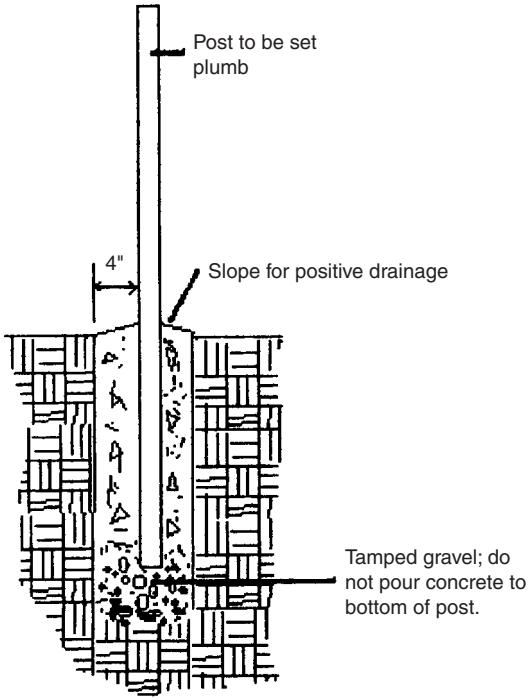

Figure 4.54 Typical wooden post installation.

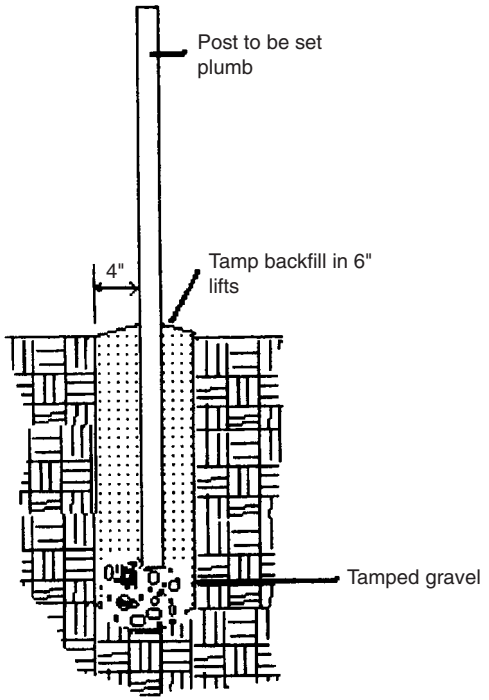

Figure 4.55 Fence post set in tamped backfill.

Walls

For more substantial applications, masonry or stone walls may be desirable. The heavy materials require an adequate supporting foundation. All free-standing walls must be designed to resist overtopping due to wind loads and subsurface soil failures. When wind pushes on the solid surface of the wall, it causes the wall to act as a lever turning on a pivot at ground level. The wall is able to resist overturning by virtue of its weight and the extension of the length of the lever by a footer. Wind loads vary across the nation and are provided or dictated in many local building codes. The weight of masonry materials varies from about 120 lb/ft^3 for brick or cement masonry units (CMUs) to 145 lb for stone. Concrete mortar typically has a weight of 150 lb/ft^3.

To check a wall for its resistance to overturning, it is necessary to determine the wind load for the area in which the wall will be constructed. Typically loads are determined for a 1-ft section of the proposed wall. To determine the wind load pressure *P,* multiply the height of the wall by the wind load. For example, consider a wall in Buffalo, New York, as shown in Fig. 4.60. The recommended wind load is 30 lb/ft^2. The pressure of the wind load *P* is determined at the center of moments of overtopping and righting. The overtopping moment *M* is calculated at half of the wall height above grade plus the depth below grade. For a wall that is 4 ft above grade and 1 ft below grade and 0.67 ft thick, *P* is 3 ft^2 by 30 lb/ft^2, or 90 lb. The weight of a 1-ft section of the wall