

CODE

12.5.4.2 Collectors shall be designed as tension members, compression members, or both, in accordance with 22.4.

12.5.4.3 Where a collector is designed to transfer forces to a vertical element, collector reinforcement shall extend along the vertical element at least the greater of (a) and (b):

- (a) The length required to develop the reinforcement in tension
- (b) The length required to transmit the design forces to the vertical element through shear-friction in accordance with 22.9, through mechanical connectors, or through other force transfer mechanisms

COMMENTARY

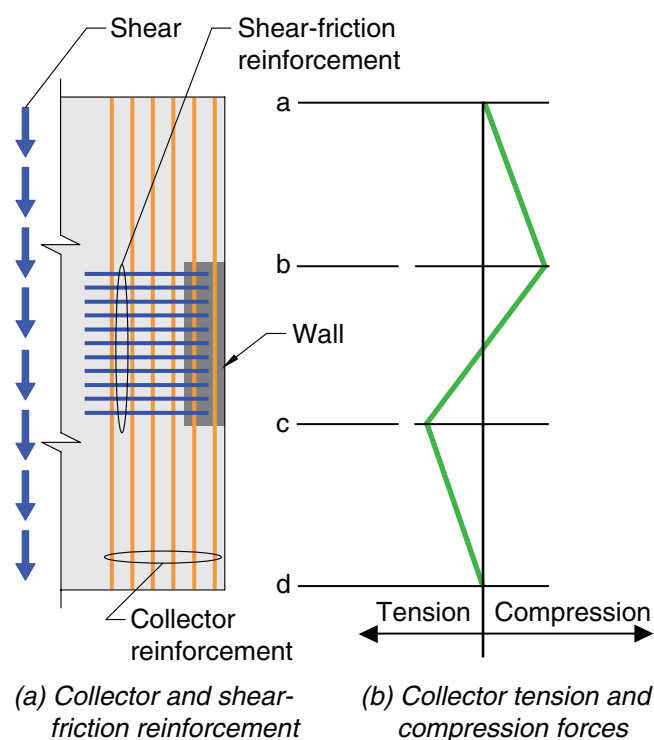


Fig. R12.5.4.1—Full-depth collector and shear-friction reinforcement required to transfer collector force into wall.

R12.5.4.2 Tension and compression forces in a collector are determined by the diaphragm shear forces they transmit to the vertical elements of the lateral-force-resisting system (refer to Fig. R12.5.4.1). Except as required by 18.12.7.6, the Code does not require that collectors resisting design compressive forces be detailed as columns. However, in structures where collectors resist large compressive forces compared with axial strength, or are designed as struts passing adjacent to edges or openings, detailing with transverse reinforcement similar to column hoops should be considered. Such detailing is required by 18.12.7.6 for some diaphragms in buildings assigned to Seismic Design Categories D, E, and F.

R12.5.4.3 In addition to having sufficient development length, the collector reinforcement should be extended as needed to fully transfer its forces into the vertical elements of the lateral-force-resisting system. A common practice is to extend some of the collector reinforcement the full length of the vertical element, such that collector forces can be transmitted uniformly through shear-friction (refer to Fig. R12.5.4.1). Figure R12.5.4.3 shows an example of collector reinforcement extended as required to transfer forces into three frame columns.