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Faculty of
Civil Engineering

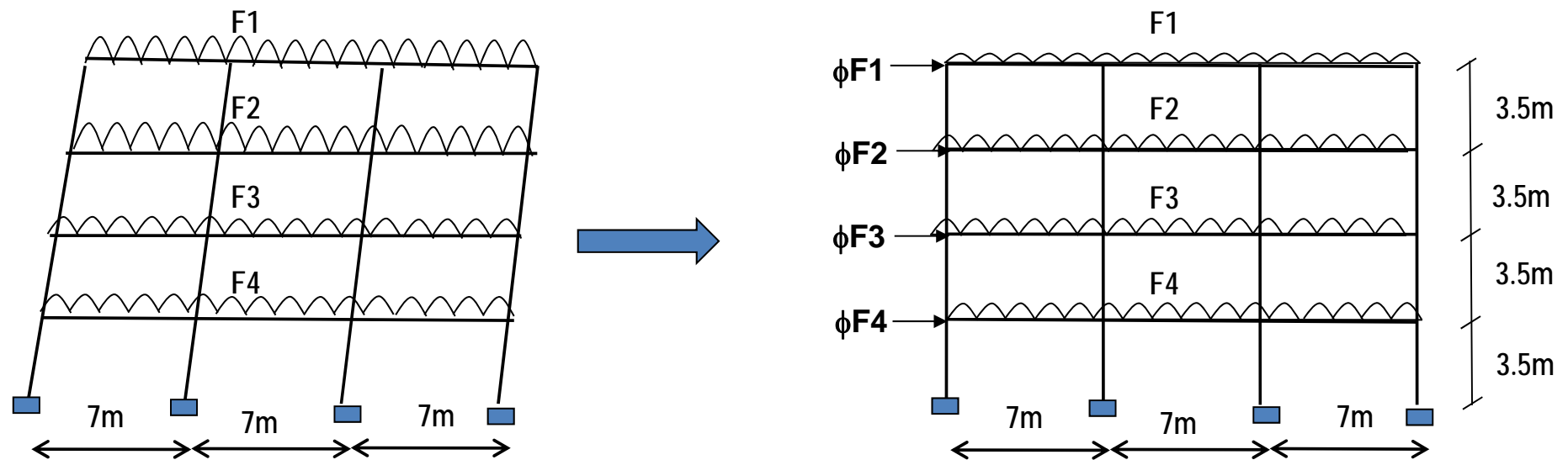


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Example to determine whether a frame is either sway or non-sway case

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Example: Check if the frame is a sway frame



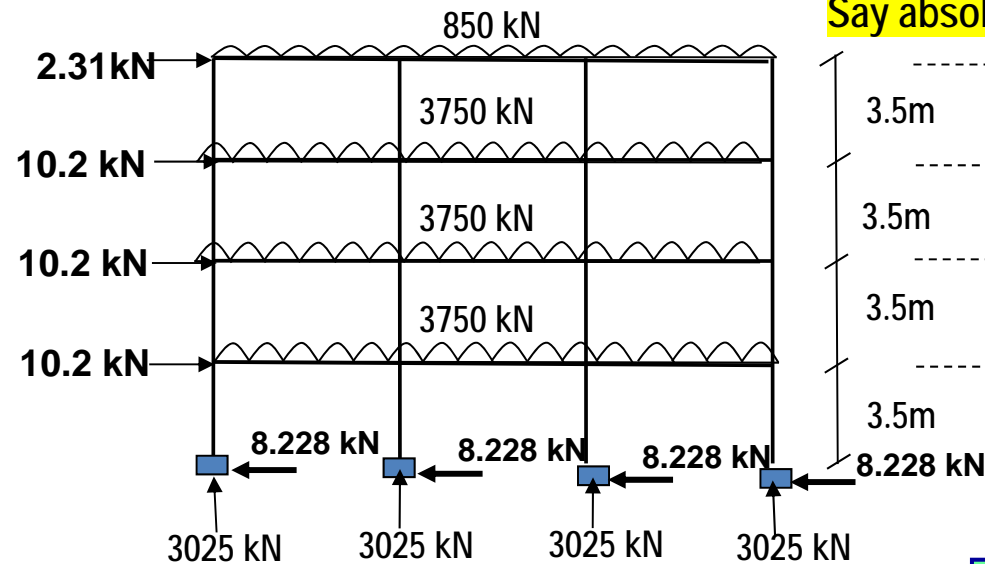
$$F1 = 850 \text{ kN}$$

$$F2 = F3 = F4 = 3750 \text{ kN}$$

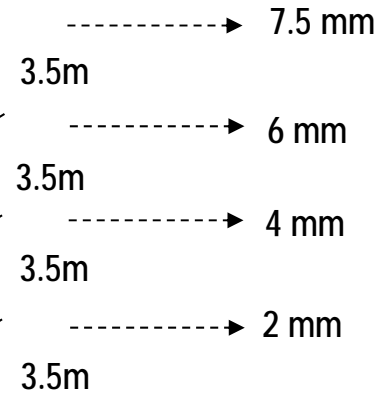
From slide 13, $m=3$ and $h=14\text{m}$,
 therefore

$$\phi = 0.00272$$

Example: Check if the frame is a sway frame



Say absolute deflections from frame analysis



$$\max\left(\frac{h}{\delta_{H,Ed}}\right) = 3500/2 = 1750\text{mm}$$

$$\alpha_{cr} = \frac{F_{cr}}{F_{Ed}} = \max\left(\frac{h}{\delta_{H,Ed}}\right) \left(\frac{H_{Ed}}{V_{Ed}}\right)$$

where:

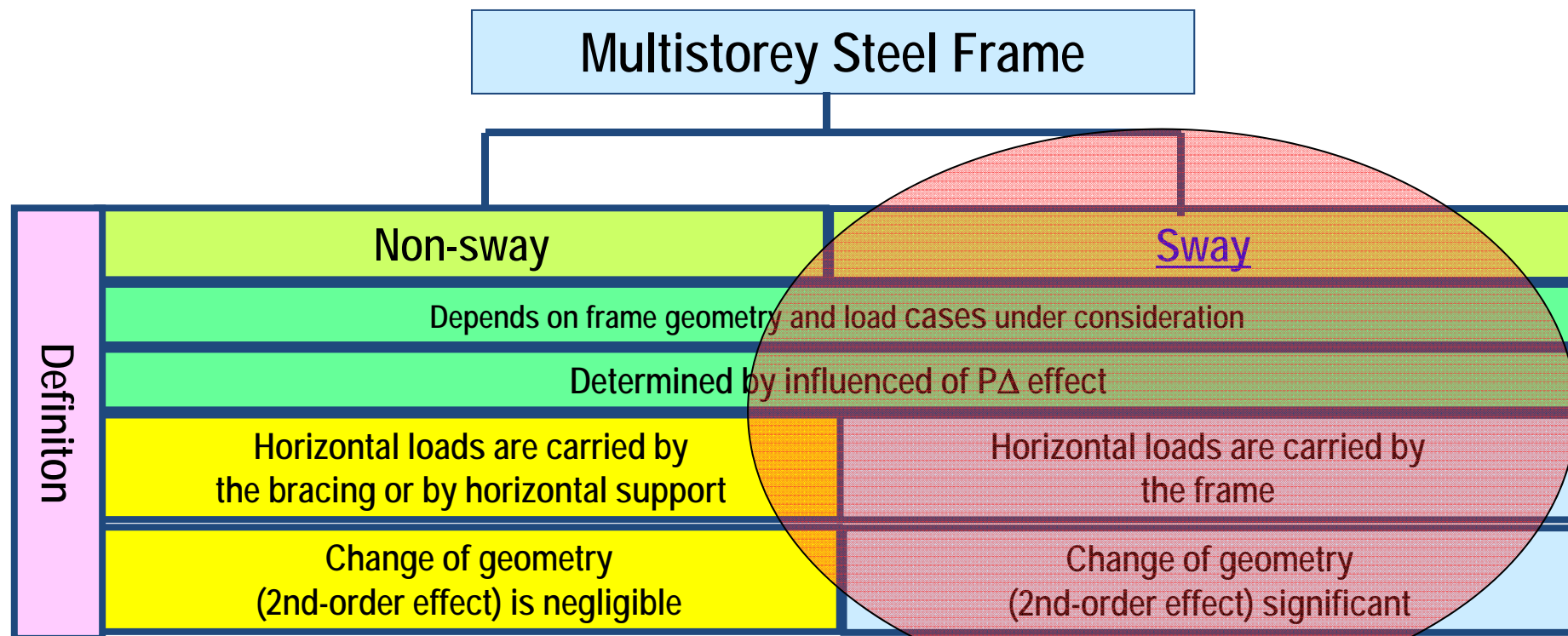
- $\delta_{H,ed}$ is the sway at the top of storey i
- h is the height of storey i
- H_{Ed} the total horizontal reactions respectively at the bottom of storey i
- V_{Ed} the total vertical reactions respectively at the bottom of storey i

Elastic Analysis	$\alpha_{cr} < 10$	Sway Frame
	$\alpha_{cr} \geq 10$	Non-Sway Frame
Plastic Analysis	$\alpha_{cr} < 15$	Sway Frame
	$\alpha_{cr} \geq 15$	Non-Sway Frame

$$\alpha_{cr} = 1750 \left(\frac{32.91}{12100}\right) = 4.8$$

Therefore it is a sway frame

Sway Stability



Analysis and design ?