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**11-0000 EROSION AND SEDIMENT CONTROL**

**11-0100 SUBDIVISION AND SITE PLAN PREPARATION**

**11-0101 Purpose and Intent**

11-0101.1 In the interest of the health, safety and welfare of the 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 may be accomplished only after the owner or 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 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 is permitted until an E&S control plan has been approved.

11-0102.2 The analysis in § 2-0108.1 and a resultant E&S control plan 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 will review these plans as submitted, and will take necessary steps to ensure compliance by the developer with these plans as finally approved.

**11-0103 Initial Plan**

11-0103.1 Preliminary plats for subdivisions or initial plans for site plans 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, must be specifically indicated.

A. Such areas 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.

B. 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

11-0104.1 The plan for the control of E&S must address both the period of construction and the post construction period (in most circumstances this will necessitate a two-phased plan submission) and 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 before clearing and rough grading the majority of the site. The ultimate tree save areas 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 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 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 E&S Guidelines

11-0105.1 Control measures must be incorporated and must be the type of required measures for an effective E&S control plan.

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

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 before the construction or development (must be included in the narrative).

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

A. Operations 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.

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

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

11-0105.5 Temporary/permanent detention must be provided to accommodate the increased runoff caused by changed soil and surface conditions effectively during and after development. Additionally, plans 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 must be made to complete the drainage system and make it operational as quickly as possible during construction.

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

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

11-0106 **Data Availability**

11-0106.1 Agencies available for consultation are LDS, DPD and the NVSWCD.

11-0106.2 Standards and specifications are provided in the current Virginia E&S Control Handbook. Some supplemental County standards are included in Plates 1-11 through 5-11, 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). 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*

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

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](#)
MINIMIZING FUTURE EROSION AND OTHER DRAINAGE RELATED PROBLEMS ON FCPA LANDS

Site Inspection

The condition of the stream banks on land proposed for FCPA or other public agency acquisition must be inspected in the preliminary plat stage by representatives of the FCPA or other appropriate administering public agency and representatives of the Director.

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

Plan Preparation

Particular attention 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.

Sediment basins 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 must follow all County requirements and policies for construction on its own land.

Where a waiver of stormwater detention facilities on developments above FCPA and/or other public agency lands is requested, the review engineer must ascertain that omission of these facilities will not cause accelerated erosion or degradation of any public property.

“Corrective work” 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.
11-0300 PLAN REVIEW AND ORDINANCE ENFORCEMENT

11-0301 General Information

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.

11-0301.2 Soil loss represents a cost to the developer and 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.

11-0301.3 The procedures called for in § 11-0300 et seq. result from public reaction to obvious instances of accelerated E&S, some of it damaging to individuals, some to the general public.

11-0301.4 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.

11-0301.5 Included in § 11-0300 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.

11-0302 Applicability of the Virginia E&S Control Handbook

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. are mandatory.

11-0302.2 The program covered in § 11-0000 et seq. has been approved by the Virginia Division of Soil and Water Conservation.

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.

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.

11-0304 General Land Conservation Notes

11-0304.1 No disturbed area which is not actively being worked may remain denuded for more than 14 calendar days unless otherwise authorized by the Director.

11-0304.2 All E&S control measures approved with the phase one E&S control plan must be placed as the first step in grading.

11-0304.3 All storm and sanitary sewer lines not in streets must be seeded and mulched within 14 days after backfill. No more than 500 feet may be open at any one time.

11-0304.4 Electric power, telephone and gas supply trenches must be compacted, seeded and mulched within 14 days after backfill.

11-0304.5 All temporary earth berms, diversions and sediment control dams 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 must be seeded and mulched within 14 days after grading.

11-0304.6 During construction, all storm sewer inlets must be protected by sediment traps, maintained and modified during construction progress as required.

11-0304.7 Any disturbed area not covered by § 11-0304.1 and not paved, sodded or built upon by Nov. 1, or disturbed after that date, must be mulched immediately with hay or straw mulch at the rate of 2 tons/acre and over-seeded by April 15.

11-0304.8 At the completion of any project construction and before bond release, all temporary sediment controls must be removed and all denuded areas must be stabilized.
11-0305 Land Conservation Notes - Linear Projects

11-0305.1 No disturbed area which is not actively being worked may remain denuded for more than 14 calendar days unless authorized by the Director.

11-0305.2 Sediment control measures, as appropriate, must be placed as shown on the approved plans as the first step in the land disturbing process.

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

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

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

11-0305.6 All disturbed areas 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.

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

B. The acreage to be disturbed must be identified.

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

1. Off-site properties.

2. Parklands.

3. Major streams and lakes or ponds.

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

E. Tree preservation and other areas to remain undisturbed must be determined and depicted on the plan.
F. Possible problem areas must be identified and addressed.

G. The lengths and grades of existing and proposed long slopes must be examined:
   1. Classify soils as to degree of erodibility.
   2. Check velocities of sheet, swale or pipe discharge on slopes, or unprotected soil surfaces.
   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.
   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.

H. Storm and sanitary sewer routes must be reviewed. Sediment traps around all structures and work area sediment controls must be identified. The construction sequence must be visualized.

I. The locations for and suitability of the following must be checked:
   1. Temporary diversion dikes, ditches and terraces.
   2. Permanent dikes, ditches and terraces.
   3. Temporary seeding and mulching, highly erodible areas, steep and long slopes.
   4. Sediment barriers, straw bales, gravel weirs and silt fences.
   5. Minor sediment dams, areas 2 to 3 acres.
   6. Major sediment basins, drainage areas over 3 acres (to be designed structures).

J. The sequence of construction operations and areas to be disturbed simultaneously must be checked.

K. The instructions to the contractor must be reviewed for clarity.
L. The proposed timing of construction must be reviewed for suitability of planting and mulching provisions. The time span for establishment of permanent cover must be checked.

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 must be checked. A minimum of 134 cy of storage per acre must be provided and sediment basin dimensions must be shown on the plans.

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

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 must be considered while the grading is being done and the storm drainage ditches are being dug.

P. Since the maximum runoff also occurs during construction, it is essential that sediment traps and basins be constructed 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 must be used to design these temporary measures.

11-0306 Biotechnical Slope and Bank Protection

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.

11-0306.2 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 LDS.

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.
11-0306.4 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.

11-0306.5 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.

11-0306.6 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.

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.