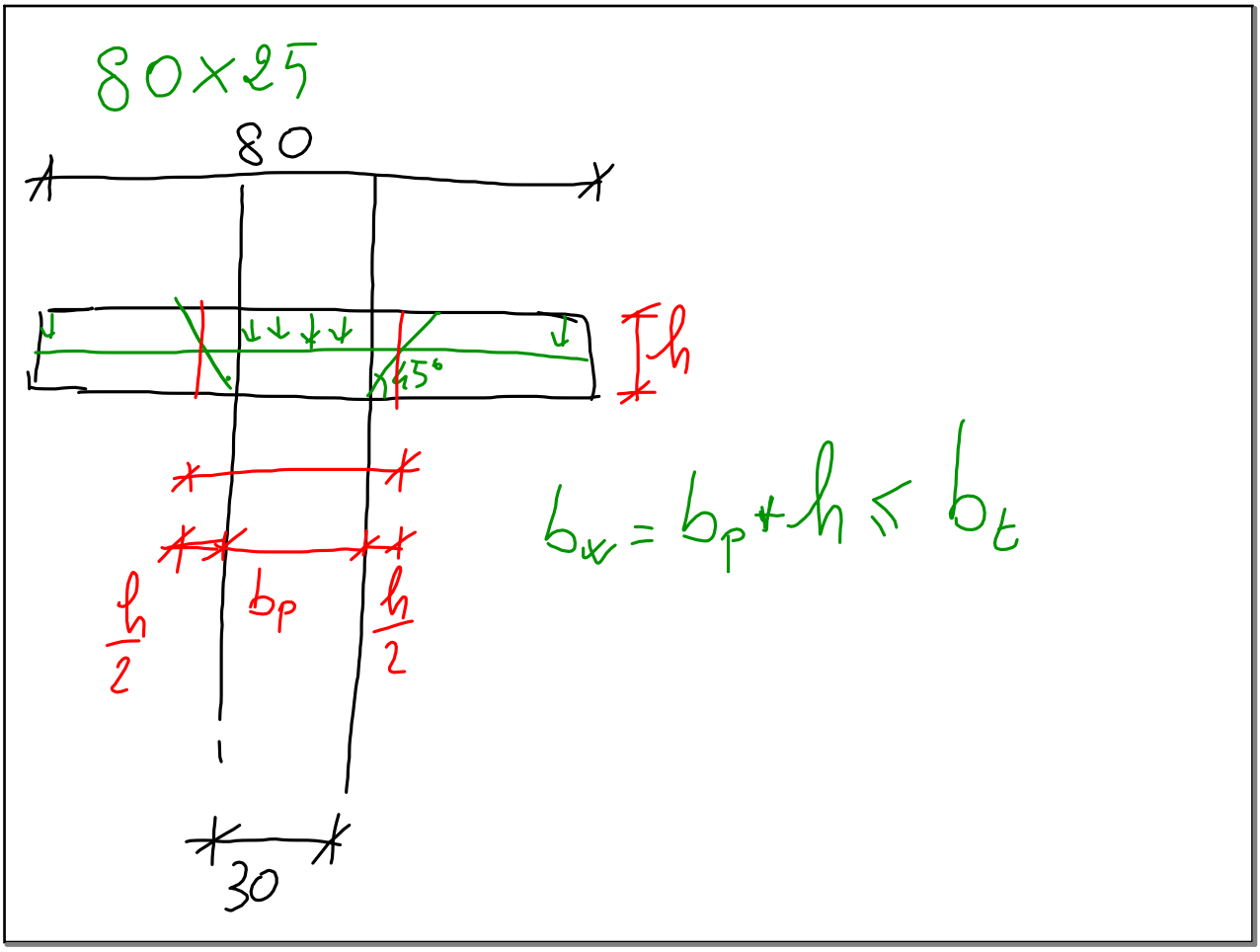
$$V_{Rd,max} = 0{,}9 \times 45 \times 30 \times 7{,}1 \times \frac{2}{1+4}\,\frac{1}{10} =$$

$$= 345\ KN$$

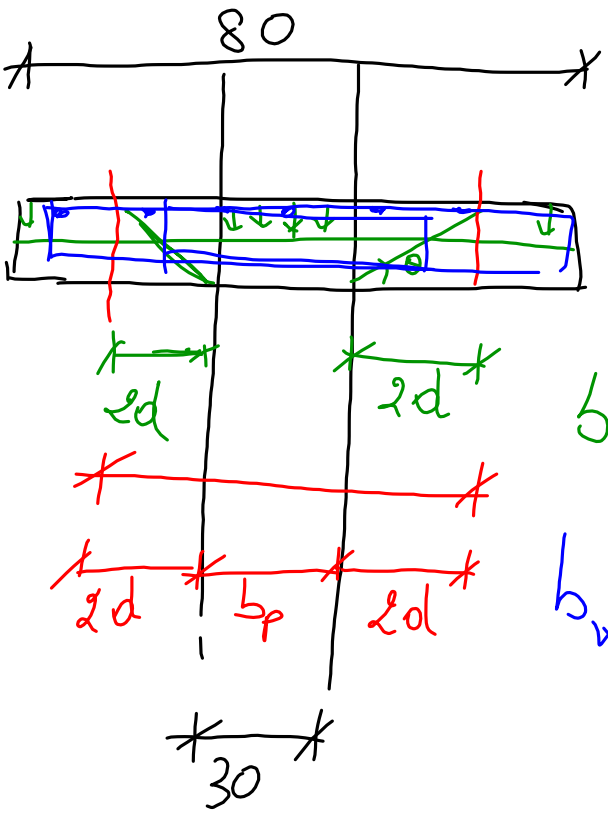
$$f'_{cd} = 0{,}5\, f_{cd} = 7{,}1\ MPa$$

$$\cot g\,\theta = 2$$


146,1
146,8
137,4
125,7
124,1
136,5
125,7
175,6
$V_{Ed} = 175,6 < V_{Rd,max} = 345\ KN$ OK!


80x25
80
45°
h
$\frac{h}{2}$
b_p
$\frac{h}{2}$
30
$b_w = b_p + h \leq b_t$

80×25



$b_w = b_p + \frac{4d}{2}$

$b_w = 30 + 2 \times 21 = 72$ cm

80×25

$V_{Rd,max} = 0{,}9 \times 21 \times 72 \times 7{,}1 \times \frac{2}{5} \frac{1}{10}$

$= 385\ kN \geq 125{,}7\ kN$

OK!

30x50

$\frac{A_{sw}}{s} \geq 0{,}15\, b = 0{,}15 \times 30 = 4{,}5 \text{ cm}^2/\text{m}$

$\phi 8/20 \quad \frac{A_{sw}}{s} = 5 \text{ cm}^2/\text{m}$

$s < 33 \text{ cm}$

$s \leq 0{,}8\, d = 0{,}8 \times 45 = 37 \text{ cm}$

$\phi 8/20$

$V_{Rd,s} = 0{,}9 \times 45 \times \frac{1}{20} \times \frac{3{,}91 \times 2}{10} = 158{,}5 \text{ KN}$

$\phi 8/15$

$V_{Rd,s} = 158{,}5 \times \frac{20}{15} = 211 \text{ KN}$

$\phi 8/10$

80×25

$\frac{A_{sw}}{s} \geq 0{,}15\, b_w = 0{,}15 \times 72 = 10{,}8 \text{ cm}^2/\text{m}$

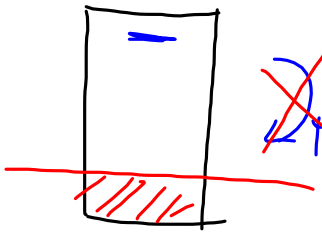
$n_{st} = \frac{10{,}8}{2} = 5{,}4$

$s = \frac{100}{5{,}4} = 18{,}5$ $\phi 8/15$ 4 bracci

ok!

$s < 33$ cm

$s < 0{,}8d = 0{,}8 \times 21 = 16{,}8$ cm



N_s $V \cot g\, \theta/2$

$V \cot g\, \theta$

N_c $V \cot g\, \theta/2$

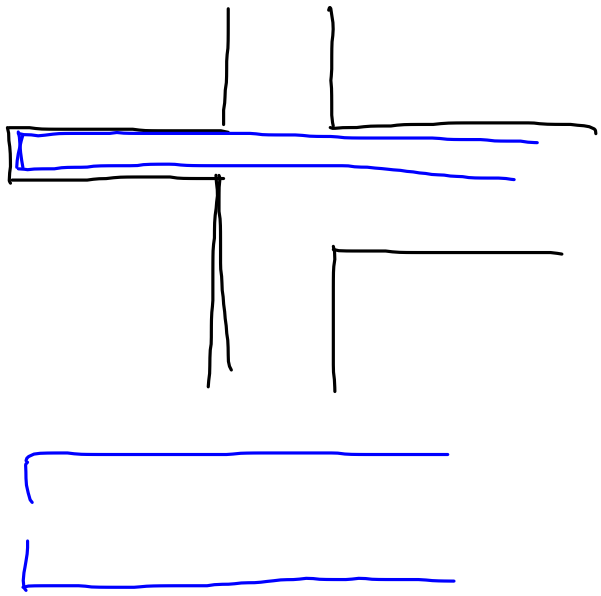
traslazione diag. M

$\frac{z}{2} \cot g\, \theta = 2$ $\frac{z}{2}$

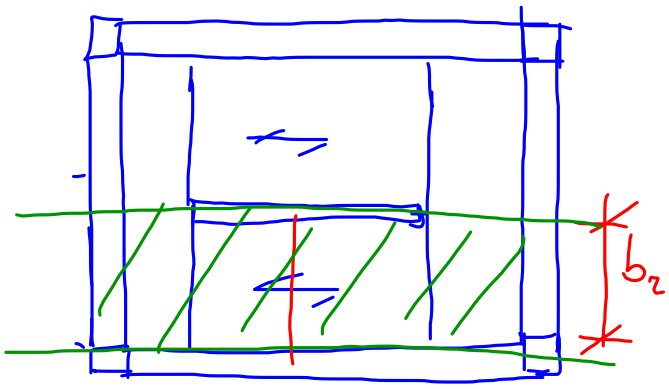
≤ 2

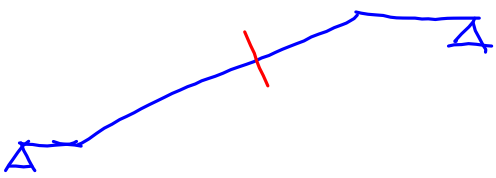
ferri di parete

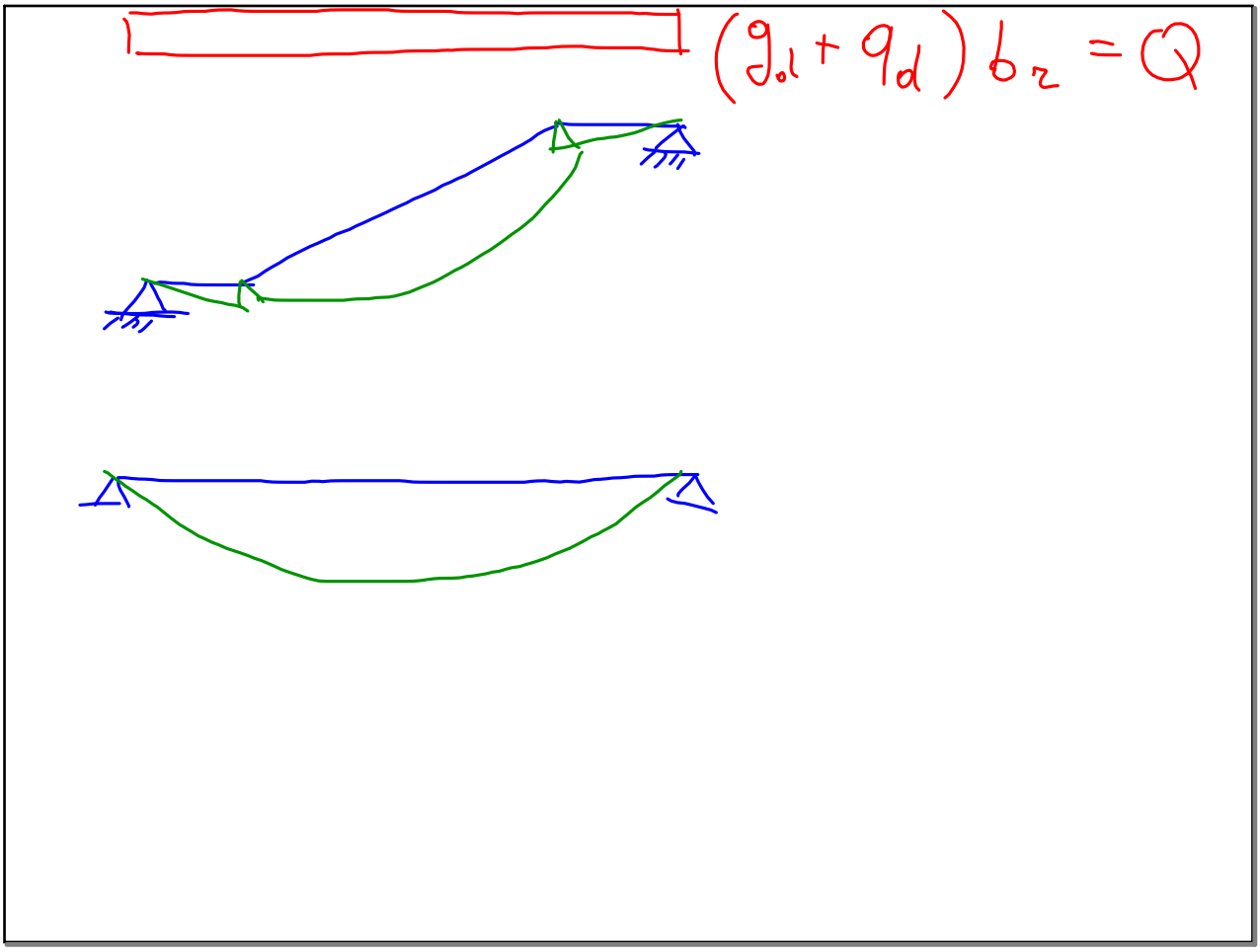
$A_{sw} = \frac{V \cot g\, \theta}{2 f_{yd}}$ $A_{sw} = \frac{V \cot g\, \theta}{4 f_{yd}}$

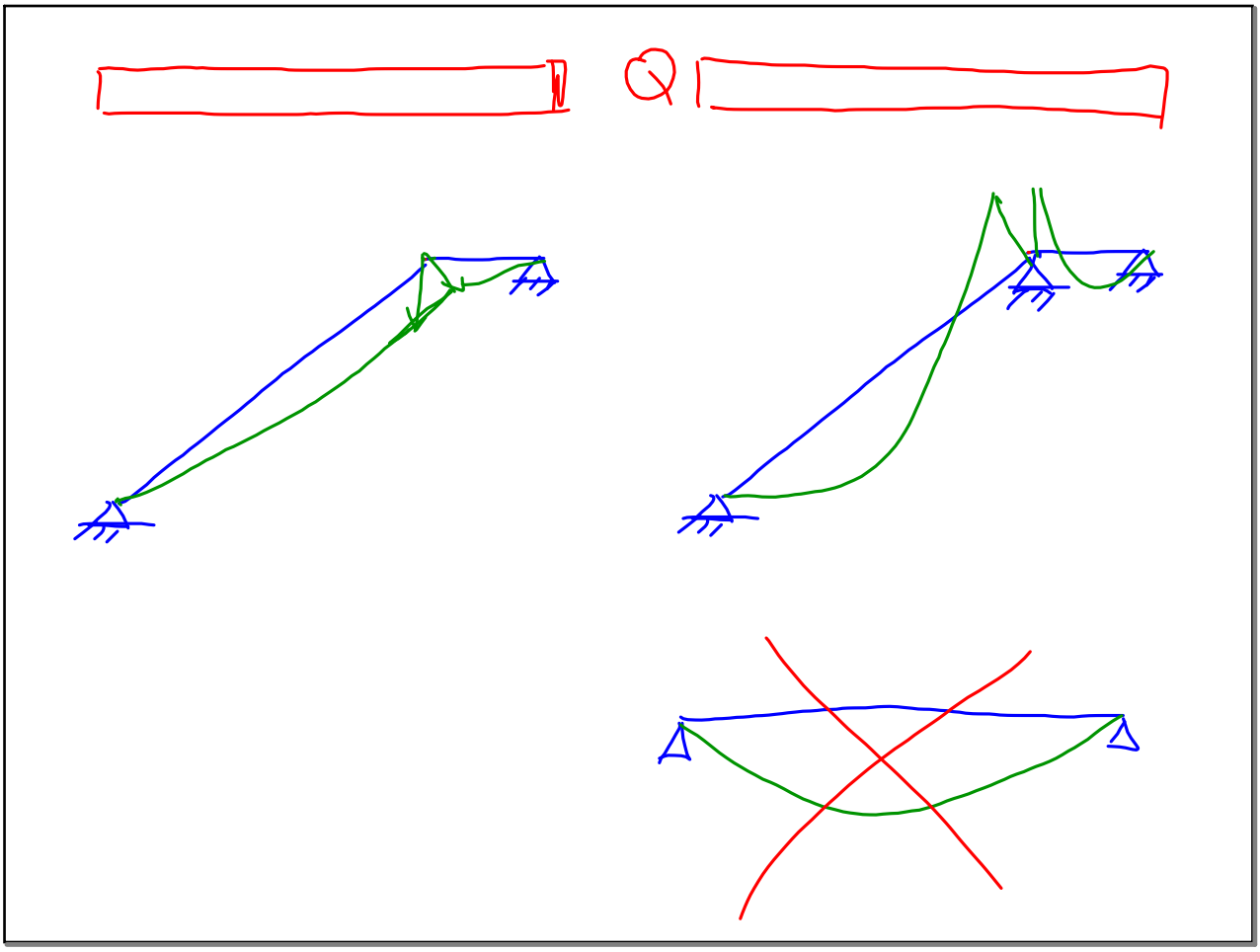


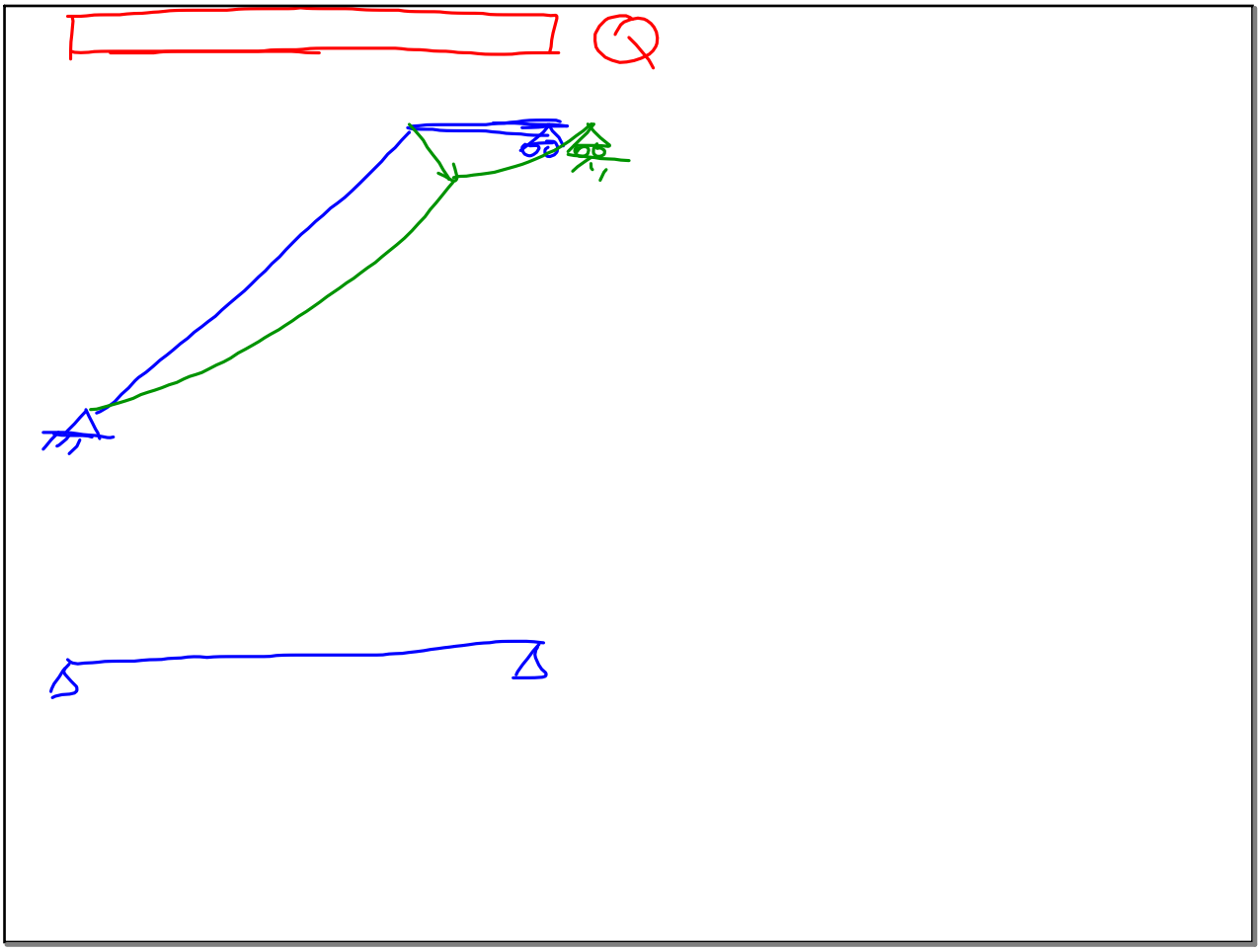
SCALA A SOLETTA RAMPANTE

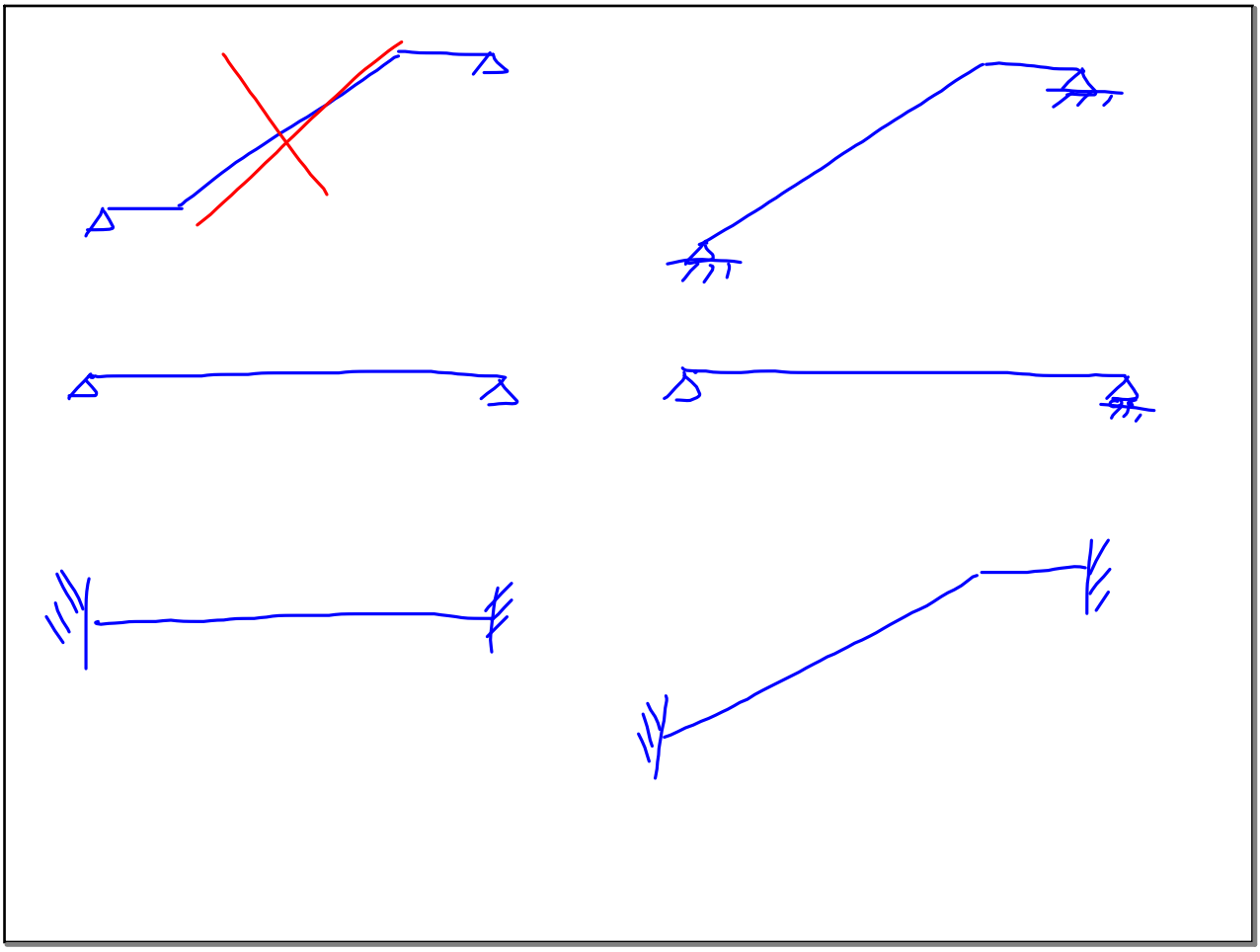


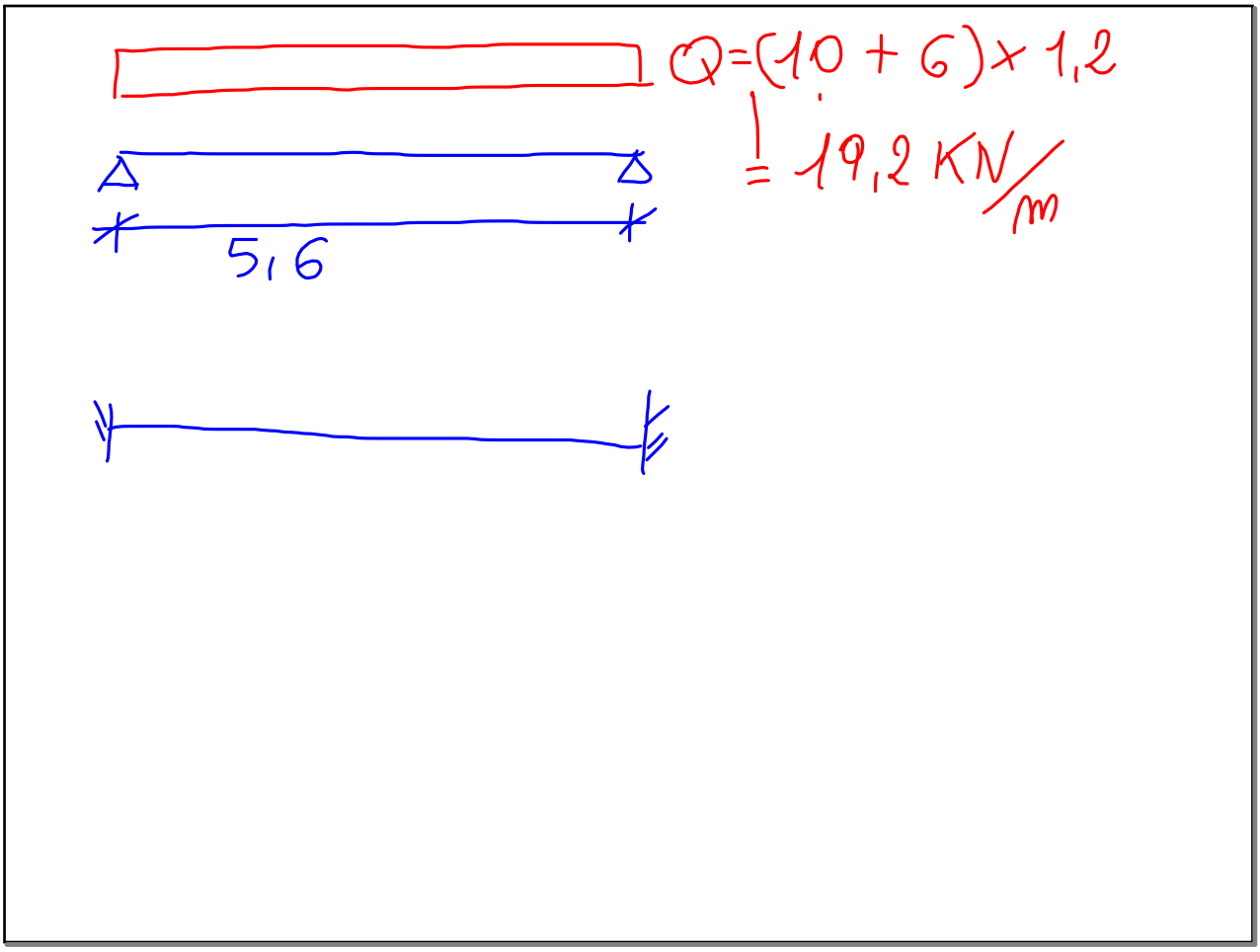


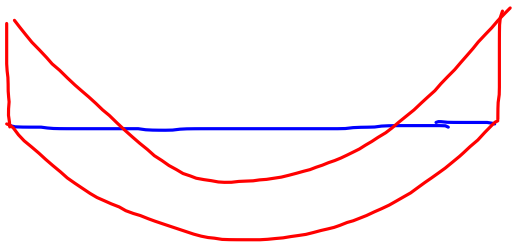

$(g_{.1} + q_d)\, b_2 = Q$


Q






Q=(10 + 6)x 1,2
= 19,2 KN/m
5,6

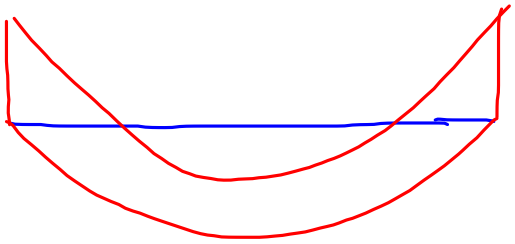


$$\frac{QL^2}{12} = \frac{19,2 \times 5,6^2}{12} = 50,2 \text{ kN m}$$

$$\frac{QL^2}{8} = \frac{19,2 \times 5,6^2}{8} = 75,3 \text{ kN m}$$

Arm inf. $A_s = \frac{75,3 \times 10}{0,9 \times 0,16 \times 391,3} = 13,4 \text{ cm}^2$

$9\phi 14$

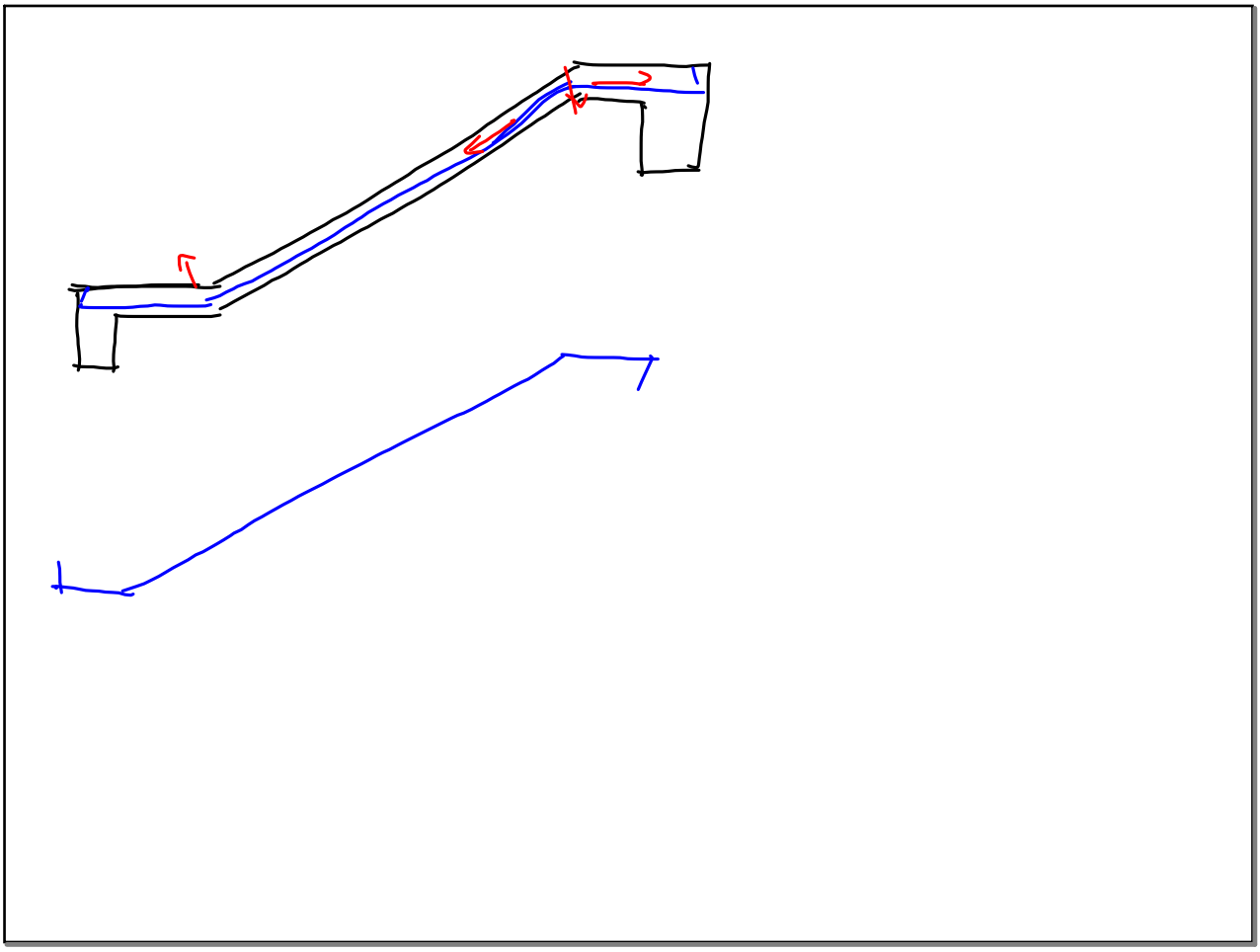


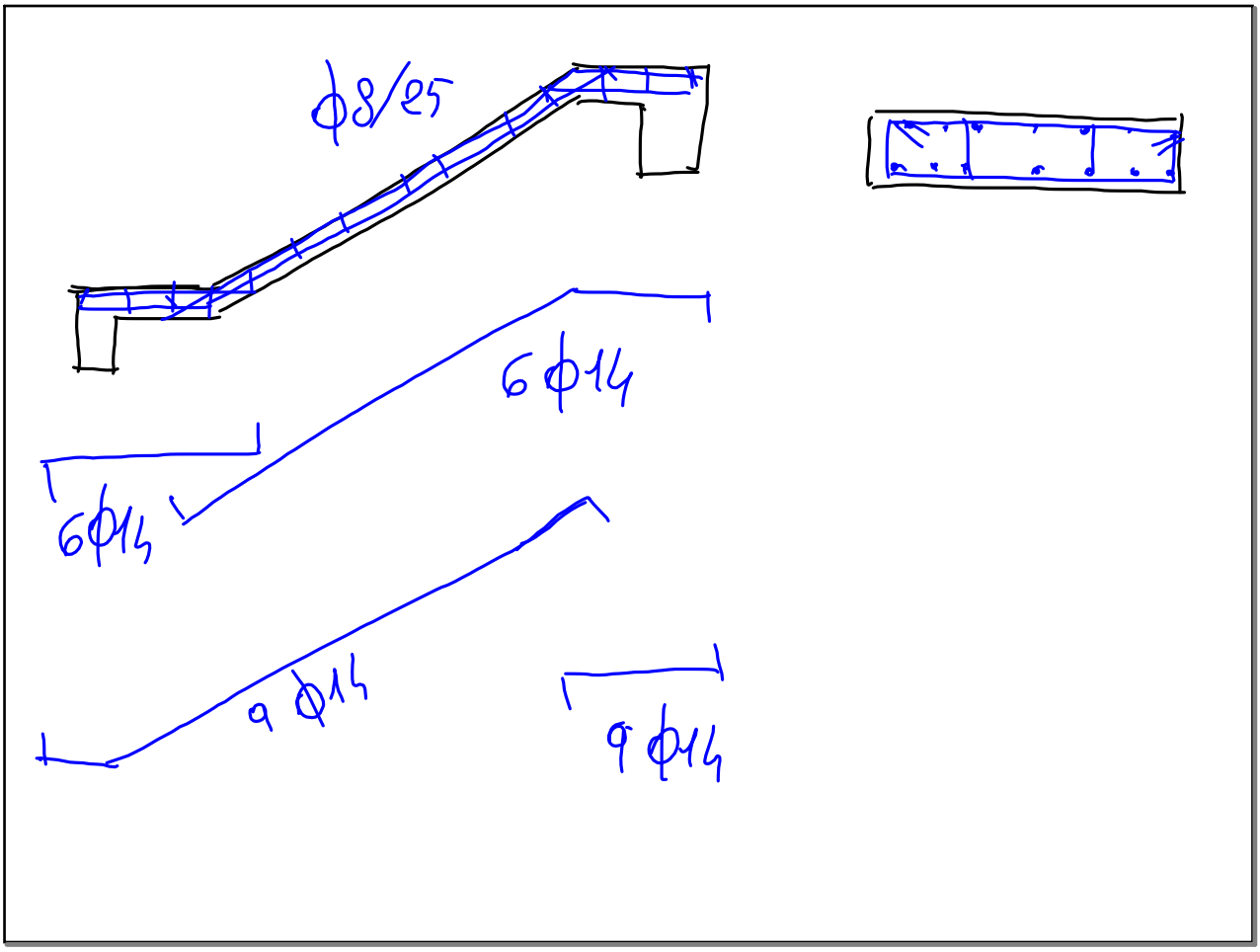
$$\frac{QL^2}{12} = \frac{19,2 \times 5,6^2}{12} = 50,2 \text{ kN m}$$

$$\frac{QL^2}{8} = \frac{19,2 \times 5,6^2}{8} = 75,3 \text{ kN m}$$

Arm. sup $A_s = \frac{50,2 \times 10}{0,9 \times 0,16 \times 391,3} = 8,9 \text{ cm}^2$

$6\phi 14$




ϕ8/25
6ϕ14
6ϕ14
9ϕ14
9ϕ14

$$M_{max} \leq M_{Rd} = \frac{b\,d^2}{\gamma^{1/2}}$$

$$V_{max} \leq V_{Rd,c} = \left(\frac{0{,}18\,K \sqrt[3]{100\,\rho_l\,f_{ck}}}{\gamma_c} + 0{,}15\,\sigma_{cp} \right) b_w\,d$$

$$\geq \left(0{,}035 \sqrt{K^3 f_{ck}} + 0{,}15\,\sigma_{cp} \right) b_w\,d$$