Soil Nail Walls

A soil nail wall is an earth retaining system consisting of reinforced in situ material which may be either original ground or an existing embankment. Construction is accomplished by excavating from the top of wall elevation down in stages that are typically 4 to 6 feet in height. After each stage of excavation soil reinforcing elements, "soil nails", generally consisting of reinforcing bars, are placed and grouted into drilled holes which have been drilled at a slight downward inclination from level into the in situ material. The face of each stage of excavation is protected by a layer of reinforced shotcrete. After the full height of wall has been excavated and reinforced, a finish layer of concrete facing is placed full height of the wall.

Soil nailing is most applicable for retaining excavations and for increasing the stability of slopes.

A soil nail wall earth retaining system is categorized as a special design system in the *Highway Design Manual*. The Division of Structures has responsibility for the structural design and preparation of the contract documents (PS&E). The Geotechnical Engineering Branch of the Division of New Technology and Research has responsibility for the geotechnical design. The geotechnical aspect of design establishes the soil nail size, length, spacing and minimum drilled hole diameter.

The Federal Highway Administration requires that these walls be considered experimental when the following conditions exist:

1. Wall height greater than 30 feet;
2. Wall to be built in clay or soils with sufficient clay content such that the soil mass will behave as a clay (based on engineering considerations);
3. Wall has unusual surcharge load.

Floyd L. Mellon

Jerry A. McKee

JCM:tr

New Memo