CODE

COMMENTARY

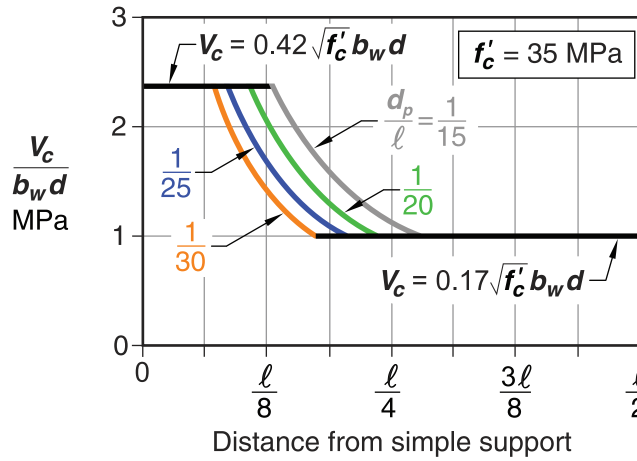

***Fig. R22.5.6.2**—Application of Table 22.5.6.2 to uniformly loaded prestressed members with* f_c' *= 35 MPa.*

22.5.6.3 For prestressed members, V_c shall be permitted to be the lesser of V_{ci} calculated in accordance with 22.5.6.3.1 and V_{cw} calculated in accordance with 22.5.6.3.2 or 22.5.6.3.3.

R22.5.6.3 Two types of inclined cracking occur in concrete beams: web-shear cracking and flexure-shear cracking. These two types of inclined cracking are illustrated in Fig. R22.5.6.3.

Web-shear cracking begins from an interior point in a member when the principal tensile stresses exceed the tensile strength of the concrete. Flexure-shear cracking is initiated by flexural cracking. When flexural cracking occurs, the shear stresses in the concrete above the crack are increased. The flexure-shear crack develops when the combined shear and flexural-tensile stress exceeds the tensile strength of the concrete.

The nominal shear strength provided by the concrete, V_c, is assumed equal to the lesser of V_{ci} and V_{cw}. The derivations of Eq. (22.5.6.3.1a) and Eq. (22.5.6.3.2) are summarized in ACI Committee 318 (1965).

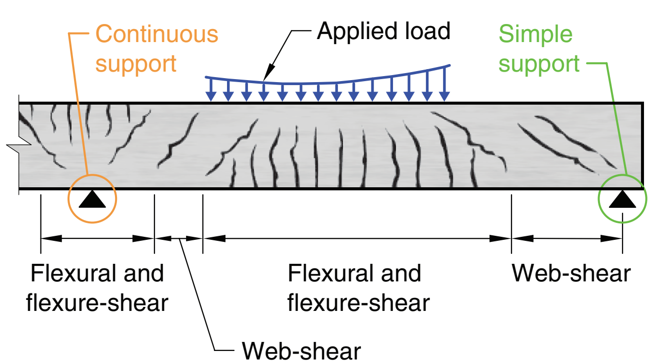

***Fig. R22.5.6.3**—Types of cracking in concrete beams.*

22.5.6.3.1 The flexure-shear strength V_{ci} shall be calculated by (a) but need not be taken less than (b) or (c):

(a) $$V_{ci} = 0.05\lambda\sqrt{f_c'}b_w d_p + V_d + \frac{V_i M_{cre}}{M_{max}} \qquad (22.5.6.3.1a)$$

(b) For members with $A_{ps}f_{se}$ **< 0.4(**$A_{ps}f_{pu} + A_s f_y$**)**,

$$V_{ci} = 0.14\lambda\sqrt{f_c'}b_w d \qquad (22.5.6.3.1b)$$

R22.5.6.3.1 In deriving Eq. (22.5.6.3.1a), it was assumed that V_{ci} is the sum of the shear required to cause a flexural crack at the section in question given by:

$$V = \frac{V_i M_{cre}}{M_{max}} \qquad (R22.5.6.3.1a)$$