Remarks: See §4.10.2, pages. 215 till 219

Answers:

a. $a = 90$ cm

b. $\sigma_{max} = 38{,}1 \times 10^{-3}$ N/mm^2

Explanation:

a. Loads on the foundation plate:

$F = 120$ kN $(\downarrow)$ and $T = (192 \text{ kN})(5 \text{ m}) = 96$ kNm $(\curvearrowleft)$

This can be replaced my a single force at a distance e from the middle: $e = \dfrac{T}{F} = \dfrac{96 \text{ kNm}}{120 \text{ kN}} = 0{,}80$ m

The resultant of the earth pressure must therefore have a line of action at $(1{,}50 \text{ m}) - (0{,}80 \text{ m}) = 0{,}70$ m from the left edge.

The (triangular) earth pressure works over a length of $3 \times (0{,}70 \text{ m}) = 2{,}10$ m, which implies $a = 0{,}90$ m.

b. Taking the maximum earth pressure as σ, then:

$\frac{1}{2} \times \sigma \times (2{,}10 \text{ m}) \times (3 \text{ m}) = 120 \text{ kN} \Rightarrow \sigma = 38{,}1 \text{ kN/m}^2$