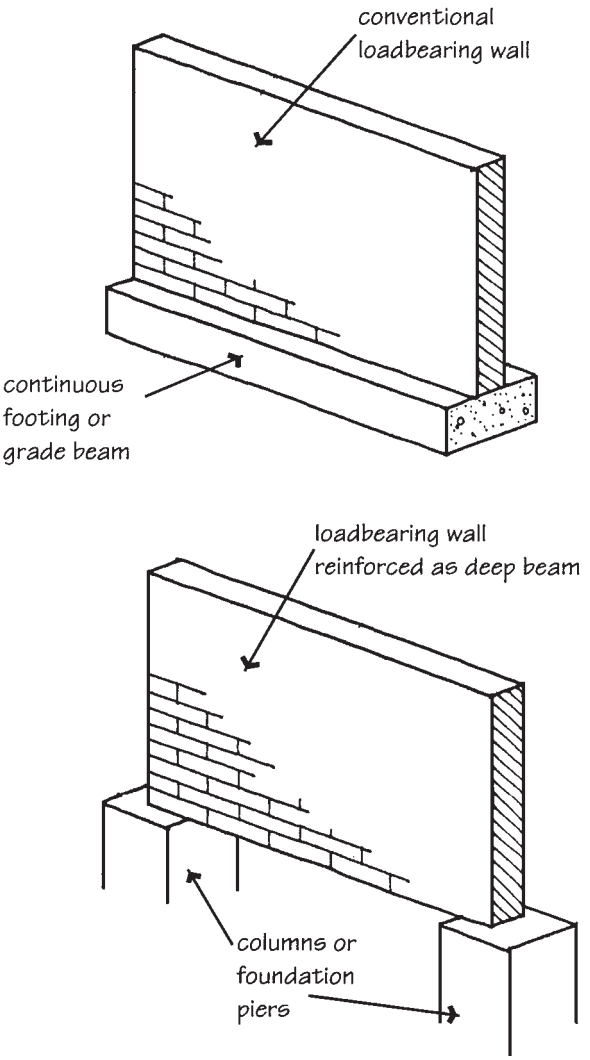

Figure 12-13 Deep wall beams. (*From Schneider and Dickey,* Reinforced Masonry Design, *2nd ed., Prentice-Hall, 1987.*)

columns to act as a deep wall beam and transfer its load to the supports. This alternative permits the design of larger rooms and open spaces that might not be possible with regularly spaced bearing walls. Bearing walls, non-bearing walls, and shear walls may all use this principle to advantage in some circumstances.

12.1.6 Connections

The box frame system of lateral load transfer requires proper connection of shear walls and diaphragms. Connections may be required to transmit axial loads, shear stresses, and bending moments acting separately or in combination with one another. Connections can be made with anchor bolts, reinforcing dowels, mechanical devices, or welding, and may be either fixed or hinged. Although neither complete restraint nor a completely hinged

condition actually exists, these assumptions may be made for purposes of calculation. Each individual condition will dictate the type of connection needed, and a variety of solutions can usually be designed for a given problem. The design and detailing of structural connections are covered in depth in the engineering texts listed at the beginning of this chapter. *Figures 12-14 through 12-20* show some examples of floor and roof system connections.

12.1.7 Foundations

Although the weight of a loadbearing structure is greater than that of a similar frame building, the required soil-bearing capacity is often less because the bearing walls distribute the weight more evenly. Bearing wall structures are compatible with all of the common types of foundations, including grade beams, spread footings, piles, caissons, and mats. Foundation walls below grade may be of either concrete or masonry, but must be doweled to the footing to assure combined action of the wall and the foundation.

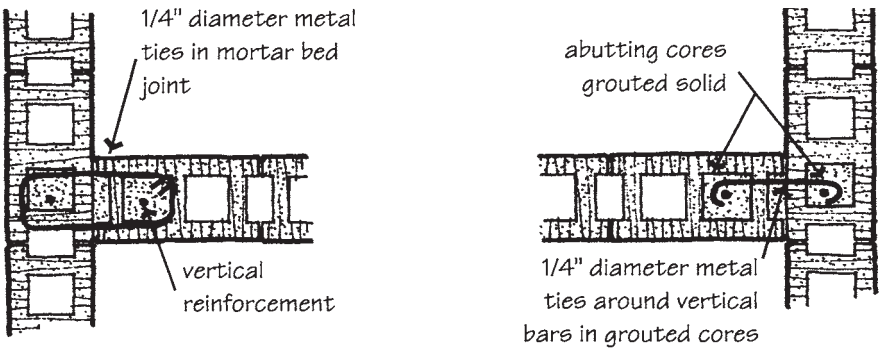

Figure 12-14 Steel reinforcing at intersecting single-wythe masonry walls.