

## CODE

- (a) Compressive forces that exceed the lesser of the concrete bearing strengths of either the supported member or the foundation, calculated in accordance with 22.8
- (b) Any calculated tensile force across the interface

**16.3.1.3** At the base of a composite column with a structural steel core, (a) or (b) shall be satisfied:

- (a) Base of structural steel section shall be designed to transfer the total factored forces from the entire composite member to the foundation.
- (b) Base of structural steel section shall be designed to transfer the factored forces from the steel core only, and the remainder of the total factored forces shall be transferred to the foundation by compression in the concrete and by reinforcement.

**16.3.2 Required strength**

**16.3.2.1** Factored forces and moments transferred to foundations shall be calculated in accordance with the factored load combinations in Chapter 5 and analysis procedures in Chapter 6.

**16.3.3 Design strength**

**16.3.3.1** Design strengths of connections between columns, walls, or pedestals and foundations shall satisfy Eq. (16.3.3.1) for each applicable load combination. For connections between precast members and foundations, requirements for vertical integrity ties in 16.2.4.3 or 16.2.5.2 shall be satisfied.

$$\phi S_n \geq U \quad (16.3.3.1)$$

where  $S_n$  is the nominal flexural, shear, axial, torsional, or bearing strength of the connection.

**16.3.3.2**  $\phi$  shall be determined in accordance with 21.2.

**16.3.3.3** Combined moment and axial strength of connections shall be calculated in accordance with 22.4.

**16.3.3.4** At the contact surface between a supported member and foundation, or between a supported member or foundation and an intermediate bearing element, nominal bearing strength  $B_n$  shall be calculated in accordance with 22.8 for concrete surfaces.  $B_n$  shall be the lesser of the nominal concrete bearing strengths for the supported member or foundation surface, and shall not exceed the strength of intermediate bearing elements, if present.

**16.3.3.5** At the contact surface between supported member and foundation,  $V_n$  shall be calculated in accordance with the shear-friction provisions in 22.9 or by other appropriate means.

## COMMENTARY

**R16.3.3 Design strength**

**R16.3.3.4** In the common case of a column bearing on a footing, where the area of the footing is larger than the area of the column, the bearing strength should be checked at the base of the column and the top of the footing. In the absence of dowels or column reinforcement that continue into the foundation, the strength of the lower part of the column should be checked using the strength of the concrete alone.

**R16.3.3.5** Shear-friction may be used to check for transfer of lateral forces to the supporting pedestal or footing. As an alternative to using shear-friction across a shear plane, shear keys may be used, provided that the reinforcement crossing