

14-11-107
(Also see Public Facilities Manual Amendment 107-11-PFM,
adopted simultaneously on June 7, 2011.)

ADOPTION OF AMENDMENTS TO CHAPTER 107
(PROBLEM SOILS)
OF THE 1976 CODE OF THE COUNTY OF FAIRFAX, VIRGINIA

At a regular meeting of the Board of Supervisors of Fairfax County, Virginia, held in the Board Auditorium of the Government Center at Fairfax, Virginia, on Tuesday, June 7, 2011, the Board after having first given notice of its intention so to do, in the manner prescribed by law, adopted amendments regarding Chapter 107 (Problem Soils) of the 1976 Code of the County of Fairfax, Virginia, said amendments so adopted being in the words and figures following, to-wit:

***BE IT ORDAINED BY THE BOARD OF SUPERVISORS OF FAIRFAX
COUNTY, VIRGINIA:***

That Chapter 107 (Problem Soils), is amended -- where insertions are shown as underlines and deletions are shown as strikeouts-- to read as follows:

CHAPTER 107. Problem Soils.¹

Article 1. General Provisions.

Section 107-1-1. Unlawful to construct or grade in certain problem soil areas without compliance with applicable requirements of this Chapter, Subdivision Ordinance and Zoning Ordinance of this Code.

Section 107-1-2. Soil Classes.

Section 107-1-23. ~~Soil~~ Geotechnical report required.

Section 107-1-34. Referral to Geotechnical Review Board; effect of recommendations.

Section 107-1-45. Prerequisite for issuance of residential and non-residential use permits.

Section 107-1-56. Waiver of ~~soil~~ geotechnical report.

Section 107-1-67. Responsibility of developers and builders.

Section 107-1-78. Keeping of records; index of locations of ~~soil~~ geotechnical reports.

Article 2. Definitions.

Section 107-2-1. Definitions.

Article 1. General Provisions.

Section 107-1-1. Unlawful to construct or grade in certain problem soil areas without compliance with applicable requirements of this Chapter, Subdivision Ordinance and Zoning Ordinance of this Code.

(a) It is hereby determined by the Board of Supervisors that grading and the construction of any building or structure on land containing problem soils is potentially injurious to the health, safety and welfare of the public and that no such construction or grading shall occur until adequate safeguards have been taken.

(b) It shall be unlawful for any person to grade, construct or to perform any foundation related work on any new building or structure or to add to the exterior dimensions of any existing building or structure on land containing problem soils without first complying with the applicable provisions of this Chapter, the Zoning Ordinance, the Subdivision Ordinance of this Code and any applicable Federal or State Regulations. (17-75-17; 1961 Code, §§ 7-2 and 7-3; §§ 15.2-2241-2246; 15-02-107.)

Section 107-1-2. Soil Classes.

Soil Class designations I, II, III, and IV are based on the severity of problems associated with these soils and the potential difficulty of analyzing and correcting those problems. Class I soils are undisturbed natural soils that typically have few characteristics that would adversely affect building foundations. Class II soils are

¹ For "Guidelines for the Preparation of Geotechnical Studies," refer to the Fairfax County *Public Facilities Manual*.

undisturbed natural soils that typically have high groundwater or restrictive soil layers. Class III soils are undisturbed natural soils with characteristics such as high shrink/swell potential, compressibility, low bearing strength, and high water table, which may result in poor drainage, building settlement, and unstable slopes, etc. Class IV soils are soils that have been disturbed or altered as a result of grading or construction resulting in soils with variable characteristics. Class IV soils are divided into two groups, IVA and IVB. Class IVA soils are disturbed soils that were originally Class III soils, and Class IVB soils are disturbed soils that were originally Class I or Class II soils.

Section 107-1-23. Soil Geotechnical report required.

(a) Unless otherwise stipulated in this Chapter, a soil geotechnical report prepared by, or under the direction of, a professional engineer experienced in soil and foundation engineering must be submitted for all construction and grading work located in problem soils ~~which are delineated on the official map adopted by the Board of Supervisors, and for such other construction and grading work areas~~ where special soil or water conditions are deemed by the Director to be potentially injurious and in instances where problem soils are discovered on the project site. If the Director determines that problem soils are not located adjacent to or within the construction area and that the proposed construction on a site with problem soils will not adversely impact either the subject property or adjoining properties, ~~the Director may exempt the project from the requirement of a soil geotechnical report will not be required.~~

(b) The required soil geotechnical report and associated plans, specifications and other documentation must be prepared in accordance with the procedures outlined in the Public Facilities Manual adopted by the Board of Supervisors. When the Director deems that the proposed construction or grading located in a problem soil may adversely impact adjacent properties as a result of grading or construction methods including, but not limited to, blasting and dynamic compaction, the soil geotechnical report must be accompanied by written proof of notification of all owners of property abutting and immediately across the street from the subject property. If there are fewer than five (5) properties abutting and immediately across the street from the subject property, then notices shall be sent to other property owners in the immediate vicinity so that notices are sent to different owners of not fewer than five (5) properties. Notice shall be sent to the last known address of the owner(s) as shown in the current Real Estate Assessment files and shall be sent by certified mail, return receipt requested. ~~five (5) adjoining property owners or all adjoining property owners if there are less than five (5).~~ The form of such notice shall be approved by the Director.

(c) Submission of a soil geotechnical report shall not be required for additions, alterations or repairs to existing structures or proposed residential dwellings located in Class IVB soils on non-bonded lots meeting the conditions specified in the Public Facilities Manual unless the grading or construction work in combination with soil or water conditions are deemed by the Director to be potentially unsafe for the occupants of the structure or adjoining properties. In lieu of a soil geotechnical report, the Director

may require a permit applicant to provide drawings and/or calculations showing that the soil problems have been addressed in accordance with the building codes. Any required drawings and calculations must be certified by a licensed professional engineer or architect and must be in compliance with the building codes.

Examples of conditions that may require submission of ~~soil~~ geotechnical reports for additions, alterations or repairs, include, but are not limited to the following:

1. Construction work involving deep excavations in close proximity to existing structures.
2. Construction work resulting in vibrations from the installation of piles, dynamic compaction, or blasting.
3. Construction work involving foundations in close proximity to retaining walls or steep slopes, or grading work in problem soils.
4. Major Additions.

Examples of conditions that do not typically require the submission of ~~soil~~ geotechnical reports for additions, alterations, or repairs include, but are not limited to the following:

1. At grade construction work not involving deep excavations.
2. At grade construction work not requiring piles, dynamic compaction, or blasting of rocks.
3. Minor Additions.

(d) Submission of a ~~soil~~ geotechnical report shall not be required as a prerequisite for any plat approval when no grading or construction work is proposed with the subject plat. The Director may require that the engineer or surveyor note on the plat that future grading or construction work in problem soil may require the submission of a ~~soil~~ geotechnical report. ~~For the subdivision of parcels of land where the soils on the site are unmapped on the County soils map, a soils map shall be required prior to approval of the associated construction plan.~~

(e) Submission of a ~~soil~~ geotechnical report shall not be required for the installation or repairs of linear structures in problem soils such as public utilities, sanitary sewer lines, storm sewer lines, trails, sidewalks, drainage channel improvements, telephone and cable TV lines, etc., when the associated work complies with the safety requirements of the Occupational Safety and Health Administration (OSHA) as adopted by the Commonwealth. (17-75-17; 1961 Code, § 7-4; 32-91-107; 15-02-107; 15-02-107.)

Section 107-1-34. Referral to Geotechnical Review Board²; effect of recommendations.

After a ~~soil~~ geotechnical report on the proposed work has been submitted, the Director shall refer those projects, ~~except those projects that he determines do not pose any~~ a serious threat of soil-related problems, to the Geotechnical Review Board for analysis and appropriate advice and recommendations. The recommendations of the Geotechnical Review Board shall not be binding on the Director. No work shall be commenced until after the proposed work has been approved. However, approval as to

² For "Geotechnical Review Board" refer to the Fairfax County *Public Facilities Manual*

soil conditions shall not relieve any person from obtaining any or all additional permits and approvals necessary for the proposed work. (17-75-17; 1961 Code, § 7-4; 15-02-107.)

Section 107-1-~~45~~. Prerequisite for issuance of residential and non-residential use permits.

Residential and non-residential use permits shall be issued only after receipt and approval of the soil engineer's inspection report on earthwork, roadway and foundation construction. (17-75-17; 1961 Code, § 7-4; 15-02-107.)

Section 107-1-~~56~~. Waiver of ~~soil~~ geotechnical report.

The Director, or the Director's designee may waive any requirements of Section 107-1-~~23~~ so long as the waiver is not contrary to any mandatory requirements of the County Code (17-75-17; 1961 Code, § 7-4; 15-02-107.)

Section 107-1-~~67~~. Responsibility of developers and builders.

(a) Review and approval of plans, specifications and reports by the County, with or without recommendations by the Geotechnical Review Board, shall in no way relieve a developer or builder of the responsibility for the design, construction and performance of the structures, pavement and slopes on the project and damage to surrounding properties.

(b) The warranty on the foundation of any new dwelling against structural defects shall be for a period no less than five years. (§ 55-70.1)

(c) Innovative construction methods or techniques are encouraged for solving soil-related problems. The Director may require special bonding in such form and amount as may be deemed necessary when such methods or techniques are approved for construction. (17-75-17; 1961 Code, § 7-4; 15-02-107.)

Section 107-1-~~78~~. Keeping of records; index of locations of ~~soil~~ geotechnical reports.

The Director shall keep on file all ~~soil~~ geotechnical reports which have been required to be submitted and an index of the location of said ~~soil~~ geotechnical reports for the benefit of the public. (17-75-17; 1961 Code, § 7-4; 15-02-107.)

ARTICLE 2. Definitions.

Section 107-2-1. Definitions.

(a) Director means the Director of the Department of Public Works and Environmental Services or designated agent.

(b) Class I soils consist of Soil Nos. 11, 28, 33, 38, 39, 76, 79, 80, 81, 84, 85, 87, 88, and 90.

(c) Class II soils consist of Soil Nos. 2, 7, 9, 31, 75, 77, 78, 92, and 93.

(d) Class III soils consist of Soil Nos. 1, 8, 10, 29, 30, 32, 34, 35, 36, 37, 48, 49, 59, 60, 61, 62, 63, 64, 65, 74, 82, 83, 89, 91, and 94.

(e) Class IVA soils consist of Soil Nos. 13, 15, 17, 20, 21, 26, 27, 42, 43, 44, 47, 51, 52, 53, 54, 55, 56, 57, 69, 71, 73, 86, 103, 106, and 109.

(f) Class IVB soils consist of Soil Nos. 3, 4, 5, 6, 12, 14, 16, 18, 19, 22, 23, 24, 25, 40, 41, 45, 46, 50, 66, 67, 68, 70, 72, 95, 96, 97, 98, 99, 100, 101, 102, 104, 105, 107, and 108.

(g) Geotechnical Report shall mean a geotechnical or foundation engineering study prepared in accordance with the design and construction criteria outlined in the Public Facilities Manual.

(h) Major Addition is considered any addition or alteration to an existing residential structure of equal to or greater than 500 square feet in exterior footprint area, or equal to or greater than fifty (50) percent of the exterior footprint area of an existing non-residential structure, when such addition entails grading or construction of foundations in problem soils.

(i) Minor Addition is considered any addition or alteration to an existing structure of less than 500 square feet in exterior footprint area for residential structures, or less than fifty (50) percent of the exterior footprint area of an existing non-residential structure, when such addition entails grading or construction of foundations in problem soils.

(j) Problem Soils shall mean ~~"marine clays" and other associated~~ landslide susceptible soils, shrinking and swelling ~~soils~~clays, soils with high water table conditions, soils containing hazardous material, buried waste sites, uncompacted and/or undocumented man-placed fills, and earthen structures that would require special precautions for safety during and after construction activity. Problem soils include areas of Marumsco soils, "marine clays", Class III soils, and Class IV soils, as shown and/or identified on the official map adopted by the Board of Supervisors or any other soil as determined by the Director of the Department of Public Works and Environmental Services.

(k) "Marine clay" is a term used locally for clay-rich sediments of the Cretaceous-Age Potomac Formation of the Atlantic Coastal Plain. The Potomac Formation, identified as unit Kp on USGS geologic maps, thickens from a few feet along the boundary with the Piedmont Province in the west to over one hundred feet along the eastern boundary of Fairfax County. As a result of removal of younger deposits that have since eroded away, the sediments are commonly over-consolidated. The "marine clay" sediments consist mostly of montmorillonite minerals (which results in a high potential for shrink and swell with variations in moisture) that are commonly classified as elastic SILT (MH) and fat CLAY (CH) by the Unified Soil Classification System. Due to physical and

chemical weathering, "marine clay" in the uppermost 20 ft of the Potomac Formation are preferentially weakened along fractures, joints and parting planes, and can cause landslides many years after the slopes are created. Sand layers, often water-bearing, are frequently mixed with the "marine clay" layers. The clays and silts are subject to large changes in volume with soil moisture changes. Regulations in the Fairfax County Zoning Ordinance, regarding "Marine Clay" are only applicable to the areas mapped as "Previously Mapped Marine Clay."

(l) Soil Number shall mean the identifying number assigned to a soil unit in the Soil Survey of Fairfax County prepared by the United States Department of Agriculture National Resource Conservation Service.

~~(e) Soil Report shall mean a geotechnical or foundation engineering study prepared in accordance with the design and construction criteria outlined in the Public Facilities Manual. (15-02-107.)~~

This amendment shall become effective at 12:01 a.m. on June 8, 2011.

GIVEN under my hand this 7th day of June, 2011.



NANCY VEHR

Clerk to the Board of Supervisors