

CODE

22.8.1.1 Section 22.8 shall apply to the calculation of bearing strength of concrete members.

22.8.1.2 Bearing strength provisions in 22.8 shall not apply to post-tensioned anchorage zones.

22.8.2 Required strength

22.8.2.1 Factored compressive force transferred through bearing shall be calculated in accordance with the factored load combinations defined in **Chapter 5** and analysis procedures defined in **Chapter 6**.

22.8.3 Design strength

22.8.3.1 Design bearing strength shall satisfy:

$$\phi B_n \geq B_u \quad (22.8.3.1)$$

for each applicable factored load combination.

22.8.3.2 Nominal bearing strength B_n shall be calculated in accordance with Table 22.8.3.2, where A_1 is the loaded area, and A_2 is the area of the lower base of the largest frustum of a pyramid, cone, or tapered wedge contained wholly within the support and having its upper base equal to the loaded area. The sides of the pyramid, cone, or tapered wedge shall be sloped 1 vertical to 2 horizontal.

Table 22.8.3.2—Nominal bearing strength

Geometry of bearing area	B_n	
Supporting surface is wider on all sides than the loaded area	Lesser of (a) and (b)	$\sqrt{A_2/A_1} (0.85f'_c A_1)$ (a)
		$2(0.85f'_c A_1)$ (b)
Other cases		$0.85f'_c A_1$ (c)

COMMENTARY

R22.8.1.2 Because post-tensioned anchorage zones are usually designed in accordance with **25.9**, the bearing strength provisions in 22.8 are not applicable.

R22.8.3 Design strength

R22.8.3.2 The permissible bearing stress of $0.85f'_c$ is based on tests reported in **Hawkins (1968)**. Where the supporting area is wider than the loaded area on all sides, the surrounding concrete confines the bearing area, resulting in an increase in bearing strength. No minimum depth is given for the support, which will most likely be controlled by the punching shear requirements of 22.6.

A_1 is the loaded area but not greater than the bearing plate or bearing cross-sectional area.

Where the top of the support is sloped or stepped, advantage may still be taken of the condition that the supporting member is larger than the loaded area, provided the supporting member does not slope at too great an angle. Figure R22.8.3.2 illustrates the application of the frustum to find A_2 for a support under vertical load transfer.

Adequate bearing strength needs to be provided for cases where the compression force transfer is in a direction other than normal to the bearing surface. For such cases, this section applies to the normal component and the tangential component needs to be transferred by other methods, such as by anchor bolts or shear lugs.

The frustum should not be confused with the path by which a load spreads out as it progresses downward through the support. Such a load path would have steeper sides. However, the frustum described has somewhat flat side slopes to ensure that there is concrete immediately surrounding the zone of high stress at the bearing.

Where tensile forces occur in the plane of bearing, it may be desirable to reduce the allowable bearing stress, provide confinement reinforcement, or both. Guidelines are provided in the *PCI Design Handbook* for precast and prestressed concrete (**PCI MNL 120**).