UNIT II
EROSION AND SEDIMENT CONTROL (ESC) NARRATIVE

INTRODUCTION

The narrative is the written portion of the Erosion and Sediment Control (ESC) plan. The information in the narrative should describe and explain the overall development of the project. Combined with the ESC site plan, the written narrative provides sufficient information to ensure that ESC controls are installed, inspected, and maintained as designed.

LEARNING OBJECTIVES

1. To understand the development and implementation of an ESC narrative for a construction project.

2. To adequately review an ESC narrative and provide recommendations and comments according to the Virginia Erosion and Sediment Control Law and Regulations (VESCLR) and the *Virginia Sediment and Control Handbook, 1992 Edition* (VESCH).

~~INSTRUCTION ELEMENTS~~

II.1 GENERAL GUIDELINES

Why is A Narrative Important?

A narrative is a written statement which explains the erosion and sediment control decisions made for a particular project and the justification for those decisions. The narrative is especially important to the plan-approving authority because it contains concise information concerning existing site conditions, construction schedules, and other pertinent items which are not apparent in a typical site plan. Since a plan reviewer cannot always visit the site or discuss the project at length with the site planner, it is essential that the necessary information be provided for the plan review.

The narrative is also important to the construction superintendent and the inspector who are responsible for seeing that the plan is implemented properly. It provides them with a single report which describes where and when the various erosion and sediment control practices should be installed.

II.2 EROSION AND SEDIMENT CONTROL NARRATIVE COMPONENTS

1. Minimum Standards

Requirements:

All applicable Minimum Standards must be addressed.

Discussion:

The "Minimum Standards" are intended to provide local officials with the guidance and authority they need to ensure adequate erosion and sediment control on all land-disturbing projects. The "Minimum Standards" must be satisfied on every construction project, unless a specific variance is granted. It is a standard practice in many localities to require that all the "Minimum Standards" simply be reprinted in the project narrative. It may also be beneficial to expand the standard plan review checklist to include a checklist that identifies the applicable "Minimum Standards" for the plan under review.

The following is a brief overview of the "Minimum Standards." Refer to the Virginia Erosion and Sediment Control Regulations (Section §4VAC50-30-40) or Chapter 3 and Chapter 8 of the VESCH for a complete list.

MS-1. Stabilization of Denuded Areas

Timing of Permanent or temporary soil stabilization.

MS-2. Stabilization of Soil Stockpiles

Protection of the project, soil stockpiles, and waste and borrow areas both on site and off-site.

MS-3. Permanent Vegetative Cover

The establishment of a permanent vegetative cover.

MS-4. Timing and Stabilization of Sediment Trapping Measures

First step measures intended to trap sediment shall be made functional before up-slope land disturbance takes place.

MS-5. Stabilization of Earthen Structures

Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.

MS-6. Sediment Traps and Basins

Sediment traps and basins shall be designed and constructed based upon the total drainage area to be served.

MS-7. Cut and Fill Slopes

Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion.

MS-8. Concentrated Runoff Flow Down Cut or Fill Slopes

Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.

MS-9. Water Seeps From a Slope Face

Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.

MS-10. Storm Sewer Inlet Protection

All storm sewer inlets shall be protected so that sediment-laden water cannot enter the conveyance system.

MS-11. Stabilization of Outlets

Before newly constructed stormwater conveyance channels are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and the receiving channel.

MS-12. Work in Live Watercourses

When work in a live watercourse is performed, precautions shall be taken to minimize encroachment.

MS-13. Crossing a Live Watercourse

When a live watercourse must be crossed by construction vehicles, a temporary vehicular steam crossing constructed of nonerodible material shall be provided.

MS-14 Applicable Regulations

All applicable federal, state, and local regulations pertaining to working in or crossing live watercourses shall be met.

MS-15. Stabilization of Bed and Banks

The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.

MS-16. Underground Utility Construction

Underground utility lines shall be installed in accordance with the following standards, in addition to other applicable criteria:

A. No more than 500 linear feet of trench may be opened at one time.
B. Excavated material shall be placed on the uphill side of trenches.
C. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.
D. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and to promote stabilization.
E. Restabilization shall be accomplished in accordance with these regulations.
F. Applicable safety regulations shall be complied with.

MS-17. Construction Access Routes

Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface.

MS-18. Temporary Erosion & Sediment Control Measure Removal

All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization.

MS-19. **Stormwater Volume, Velocity, & Peak Flow**

Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion, and damage.

2. **Project description**

Requirements:

Briefly describes the nature and purpose of the land-disturbing activity, and the area (acres) to be disturbed.

Discussion:

It is imperative to know the intentions of the developer's land-disturbing activity in order to assure that the ESC plan adequately addresses the site. In order to plan and design stormwater management for a project, the ultimate build-out or development of that site must be taken into consideration.

This part of the narrative should list the total amount of area (in acres) to be disturbed by this project. Every ESC program is required to maintain a database, which is used to calculate nonpoint source pollution associated with land-disturbing construction activities. This information is collected by the regional Soil and Water Conservation offices on an annual basis and is compiled into a statewide report.

3. **Existing site conditions**

Requirements:

A description of the existing topography, vegetation, and drainage.

Discussion:

Ground cover is the most important factor in terms of preventing erosion. Any existing vegetation which can be saved will help prevent erosion. Trees and existing vegetation protect the soil and help to preserve the natural beauty of a site after construction. Development should be planned carefully in an effort to preserve the existing green spaces. If this is not possible, the contractor should consider staging his construction. The use of temporary seeding, or mulching, will greatly reduce soil loss by shielding bare soil from erosion due to raindrop impact.

Descriptions of existing vegetation are important clues for planning temporary and permanent seeding specifications. Certain species may indicate poor soil conditions which may require additional fertilizer or liming. Also, a description of existing vegetation will help the plan reviewer and developer determine which vegetation to preserve. This is essential in providing tree preservation and protection controls.

As mentioned previously, a site visit is an important part of the plan review process. However, not all those involved with ESC plan review may be able to visit the site. The ESC plan narrative should convey existing site conditions to plan reviewers. Controls must be designed that are appropriate to the existing topography and drainage. For instance, silt fence is only appropriate for sheet flow or concentrated flows of less than 1 cfs and should not be used at the base of slopes which are steeper than 2:1 or longer than 100 feet. A description of the existing drainage area should be noted in the narrative. This will assist the plan reviewer in reviewing pre-development runoff calculations to verify Minimum Standard 19.

4. **Adjacent Areas**

Requirements:

A description of neighboring areas such as streams, lakes, residential areas, roads, etc., which might be affected by the land-disturbance.

Discussion:

Many plans will stop at the construction limits. What is located on the boundaries of the project site? Does the potential exist for off-site damage from increased stormwater discharge? Are environmentally sensitive areas located near the site which may be impacted by construction activities? These areas would include wetlands, streams, rivers, and bodies of water such as ponds, lakes, and reservoirs. Added precaution should be taken to prevent sediment from reaching these areas. The plan reviewer should verify that adequate perimeter controls are in place.

The location of existing roads is also important for determining the location of construction entrances and possible haul roads. Areas with blind spots, high traffic counts, congestion, and high speeds should be avoided.

5. **Off-Site Areas**

Requirements:

Describe any off-site land-disturbing activities that will occur (including borrow sites, stockpiles, etc.). Will any other areas be disturbed?

Discussion:

By comparing the existing contours, to the final contours the plan reviewer should determine if the grading operation will result in cut or fill. Any off-site land-disturbing activities associated with this project need to be covered by an ESC plan. A separate ESC plan should be submitted for review before beginning this off-site land-disturbance. This plan should meet the same requirements as a formal ESC plan. Special attention needs to be paid to perimeter controls, temporary stabilization, and permanent stabilization for off-site areas. It should be noted that it is permissible to haul waste

material to a regulated landfill. Landfill operations are land-disturbing activities with approved ESC plans, monitored by the local ESC program. However, the developer may not waste material on private property without an approved ESC plan.

If no off-site areas will be disturbed by this project, then the narrative should contain a statement to that effect. This will prevent the developer from engaging in a potentially unregulated land-disturbing activity.

6. **Soils**

Requirements:

A brief description of the soils on the site giving such information as soil name, mapping unit, erodibility, permeability, depth, texture, and soil structure.

Discussion:

In many instances, a major soil-related problem is discovered after a site has been selected and construction is either well under way or in some cases completed. These problems often necessitate delays in construction and ultimately increase the total cost of the project. By consulting a soil survey early in the planning process, designs can be prepared to address soil characteristics or alternate sites can be selected. Knowing the types of soil, the topography, and surface drainage patterns will prove very beneficial in planning and designing almost any type of land development project and is essential for erosion control planning.

Reference to soil maps and accompanying supportive data contained in soil surveys enables planners to determine the soil conditions in areas proposed for development. Consulting soil surveys has proven to result in a savings in time and money, and the use of this information has resulted in improved designs, more effective planning, and more accurate preliminary estimates of construction costs. In many cases, the survey will provide adequate information, but in other situations, it may only provide warnings or indications of soil-related problems likely to be encountered. In such cases, a more in-depth, on-site investigation may be needed.

Soil surveys are helpful in providing interpretations of the effect of soil properties on various land uses. This information can aid in determining soil suitability as a source of topsoil, fill for highway subgrade, or sand and gravel. The interpretations also show the degree of limitation on soils used for purposes such as building foundations, highways, streets, roads, parking lots, pipelines, underground utility lines, and septic tank absorption fields.

Soil surveys describe soil properties that become important in erosion and sediment control planning for construction sites. Refer to Appendix 6A of Chapter 6 in the VESCH for more information.

7. **Critical Areas**

Requirements:

A description of areas on the site which have potentially serious erosion problems (e.g., steep slopes, channels, wet weather/underground springs, etc.).

Discussion:

Are the appropriate controls designed for these areas? Noting critical areas will caution the designer, developer, and job superintendent, as well as the local ESC program inspector, to install, maintain, and monitor controls on this area of the site. This lets everyone know that the area is a high priority and should be given extra attention.

8. **Erosion and Sediment Control Measures**

Requirements:

A description of the methods which will be used to control erosion and sedimentation on the site. (Controls should meet the specifications in Chapter 3 of the VESCH.)

Discussion:

The project narrative must contain notes on the required erosion and sediment control practices. This part of the narrative should explain why these particular controls were selected and how they will be used to control erosion and sedimentation on the site. The Virginia uniform coding system should be referenced from Chapter 3 of the VESCH. The ESC practices should also reference the standard and specification number in this chapter. It is very important that structural practices be selected, designed, and constructed according to the standards and specifications in Chapter 3 of the VESCH. Improper use or installation can result in failure of the control and subsequent release of any trapped sediment.

This part of the narrative is also a good place to include a description of the sequence of construction for the project. This sequence of construction should describe how erosion and sediment control is going to be implemented on site. If the project is complex or large, a multi-phase ESC plan may be considered. The strategy and implementation of the ESC controls provided on the plan should be explained in detail in this section.

9. **Permanent Stabilization**

Requirements:

A brief description, including specifications, of how the site will be stabilized after construction is completed.

Discussion:
A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive, and will inhibit erosion.

This part of the narrative should address how the site will be stabilized after construction is completed. Information should include site specific seed mixes for the appropriate physiographic region, season of the year, site typography and soil conditions. Soil amendments and the amount of mulch cover required should also be addressed in this section of the narrative.

10. **Stormwater Runoff Considerations**

Requirements:
Will the development site cause an increase in peak runoff rates? Will the increase in runoff cause flooding or channel degradation downstream? Describe the strategy used to control stormwater runoff.

Discussion:
Developers are responsible for managing their stormwater in a manner that will prevent erosion damage to downstream properties and waterways. The measures which are taken to satisfy this criterion are usually selected and designed in the site planning stage. It is the primary role of the job superintendent and inspector to see that the stormwater management practices are installed properly and on time.

The plan should address all points where concentrated stormwater runoff will leave the site. Where there is a potential for erosion at the outlet of pipes or paved channels, riprap outlet protection should be specified on the plan. In addition, the adequacy of both on-site channels and receiving channels should be analyzed to determine if stormwater controls are needed.

Stormwater management practices include detention basins, parking lot and rooftop storage, infiltration trenches, and porous pavement. There are no construction specifications for these practices in the VESCH, therefore, the construction plans must contain sufficient information for construction purposes.

This part of the narrative should state whether or not stormwater runoff will increase as a result of the proposed development. If there is an increase, the strategy for controlling this runoff should be explained.

11. **Calculations**

Requirements:

Detailed calculations for the design of temporary sediment basins, permanent stormwater detention basins, diversions, channels, etc. Include calculations for pre- and post-development runoff.

Discussion:

A detailed description of the strategies for controlling runoff during construction and after construction should be included in this part of the narrative. Each drainage area should be described with an explanation of the drainage in the pre-development and post-development stages. If structural controls are utilized to control drainage, detailed calculations must be provided to verify capacity and design.

Runoff calculations must also be provided to determine the effect of the overall development on the existing hydrologic system. Refer to Chapters 4 and 5 of the VESCH for more information.

12. **Maintenance**

Requirements:

A schedule of regular inspections and repair of erosion and sediment control structures should be set forth.

Discussion:

The ESC narrative should specify a regular schedule of maintenance for erosion and sediment control practices. If possible, this part of the narrative should designate one individual (preferably the job superintendent) responsible for implementing the erosion and sediment control plan. This individual should make sure that all workers understand the major provisions of the ESC plan and should establish procedures for reporting problems identified by workers.

The maintenance schedule should be tailored to the specific project controls. For instance, if the project utilizes sediment traps or sediment basins, guidelines should be included on clean-out requirements. Also, specifications for maintenance/clean-out of perimeter controls such as silt fence, straw bale barriers, and brush barriers should be provided in this section. A periodic ESC inspection schedule should be established that includes inspection during or immediately following a runoff producing storm event.

Another important aspect of the maintenance schedule pertains to the permanent stormwater management facility. If a permanent facility is part of the planned development, the party responsible for maintaining this facility must be designated. This can be a home owner's association, an individual, a corporation, or a local government. It

needs to be clear who is going to be legally responsible for maintaining the facility after completion of the project.

II.3 OTHER ITEMS IMPORTANT IN NARRATIVES

What Other Items Should be Included in the Narrative?

1. "The inspector has the authority to add or delete erosion and sediment controls as needed in the field, as site conditions warrant."

   Very seldom is any development plan implemented without changes. Unforeseen events or site conditions often result in the need for modifications in the field. The ESC plan is no exception. It is very difficult to predict all of the potential problems during the site-planning process. The job superintendent and inspector need to be able to respond quickly and effectively to unforeseen problems which arise during construction. The "Minimum Standards" provide needed guidance for making necessary field changes. Therefore, these standards can be applied during construction to rectify problems that may not be addressed in the approved plan. For example, if a construction access road was causing excessive sediment to be tracked onto a public road, the inspector could cite Minimum Standard MS-17 and require that a temporary construction entrance be installed, even if it were not called for on the approved plan. The inspector must be careful about making independent field decisions, however, particularly if they relate to a design question. When in doubt, it is advisable to consult with the plan-approving authority before authorizing or requiring significant changes.

2. The current Virginia Erosion and Sediment Control Law and Regulations (VESCLR) and the *Virginia Sediment and Control Handbook, 1992 Edition* (VESCH) should be referenced in the narrative.

3. Refer to the "Checklist for Plan Preparation" and Appendix II-2 at the end of this unit for more information on the type of information that should be presented in the narrative.

CHECKLIST

FOR EROSION AND SEDIMENT CONTROL PLANS

_____ Minimum Standards - All applicable Minimum Standards must be addressed.

NARRATIVE

_____ Project description - Briefly describes the nature and purpose of the land-disturbing activity, and the area (acres) to be disturbed.

_____ Existing site conditions - A description of the existing topography, vegetation and drainage.

_____ Adjacent areas - A description of neighboring areas such as streams, lakes, residential areas, roads, etc., which might be affected by the land disturbance.

_____ Off-site areas - Describe any off-site land-disturbing activities that will occur (including borrow sites, waste or surplus areas, etc.). Will any other areas be disturbed?

_____ Soils - A brief description of the soils on the site giving such information as soil name, mapping unit, erodibility, permeability, depth, texture and soil structure.

_____ Critical areas - A description of areas on the site which have potentially serious erosion problems (e.g., steep slopes, channels, wet weather/underground springs, etc.).

_____ Erosion and sediment control measures - A description of the methods which will be used to control erosion and sedimentation on the site. (Controls should meet the specifications in Chapter 3.)

_____ Permanent stabilization - A brief description, including specifications, of how the site will be stabilized after construction is completed.

_____ Stormwater runoff considerations - Will the development site cause an increase in peak runoff rates? Will the increase in runoff cause flooding or channel degradation downstream? Describe the strategy to control stormwater runoff.

_____ Calculations - Detailed calculations for the design of temporary sediment basins, permanent stormwater detention basins, diversions, channels, etc. Include calculations for pre- and post-development runoff.

_____ Maintenance - A schedule of regular inspections and repair of erosion and sediment control structures should be set forth.

APPENDIX II-2

GENERAL EROSION AND SEDIMENT CONTROL NOTES

ES-1: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices will be constructed and maintained according to minimum standards and specifications of the Virginia Erosion and Sediment Control Handbook and Virginia Regulations §4VAC50-30 Erosion and Sediment Control Regulations.

ES-2: The plan approving authority must be notified one week prior to the pre-construction construction conference, one week prior to the commencement of land disturbing activity, and one week prior to the final inspection.

ES-3: All erosion and sediment control measures are to be placed prior to or as the first step in clearing.

ES-4: A copy of the approved erosion and sediment control plan shall be maintained on the site at all times.

ES-5: Prior to commencing land disturbing activities in areas other than indicated on these plans (including, but not limited to, off-site borrow or waste areas), the contractor shall submit a supplementary erosion control plan to the owner for review and approval by the plan approving authority.

ES-6: The contractor is responsible for installation of any additional erosion control measures necessary to prevent erosion and sedimentation as determined by the plan approving authority.

ES-7: All disturbed areas are to drain to approved sediment control measures at all times during land disturbing activities and during site development until final stabilization is achieved.

ES-8: During dewatering operations, water will be pumped into an approved filtering device.

ES-9: The contractor shall inspect all erosion control measures periodically and after each runoff-producing rainfall event. Any necessary repairs or cleanup to maintain the effectiveness of the erosion control devices shall be made immediately.