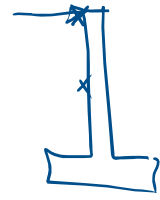


K : Lateral earth pressure factor

① K_0 : at rest (no movement allowed in wall)

$$K_0 = 1 - \sin \phi$$

↓
angle of friction



② K_a : active earth pressure

$$K_a = \frac{1 - \sin \phi}{1 + \sin \phi}$$

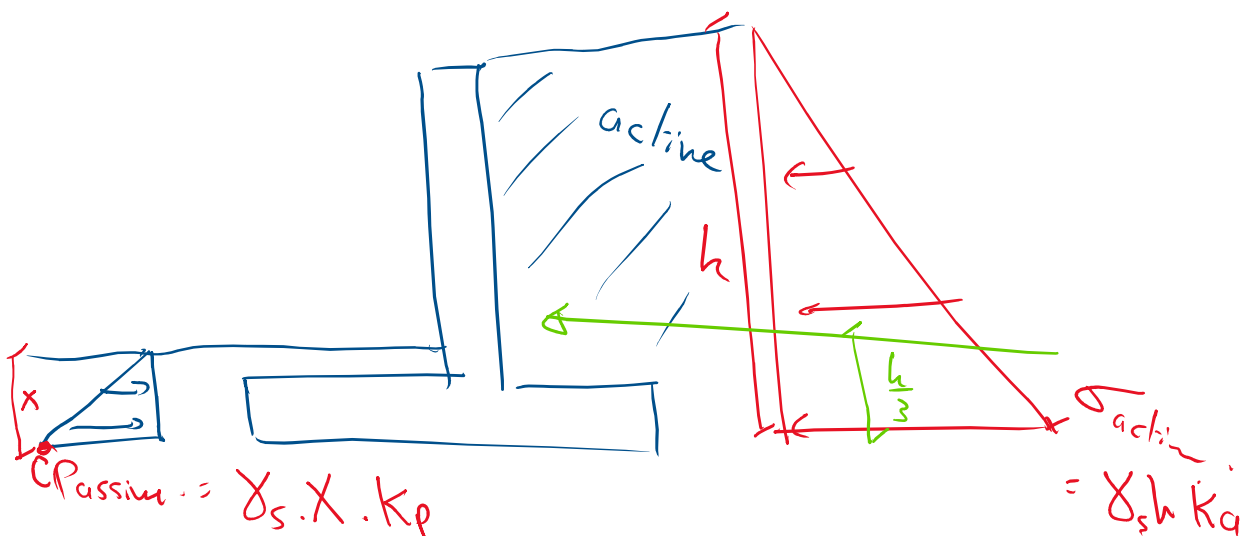


③ K_p : passive earth pressure

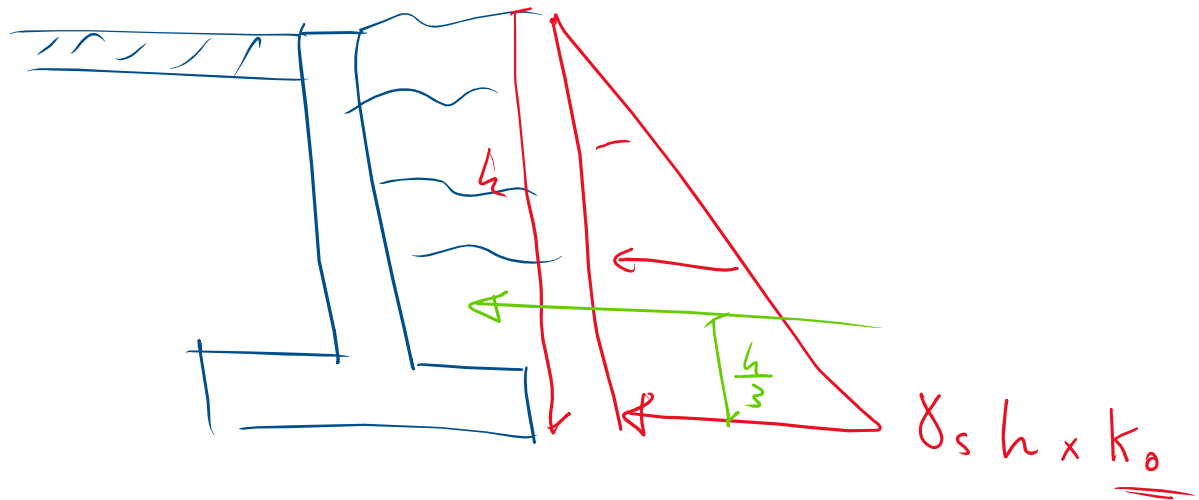
$$K_p = \frac{1}{K_a} = \frac{1 + \sin \phi}{1 - \sin \phi}$$

$$K_p > K_a$$

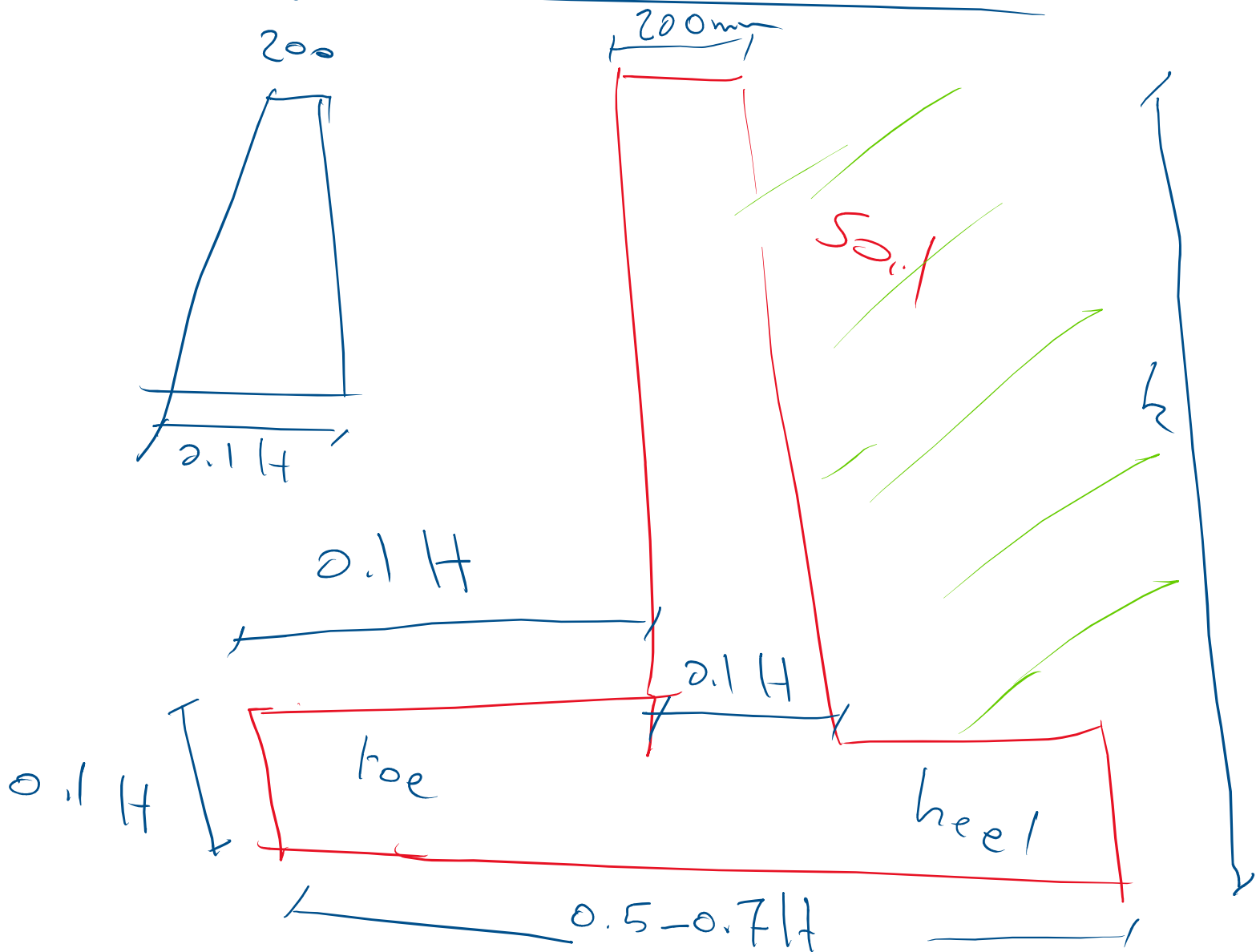
For Cantilever RW



For basement Wall



Preliminary Dimension of Cantiliver RW



Example Cantiliver RW

Check and Design the Retaining Wall

Shown Below assuming.

$\phi = 30^\circ$

$\gamma_s = 18 \text{ kN/m}^3$

$f_c = 25 \text{ MPa}$

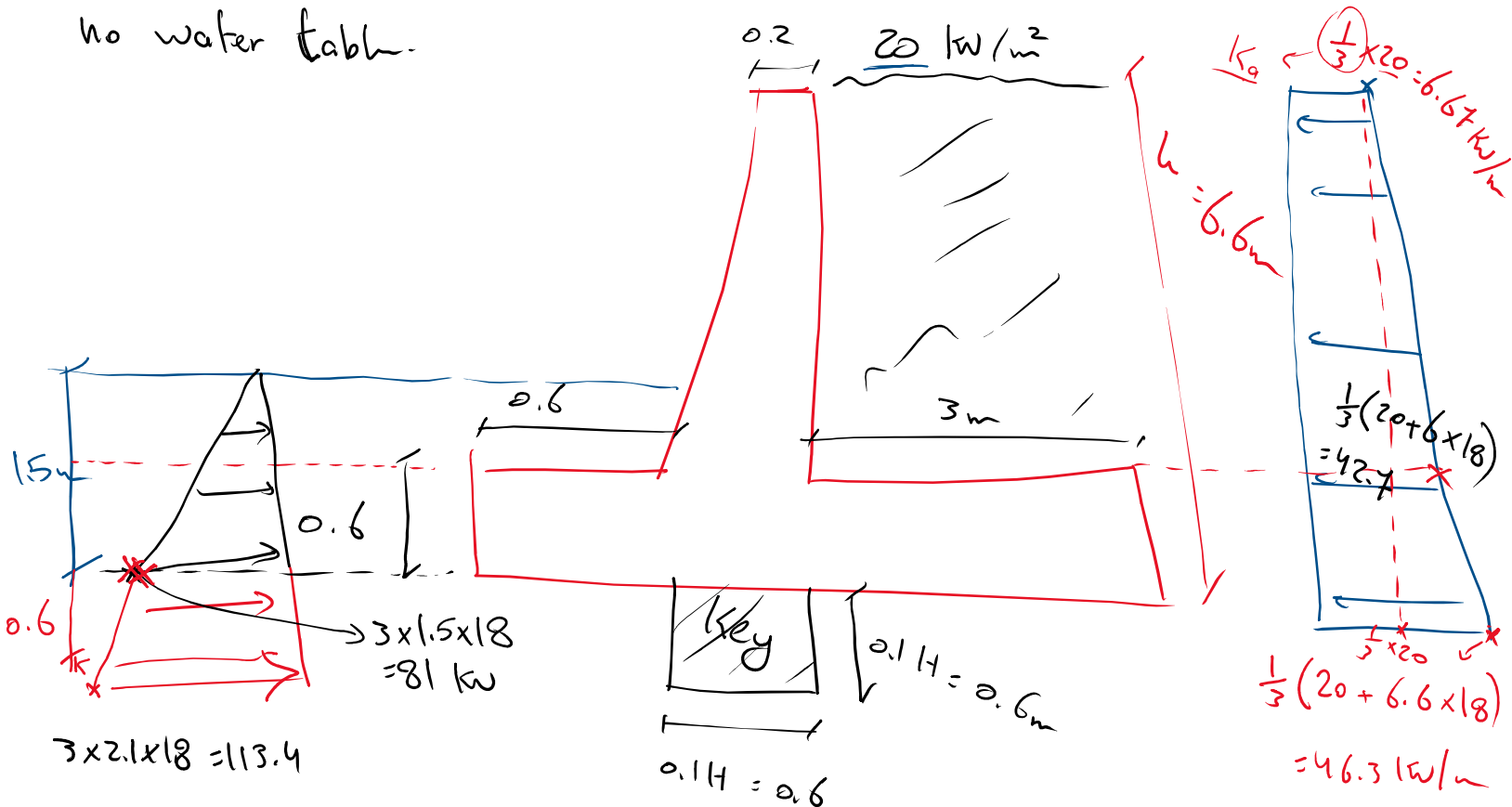
F.S over turning : 2.5 at least

F.S sliding = 2

$\mu = 0.5$ Friction factor Between Wall and Soil (0.3-0.7) larger is better

$q_{\text{wall}} = 250 \text{ kN/m}^2$

no water table.



Solu

$$K_a = \frac{1 - \sin 30}{1 + \sin 30} = \frac{1}{3}$$

$$K_p = \frac{1}{K_a} = 3$$

→ Stability → ① overturning ✓

② sliding ✓

③ Bearing ✓

OK
↓

→ strength → ① moment

② shear

overturning

$$F.S = \frac{M_{Resisting}}{M_{Applied}} \gg 2.5$$

