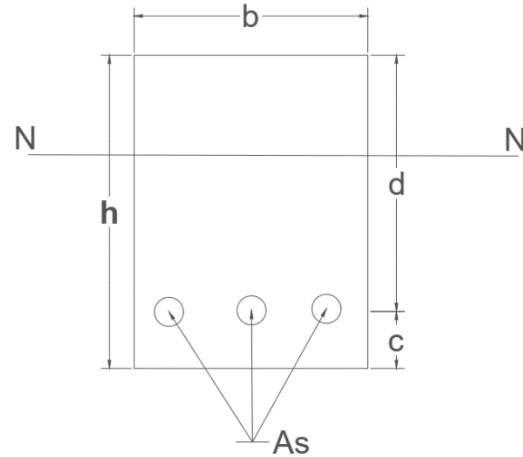| **Learning Tool for Reinforced Concrete Design**	Project				Job Ref.	
	Section				Sheet no./rev. 1	
	Calc.by	Date	Chk'd by	Date	App'd by	Date

DEFLECTION CALCULATION (BS8110:PART1:1997)

STEP 1
Calculate the curvature for uncracked section.

$$\frac{1}{r_b} = \frac{M}{E_C I}$$

$$\frac{1}{r_b} =$$

STEP 2
Calculate the neutral axis depth of the cracked section

$$x = \frac{-\alpha_e A_s \pm \sqrt{(\alpha_e A_s)^2 + 2b\alpha_e A_s d}}{b}$$

$$x =$$

STEP 3
Calculate the design service stress at steel f_s

$$f_s = \frac{M}{\left(d - \frac{x}{3}\right) A_S}$$

$$f_s =$$

STEP 4
Calculate the curvature for cracked section

$$\frac{1}{r} = \frac{f_S}{(d - x)E_S}$$

$$\frac{1}{r} =$$

STEP 5
Calculate the Deflection

$$a = Kl^2 \frac{1}{r_b}$$

$$a =$$