ENG1020 - Engineering Structures Summary Notes

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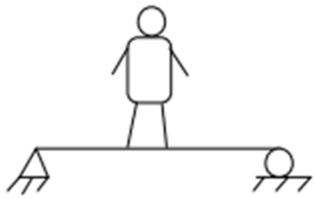
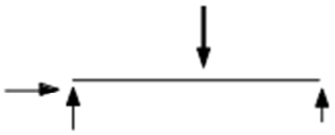
Types of Loads

Point Load

A load acting at a single point e.g. person standing on a plank

- Not perfectly the case in real life, for calculation purposes only





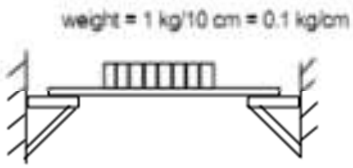
Uniformly Distributed Load (UDL)

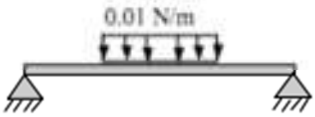
A load with constant magnitude along the structural member.

- For calculation purposes, an **effective** point load can be calculated.

$$Total\ weight = \frac{weight}{length} \times length$$

- Acts as a point load in the centre of the UDL.

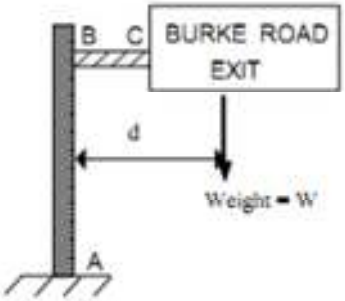


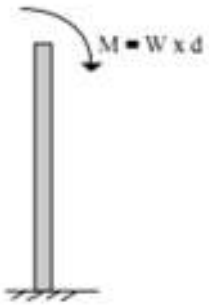


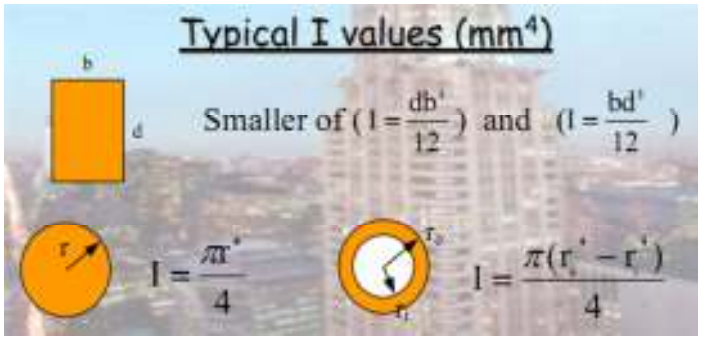
Applied Moment

A twisting/rotating force. Caused by a force acting perpendicular to direction of member.

$$M = F \times d \qquad d = \boldsymbol{perpendicular}\ distance\ from\ pivot\ point$$



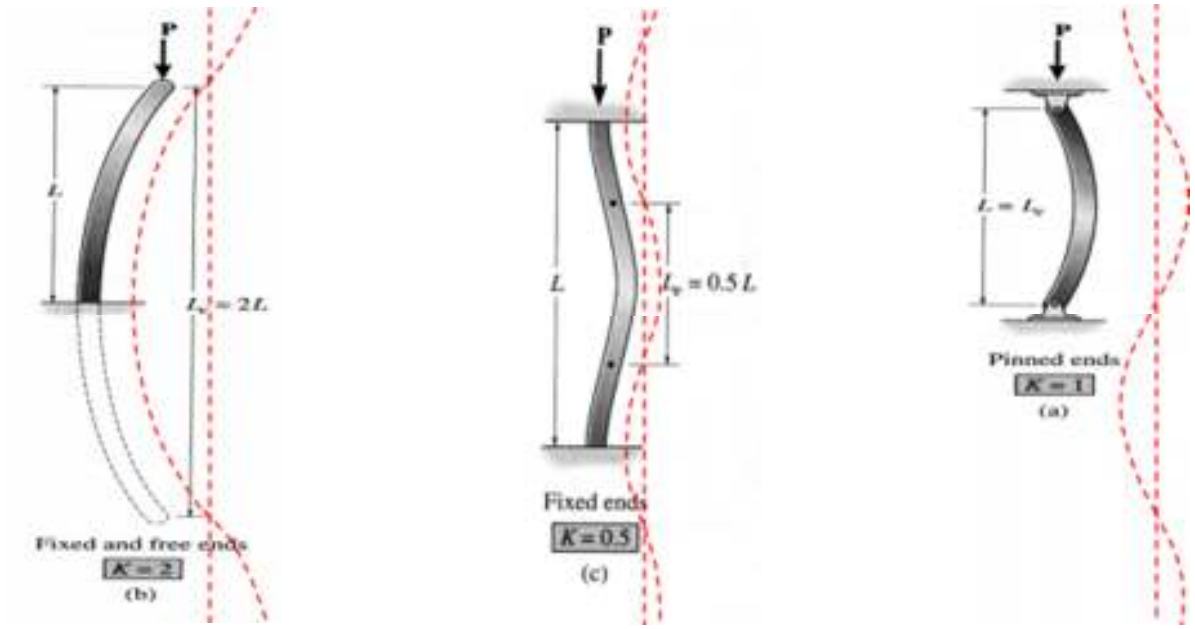




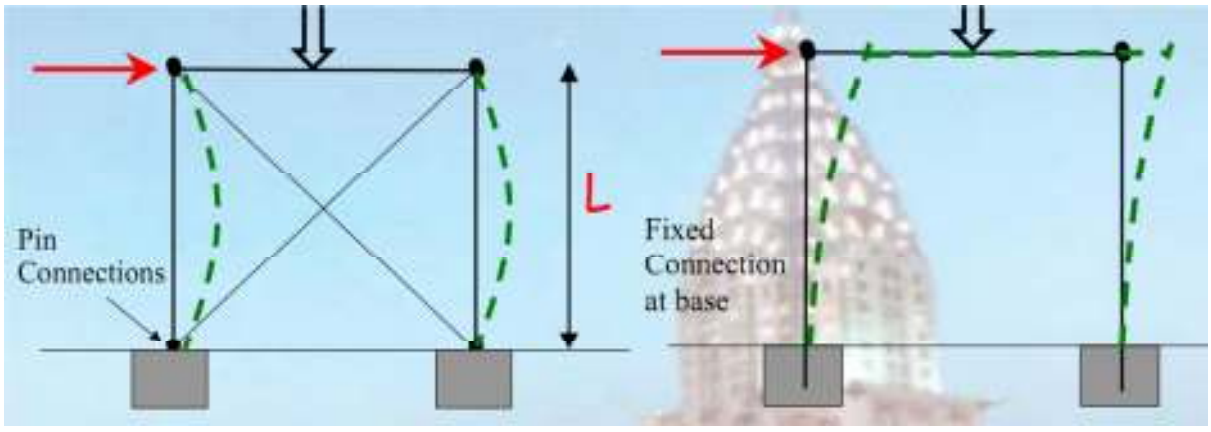
From $P_E = \frac{\pi^2 EI}{L^2}$, as $L \to 0, P \to \infty$, which is not possible, so there is a **squash load.**

$$Squash\ Load = \sigma_y A$$

L is the **effective length,** the distance over which you get a half sine curve.



Pin jointed structures can support more weight this way:



$$P_1 = \frac{\pi^2 EI}{L^2}$$

$$P_2 = \frac{\pi^2 EI}{(2L)^2} = \frac{P_1}{4}$$