

## **Site Preparation**

Site preparation is expected to include, but not be limited to, clearing of the site and stripping the topsoil with organics and other deleterious materials from the development area. About 8 to 10 inches of silty sandy topsoil with organics was encountered in the borings. However, the actual stripping depth should be determined by a representative of the Geotechnical Engineer at the time of construction.

The exposed subgrade in the building and parking areas should be proofrolled with a rubber tired vehicle weighing about 20 tons. Soils which are observed to rut or deflect excessively under the moving load should be undercut and replaced with compacted structural fill. The proofrolling and undercutting activities should be witnessed by a representative of the Geotechnical Engineer and should be performed during a period of dry weather.

After the subgrade preparation and observation have been completed, the structural fill should be placed in a relatively uniform horizontal lift and should be adequately keyed into the stripped and scarified soils. Sandy clays or clayey sands may be used as structural fill. The structural fill should have a maximum liquid limit of 40 percent and a maximum plasticity index of 18 percent. The fill should be compacted to at least 95 percent of the fill's maximum dry density as determined by ASTM D698 (Standard Proctor).

The structural fill should be placed in maximum lifts of eight (8) inches of loose material and should be compacted within the range of one (1) percentage point below to three (3) percentage points above the optimum moisture content value. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Each lift of compacted structural fill should be tested by a representative of the Geotechnical Engineer prior to placement of subsequent lifts. In-place density measurements should be taken to assure that the above degree of compaction is achieved. The compacted structural fill should extend five (5) feet beyond the perimeter of the building prior to sloping. Adequate drainage should be provided prior to and during site work. The site should be graded to promote rapid runoff.

## **Shallow Footings**

Based on the field data and laboratory test results, the proposed fire station may be supported on a shallow foundation system, provided the site is prepared as discussed in the Site Preparation section of this report. Spread footings and continuous footings bearing at least two (2) feet below the finished grade on the naturally occurring lean to sandy clay, or compacted structural fill, could be designed for maximum allowable bearing pressures of 2,500 and 2,000 psf, respectively. Minimum dimensions of twenty-four (24) inches for column footings and eighteen (18) inches for continuous footings should be used in foundation design to minimize the possibility of a localized bearing failure. The above bearing capacities include a design factor of safety of three (3).