

FOUNDATION DESIGN FOR EXPANSIVE SOILS

Foundation systems for buildings and retaining walls on expansive soils shall be designed and constructed in a manner that will minimize damage to the structure from movement of the soil. The following guidelines are intended to provide the required mitigation:

I. NEW CONSTRUCTION

In the event a soils report is not submitted to the Grading Division for review and approval, or a soils report is submitted, but the expansion potential was not evaluated, or it was determined that expansive soils occur at the site, the building footings shall be designed in accordance with the following requirements:

1. Depth of footings below the natural and finish grades shall not be less than 24 inches for exterior and 18 inches for interior footings.
2. Exterior walls and interior bearing walls shall be supported on continuous footings.
3. Footings shall be reinforced with four ½-inch-diameter deformed reinforcing bars. Two bars shall be placed within 4 inches of the bottom of the footings and two bars within 4 inches of the top of the footing with a minimum concrete cover per ACI 318, Section 20.6.1.3.
4. On-grade concrete floor slabs shall be placed on a 4-inch fill of coarse aggregate or on a 2-inch sand bed over a moisture barrier membrane. The slabs shall be at least 3 ½ inches thick and shall be reinforced with ½-inch-diameter deformed reinforcing bars. Reinforcing bars shall be spaced at intervals not exceeding 16 inches each way.
5. The soil below an interior concrete slab shall be pre-saturated to a depth of 18 inches prior to placing the concrete.
6. All drainage adjacent to footings shall be conducted away from the structure by a minimum 3-foot-wide apron sloped at no less than 2 percent and draining into an approved non-erosive device.
7. Allowable foundation and lateral pressures for footing design shall not exceed the values shown in Table 1806.2.

Construction in accordance with these requirements does not prevent the building/grading inspector from requiring a soils report at any time, based upon site conditions.

In the event a soils report has been submitted, recommendations in the reports that are in addition to or more restrictive than the requirements specified herein shall be satisfied.

II. SLAB-ON-GROUND FOUNDATIONS

Slab-on-ground foundations such as a post-tensioned mat or raft will require a soils report and they shall be designed in accordance with Code Section 1808.6.2.

III. EXISTING FOOTINGS

Existing residential buildings which are being remodeled or added onto may utilize the existing footings to support the proposed construction in lieu of compliance with the requirements specified above provided the following conditions are met:

1. The total value of the remodeling project, including any additions, must not exceed 50% of the replacement value of the existing building.
2. The project shall be limited to the existing single family dwellings being enlarged or remodeled using the existing footings. All new footings must comply with all requirements contained in this information bulletin.
3. For other than one-story additions, the civil or structural engineer of record shall prepare a statement to be included on the plans, stating that the engineer has inspected the supporting soils on the site and is knowledgeable of the soils in the area. The statement shall also include the following information:
 - a. The type of soil on the site and the estimated classification of expansiveness.
 - b. The structural adequacy and condition of existing footings.
4. All drainage adjacent to existing footings shall be conducted away from the structure.