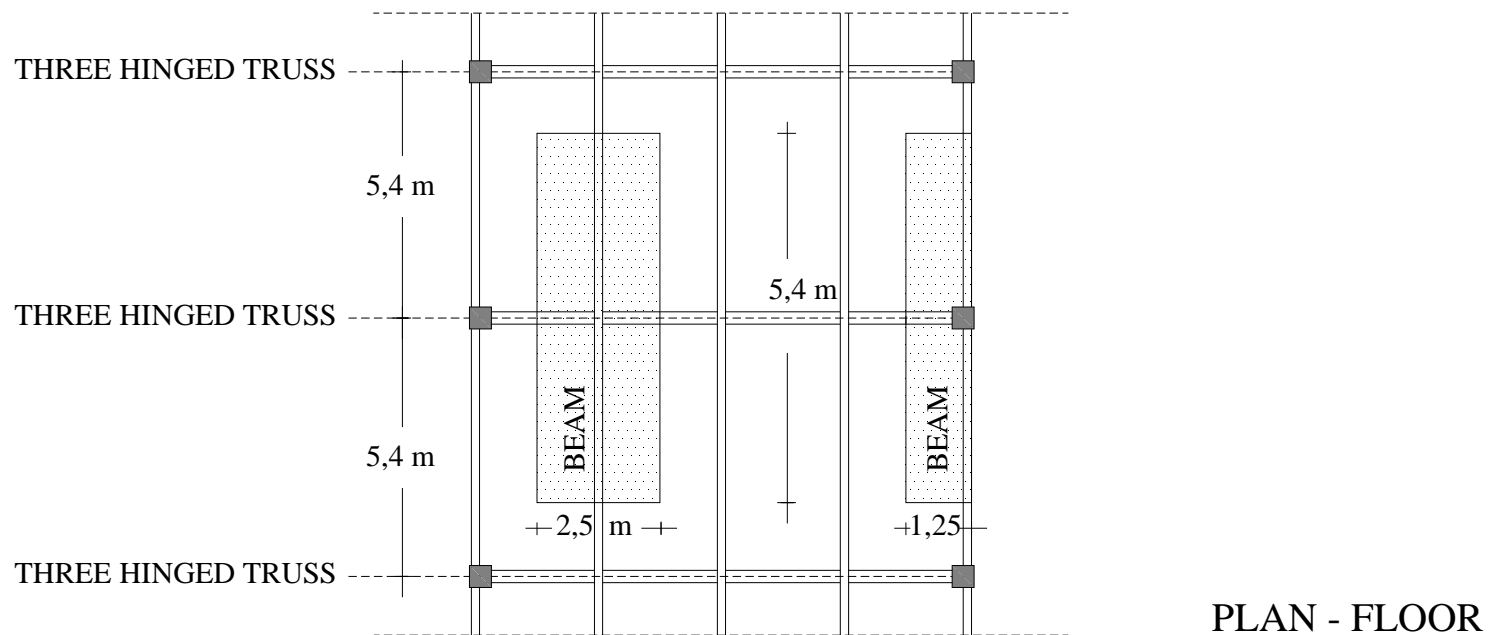
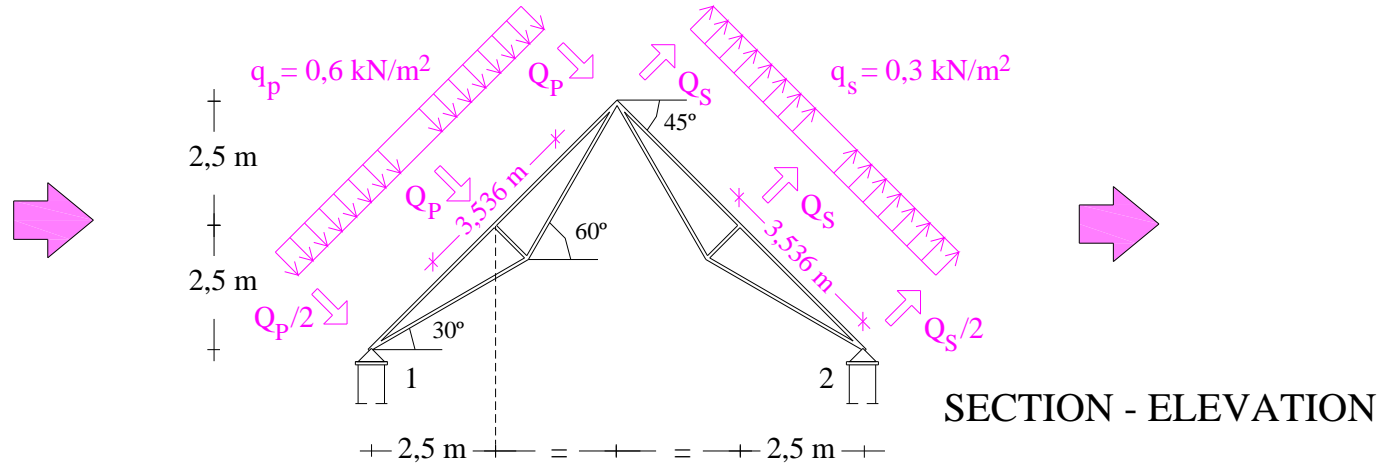


LEFT-TO-RIGHT WIND

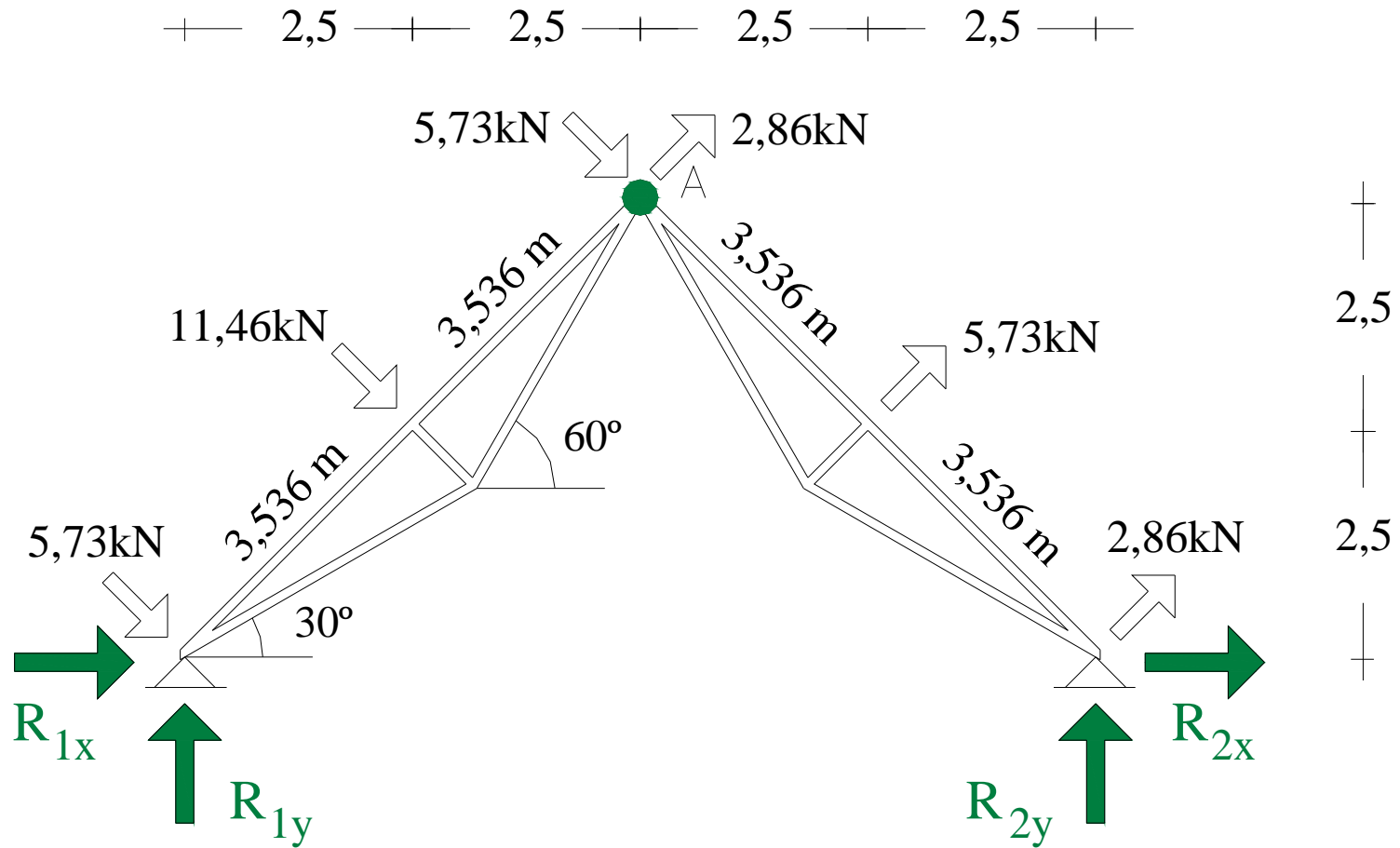
WIND PRESSURE AND SUCTION
(MEASURED ON ROOF PLANE)

$$Q_p = 0,6 \text{ kN/m}^2 \cdot 5,4 \cdot 3,54 = 11,46 \text{ kN}$$

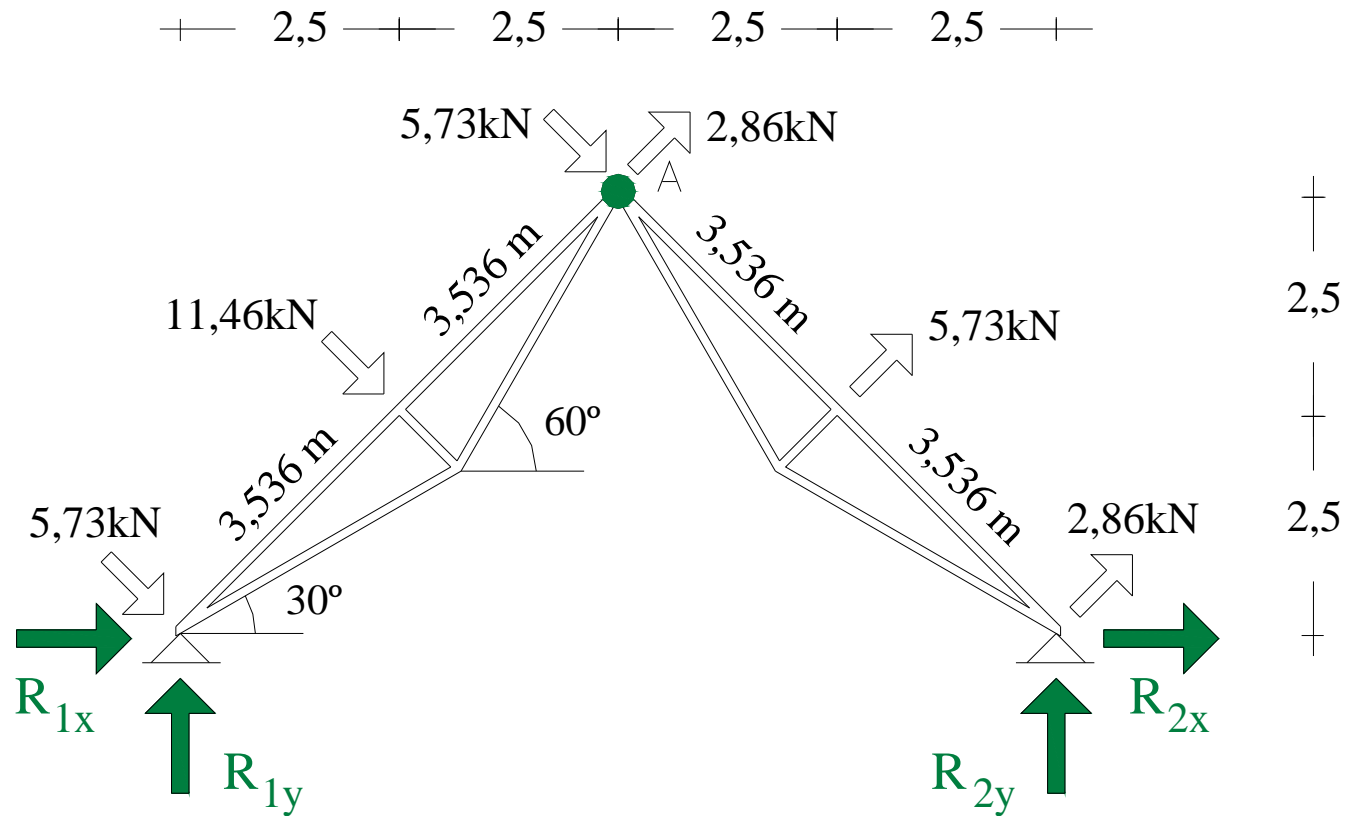
$$Q_s = 0,3 \text{ kN/m}^2 \cdot 5,4 \cdot 3,536 = 5,73 \text{ kN}$$



three-hinged truss: wind load (left→right)



equilibrium of external forces (3 equations; 4 unknowns)



$$\Sigma F_x = 0 : (11,46 + 3 \cdot 5,73 + 2 \cdot 2,86) \cos 45 + R_{1x} + R_{1y} = 0 : R_{1x} + R_{2x} = -24,3 \text{ kN}$$

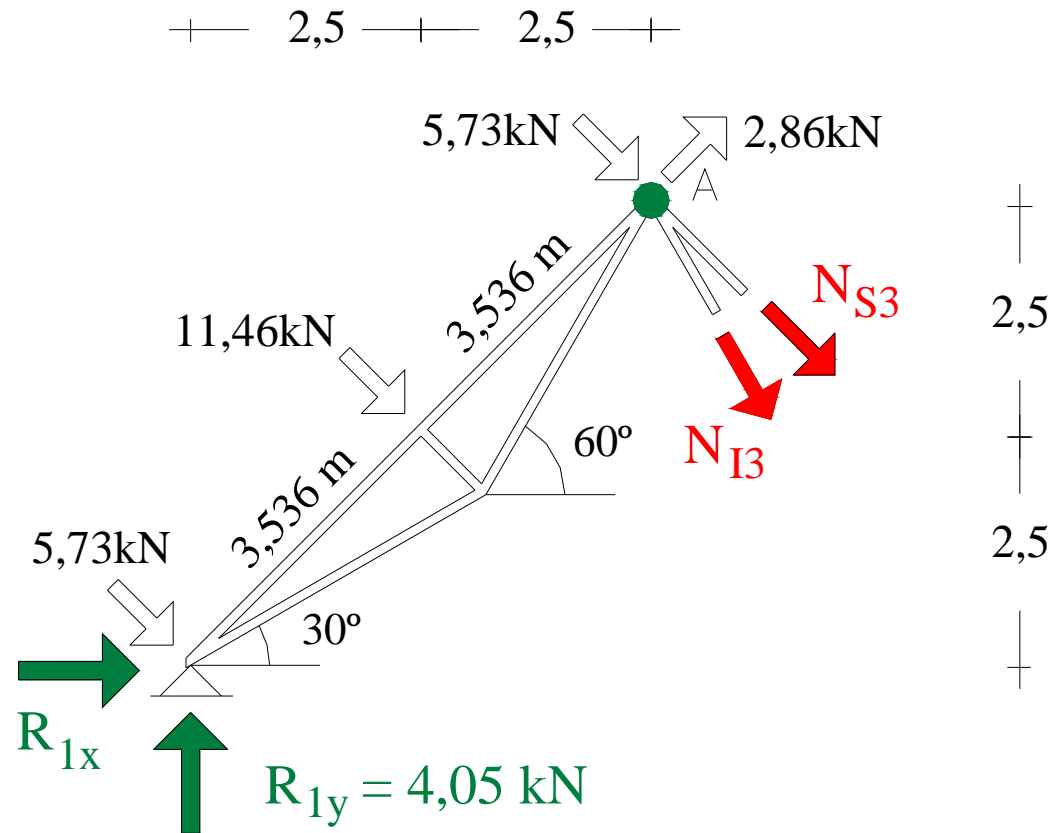
$$\Sigma F_y = 0 : (-11,5 - 5,75 + 2 \cdot 2,87) \sin 45 + R_{1y} + R_{2y} = 0 : R_{1y} + R_{2y} = -8,1 \text{ kN}$$

$$\Sigma M_2 = 0 : 5,73 \cdot 7,071 + 11,5 \cdot 3,536 - 2,86 \cdot 7,071 - 5,73 \cdot 3,536 - R_{1y} \cdot 10 = 0$$

$$R_{1y} = 4,05 \text{ kN}$$

$$R_{2y} = 4,05 \text{ kN}$$

'internal' equilibrium: 'extra' equation (third hinge!)

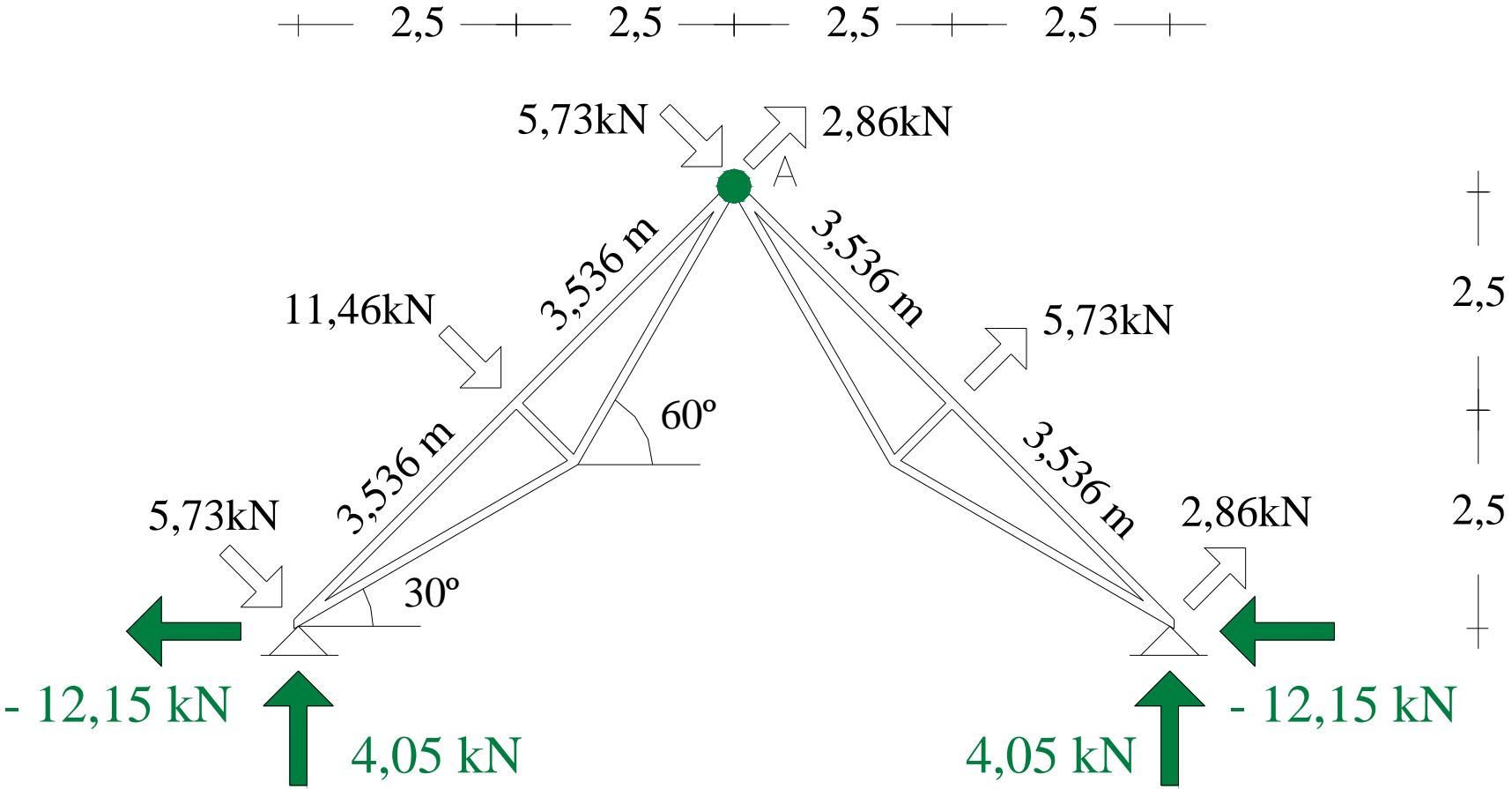


$$\Sigma M_A = 0 : 5,73 \cdot 7,071 + 11,46 \cdot 3,536 + 4,05 \cdot 5 + R_{1x} \cdot 5 = 0$$

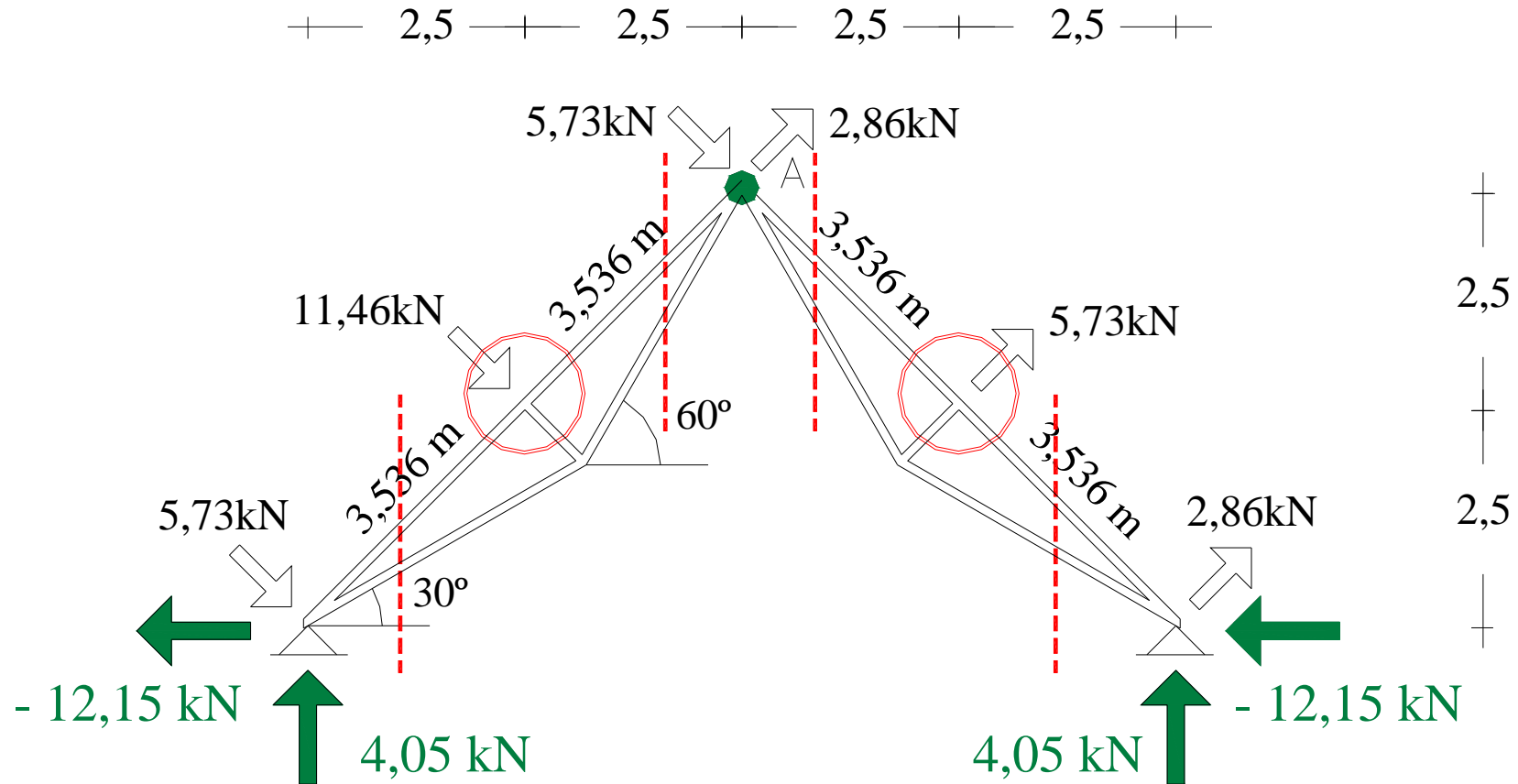
$$R_{1x} = -12,15 \text{ kN}$$

$$R_{2x} = -12,15 \text{ kN}$$

external + internal equilibrium → reactions



'internal equilibrium' → axial forces



wind load: reactions and axial forces

