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**11-0100 SUBDIVISION AND SITE PLAN PREPARATION ~~(55-96-PFM)~~**

**11-0101 Purpose and Intent**

11-0101.1 In the interest of the health, safety and welfare of the ~~general~~ public, the County may require the developer to submit Erosion and Sedimentation (E&S) control plans where necessary.

11-0101.2 If any developer intends to make changes in the contour of any land proposed to be subdivided, developed or changed in use by grading, excavating or the removal or destruction of the natural topsoil, trees or other vegetative covering thereon under a site plan or subdivision plat submitted to the County, the same ~~shall~~ may be accomplished only after the owner or ~~his~~ the owner's agent has obtained the Director's approval of a plan for E&S controls.

11-0101.3 The Director and other interested County agencies will make a continuing review and evaluation of the methods used and the overall effectiveness of the E&S control program.

**11-0102 General Plan Preparation**

11-0102.1 The designer preparing the drawings ~~shall~~ must include in these construction plans adequate measures for control of E&S conforming to the guidelines, policies, standards and specifications contained in the PFM, the current "[Virginia Erosion and Sediment Control Handbook](#)," and [Chapter 104 \(Erosion and Sedimentation Control\)](#) of the Code. No development ~~shall be~~ is permitted until an E&S control plan has been approved.

11-0102.2 ~~(107-10-PFM, 56-96-PFM) For all land proposed for development, a soil map showing soil type boundaries and highlighting areas posing problems for urban development shall be required. Such soil map shall be at a scale of not less than 1" = 500', and shall also identify classification of soil types, based upon the official County soils map. The~~ is analysis in [§ 2-0108.1](#) and a resultant E&S control plan ~~shall~~ must provide guidance to the developer as to those areas where topography, drainage and soils are most favorable for intended development and the most favorable routing of roads and sewers so as to create the least erosion potential.

11-0102.3 The Director ~~shall~~ will review these plans as submitted, and ~~shall~~ will take necessary steps to ensure compliance by the developer with these plans as finally approved.

**11-0103 Initial Plan Stage 1**

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- 11-0103.1 Preliminary plats for subdivisions or initial plans for site plans ~~shall~~ must clearly indicate the approximate limits of clearing and the approximate limits of grading which may not be the same as for clearing, together with tentative methods for E&S control.
- 11-0103.2 Areas with unstable or highly erodible soils, which are to be disturbed by clearing or grading, ~~shall~~ must be specifically indicated.
- ~~11-0103.2A~~
- A. ~~(107-10 PFM, 56-96 PFM)~~ Such areas ~~shall~~ must be identified by use of the official soils map or by use of a supplemental geotechnical report prepared by a professional authorized by the State to provide such information.
- ~~11-0103.2B~~
- B. ~~(107-10 PFM, 56-96 PFM)~~ The official soils map adopted by the [Board of Supervisors](#) is available on the [Fairfax County](#) website. Associated soil properties and tables are available on the [Fairfax County](#) and [NRCS](#) websites.
- C. The comprehensive source of information about soils in the County is the [Soil Survey of Fairfax County](#), prepared by the [NRCS](#). This survey describes 108 units of soils, numbered 1-57, and 59-109. The [Soil Survey](#) was used to create the County soils map, which depicts the soil unit boundaries, and the [Description and Interpretive Guide to Soils in Fairfax County](#), which describes the differences in soil characteristics (i.e., color, texture, depth, drainage, chemistry, permeability, erodibility). The [County soils map](#) and the [Description and Interpretive Guide](#) are found on the [Fairfax County](#) website.
- 11-0103.3 The Director will enforce compliance with the approved plans.

**11-0104 Phase I and Phase II E&S Controls Stage 2**

- 11-0104.1 ~~(24-88 PFM)~~ The plan for the control of E&S ~~shall~~ must address both the period of construction and the post construction period (in most circumstances this will necessitate a two-phased plan submission) and ~~shall~~ must be submitted to the Director at the time construction and site plans are submitted. Where two-phased plans are submitted, the Phase one plan will address the controls needed with minimal clearing and grading limits provided ~~prior to~~ before clearing and rough grading the majority of the site. The ultimate tree save areas ~~shall~~ must be depicted on the Phase one plan to ensure their preservation throughout the development process. The second phase plan will address the controls needed after the utilities and curb and gutter are installed and the roads roughed in. A single plan may be approved by the Director if it can be shown that the single plan will adequately control conditions from the beginning of the project until it is completed.
- 11-0104.2 Final plans for the sequentially phased control of E&S as well as a narrative describing the control measures and practices approved must be a part of

11-0000 EROSION AND SEDIMENT CONTROL

subdivision and site plans, compliance with which is assured by subdivision or site plans conservation agreement and cash deposit.

11-0104.3 The E&S control plan must be noted to provide that “No area shall may be left denuded for a period longer than 14 days except for that portion of the site in which work will be continuous beyond 14 days.” If the maximum period is exceeded and any such areas remain exposed without cover, the County will (if the developer or builder does not) install the necessary temporary or permanent vegetative stabilization measures to achieve adequate E&S control.

11-0104.4 The cost of any such temporary measures taken by the County must be borne by the developer or builder, and will be charged against the conservation deposit amount set forth in [§ 2-0600 et seq.](#)

11-0104.5 During the construction phase, further consultative technical assistance may be furnished, if necessary, by the Director and the [NVSWCD](#).

**11-0105 — Stage 3**

~~11-0105.1 (24-88 PFM) Final plans for the sequentially phased control of E&S as well as a narrative describing the control measures and practices approved shall be a part of subdivision and site plans, compliance with which is assured by subdivision or site plans conservation agreement and cash deposit.~~

~~11-0105.2 (24-88 PFM) The E&S control plan shall be noted to provide that “No area shall be left denuded for a period longer than 14 days except for that portion of the site in which work will be continuous beyond 14 days.” In the event such maximum period is exceeded and any such areas remain exposed without cover, the County shall (in the event the developer or builder does not) install the necessary temporary or permanent vegetative stabilization measures to achieve adequate E&S control.~~

~~11-0105.3 (24-88 PFM) The cost of any such temporary measures taken by the County shall be borne by the developer or builder, and shall be charged against the conservation deposit amount set forth in [§ 2-0700 et seq.](#)~~

**11-0106 — Stage 4**

~~11-0106.1 At the building permit application stage, a review shall be conducted by the Director to ensure conformance with the approved plans.~~

**11-0107 — Stage 5**

~~11-0107.1 (56-96 PFM) During the construction phase, further consultative technical assistance may be furnished, if necessary, by the Director and the [NVSWCD](#).~~

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~~11-0107.2 The Director shall enforce compliance with the approved plans.~~

~~11-0108 Stage 6~~

~~11-0108.1 The Director and other interested County agencies shall make a continuing review and evaluation of the methods used and the overall effectiveness of the E&S control program.~~

~~11-0109 Stage 7~~

~~11-0105 E&S Guidelines~~

~~11-0109.1~~

~~11-0105.1 Control measures shall must be incorporated as set forth herein and shall must be the type of required measures for an effective E&S control plan.~~

~~11-0109.2~~

~~11-0105.2 The development plan shall must be fitted to the topography and soils so as to create the least erosion potential.~~

~~11-0109.3~~

~~11-0105.3 E&S control measures must be coordinated with the required steps in construction, and appropriate control measures must be installed as the first step ~~prior to~~ before the construction or development (must be included in the narrative).~~

~~11-0109.4~~

~~11-0105.4 Land shall must be developed in increments of workable size on which adequate controls of E&S can be provided and maintained during construction. These increments shall must be included in the narrative.~~

~~11-0109.4A~~

~~A. Operations shall must be staged properly so that the area being developed is not exposed for a long period of time without stabilization, and so that the first disturbed areas are completely controlled before the next section is opened.~~

~~11-0109.4B~~

~~B. The developer shall be is required to sequentially phase the E&S controls with the development and construction sequences, and shall must specify in detail which areas will be cleared first, and how long these areas will be exposed to the elements.~~

~~11-0109.4C~~

~~C. No exposure period shall may be planned to exceed 120 days provided, ~~however,~~ except that such the period may be extended by the Director if satisfactory control measures are established and remain in place.~~

~~11-0109.5~~

~~11-0105.5 (38-93 PFM) Temporary/permanent detention shall must be provided to accommodate the increased runoff caused by changed soil and surface conditions effectively during and after development. Additionally, plans shall must address the need to intercept and convey runoff safely to storm drains or natural outlets where it will not erode or flood the land. Provisions also shall must be made to complete the drainage system and make it operational as quickly as possible during construction.~~

~~11-0109.6~~ — ~~Wherever feasible, natural vegetation shall be retained and protected. Where necessary, temporary vegetation and/or mulching shall be used to protect exposed areas during development, until permanent cover can be applied.~~

~~11-0109.7~~

11-0105.6 Sediment basins or sediment traps ~~shall~~ must be installed and maintained to remove sediment from runoff waters from land undergoing development. Storm sewer inlet protection ~~shall~~ must be provided with micro-sediment basins to trap sediment and avoid possible damage resulting from blockage. (See [Plates 1-11](#) and [2-11](#)).

~~11-0109.8~~

11-0105.7 The permanent vegetation and structures ~~shall~~ must be installed as soon as practical in the development.

~~11-0109.9~~ — ~~Paving of streets, parking lots and other areas shall be completed as soon as practical.~~

~~11-0110~~

**11-0106 Data Availability**

~~11-0110.1~~ — ~~(24-88 PFM) Data on various practices and methods of controlling E&S are available at NVSWCD.~~

~~11-0110.2~~

11-0106.1 ~~(56-96 PFM) Other a~~ Agencies available for consultation are [LDS](#), and [DPZ](#) and the [NVSWCD](#).

~~11-0110.3~~

11-0106.2 ~~(107-10 PFM, 24-88 PFM)~~ Standards and specifications are provided in the current [Virginia E&S Control Handbook](#). Some supplemental County standards are included in [Plates 1-11](#) ~~thru~~ through [7 5-11](#), and [Chapter 104](#) of the Code and below. [Section 104-1-8\(a\)](#) of the Code contains modifications to State standards which are mandatory in the County.

A. Standard and Specification #3.05 – Silt Fence. “Super” silt fence (See [Plate 5-11](#)), which is a temporary sediment barrier consisting of synthetic filter fabric stretched across and attached to chain link fencing supported by metal posts, may be utilized below disturbed areas where topographical and drainage conditions do not exceed the design criteria below.

B. Standard and Specification #3.13 - Temporary Sediment Trap. For land areas designated as RPAs, the storage volume must be 202 cy/acre of disturbed area. Pipe outlet sediment traps are required for drainage areas of 1 to 3 acres; for land areas designated as RPAs, pipe outlet sediment traps may also be required for disturbed areas of less than 1 acre where topographical and drainage conditions are favorable for field implementation (see [Plate 2-11](#) for details).

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Stone outlets for temporary sediment traps for drainage areas under 1 acre outside of County designated RPAs must be constructed according to current Virginia E&S Control Handbook specifications.

C. Standard and Specification #3.14 - Temporary Sediment Basin. For land areas designated as RPAs, the storage volume must be 202 cy/acre of disturbed area.

D. Standard and Specification #3.02 - Temporary Stone Construction Entrance. The minimum length for a temporary gravel construction entrance must be 75 feet and a woven filter fabric underliner is required. If the action of vehicles traveling over the gravel pad is not sufficient to remove the majority of the mud, then a wash rack is required with an appropriate water source to wash the mud off the tires before entering the public road.

**Table 11.1 Design Criteria\***

<u>Slope %</u>	<u>Slope Steepness</u>	<u>Slope Length (maximum) ft.</u>	<u>Silt Fence Length (maximum) ft.</u>
<u>0 &lt; 10%</u>	<u>0 &lt; 10:1</u>	<u>Unlimited</u>	<u>Unlimited</u>
<u>10 &lt; 20%</u>	<u>10:1 &lt; 5:1</u>	<u>200</u>	<u>1500</u>
<u>20 &lt; 33%</u>	<u>5:1 &lt; 3:1</u>	<u>100</u>	<u>1000</u>
<u>33 &lt; 50%</u>	<u>3:1 &lt; 2:1</u>	<u>100</u>	<u>500</u>
<u>50%+</u>	<u>2:1+</u>	<u>50</u>	<u>250</u>

Similar to normal silt fence, "Super" silt fence, if utilized, is to be installed on the contour. The quantity of concentrated flow should not exceed 5 cfs.

\*Source: [Maryland Department of Environment, Water Management Administration](#)

~~11-0110.3A Standard and Specification #3.04 Straw Bale Barriers. Rebars shall not be used to stake these barriers. Straw bales are to be used only for sheet flow application; they are not to be used for any drainageway or channel flow applications or site development perimeter control.~~

~~11-0110.3B Standard and Specification #3.06 Brush Barrier. This practice shall not be used without the specific authorization of the Director.~~

~~11-0110.3C Standard and Specification #3.07 Storm Drain Inlet Protection. Any storm drain inlet protection measure which completely blocks the drain throat or entrance shall not be used. Straw bales and cinder block wrapped with filter fabric shall not be used for curb inlet protection.~~

~~11-0110.3D (38-93 PFM) Standard and Specification #3.13 Temporary Sediment Trap. For land areas designated as RPAs, the storage volume shall be 202 cy/acre of disturbed area. Pipe outlet sediment traps shall be required for drainage areas of 1 to 3 acres; for land areas designated as RPAs, pipe outlet sediment traps may also be required for disturbed areas of less than 1 acre where topographical and~~



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~~drainage conditions are favorable for field implementation (see Plate 2-11 for details). Stone outlets for temporary sediment traps for drainage areas under 1 acre outside of County designated RPAs shall be constructed according to current Virginia E&S Control Handbook specifications.~~

~~11-0110.3E (38-93 PFM) Standard and Specification #3.14 Temporary Sediment Basin. For land areas designated as RPAs, the storage volume shall be 202 cy/acre of disturbed area.~~

~~11-0110.3F Standard and Specification #3.34 Bermuda Grass and Zoysia Grass Establishment. This practice shall not be employed.~~

~~11-0110.3G Standard and Specification #3.38 Tree Preservation and Protection. This Section shall not be implemented. In its place, § 12-0000 *et seq.* shall be used.~~

~~11-0110.3H Standard and Specification #3.02 Temporary Stone Construction Entrance. The minimum length for a temporary gravel construction entrance shall be 75 feet and a woven filter fabric underliner is required. If the action of vehicles traveling over the gravel pad is not sufficient to remove the majority of the mud, then a wash rack shall be required with an appropriate water source to wash the mud off the tires before entering the public road.~~

~~11-0110.3I Standard and Specification #3.31 Temporary Seeding. Temporary seeding and mulching shall be required once an area is denuded for a maximum of 14 days except for that portion of the site in which work will be continuous beyond 14 days. For winter stabilization, any area denuded for 14 days after November 1 shall be seeded and mulched with the appropriate seed mixture as specified in Chapter 3 of the current "Virginia Erosion and Sediment Control Handbook."~~

~~11-0110.3J Standard and Specification #3.05 Silt Fence. "Super" silt fence (See Plate 7-11), which is a temporary sediment barrier consisting of synthetic filter fabric stretched across and attached to chain link fencing supported by metal posts, may be utilized below disturbed areas where topographical and drainage conditions do not exceed the design criteria below.~~

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~~\*Design Criteria~~

<del>Slope %</del>	<del>Slope Steepness</del>	<del>Slope Length (maximum) ft.</del>	<del>Silt Fence Length (maximum) ft.</del>
<del>0 &lt; 10%</del>	<del>0 &lt; 10:1</del>	<del>Unlimited</del>	<del>Unlimited</del>
<del>10 &lt; 20%</del>	<del>10:1 &lt; 5:1</del>	<del>200</del>	<del>1500</del>
<del>20 &lt; 33%</del>	<del>5:1 &lt; 3:1</del>	<del>100</del>	<del>1000</del>
<del>33 &lt; 50%</del>	<del>3:1 &lt; 2:1</del>	<del>100</del>	<del>500</del>
<del>50%+</del>	<del>2:1+</del>	<del>50</del>	<del>250</del>

~~Similar to normal silt fence, "Super" silt fence, if utilized, is to be installed on the contour. The quantity of concentrated flow should not exceed 5 cfs.~~

~~\*Source: Maryland Department of Environment, Water Management Administration~~

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**11-0200 — CONTROL MEASURES FOR BUILDING PERMIT APPLICATIONS AND SMALL AREA GRADING PERMITS (55-96 PFM)**

**11-0201 — Applicability**

~~11-0201.1 — (38-93 PFM) Chapter 104 of the Code requires prior approval of an E&S control plan before clearing, grading, filling or otherwise disturbing natural terrain on any area over 2,500 square feet.~~

~~11-0201.2 — (38-93 PFM) Part 6 of Article 2 of the Zoning Ordinance requires approval of an E&S control plan before the removal or addition of soil in excess of 18 inches in an area exceeding 2,500 square feet.~~

**11-0202 — General Requirements**

~~11-0202.1 — Provisions for E&S control shall be shown on all grading plans unless otherwise exempted by Chapter 104 of the Code.~~

~~11-0202.1A — (38-93 PFM) The measures shown shall be reviewed by the Director.~~

~~11-0202.1B — A determination shall be made by the Director as to the adequacy of proposed control measures.~~

~~11-0202.1C — A conservation agreement and a cash deposit shall be required from the owner as set forth in § 2-0700 *et seq.*~~

~~11-0202.2 — A copy of the approved grading plan shall be kept on the site with the building permit during grading operations.~~

~~11-0202.3 — On small area grading plans, sufficient spot elevations and flow arrows shall be provided to show adequately the disposition of surface water.~~

~~11-0202.4 — (38-93 PFM) The owner/developer shall certify in a statement on the plan that all wetlands permits required by law will be obtained prior to commencing land disturbing activities. Evidence of such permits shall be provided to the Director prior to commencing land disturbing activities. For those activities regulated under general permits for which the issuing agencies do not normally provide written confirmation of permit issuance, a copy of the general permit(s) and a statement describing the proposed activity and certifying compliance with all applicable permit conditions will serve as the required evidence. Wetlands permits include both COE Permits and Virginia Water Protection Permits.~~

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~~11-0300~~

**11-0200 MINIMIZING FUTURE EROSION AND OTHER DRAINAGE RELATED PROBLEMS ON FCPA LANDS**

~~11-0301~~

**11-0201 Site Inspection**

~~11-0301.1~~

11-0201.1 The condition of the stream banks on land proposed for [FCPA](#) or other public agency acquisition ~~shall~~ must be inspected in the preliminary plat stage by representatives of the [FCPA](#) or other appropriate administering public agency and representatives of the Director.

~~11-0301.2~~

11-0201.2 If it is found that the stream banks are badly undercut or eroded or show signs of becoming so, the locations ~~shall~~ must be noted on the preliminary plat. Appropriate corrections satisfactory to the Director ~~shall~~ must be included in the subdivision or site plan for the project. All land in public ownership ~~shall~~ must receive a similar inspection.

~~11-0302~~

**11-0202 Plan Preparation**

~~11-0302.1~~

11-0202.1 Particular attention ~~shall~~ must be paid to the siting of new outfalls into park and/or other public property to ensure that they discharge into natural swales and that this discharge will be near enough to the undeveloped flow so that no major change in the swale will result.

~~11-0302.2~~

11-0202.2 Sediment ~~basins ponds~~ ~~shall~~ may not be placed on [FCPA](#) land unless required in conjunction with construction by the [FCPA](#) on its own land. Where necessary, stormwater detention ponds may be placed on land to be acquired by the [FCPA](#) and/or other public agency after obtaining that agency's approval. The [FCPA](#) ~~shall~~ must follow all County requirements and policies for construction on its own land.

~~11-0302.3~~

11-0202.3 Where a waiver of stormwater detention facilities on developments above [FCPA](#) and/or other public agency lands is requested, the review engineer ~~shall~~ must ascertain that omission of these facilities ~~shall~~ will not cause accelerated erosion or degradation of any public property.

~~11-0302.4~~

11-0202.4 "Corrective work" ~~shall~~ must be carefully limited to ensure that installation is not more damaging than the natural forces. The correction may be limited to such items as minor tree removal, minor excavation of sandbars, and minor riprapping or gabion support for undercut banks.

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~~11-0400~~

**11-0300**

**PLAN REVIEW AND ORDINANCE ENFORCEMENT (~~55-96 PFM~~)**

~~11-0401~~

**11-0301**

**General Information**

~~11-0401.1~~

11-0301.1

The accelerated erosion from construction activities and the subsequent deposition of sediments in stream channels, storm sewers, ponds and lakes have come to be recognized as major environmental concerns.

~~11-0401.2~~

11-0301.2

Soil loss represents a cost to the developer and ~~his~~ the developer's client, while sedimentation, a public and private cost, reduces channel and sewer capacities, smothers aquatic growth on which fish and wildlife feed, provides transportation for other pollutants, and causes rapid degradation of recreational values of private and public impoundments. Additionally, after construction is completed, the increased quantity and velocity of runoff causes erosion of the stream banks and bottom.

~~11-0401.3~~

11-0301.3

The procedures called for in [§ 11-0300](#) ~~11-0400~~ *et seq.* result from public reaction to obvious instances of accelerated E&S, some of it damaging to individuals, some to the general public.

~~11-0401.4~~

11-0301.4

Recognizing that sediment is a major pollutant, all who have responsibility in the fields of development and construction should be aware of what can be accomplished and include in their operations systematic consideration of soil problems and control measures.

~~11-0401.5~~

11-0301.5

Included in [§ 11-0300](#) ~~11-0400~~ *et seq.* is information prepared specifically for use in the County, such as soil data, helpful design information not included in the "[Virginia E&S Control Handbook](#)," and a listing of local sources of assistance in E&S control plan development.

~~11-0402~~

**11-0302**

**Applicability of the Virginia E&S Control Handbook (~~38-93 PFM~~)**

~~11-0402.1~~

11-0302.1

The State Minimum Standards and Specifications, contained in Chapter 3 of the current "[Virginia Erosion and Sediment Control Handbook](#)" modified for the County as shown in [§ 11-0000](#) *et seq.* ~~shall be~~ are mandatory.

~~11-0402.2~~

11-0302.2

The program covered in [§ 11-0000](#) *et seq.* has been approved by the [Virginia Division of Soil and Water Conservation](#).



**11-0403 — General Principles**

11-0403.1 — Erosion is caused by rainfall and runoff. The energy of raindrops displaces soil particles on incompletely protected areas, and water running over this land toward downstream channels moves these soil particles generally in proportion to the water's velocity and volume.

11-0403.2 — As the volume and velocity increase, additional particles are picked up from the channels and added to the sediment load.

11-0403.3 — Deposition occurs as the water slows down in dispersion or behind barriers such as causeways and dams.

**11-0404 — Specifics for Reduction of Soil Loss and Sediment Deposit**

11-0404.1 — Minimize the area of soil exposed.

11-0404.1A — A 2-inch storm of high intensity is made up of raindrops traveling 18 to 20 mph at time of impact, releasing up to 4 million foot pounds of energy per acre per year. Raindrops knock the soil particles loose from unprotected surfaces into suspension, causing sheet erosion as the muddy water flows downhill.

11-0404.1B — The impact of the rain also tends to seal the surface, reducing the amount of water that can infiltrate into the soil, thereby increasing the runoff.

11-0404.1C — As the runoff water concentrates, rill and gully erosion result as the energy from the increased velocity and volume of water causes dislodging of additional soil particles.

11-0404.1D — The smaller the area exposed, the less chance there is for this energy to produce costly soil loss.

11-0404.1E — Soil exposure can be reduced by minimizing grading, by adapting the development to the natural terrain, and by limiting grading to areas of workable size.

11-0402.2 — Reduce the duration of soil exposure.

11-0404.2A — In the County, 75 percent of the erosion producing rainstorms occur during a five-month period, May 1 to Oct. 1, which coincides with the active construction season. Fifty percent of the rainstorms occur during the period from June 1 to Sept. 1.

11-0404.2B — Because the average amount of rainfall is evenly distributed throughout the year, it follows that 25 percent to 40 percent of the total rainfall produces 50 percent to 75 percent of the erosion.

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- ~~11-0404.2C — The less time the land is exposed during this vulnerable period, the less chance there is of serious erosion.~~
- ~~11-0404.3 — Protect the soil with mulch or vegetative cover.~~
- ~~11-0404.3A — The objectives of § 11-0404.1 and 11-0404.2C can be accomplished by covering denuded areas quickly with mulches of straw, hay or fibers, by sodding or by planting with temporary or permanent vegetation.~~
- ~~11-0404.3B — All areas not being actively worked shall be covered. This requires detailed scheduling for grading, utilities installation and building construction.~~
- ~~11-0404.3C — Mulch or grass will absorb the impact energy of raindrops, slow the flow and permit more rainfall to soak into the soil.~~
- ~~11-0404.3D — Street areas can be protected by installing the gravel base early.~~
- ~~11-0404.4 — Reduce the velocity of runoff with planned engineering works.~~
- ~~11-0404.4A — Water velocity provides energy for soil transportation.~~
- ~~11-0404.4B — Velocities of 6 to 8 FPS will cause erosion even on a cohesive soil with good vegetation.~~
- ~~11-0404.4C — Intercceptors and diversions with grades of ½ percent to 3 percent will reduce velocities to the point where erosion is minimized and deposition will occur on-site rather than off-site.~~
- ~~11-0404.5 — Reduce the volume of runoff on denuded areas with planned diversions.~~
- ~~11-0404.5A — A diversion at the top of a slope can reduce the volume of flow across the slope to that which actually falls on the slope.~~
- ~~11-0404.5B — The energy of an ever increasing stream running unimpeded for lengths of 50 feet or more down a 10 percent grade will carve large gullies in a single storm.~~
- ~~11-0404.5C — Designed interceptors which divert the flow to protected areas can reduce the volume of flow across unprotected areas and minimize gullyng. Temporary storage can produce the same benefits.~~
- ~~11-0404.6 — Prepare the drainageways to handle the concentrated and increased runoff.~~

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~~11-0404.6A — Paving, riprap, sodding or protection by seeding and anchoring with jute or other fibers permit waterways to carry the increased peak volumes and velocities without contributing to the erosion potential.~~

~~11-0404.6B — The waterway must be protected in advance of the increase in runoff.~~

~~11-0404.7 — Trap the sediment in temporary or permanent basins.~~

~~11-0404.7A — Stopping the flow for even short periods of time will cause some deposition to occur.~~

~~11-0404.7B — Sediment basins offer the most positive remedy against downstream sedimentation. For the basins to be effective, however, a proper maintenance program must be in place for their periodic cleanout and proper disposal of the removed sediment.~~

~~11-0404.7C — Only 70 percent to 80 percent trap efficiency is attainable with mechanical measures, while 98 percent to 99 percent efficiency is possible with vegetative measures.~~

~~11-0404.8 — Maintain the work done and inspect it frequently.~~

~~11-0404.8A — Diversion berms which are breached during construction and not repaired are of no value when the storm occurs. Likewise, sediment traps which are full have no further functional value.~~

~~11-0404.8B — Gullies starting on seeded slopes may be checked if quick action is taken for repair.~~

~~11-0404.8C — All measures must be inspected at the close of each work day and after every rainstorm.~~

11-0405

### **11-0303 Plan Review and Ordinance Enforcement**

#### **11-0303.1 Responsibilities and Procedures.**

A. [Land Development Services](#) has overall responsibility for the E&S control program, including enforcement of requirements for the preparation and submittal of plans and of inspection to see that the plans are effectively followed.

B. Complaints concerning absent or ineffective E&S control measures should be referred to the [Site Development and Inspections Division](#) for investigation and report.

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11-0303.2 Assistance. All concerned County agencies are encouraged to seek the assistance of the [NVSWCD](#) for problems of soils, vegetative covers and other E&S controls.

11-0303.3 Review of E&S Control features – [Site Development and Inspections Division, Land Development Services](#).

A. The [NVSWCD](#) provides advice and reviews plans as requested. The [NVSWCD](#) staff is available to provide technical assistance on all proposed developments.

B. [Special Procedures Applicable to County Projects and Pohick Basin Projects](#). The following items apply in addition to those above:

1. The [Customer and Technical Support Center](#) will send to the [NVSWCD](#), one copy of the following:

a. [Preliminary plats](#) and all construction plans located in the Pohick Basin.

b. [All County Projects](#).

c. [Any other plans which appear to involve special difficulties in soil types and slopes as determined by the \[Site Development and Inspections Division \\(SDID\\)\]\(#\).](#)

2. The [NVSWCD](#) will review plans and recommend locations and types of treatment or concur in those proposed, and will recommend additional measures based on field observation of current projects. The [NVSWCD](#) will be available to assist the developer or the developer's agent in the preparation of E&S control plans during the preliminary planning stage.

11-0303.4 Construction Plans and Profiles.

A. [An identifiable E&S control plan\(s\) must be included for each construction plan. The plan must meet the general guidelines for preparing an E&S control plan contained in Chapter 6 of the current "\[Virginia Erosion and Sediment Control Handbook\]\(#\)."](#) The plan must include a written summary of the measures to be used and the sequence of construction as it relates to the E&S control program.

B. [Major soil types must be identified in the area and the physical limitations of the soils must be determined for the intended use.](#)

C. [Standard conservation notes applicable to the site must appear with the E&S control plan as set forth in \[§ 11-0304\]\(#\) and \[11-0305\]\(#\).](#)

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- ~~11-0405.1 (38-93 PFM) References. The following documents contain specific requirements affecting E&S control in the County.~~
- ~~11-0405.1A Code, § 105-1-1 (Pollution of State Waters).~~
- ~~11-0405.1B Subdivision Ordinance, § 101-2-2(17) as amended, of the Code.~~
- ~~11-0405.1C Zoning Ordinance, § 2-601 and 2-603 as amended.~~
- ~~11-0405.1D Code, Article 1 of Chapter 104 (Erosion and Sedimentation Control).~~
- ~~11-0405.1E (38-93 PFM) The Virginia E&S Control Law, Title 10.1, Chapter 5 of the Va. Code, as amended.~~
- ~~11-0405.1F The Virginia E&S Control Handbook, current edition.~~
- ~~11-0405.2 General Enforcement.~~
- ~~11-0405.2A In strengthening the County requirements for E&S control, the Board intended prompt and effective enforcement of both the spirit and letter of the changes.~~
- ~~11-0405.2B The responsibilities of the Director and other County agencies in the review, approval and inspection of plans for the reduction of E&S and promotion of land conservation are indicated in § 11-0000 *et seq.*~~
- ~~11-0405.3 Responsibilities and Procedures.~~
- ~~11-0405.3A (38-93 PFM) The Director is the Program Administrator and Plan Approving Authority as defined in § 10.1-560 of the Va. Code, as amended.~~
- ~~11-0405.3B Land Development Services, DPWES, has overall responsibility for the E&S control program, including enforcement of requirements for the preparation and submittal of plans and of inspection to see that the plans are effectively followed.~~
- ~~11-0405.3C Site Development and Inspections Division, Land Development Services, DPWES.~~
- ~~11-0405.3C(1) This Division has primary responsibility for enforcing the requirements of the preparation of subdivision plans and site development plans relating to the control of E&S; and for specific review from the initial submission to final approval of all site plans, subdivision plans and grading plans involving land disturbance.~~
- ~~11-0405.3C(2) The Site Development and Inspections Division shall review all School Board,~~

## 11-0000 EROSION AND SEDIMENT CONTROL

~~FCPA, Fairfax Water, and DPWES projects for adherence to the same standards of E&S control and conservation as required for private developers and shall ensure that easements needed for proper control are specified on the plans.~~

~~11-0405.3C(3) All requests for clearing and grading permits, building permits and other requests involving clearing, grading, filling and construction shall be routed to the Site and Addressing Center for determination of E&S control requirements as specified in § 11-0000 *et seq.*~~

~~11-0405.3C(4) Where it is determined that E&S controls are required, the Site Development and Inspections Division shall be the approving authority for the plans. A two-phased construction permit will be issued by the Site and Addressing Center, Land Development Services, only after it has determined the estimated cost of providing this control and a conservation agreement and cash deposit have been executed by the owner or developer for compliance with the required conservation measures.~~

~~11-0405.3C(5) The Site Development and Inspections Division has overall responsibility for ensuring that controls shown on approved plans are installed and maintained.~~

~~11-0405.3C(6) The Site Development and Inspections Division has primary responsibility for field inspection to ensure that the E&S control measures shown on approved grading plans or site and subdivision plans are actually provided. Field inspectors are authorized to make minor modifications to the requirements shown on plans where necessary to conform to field conditions or to ensure effective control. Major changes shall be cleared with the site plan reviewers.~~

~~11-0405.3C(7) Complaints concerning absent or ineffective E&S control measures shall be referred to the Site Development and Inspections Division for investigation and report.~~

~~11-0405.3D Zoning Enforcement Branch, Zoning Administration Division, DPZ—The Zoning Enforcement Branch shall ensure that violations noted during zoning inspections are brought to the attention of the Director, Site Development and Inspections Division, or the Director of Land Development Services.~~

~~11-0405.4—Training.~~

~~11-0405.4A—The Director shall ensure that all appropriate personnel are familiar with the E&S control requirements of the Code and the PFM.~~

~~11-0405.4B—Following completion of the initial training program, periodic refresher courses in E&S control shall be conducted to ensure that new employees are trained and that all personnel are kept abreast of the latest developments.~~

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~~11-0405.4C (38-93 PFM) All training shall be monitored by Land Development Services.~~

~~11-0405.5 Publicity.~~

~~11-0405.5A Divisions within DPWES with a responsibility for administering E&S control requirements shall establish an information program to inform the general public, developers, engineers, and County employees of the progress being made or the failures noted in the E&S program, with emphasis on the demonstrated practicality and limitations of specific operations or measures.~~

~~11-0405.5B All publicity releases shall be cleared through the Office of the Director, to the Director of Public Affairs.~~

~~11-0405.6 (56-96 PFM) Assistance. All concerned County agencies are encouraged to seek the assistance of the NVSWCD in resolving problems of soils, vegetative covers and mechanical controls.~~

~~11-0405.7 Review of E&S Control features Site Development and Inspections Division, Land Development Services.~~

~~11-0405.7A General.~~

~~11-0405.7A(1) Objective. The objective is to reduce soil loss and downstream sedimentation through practical agronomic measures and engineering works.~~

~~11-0405.7A(2) Means of Control. Any measures that protect the surface, to increase the erosion resistance of the slope, or to reduce the volume and velocity of surface flow.~~

~~11-0405.7B (38-93 PFM) Procedures and Responsibilities. In order to meet the objectives above, the following groups shall review E&S control plans systematically and at all stages for construction in the County:~~

~~11-0405.7B(1) (38-93 PFM) The Site Development and Inspections Division shall highlight major expected problem areas in initial review of preliminary subdivision plans and site plans. The major contribution to E&S control review shall be made by the reviewing engineer on all construction plans, site plans and grading plans.~~

~~11-0405.7B(2) (102-08 PFM, 38-93 PFM) Urban Forest Management may review all construction plans to insure that proposed controls are consistent with proper tree preservation except those exempt from Chapter 122.~~

~~11-0405.7B(3) (56-96 PFM) Bonds & Agreements, Land Development Services, shall obtain conservation agreements and cash deposits for the installation and maintenance of E&S control measures associated with major plans.~~

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~~11-0405.7B(4) (56-96 PFM) Site and Addressing Center, Land Development Services, shall obtain conservation agreements and cash deposits for plans approved prior to issuing any construction permits for rough grading and building permits.~~

~~11-0405.7B(5) (56-96 PFM) The NVSWCD provides advice and reviews plans as requested. The NVSWCD staff is available to provide technical assistance on all proposed developments, and can provide a maximum contribution if consulted prior to the start of detailed planning.~~

~~11-0405.7C Special Procedures Applicable to County Projects and Pohick Basin Projects. The following items apply in addition to those above:~~

~~11-0405.7C(1) Following County review, the Customer and Technical Support Center shall send to the NVSWCD, one copy of the following:~~

~~11-0405.7C(1)(a) Preliminary plats and plans and profiles for subdivisions, Pohick Basin.~~

~~11-0405.7C(1)(b) Site plans and pre-site plans, Pohick Basin.~~

~~11-0405.7C(1)(c) All DPWES, FCPA, Fairfax Water, and School Board projects, regardless of basin.~~

~~11-0405.7C(1)(d) Any other plans which appear to involve special difficulties in soil types and slopes.~~

~~11-0405.7C(2) (38-93 PFM) The NVSWCD will review plans and recommend locations and types of treatment or concur in those proposed, and will recommend additional measures based on field observation of current projects. The NVSWCD will be available to assist the developer or his agent in the preparation of E&S control plans during the preliminary planning stage.~~

~~11-0405.7D (38-93 PFM) Coordination within the Site Development and Inspections Division. The site inspector shall maintain a liaison with the site plan reviewer to:~~

~~11-0405.7D(1) Ensure installation and maintenance of E&S control measures called for on plans.~~

~~11-0405.7D(2) Determine effectiveness of measures proposed and installed with particular attention to reporting measures which prove highly effective as well as those which turn out to be ineffective or impractical in the field.~~

~~11-0405.7D(3) Receive suggestions for improvements as to:~~

~~11-0405.7D(3)(a) Effectiveness.~~



~~11-0405.7D(3)(b) Practicality and Cost.~~

~~11-0405.7D(4) Determine training needs of engineers, inspectors and builders.~~

~~11-0405.8 — E&S Control Review Sequence and Check List.~~

~~11-0405.8A — Preliminary plats and preliminary site plans.~~

~~11-0405.8A(1) The following information shall be provided:~~

~~11-0405.8A(1)(a) Soil boundaries of all major soil types.~~

~~11-0405.8A(1)(b) Approximate limits of clearing and grading.~~

~~11-0405.8A(1)(c) Tentative means of E&S control.~~

~~11-0405.8A(1)(d) Phasing of development to minimize area and time of exposure.~~

~~11-0405.8A(1)(e) Location of on-site detention measures.~~

~~11-0405.8A(2) The preliminary plan should not be cluttered with detailed control measures; control measures shall be depicted on construction plans.~~

~~11-0405.8B Subdivision plans and profiles, site plans and grading plans.~~

~~11-0405.8B(1) (38-93 PFM) An identifiable E&S control plan(s) shall be included for each subdivision, site or grading plan. The plan shall meet the general guidelines for preparing an E&S control plan contained in Chapter 6 of the current "Virginia Erosion and Sediment Control Handbook". The plan shall include a written summary of the measures to be used and the sequence of construction as it relates to the E&S control program.~~

~~11-0405.8B(2) Major soil types shall be identified in the area and the physical limitations of the soils shall be determined for the intended use.~~

~~11-0405.8B(3) (38-93 PFM) Standard conservation notes applicable to the site shall appear with the E&S control plan as set forth in § 11-0406 and 11-0407.~~

11-0406

**11-0304 General Land Conservation Notes**

11-0406.1

11-0304.1

~~(38-93-PFM)~~ No disturbed area which is not actively being worked shall ~~may~~ remain denuded for more than 14 calendar days unless otherwise authorized by the Director.

11-0406.2

11-0304.2

All E&S control measures approved with the phase one E&S control plan shall ~~shall~~ must be placed as the first step in grading.

11-0406.3

11-0304.3

~~(38-93-PFM)~~ All storm and sanitary sewer lines not in streets shall ~~must~~ be seeded and mulched within 14 days after backfill. No more than 500 feet shall ~~may~~ be open at any one time.

11-0406.4

11-0304.4

~~(38-93-PFM)~~ Electric power, telephone and gas supply trenches shall ~~must~~ be compacted, seeded and mulched within 14 days after backfill.

11-0406.5

11-0304.5

~~(38-93-PFM)~~ All temporary earth berms, diversions and sediment control dams shall ~~must~~ be seeded and mulched for temporary vegetative cover immediately (as soon as possible but no later than 48 hours) after completion of grading. Straw or hay mulch is required. All soil stockpiles shall ~~must~~ be seeded and mulched within 14 days after grading.

11-0406.6

11-0304.6

During construction, all storm sewer inlets shall ~~must~~ be protected by sediment traps, maintained and modified during construction progress as required.

11-0406.7

11-0304.7

Any disturbed area not covered by [§ 11-0304.1](#) ~~11-0406.1~~ and not paved, sodded or built upon by Nov. 1, or disturbed after that date, shall ~~must~~ be mulched immediately with hay or straw mulch at the rate of 2 tons/acre and over-seeded by April 15.

11-0406.8

11-0304.8

At the completion of any project construction and ~~prior to~~ before bond release, all temporary sediment controls shall ~~must~~ be removed and all denuded areas shall ~~must~~ be stabilized.

11-0407

**11-0305 Land Conservation Notes - Linear Projects ~~(38-93-PFM)~~**

11-0407.1

11-0305.1

No disturbed area which is not actively being worked shall ~~may~~ remain denuded for more than 14 calendar days unless authorized by the Director.

11-0407.2

11-0305.2

Sediment control measures, as appropriate, shall ~~must~~ be placed as shown on the approved plans as the first step in the land disturbing process.

11-0407.3

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11-0305.3 Where consistent with job safety requirements, all excavated material ~~shall~~ must be placed on the uphill side of trenches. No material ~~shall~~ may be placed in streambeds. Any stockpiled material which will remain in place longer than 14 days ~~shall~~ must be seeded and mulched. When spoil is placed on the downhill side of trench, it ~~shall~~ must be backsloped to drain toward the trench. When necessary to dewater the trench, the pump discharge hose ~~shall~~ must outlet in a stabilized area or a sediment trapping device.

~~11-0407.4~~

11-0305.4 Where stream crossings are required for equipment, temporary culverts ~~shall~~ must be provided.

~~11-0407.5~~

11-0305.5 No more than 500 feet of trench ~~shall~~ may be open at any one time.

~~11-0407.6~~

11-0305.6 All disturbed areas ~~shall~~ must be seeded and mulched within 14 days after backfill of the applicable trench section. Speed is the essential land conservation element for linear projects.

~~11-0407.6A~~

A. The existing and proposed drainage patterns ~~shall~~ must be examined. The drainage area and the 2-yr storm runoff quantities ~~shall~~ must be reviewed to determine the existing and proposed direction of stormwater runoff.

~~11-0407.6B~~

B. The acreage to be disturbed ~~shall~~ must be identified.

~~11-0407.6C~~

C. The exit swales and slopes to the following ~~shall~~ must be examined:

~~11-0407.6C(1)~~

1. Off-site properties.

~~11-0407.6C(2)~~

2. Parklands.

~~11-0407.6C(3)~~

3. Major streams and lakes or ponds.

~~11-0407.6D~~

D. A determination ~~shall~~ must be made as to what property would be impacted by sediment if controls are not provided.

~~11-0407.6E~~

E. Tree preservation and other areas to remain undisturbed ~~shall~~ must be determined and depicted on the plan.

~~11-0407.6F~~

F. Possible problem areas ~~shall~~ must be identified and addressed.

~~11-0407.6G~~

G. The lengths and grades of existing and proposed long slopes ~~shall~~ must be examined:

~~11-0407.6G(1)~~

1. Classify soils as to degree of erodibility.

~~11-0407.6G(2)~~

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- 11-0407.6G(3) 2. Check velocities of sheet, swale or pipe discharge on slopes, or unprotected soil surfaces.
- 11-0407.6G(4) 3. Check use of diversions and seeding and mulching when slope exceeds 4:1 and length exceeds 20 feet. See that adequate outlets are provided for diversions.
- 11-0407.6H 4. Look for interceptor ditch at top of cut slopes, for berm (dike) at base of fill slopes and see that outlets with storage are provided.
- 11-0407.6I H. Storm and sanitary sewer routes ~~shall~~ must be reviewed. Sediment traps around all structures and work area sediment controls ~~shall~~ must be identified. The construction sequence ~~shall~~ must be visualized.
- 11-0407.6I(1) I. The locations for and suitability of the following ~~shall~~ must be checked:
- 11-0407.6I(2) 1. Temporary diversion dikes, ditches and terraces.
- 11-0407.6I(3) 2. Permanent dikes, ditches and terraces.
- 11-0407.6I(4) 3. Temporary seeding and mulching, highly erodible areas, steep and long slopes.
- 11-0407.6I(5) 4. Sediment barriers, straw bales, gravel weirs and silt fences.
- 11-0407.6I(6) 5. Minor sediment dams, areas 2 to 3 acres.
- 11-0407.6J 6. Major sediment basins, drainage areas over 3 acres (to be designed structures).
- 11-0407.6K J. The sequence of construction operations and areas to be disturbed simultaneously ~~shall~~ must be checked.
- 11-0407.6L K. The instructions to the contractor ~~shall~~ must be reviewed for clarity.
- 11-0407.6M L. The proposed timing of construction ~~shall~~ must be reviewed for suitability of planting and mulching provisions. The time span for establishment of permanent cover ~~shall~~ must be checked.
- 11-0407.6N M. The adequacy of diversions to handle the design storm runoff without excessive velocities or over-topping and the dimensions of all storage areas and outlets ~~shall~~ must be checked. A minimum of 134 cy of storage per acre ~~shall~~ must be provided and sediment basin dimensions ~~shall~~ must be shown on the plans.

~~11-0407.6N~~

N. Adequate instructions to the contractor and the developer ~~shall~~ must be provided to ensure proper maintenance of the E&S control facilities (including cleanout). A daily inspection by the contractor ~~shall be~~ is required.

~~11-0407.6O~~

O. Maximum erosion occurs during construction; the period immediately following stripping and stockpiling of topsoil is critical. The probable drainage flow expected before and during the time of maximum erosion ~~shall~~ must be considered while the grading is being done and the storm drainage ditches are being dug.

~~11-0407.6P~~

P. Since the maximum runoff also occurs during construction, it is essential that sediment traps and basins be constructed ~~prior to~~ before general stripping and be maintained during construction to provide temporary stormwater management to compensate for increased runoff. A minimum runoff coefficient of 0.5 ~~shall~~ must be used to design these temporary measures.

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**11-0408 — Soils of the County**

- ~~11-0408.1 (107-10 PFM, 56-96 PFM) The comprehensive source of information about soils in the County is the Soil Survey of Fairfax County, prepared by the NRCS and publicly released in January 2008. This survey describes 108 units of soils, numbered 1-57, and 59-109. Names for the units of soils were formulated using the NRCS's Soil Taxonomy: 2<sup>nd</sup> Ed. (see 11-0103.2B) The differences in soil characteristics (i.e., color, texture, depth, drainage, chemistry, permeability, erodibility, etc.) are due to the diversity of parent materials and topography in the County.~~
- 11-0408.2 (107-10 PFM) Three major separations, or physiographic provinces, have been identified in the County (see Plate 3-11):
- 11-0408.2A The Piedmont Upland which extends northeast and southwest through the center of the County and consists of soils developing in metamorphic and igneous rocks;
- 11-0408.2B The Piedmont Triassic Lowlands to the west which consist primarily of shallow soils developing in sedimentary rock and igneous intrusions;
- 11-0408.2C The Coastal Plain which consists of soils developing in alluvial deposits of sand, silt and clay sediments.
- 11-0408.2D The depth of unconsolidated soil materials in the County may be from 2 inches to over 100 feet thick in the Piedmont provinces, and may reach a depth of 1,200 feet in the Coastal Plain.
- 11-0408.3 Soil textures range from clayey to silty to sandy to gravelly. The topography ranges from nearly level to very steep. All areas of the County have both well-drained and poorly drained soils and gradations in between, often in close topographic association. Some soils are well suited to most engineering uses, while many soils have one or more limiting soil properties which require sound engineering practice to avoid soil related problems relative to foundation support, slope stability, drainage, and erosion.
- 11-0408.4 There are significant soil differences, and similarities, that exist in and among the various areas of the County. These factors must be recognized in order to determine practices required for successful use and management. Primary soil characteristics that influence erosion by rainfall and runoff are soil texture, organic matter content, natural soil structure, and soil permeability.
- 11-0408.5 While soils of the County are extremely varied as to composition, grain size, cementation and compaction, many are highly erodible, particularly in the surface horizon and lower strata. Soils occurring on moderate to steep slopes are especially

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subject to erosion. It is not always possible for the layman to recognize a highly erodible soil horizon since it may be masked by a stand of vegetative cover or may exist as a soil horizon beneath a surface soil of different characteristics.

- 11-0408.6 — Highly erodible soils often have low cohesive strength. Cohesive strength is usually a function of the clay sized fraction, and soil structure. Soils containing high percentages of fine micaceous silt and coarse sands in substrata of some soils in the Piedmont Upland are especially subject to erosion. However, there is no absolute rule of thumb because soil characteristics can be variable even within the boundaries of individual soil mapping units.
- 11-0408.7 — It is very important, however, that the presence of highly erodible soils be confirmed early, prior to changing the existing use and management of a site. A thorough knowledge of the soils involved is essential to successful planning for E&S control. These factors may not be the controlling soil characteristics for project construction, but need to be considered in developing effective E&S control plans.
- 11-0408.8 — (107-10 PFM, 56-96 PFM) The Erosion Factor and selected engineering data for the County Soils are available on the NRCS website. Additional information and advice concerning the County soils is available from the NVSWCD and the NRCS.
- 11-0408.9 — (107-10 PFM) Soil survey maps and data should be regarded as excellent guides for conducting preliminary detailed engineering investigations, and in making land-use decisions. They should not be used alone for design or construction purposes.
- 11-0408.10 — (107-10 PFM, 56-96 PFM) In the following tables, soils are listed by Soil Series name. Soil maps available from the County utilize a numeric system of soil identification, for example, 39B:
- 39 — Soil Number — Glenelg silt loam (Soil Series name and type) (see Table 11.2)
- B — Grade Class — 2 percent to 7 percent grades
- The first number(s) in the legend indicates the Soil Series name and Soil Type (which is the texture of the surface, or A horizon, of the representative soil of the Series). The letter in the legend indicates the grade class. (See Table 11.1)
- 11-0408.11 — (107-10 PFM, 56-96 PFM) The legend used on the County soil maps is located in Plate 4-11.

**Table 11.1 ~~Grade Class (107-10-PFM)~~**

- ~~A = 0 - 2%~~
- ~~B = 2 - 7%~~
- ~~C = 7 - 15%~~
- ~~D = 15 - 25%~~
- ~~E = 25 - 45%~~

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**Table 11.2 Numerical Index County Soils**

1A, Albano silt loam, 0 to 2 percent slopes  
 2B, Ashburn silt loam, 2 to 7 percent slopes  
 3, Barkers Crossroads loam, 0 to 45 percent slopes  
 4B, Barkers Crossroads Nathalie complex, 2 to 7 percent slopes  
 4C, Barkers Crossroads Nathalie complex, 7 to 15 percent slopes  
 4D, Barkers Crossroads Nathalie complex, 15 to 25 percent slopes  
 5B, Barkers Crossroads Rhodhiss complex, 2 to 7 percent slopes  
 5C, Barkers Crossroads Rhodhiss complex, 7 to 15 percent slopes  
 5D, Barkers Crossroads Rhodhiss complex, 15 to 25 percent slopes  
 5E, Barkers Crossroads Rhodhiss complex, 25 to 45 percent slopes  
 6B, Barkers Crossroads Rhodhiss Rock outcrop complex, 2 to 7 percent slopes  
 6C, Barkers Crossroads Rhodhiss Rock outcrop complex, 7 to 15 percent slopes  
 6D, Barkers Crossroads Rhodhiss Rock outcrop complex, 15 to 25 percent slopes  
 6E, Barkers Crossroads Rhodhiss Rock outcrop complex, 25 to 45 percent slopes  
 7B, Beltsville silt loam, 2 to 7 percent slopes  
 8A, Bermudian silt loam, 0 to 2 percent slopes occasionally flooded  
 9B, Birdsboro loam, 2 to 7 percent slopes  
 10A, Bowmansville silt loam, 0 to 2 percent slopes, occasionally flooded  
 11B, Catlett gravelly silt loam, 2 to 7 percent slopes  
 11C, Catlett gravelly silt loam, 7 to 15 percent slopes  
 11D, Catlett gravelly silt loam, 15 to 25 percent slopes  
 12, Chantilly loam, 0 to 45 percent slopes  
 13A, Chantilly Albano complex, 0 to 2 percent slopes  
 14B, Chantilly Ashburn complex, 2 to 7 percent slopes  
 15A, Chantilly Bermudian complex, 0 to 2 percent slopes  
 16B, Chantilly Birdsboro complex, 2 to 7 percent slopes  
 17A, Chantilly Bowmansville complex, 0 to 2 percent slopes  
 18B, Chantilly Catlett complex, 2 to 7 percent slopes  
 18C, Chantilly Catlett complex, 7 to 15 percent slopes  
 18D, Chantilly Catlett complex, 15 to 25 percent slopes  
 19B, Chantilly Clover complex, 2 to 7 percent slopes  
 20B, Chantilly Delanco complex, 2 to 7 percent slopes  
 21A, Chantilly Dulles complex, 0 to 2 percent slopes  
 21B, Chantilly Dulles complex, 2 to 7 percent slopes  
 22B, Chantilly Manassas complex, 2 to 7 percent slopes  
 23B, Chantilly Montalto complex, 2 to 7 percent slopes  
 23C, Chantilly Montalto complex, 7 to 15 percent slopes  
 24D, Chantilly Nestoria complex, 15 to 25 percent slopes  
 24E, Chantilly Nestoria complex, 25 to 45 percent slopes  
 25B, Chantilly Penn complex, 2 to 7 percent slopes  
 25C, Chantilly Penn complex, 7 to 15 percent slopes  
 26A, Chantilly Rowland complex, 0 to 2 percent slopes, frequently flooded  
 27B, Chantilly Sycoline Kelly complex, 2 to 7 percent slopes  
 27C, Chantilly Sycoline Kelly complex, 7 to 15 percent slopes  
 28B, Clover silt loam, 2 to 7 percent slopes  
 29A, Codorus silt loam, 0 to 2 percent slopes, occasionally flooded  
 30A, Codorus and Hathoro soils, 0 to 2 percent slopes, occasionally flooded  
 31B, Danripple gravelly loam, 2 to 7 percent slopes  
 31C, Danripple gravelly loam, 7 to 15 percent slopes  
 32B, Delanco loam, 2 to 7 percent slopes

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33A, Downer loamy sand, 0 to 2 percent slopes  
34A, Dulles silt loam, 0 to 2 percent slopes  
34B, Dulles silt loam, 2 to 7 percent slopes  
35A, Elbert silt loam, 0 to 2 percent slopes, frequently flooded  
36A, Elkton silt loam, 0 to 2 percent slopes, occasionally ponded  
37B, Elsinboro loam, 2 to 7 percent slopes, rarely flooded  
38B, Fairfax loam, 2 to 7 percent slopes  
38C, Fairfax loam, 7 to 15 percent slopes  
38D, Fairfax loam, 15 to 25 percent slopes  
39B, Glenelg silt loam, 2 to 7 percent slopes  
39C, Glenelg silt loam, 7 to 15 percent slopes  
39D, Glenelg silt loam, 15 to 25 percent slopes  
39E, Glenelg silt loam, 25 to 45 percent slopes  
40, Grist Mill sandy loam, 0 to 25 percent slopes  
41A, Grist Mill Downer complex, 0 to 2 percent slopes  
42A, Grist Mill Elkton complex, 0 to 2 percent slopes  
43A, Grist Mill Gunston complex, 0 to 2 percent slopes  
44A, Grist Mill Honga complex, 0 to 2 percent slopes  
45A, Grist Mill Matapeake complex, 0 to 2 percent slopes  
45B, Grist Mill Matapeake complex, 2 to 7 percent slopes  
46A, Grist Mill Mattapex complex, 0 to 2 percent slopes  
46B, Grist Mill Mattapex complex, 2 to 7 percent slopes  
47B, Grist Mill Woodstown complex, 2 to 7 percent slopes  
48A, Gunston silt loam, 0 to 2 percent slopes  
49A, Hatboro silt loam, 0 to 2 percent slopes, frequently flooded  
50, Hattontown silt loam, 0 to 25 percent slopes  
51A, Hattontown Elbert complex, 0 to 2 percent slopes  
52B, Hattontown Haymarket complex, 2 to 7 percent slopes  
52C, Hattontown Haymarket complex, 7 to 15 percent slopes  
53A, Hattontown Jackland complex, 0 to 2 percent slopes  
54B, Hattontown Jackland Haymarket complex, 2 to 7 percent slopes  
54C, Hattontown Jackland Haymarket complex, 7 to 15 percent slopes  
55B, Hattontown Kelly complex, 2 to 7 percent slopes  
56B, Hattontown Orange complex, 2 to 7 percent slopes  
57C, Hattontown Orange complex, 7 to 15 percent slopes, very stony  
59B, Haymarket silt loam, 2 to 7 percent slopes  
59C, Haymarket silt loam, 7 to 15 percent slopes  
60A, Honga peat, 0 to 1 percent slopes, very frequently flooded, tidal  
61A, Huntington silt loam, 0 to 2 percent slopes, occasionally flooded  
62A, Jackland silt loam, 0 to 2 percent slopes  
63B, Jackland and Haymarket soils, 2 to 7 percent slopes  
63C, Jackland and Haymarket soils, 7 to 15 percent slopes  
64B, Jackland and Haymarket soils, 2 to 7 percent slopes, very stony  
64C, Jackland and Haymarket soils, 7 to 15 percent slopes, very stony  
64D, Jackland and Haymarket soils, 15 to 25 percent slopes, very stony  
65B, Kelly silt loam, 2 to 7 percent slopes  
66, Kingstowne sandy clay loam, 0 to 45 percent slopes  
67B, Kingstowne Beltsville complex, 2 to 7 percent slopes  
68B, Kingstowne Danripple complex, 2 to 7 percent slopes  
68C, Kingstowne Danripple complex, 7 to 15 percent slopes  
69B, Kingstowne Elsinboro complex, 2 to 7 percent slopes  
70A, Kingstowne Sassafra complex, 0 to 2 percent slopes  
70B, Kingstowne Sassafra complex, 2 to 7 percent slopes

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70C, Kingstowne-Sassafras complex, 7 to 15 percent slopes  
71C, Kingstowne-Sassafras-Marumseo complex, 7 to 15 percent slopes  
71D, Kingstowne-Sassafras-Marumseo complex, 15 to 25 percent slopes  
71E, Kingstowne-Sassafras-Marumseo complex, 25 to 45 percent slopes  
72B, Kingstowne-Sassafras-Neabseo complex, 2 to 7 percent slopes  
73A, Lindside silt loam, 0 to 2 percent slopes, occasionally flooded  
74B, Lunt-Marumseo complex, 2 to 7 percent slopes  
75B, Manassas silt loam, 2 to 7 percent slopes  
76A, Matapeake silt loam, 0 to 2 percent slopes  
76B, Matapeake silt loam, 2 to 7 percent slopes  
77A, Mattapex loam, 0 to 2 percent slopes  
77B, Mattapex loam, 2 to 7 percent slopes  
78B, Meadowville loam, 2 to 7 percent slopes  
79B, Nathalie gravelly loam, 2 to 7 percent slopes  
79C, Nathalie gravelly loam, 7 to 15 percent slopes  
79D, Nathalie gravelly loam, 15 to 25 percent slopes  
80D, Nestoria channery silt loam, 15 to 25 percent slopes  
80E, Nestoria channery silt loam, 25 to 45 percent slopes  
81B, Oatlands loam, 2 to 7 percent slopes  
81C, Oatlands loam, 7 to 15 percent slopes  
82B, Orange silt loam, 2 to 7 percent slopes  
83C, Orange silt loam, 7 to 15 percent slopes, very stony  
84B, Panorama loam, 2 to 7 percent slopes  
85B, Penn silt loam, 2 to 7 percent slopes  
85C, Penn silt loam, 7 to 15 percent slopes  
86, Pits, gravel  
87C, Rhodhiss sandy loam, 7 to 15 percent slopes  
87D, Rhodhiss sandy loam, 15 to 25 percent slopes  
87E, Rhodhiss sandy loam, 25 to 45 percent slopes  
88C, Rhodhiss-Roek outerop complex, 2 to 15 percent slopes  
88D, Rhodhiss-Roek outerop complex, 15 to 25 percent slopes  
88E, Rhodhiss-Roek outerop complex, 25 to 45 percent slopes  
89A, Rowland silt loam, 0 to 2 percent slopes, frequently flooded  
90A, Sassafras sandy loam, 0 to 2 percent slopes  
90B, Sassafras sandy loam, 2 to 7 percent slopes  
90C, Sassafras sandy loam, 7 to 15 percent slopes  
91C, Sassafras-Marumseo complex, 7 to 15 percent slopes  
91D, Sassafras-Marumseo complex, 15 to 25 percent slopes  
91E, Sassafras-Marumseo complex, 25 to 45 percent slopes  
92B, Sassafras-Neabseo complex, 2 to 7 percent slopes  
93B, Sumerduck loam, 2 to 7 percent slopes  
94B, Sycoline-Kelly complex, 2 to 7 percent slopes  
94C, Sycoline-Kelly complex, 7 to 15 percent slopes  
95, Urban land  
96, Urban land-Barker Crossroads complex  
97, Urban land-Chantilly complex  
98, Urban land-Grist Mill  
99, Urban land-Hattontown complex  
100, Urban land-Kingstowne complex  
101, Urban land-Wheaton complex  
102, Wheaton loam, 2 to 25 percent slopes  
103A, Wheaton-Codorus complex, 0 to 2 percent slopes  
104B, Wheaton-Fairfax complex, 2 to 7 percent slopes

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- ~~104C, Wheaton-Fairfax complex, 7 to 15 percent slopes~~
- ~~104D, Wheaton-Fairfax complex, 15 to 25 percent slopes~~
- ~~104E, Wheaton-Fairfax complex, 25 to 45 percent slopes~~
- ~~105B, Wheaton-Glenelg complex, 2 to 7 percent slopes~~
- ~~105C, Wheaton-Glenelg complex, 7 to 15 percent slopes~~
- ~~105D, Wheaton-Glenelg complex, 15 to 25 percent slopes~~
- ~~106A, Wheaton-Hatboro complex, 0 to 2 percent slopes, frequently flooded~~
- ~~107B, Wheaton-Meadowville complex, 2 to 7 percent slopes~~
- ~~108B, Wheaton-Sumerduck complex, 2 to 7 percent slopes~~
- ~~109B, Woodstown sandy loam, 2 to 7 percent slopes W, Water~~

DRAFT

~~11-0409~~

**11-0306**

**Biotechnical Slope and Bank Protection** (~~107-10 PFM~~)

~~11-0409.1~~

11-0306.1

Conditions in the County have resulted in numerous eroded or unstable banks. Some soils are difficult to stabilize on steep slopes after they are disturbed by construction activities. Also, conversion of watersheds to urban uses has increased storm runoff and enlarged, deepened and eroded many stream channels.

~~11-0409.2~~

11-0306.2

Cost and aesthetic concerns make it desirable to consider vegetative measures as an alternative to conventional structural solutions to these problems. Biotechnical slope and bank protection is one alternative which warrants consideration on an experimental basis, case by case, with the advance approval of ~~DPWES~~ [LDS](#).

~~11-0409.3~~

11-0306.3

Biotechnical slope and bank protection consists of the use of natural materials to stabilize stream banks and other unstable or eroding slopes. Dormant wood vegetative materials which grow from cuttings are combined with natural materials such as stone and wood in an integrated, complementary manner.

~~11-0409.4~~

11-0306.4

When the cuttings root and grow, they produce a mass of leafy vegetation protecting the soil surface and a dense mat of roots which bind the subsoil to prevent caving, sloughing, and erosion.

~~11-0409.5~~

11-0306.5

The plant materials may be combined with riprap, crib walls and other combinations to meet the needs of each site. Such structures are flexible, tend to move with the dynamics of the site, and are self-repairing.

~~11-0409.6~~

11-0306.6

Descriptions of biotechnical treatment may be found in the "[Virginia Erosion and Sediment Control Handbook](#)." Diagrams showing some forms of biotechnical slope and bank protection are shown in [Plate 4-11](#) ~~6-11~~.

~~11-0409.7~~

11-0306.7

As bioengineering stabilization techniques call for coordination of plant science, soils science and engineering principles, they should be employed only with the guidance of experts familiar with bioengineering work. Approval of the Director is required.