

Revision of KCI Code for Flexure (2006)

Safe limits for maximum reinforcement ratios take two forms according to revised KCI Code provisions.

1) the Code addresses the Minimum tensile reinforcement STRAIN allowed at nominal strength in the design of beams.

2) Code defines strength reduction factors that may depend on the tensile strain at normal strength

⌞ Both limitations are based on the net tensile strain ϵ_t and the depth d_t .

• The net tensile strain

$$\epsilon_t = \epsilon_u \frac{d_t - c}{c}$$

• The reinforcement ratio to produce a selected value of a net tensile strain is

$$\rho = 0.85 \beta_1 \frac{f_{ck}}{f_y} \frac{\epsilon_u}{\epsilon_u + \epsilon_t}$$

• To ensure underreinforced behavior, KCI 6.2.2 establishes a minimum net tensile strain ϵ_t of 0.004 for members subjected to axial loads less than $0.1 f_y A_g$

Using $\epsilon_t = 0.004$ provides the maximum reinforcement ratio allowed by the KCI Code for beams.

$$\rho_{max} = 0.05 \beta_1 \frac{f_{ck}}{f_y} \frac{\epsilon_u}{\epsilon_u + 0.004}$$

Q1 > What is the difference from KCI Code 2003 ?

Q2 > Which is more conservative ?

FIGURE 3.9
Variation of strength reduction factor with net tensile strain.

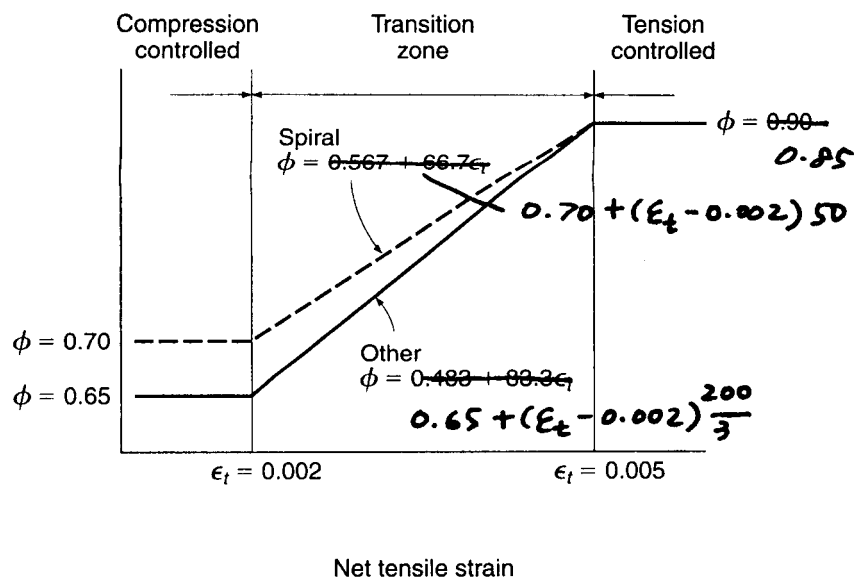


FIGURE 3.10
Net tensile strain and c/d_t ratios.

