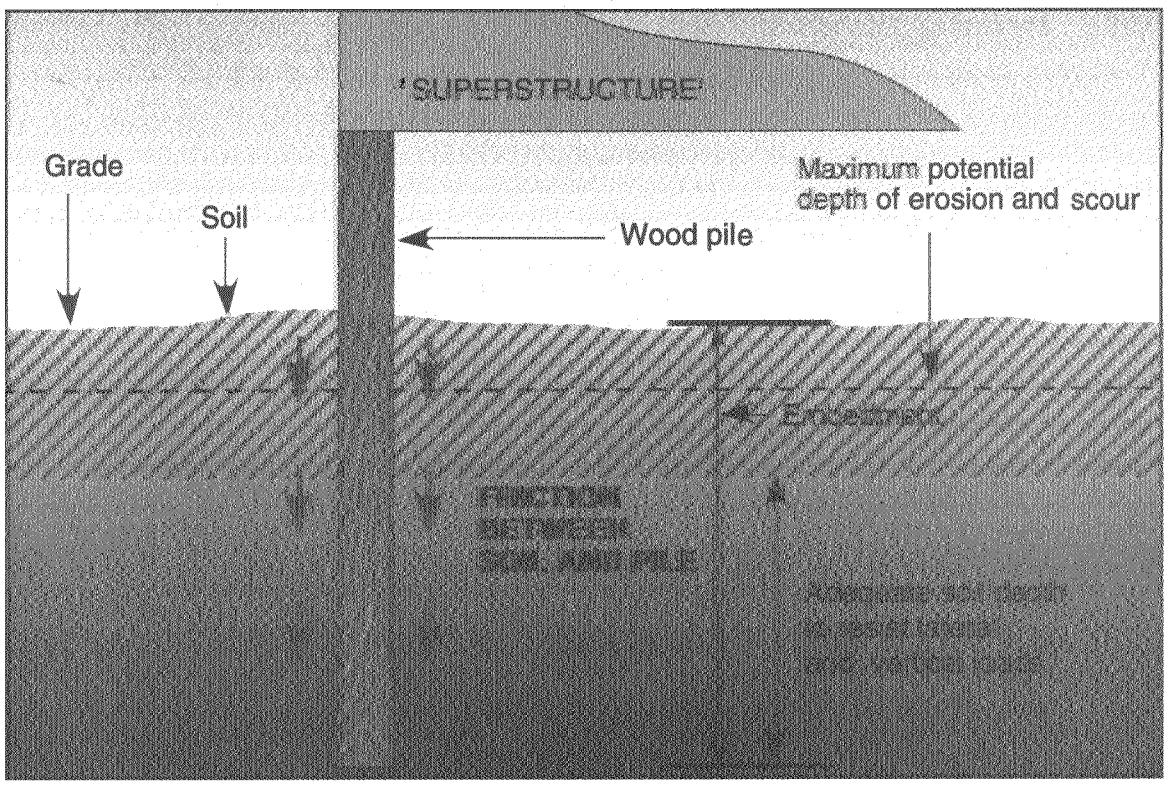

Figure 3-8 *The depth of pile embedment provides stability by enabling the pile to resist lateral and vertical loads through passive earth pressure . Soil depth below maximum potential depth of scour is adequate to withstand lateral and vertical loads during the base flood (after FEMA 1993a).*

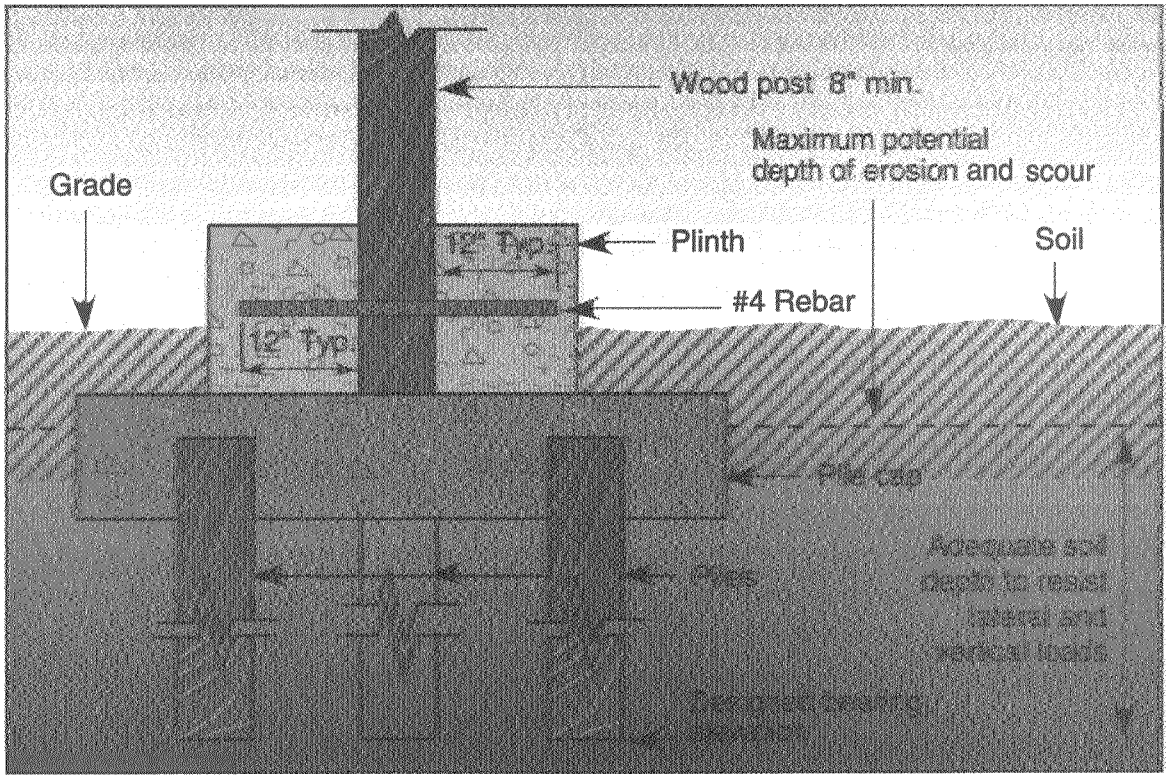

Figure 3-9 *Post/pile foundation. Soil depth below maximum potential depth of scour is adequate to withstand lateral and vertical loads during the base flood (after FEMA 1993a).*

3.5.3 Framing Systems

Framing systems should be designed to support all anticipated loads, and any cutting of holes for electrical lines, ductwork, or plumbing piping must be in accordance with code requirements. Framing systems should not be compromised by the excessive or improper drilling or cutting of holes. If such drilling or cutting is necessary, additional support may be required to return the structure to its design strength. It is also important that proper bracing and fire stops be included.

3.5.4 Connections

All metal connectors should, at a minimum, be constructed of hot-dip galvanized steel and should conform to the Standard Building Code specifications; the guidance provided in FEMA's Technical Bulletin 8-96, *Corrosion Protection for Metal Connectors in Coastal Areas* (FEMA 1996); and any other requirements specified by the design professional of record. Metal connectors include the following:

- wood-to-wood anchors and angles, caps and bases, hangers, and structural connectors
- wood-to-masonry foundation straps, masonry hangers, purlin anchors, plates, tension ties, truss anchors, and brick anchors
- wood-to-concrete anchors and holddowns; bases for beam seats, post bases, and truss seats; hangers; and wedge shims.

Wood should not be used as a shim material since it is subject to compression and may lead to connection failure; instead, metal, brick, or mortar can be used.

3.5.5 Bracing

It is preferable that structures be designed with deep foundations to withstand all anticipated loads without reliance on bracing. However, where used to provide additional stiffening, bracing should consist of hot-dip galvanized steel rods threaded on both ends and joined in the center with a turnbuckle (see Figure 2-10). Alternatively, wood bracing can be used if it is properly designed and attached to piles with bolts. All bracing should be designed as part of the structure by the designer to survive hydrodynamic and debris impact forces generated by the base flood.

3.5.6 Breakaway Construction, Free-Of-Obstruction, and Enclosure Requirements Under the NFIP

In general, recently constructed breakaway walls in Coastal High Hazard Areas (V-Zones) and seaward of the CCCL performed well. However, State and local building officials and floodplain administrators should be aware of and should prevent two problems noted during post-Opal damage assessments: (1) breakaway walls attached to walls and other structure elements above the lowest floor and (2) attachment of utility lines and similar components to breakaway walls. In accordance with V-Zone requirements:

- Breakaway walls and panels below an elevated structure must be separate and distinct from walls and construction above the lowest floor elevation. These sections are intended to break free and must be able to do so without damaging upper walls, sheathing, cladding, and other components.