



COUNTY OF LOUISA, VIRGINIA Shrink / Swell Soil Policy

2015 Virginia Uniform Statewide Building Code – Effective date September 04, 2018

Referenced Codes: 2015 Virginia Residential Code [R] and 2015 Virginia Construction Code

[R401.4] Soil Tests: Where quantifiable data created by sound soil science methodologies indicate expansive, compressible, shifting or unknown soil characteristics are likely to be present, the *building official* shall determine whether to require a soil test to determine the soil's characteristics at a particular location. This test shall be made by an *approved agency* using an *approved method*.

[R403.1.8] Foundations on Expansive Soil: Foundation and floor slabs for buildings located on expansive soils shall be designed in accordance with Section 1808.6 of the *International Building Code*.

Section 1808.6 of the Virginia Construction Code: Foundations for buildings and structures founded on expansive soils shall be designed in accordance with Section 1808.6.1 or 1808.6.2. [Copies of these sections are available upon request.]

Past development has indicated that soils having either a moderate or a high shrink-swell potential exist throughout various areas of Louisa County. This potential for shrink-swell soils has also been confirmed through the Soil Survey of Louisa County, Virginia issued in March 1976, a survey made by the USDA Soil Conservation Service in cooperation with the Virginia Polytechnic Institute and State University.

Prior to the issuance of a building permit for certain structures a soil test shall be performed to determine the shrink-swell potential of the soil. In some instances, a soil test may be required to determine the presumptive load-bearing values of the foundation materials, in accordance with Section R401.4.1.

IF A SOIL TEST IS REQUIRED TO DETERMINE SHRINK-SWELL POTENTIAL, THE TEST SHALL BE PERFORMED BY A VIRGINIA LICENSED PROFESSIONAL ENGINEER, OR A VIRGINIA CERTIFIED SOIL SCIENTIST. Such person(s) or firm(s) shall be pre-approved to perform third-party inspections in accordance with Louisa County's 3rd-Party Inspection policy.

A soil test to determine shrink-swell potential shall be performed for the following structures:

1. All new one-family dwellings, two-family dwellings and townhouses regulated by the Virginia Residential Code.
2. All new structures regulated by the Virginia Construction Code, unless exempted as outlined in this document.
3. All additions to structures where the floor slab is four feet or more below the existing grade (on any side), or where the building addition has a footprint of 400 square feet or larger.

4. The building official reserves the right to require a soil test for structures not listed above, if deemed appropriate.

NOTE: At the discretion of the building official, an existing soil report that was prepared for the original dwelling shall be adequate for an addition.

A soil test to determine shrink-swell potential shall NOT be required for the following structures:

1. Decks, stoops or porches when added to an existing structure, and supported by post construction (open, covered or screened)
2. Detached storage sheds (if over 256 sq. ft. footings/foundation are still applicable)
3. Detached garages *without habitable space* above
4. Swimming pools (above-ground or in-ground)
5. Manufactured homes (as defined in Chapter 2 of the Virginia Uniform Statewide Building Code) when installed on piers with tie-downs. (Footings still required)
6. Industrialized buildings, used for human occupancy (residential or commercial) when installed on piers with tie-downs. (Footings still required)

Note: If questionable soils are encountered during the excavation process or during construction, either by an inspector, approved third-party inspection agency or a contractor, the building official reserves the right to issue a stop work order and require a soil test to determine shrink-swell potential prior to construction proceeding.

The following parameters shall be followed when a soil test is required to be performed to determine shrink-swell potential.

Taking the soil sample:

1. A minimum of two (2) soil borings per site shall be taken which shall be located at opposite, outside corners of the proposed structure.
2. Test borings shall extend a minimum depth of two (2) feet below the recommended footing depth, or to a depth of five (5) feet, whichever is greater, or until auger refusal is encountered.
3. A sample which exhibits the "poorest" observed soil quality from each boring shall be taken to a laboratory for testing.

Report of soil test:

When required, a written report of the soil investigation shall be submitted that includes, but need not be limited to the following information. This report shall become part of the permit application and may affect the issuance of the building permit.

1. A plot showing the location of the test borings and/or excavations. These locations shall coincide directly with the specific location of the structure on the property, including the proposed distances to property lines and to existing structures located on the same property.
 - a. *If the structure is relocated and does not coincide with the soil report locations, the report shall be deemed null and a new test shall be performed; a new report shall be submitted.*
 - i. *The building official reserves the right to issue a stop work order until the revised test and report has been performed and submitted for approval.*
2. A record of soil samples including the existing, proposed fill materials.
3. A record of the soil profiles.

4. Elevation of water table, IF encountered.
 5. Shrink-swell potential of the soil, including swell pressure
 6. Design load-bearing capacity of the soil
 7. Reason for auger refusal, IF applicable.
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8. The report shall outline the test procedure used to determine the shrink-swell potential. These procedures shall be in accordance with either Section R403.1.8 of the Virginia Residential Code, or Section 1808.6 of the Virginia Construction Code.
 9. The report shall include the name(s) along with original signature(s) and professional seals of the person(s) who performed or supervised the soil sampling, laboratory testing or evaluation, and the preparation of the report.

When the soil is identified as having **zero or low shrink-swell potential**:

- Footing and/or foundation design shall be allowed to be based on the minimum requirements of the Virginia Uniform Statewide Building Code.
- All footing and/or foundation inspections shall be allowed to be performed by either (i) Louisa County inspectors, or (ii) an approved 3rd-party inspection agency.

When the soil is identified as having **moderate or high shrink-swell potential**:

- The footing/foundation shall be designed by a Virginia licensed professional engineer, or a Virginia licensed architect.
 - This design shall be submitted as part of the permit application and may affect the issuance of the building permit.
- All footing and/or foundation inspections shall be allowed to be performed by either (i) Louisa County inspectors, or (ii) an approved 3rd-party inspection agency.

This policy is created in accordance with Section R401.4 of the Virginia Residential Code and Section 1803.1 of the Virginia Construction Code.

Paul R. Snyder
Building Official

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