



**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

CRACK WIDTH CALCULATION (BS8110:PART1:1997)

STEP 1

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 2

Calculate the design service stress at steel f_s

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

$f_s =$

STEP 3

$$\epsilon_1 = \frac{(h - x) \times f_s}{(d - x) \times E_s}$$

$\epsilon_1 =$

STEP 4

$$\epsilon_m = \epsilon_1 - \frac{b_t(h - x) \times (a' - x)}{3E_s A_s (d - x)}$$

$\epsilon_m =$

STEP 5

$$w_{max} = \frac{3a_{cr}\epsilon_m}{1 + 2\left(\frac{a_{cr} - c_{min}}{h - x}\right)}$$

$w_{max} =$

