CODE

14.4.3.3 *Factored one-way shear*

14.4.3.3.1 For one-way shear, critical sections shall be located h from (a) and (b), where h is the footing thickness.

(a) Location defined in Table 14.4.3.2.1
(b) Face of concentrated loads or reaction areas

14.4.3.3.2 Sections between (a) or (b) of 14.4.3.3.1 and the critical section for shear shall be permitted to be designed for V_u at the critical section for shear.

14.4.3.4 *Factored two-way shear*

14.4.3.4.1 For two-way shear, critical sections shall be located so that the perimeter b_o is a minimum but need not be closer than $h/2$ to (a) through (c):

(a) Location defined in Table 14.4.3.2.1
(b) Face of concentrated loads or reaction areas
(c) Changes in footing thickness

14.4.3.4.2 For square or rectangular columns, concentrated loads, or reaction areas, the critical section for two-way shear shall be permitted to be calculated assuming straight sides.

14.5—Design strength

14.5.1 *General*

14.5.1.1 For each applicable factored load combination, design strength at all sections shall satisfy $\phi S_n \geq U$, including (a) through (d). Interaction between load effects shall be considered.

(a) $\phi M_n \geq M_u$
(b) $\phi P_n \geq P_u$
(c) $\phi V_n \geq V_u$
(d) $\phi B_n \geq B_u$

14.5.1.2 ϕ shall be determined in accordance with 21.2.

14.5.1.3 Tensile strength of concrete shall be permitted to be considered in design.

COMMENTARY

R14.4.3.4 *Factored two-way shear*

R14.4.3.4.1 The critical section defined in this provision is similar to that defined for reinforced concrete elements in 22.6.4.1, except that for plain concrete, the critical section is based on h rather than d.

R14.5—Design strength

R14.5.1 *General*

R14.5.1.1 Refer to R9.5.1.1.

R14.5.1.2 The strength reduction factor ϕ for plain concrete design is the same for all strength conditions. Because both flexural tensile strength and shear strength for plain concrete depend on the tensile strength characteristics of the concrete, with no reserve strength or ductility possible due to the absence of reinforcement, equal strength reduction factors for both bending and shear are considered appropriate.

R14.5.1.3 Flexural tension may be considered in design of plain concrete members to resist loads, provided the calculated stress does not exceed the permissible stress, and construction, contraction, or isolation joints are provided to relieve the resulting tensile stresses due to restraint of creep, shrinkage, and temperature effects.