

## CODE

**16.2.4.2** Where precast members form floor or roof diaphragms, the connections between the diaphragm and those members being laterally supported by the diaphragm shall have a nominal tensile strength of not less than 300 lb per linear ft.

**16.2.4.3** Vertical integrity ties shall be provided at horizontal joints between all vertical precast structural members, except cladding, and shall satisfy (a) or (b):

(a) Connections between precast columns shall have vertical integrity ties, with a nominal tensile strength of at least  $200A_g$  lb, where  $A_g$  is the gross area of the column. For columns with a larger cross section than required by consideration of loading, a reduced effective area based on the cross section required shall be permitted. The reduced effective area shall be at least one-half the gross area of the column.

(b) Connections between precast wall panels shall have at least two vertical integrity ties, with a nominal tensile strength of at least 10,000 lb per tie.

**16.2.5** *Integrity tie requirements for precast concrete bearing wall structures three stories or more in height*

## COMMENTARY

**R16.2.4.2** The connection between the diaphragm and the member laterally supported by the diaphragm may be direct or indirect. For example, a column may be connected directly to the diaphragm, or it may be connected to a span-drel beam, which is connected to the diaphragm.

**R16.2.4.3** Base connections and connections at horizontal joints in precast columns and wall panels, including shear walls, are designed to transfer all design forces and moments. The minimum integrity tie requirements of this provision are not additive to these design requirements. Common practice is to place the wall integrity ties symmetrically about the vertical centerline of the wall panel and within the outer quarters of the panel width, wherever possible.

**R16.2.5** *Integrity tie requirements for precast concrete bearing wall structures three stories or more in height*—Section 16.2.4 gives requirements for integrity ties that apply to all precast concrete structures. The specific requirements in this section apply only to precast concrete bearing wall structures with three or more stories, often called large panel structures. If the requirements of this section conflict with the requirements of 16.2.4, the requirements in this section control.

These minimum provisions for structural integrity ties in large panel bearing wall structures are intended to provide catenary hanger support in case of loss of a bearing wall support (Portland Cement Association 1980). Tie requirements calculated for specific load effects may exceed these minimum provisions. The minimum integrity tie requirements are illustrated in Fig. R16.2.5, and are based on PCI's recommendations for design of precast concrete bearing wall buildings (PCI Committee on Precast Concrete Bearing Wall Buildings 1976). Integrity tie strength is based on yield strength. The PCI Building Code Committee (1986) provides a recommendation for minimum integrity ties for precast concrete bearing wall buildings.