# Town of Front Royal Building Inspections Department
# Shrink/Swell soil policy

Expansive content clay soils are known to exist in areas of the Town of Front Royal. This classification is given to soils which exhibit a potential for shrinking and swelling with seasonal changes in ground moisture and result in damage to footings and foundations. Soils of this type have a low suitability classification for building sites, basements, foundations and roads.

It is imperative for builders to identify the soil type(s) at their proposed building site before developing foundation system plans for any proposed building(s). This can be accomplished by a soil engineer performing a soil investigation in accordance with Section 1803 of the Virginia Construction Code.

These requirements are applicable to all construction that encloses space to be occupied for dwelling uses, commercial uses, or public occupancy. Detached incidental spaces (such as garages, storage sheds, etc.) only occupied for brief periods on an occasional basis, of less than 256 square feet will be exempt from testing requirements. Other construction (primarily decks, screened porches, stoops, attached storage areas, vestibules, and other minor additions) may be exempt from the testing requirements, on a case-by-case basis, based upon review by the building official and a determination of at least one of the following:

1. That the construction proposed would be generally unaffected by the effects of expansive soils.
2. That the construction method specified is sufficient to resist the effects of expansive soils.
3. That previous soils resting information exist which is sufficient to make a determination that further soil testing is unnecessary, or that special construction techniques are not justified.
4. When a licensed designer has assumed the presence of expansive soils and designed accordingly.

**SOILS TESTING IS REQUIRED**

Soil testing will be required for all construction which encloses occupiable space. It will be determined at the time of application or plan review if an exemption of this requirement may be appropriate. These tests must be site specific and submitted with the building permit application. As an acceptable alternative, tests which were completed at the subdivision stage of development that have sufficient detail to show that no additional testing should be required for building construction, will be accepted. The following minimum requirements will apply to all tests and reports submitted:

1. All projects (residential and commercial) that include footings and foundations for structures and towers, habitable construction and garages over 256 square feet must have a geotechnical report, this excludes non habitable buildings under 256 square feet.
2. A minimum of two borings shall be provided in the vicinity of the planned construction, at a depth of at least 6 feet, and one foot below the bottom of the recommended footing depth, or to refusal. An additional boring may be required based upon construction or soils encountered, or recommendation for the geotechnical engineer.
3. The report shall contain a description of the project site including all areas of prior disturbance, water courses, ditches, general site condition, and surrounding area. Special care should be given to issues pertaining to slope conditions or slide areas. Hydrologic features should be described including any evidence of groundwater, seepage areas, or seasonal variations in hydrologic conditions.
4. A drawing to scale must be included that shows surface contours, locations of soil borings, and accurate detail to locate the property and proposed construction. Boring logs must be provided to show the stratification of soil deposits, including the thickness of soil profiles, relative surface elevation of test borings and character of the soil encountered. This log should show any evidence of groundwater, if encountered, and any evidence of expansive activity.
5. Soils should be classified based upon ASTM Specification D2487 or D2488 and include any other textural or geologic names as appropriate. Information should be provided concerning the relative compactness of non-cohesive soils, or relative consistency or cohesive soils and include approximate bearing capacity at the recommended footing depth.
6. The report shall contain recommendations concerning foundation placement and should contain recommendations for footing design if appropriate.
7. Results of laboratory testing done consistent with ASTM Standards shall be provided of all tests conducted. The geotechnical engineer shall determine the appropriate tests based on soil characteristics and any anticipated problems. In granular soils, natural moisture content and gradation may suffice. In cohesive soils, Atterberg limits, moisture content, or other tests may be required as appropriate.
8. The report shall contain sufficient information to allow adequate review of the logic and assumptions underlying any conclusions reached or recommendations made. Sufficient supporting documentation should be provided as necessary. The stamp or seal of the design professional or certified soil scientist providing the soils test information, including full address, must be placed on any report. (NOTE, soils data will be accepted from a certified soils scientist, but as a matter of law recommendations for footing, foundation, or other building related work is design and must be provided by a qualified architect or engineer.)
9. The use of the surface laid footing pads would be limited to sheds under 256 square feet.
10. The use of the presumed bearing would be limited to sheds under 256 square feet.

**PROFESSIONAL DESIGN REQUIRED**

Based upon the recommendations and results of the soils testing, professional design of the footing and foundation systems shall be provided, with the designs based upon the soils testing and geotechnical recommendations. No professional design of the footing and foundation will be required if supported by the recommendation of the geotechnical engineer.

Any questions concerning these requirements should be directed to the Building Inspections Department.