

CODE

15.3.3 Longitudinal reinforcement

15.3.3.1 Development of longitudinal reinforcement terminated in the joint or within a column or beam extension, as defined in 15.2.6(a) and 15.2.7(a), shall be in accordance with 25.4.

15.3.3.2 Longitudinal reinforcement terminated in the joint with a standard hook shall have the hook turned toward mid-depth of the beam or column.

15.4—Strength requirements for beam-column joints**15.4.1 Required shear strength**

15.4.1.1 Joint shear force V_u shall be calculated on a plane at mid-height of the joint using flexural tensile and compressive beam forces and column shear consistent with (a) or (b):

- (a) The maximum moment transferred between the beam and column as determined from factored-load analysis for beam-column joints with continuous beams in the direction of joint shear considered
- (b) Beam nominal moment strengths M_n

15.4.2 Design shear strength

15.4.2.1 Design shear strength of cast-in-place beam-column joints shall satisfy:

$$\phi V_n \geq V_u$$

15.4.2.2 ϕ shall be in accordance with 21.2.1 for shear.

15.4.2.3 V_n of the joint shall be calculated in accordance with Table 15.4.2.3.

COMMENTARY

R15.3.3 Longitudinal reinforcement

R15.3.3.1 Where bars are continued through an unloaded extension at the opposite face, the bar length within the extension can be considered as part of the development length.

R15.4—Strength requirements for beam-column joints

Joint shear strength is evaluated separately in each principal direction of loading in accordance with 15.4.

R15.4.2 Design shear strength

The effective area of the joint, A_j , is illustrated in Fig. R15.4.2. In no case is A_j greater than the column cross-sectional area. A circular column may be considered as having a square section of equal area. The varied levels of shear strength provided by 15.4.2.3 are based on the recommendations of ACI 352R, although it is noted that the ACI 352R definition of effective cross-sectional joint area is sometimes different than A_j . Values of effective joint width calculated using ACI 352R and ACI 318, however, are the same or similar for many design situations.