FINAL

STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL

FOR

JOINT BASE LANGLEY EUSTIS - EUSTIS





Prepared For:

Air Force Civil Engineer Center (AFCEC) 772nd Enterprise Sourcing Squadron/PKA 2261 Hughes Avenue, Suite 163 JBSA, Texas 78236-9861 733d CED JBLE–Eustis 1407 Washington Blvd. JBLE–Eustis, Virginia 23604

Prepared By:



AECOM Technical Services, Inc. 1600 Perimeter Park Drive, Suite 400 Morrisville, NC 27560

May 2016

Contract No. FA8903-08-D-8770 Task Order No. 0311

Statement of Limitations

This plan was prepared in accordance with the customary thoroughness and competence of environmental science and engineering consulting professionals and in accordance with the standard for professional services for a national consulting firm at the time these services were provided. The analysis, conclusions, and recommendations expressed in this report were developed based upon a limited scope of services and the information made available at the time this work was conducted.

TABLE OF CONTENTS

1.0	0 INTRODUCTION						
	1.1 1.2 1.3 1.4	Purpose and Objective1-1Administrative Compliance1-1Limitations1-1Organization1-1					
2.0	ADM	NISTRATIVE GUIDELINES					
	2.1	General Guidelines for Land Disturbing Activities Greater than 10,000 Square Feet					
	2.2	General Guidelines for Land Disturbing Activities 2,500-10,000 Square Feet 2-1					
3.0	STAN	ANDARDS AND SPECIFICATIONS IMPLEMENTATION					
	3.1 3.2 3.3 3.4 3.5 3.6 3.7	Submittals3-1Plan Reviews3-1Pre-Construction Conference3-1Inspections3-1Enforcement3-2Changes and Amendments to Approved Plans3-2Variances and Exceptions3-2					
4.0	EROS	ION AND SEDIMENT CONTROL PLAN REQUIREMENTS					
5.0	4.1 4.2 4.3	Minimum Standards 4-1 Narrative 4-1 Site Plan 4-1					
5.0	EROS	ION AND SEDIMENT CONTROL MEASURES					
	5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9 5.10 5.11 5.12 5.13	Temporary Construction Entrance5-1Silt Fence5-1Storm Drain Inlet Protection5-2Temporary Diversions5-2Outlet protection5-3Rock Check Dams5-3Wattles5-4Level Spreader5-4Temporary Seeding5-4Permanent Seeding5-5Sodding5-7Mulching5-7Soil Stabilization Blankets and Matting5-8					
6.0	REFE	RENCES					

LIST OF APPENDICES

- Appendix A Flow-Chart to Determine Erosion and Sediment Control Requirements for Land-Disturbing Activities at JBLE – Eustis
- Appendix B 9VAC25-840-40. Minimum Standards
- Appendix C Checklist for Erosion and Sediment Control Plans
- Appendix D Erosion and Sediment Control Inspection Report
- Appendix E General Erosion and Sediment Control Notes

LIST OF ABBREVIATIONS AND ACRONYMS

CED-EE	Civil Engineer Division, Environmental Element
cfs	Cubic Feet Per Second
cu.yds.	Cubic Yards
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
ft.	Feet
H:V	Slope; Horizontal:Vertical
JBLE–Eustis	Joint Base Langley-Eustis – Eustis
lbs.	Pounds
MCM	Minimum Control Measures
MS4	Municipal Separate Storm Sewer System
VAC	Virginia Administrative Code
VCIA	Virginia Crop Improvement Association
VDOT	Virginia Department of Transportation
VDEQ	Virginia Department of Environmental Quality
VESCL&R	Virginia Erosion and Sediment Control Law and Regulations
VESCP	Virginia Erosion and Sediment Control Program

1.0 INTRODUCTION

1.1 Purpose and Objective

This *Standards and Specifications for Erosion and Sediment Control* provides guidance on compliance with erosion and sediment control requirements found in the Joint Base Langley-Eustis (JBLE) – Eustis Municipal Separate Storm Sewer (MS4) Permit, Permit No. VAR040035, the Virginia Erosion and Sediment Control Law (§62.1-44 et. seq.), the Virginia Erosion Control Regulations (9VAC25-840 et. seq.), and the Virginia Erosion and Sediment Control Certification Regulations (9VAC25-850 et. seq.). The objective of this document is to provide guidance to assist design professionals, project managers, and contractors with land disturbing and stormwater management activities at JBLE – Eustis that result in the disturbance of less than 10,000 square feet but more than 2,500 square feet in order to satisfy requirements for *Minimum Control Measure (MCM) #4: Construction Site Storm Water Runoff Control* prescribed by the JBLE – Eustis MS4 permit.

1.2 Administrative Compliance

The *Standards and Specifications for Erosion and Sediment Control* shall be administered by the JBLE – Eustis Civil Engineer Division, Environmental Element (CED-EE) and shall apply to all design, construction and maintenance activities undertaken by the JBLE – Eustis internal workforce or by contracted external entities where such activities are regulated by the Virginia Erosion and Sediment Control Law and Regulations (VESCL&R). Compliance with the *Standards and Specifications for Erosion and Sediment Control* and the VESCL&R will be expected during any inspections by the Virginia Department of Environmental Quality (VDEQ), the U.S. Environmental Protection Agency (EPA) or other such regulatory agencies.

1.3 Limitations

The *Standards and Specifications for Erosion and Sediment Control* do not cover every aspect of design necessary for project construction. The design professional, project manager, or contractor is responsible for the design of a properly functioning project that meets requirements within the VESCL&R. It is the responsibility of the designer to insure that the techniques utilized are appropriate for the conditions of an individual site. Where it is determined that conformance with this document is not appropriate, alternative design, materials, and methodologies may be considered on a case-by-case basis for approval by the CED-EE.

1.4 Organization

This document is organized into the following sections and appendices:

- Section 1.0 presents the purpose and objective of the *Standards and Specifications for Erosion and Sediment Control* as well as administrative compliance information, limitations, and organizational structure of the document.
- Section 2.0 describes general administrative guidelines for land disturbing activities greater than 10,000 square feet and less than 10,000 square feet but greater than 2,500 square feet.
- Section 3.0 discusses the implementation of the *Standards and Specifications for Erosion and Sediment Control.*
- Section 4.0 presents the requirements for site specific ESC plans.
- Section 5.0 describes the general guidelines for structural and vegetative ESC measures used on small projects (less than 10,000 square feet).
- Section 6.0 contains a list of references used during preparation of this document.
- Appendix A contains a flow chart to determine ESC requirements for land disturbing activities at JBLE Eustis.
- Appendix B contains the minimum standards identified in 9VAC25-840-40 of the Virginia Erosion and Sediment Control Regulations.
- Appendix C contains the ESC plan review checklist.
- Appendix D contains the ESC inspection report.
- Appendix E contains the general ESC notes to be included on all site specific ESC plans.

2.0 ADMINISTRATIVE GUIDELINES

JBLE – Eustis follows the policies and procedures described in the Virginia Erosion and Sediment Control Regulations and the *Virginia Erosion and Sediment Control Handbook* as amended. The applicant shall use the standards contained within these documents when making a submittal and in preparation of an erosion and sediment control (ESC) plan. The plan-approving authority shall be guided by the same standards, regulations, and guidelines in considering the adequacy of a submitted plan.

General administrative guidelines for land disturbing activities at JBLE – Eustis are described below in Section 2.1. For additional guidance refer to *Appendix A: Flow-Chart to Determine Erosion and Sediment Control Requirements for Land Disturbing Activities at Joint Base Langley-Eustis – Eustis.*

2.1 General Guidelines for Land Disturbing Activities Greater than 10,000 Square Feet

The VDEQ administers the state Erosion and Sediment Control program in accordance with the VESCL&R. The ESC program regulates only construction activities that constitute "land-disturbing activities," as defined in §62.1-44 that result in the disturbance of 10,000 square feet or greater.

Prior to commencement of the land disturbing activity, projects at JBLE – Eustis that meet this criteria must have a site specific ESC plan approved by a Virginia Erosion and Sediment Control Program (VESCP) authority in accordance with the Virginia ESC Law (§62.1-44 et. seq.). The plan shall be compliant with the minimum standards identified in 9VAC25-840 et. seq. of the Virginia Erosion and Sediment Control Regulations (*Appendix B: 9VAC25-840-40. Minimum Standards*) and shall be governed by the criteria standards, and specifications established in Chapter 6, *Preparing an Erosion and Sediment Control Plan*, of the *Virginia Erosion and Sediment Control Handbook* as amended.

2.2 General Guidelines for Land Disturbing Activities 2,500-10,000 Square Feet

CED-EE shall be the plan approving authority for construction activities at JBLE – Eustis that constitute "land-disturbing activities" as defined in §62.1-44, that result in the disturbance of less than 10,000 square feet but more than 2,500 square feet.

A site specific ESC plan must be developed by the design professional, project manager, or contractor and approved by the CED-EE prior to commencement of the land disturbing activity. ESC plans shall comply with the *Standards and Specifications for Erosion and Sediment Control* for JBLE – Eustis and the Virginia Erosion and Sediment Control Law (§62.1-44 et. seq.). The plan shall be compliant with the minimum standards identified in 9VAC25-840 et. seq. of the Virginia Erosion and Sediment Control Regulations (*Appendix B: 9VAC25-840-40. Minimum Standards*) and shall be governed by the criteria standards, and specifications established in *Chapter 6, Preparing an Erosion and Sediment Control Plan*, of the *Virginia Erosion and Sediment Control Handbook* as amended.

The following sections provide specific guidance for construction activities that require CED-EE approval.

3.0 STANDARDS AND SPECIFICATIONS IMPLEMENTATION

3.1 Submittals

Submittals to CED-EE shall include two complete sets of the site specific ESC plans, a narrative describing the nature and purpose of the land disturbing activity, stormwater calculations (if applicable), the completed ESC plan review checklist (See *Appendix C: Checklist for Erosion and Sediment Control Plans*), and any other supporting documentation.

3.2 Plan Reviews

Plan reviews shall be conducted by qualified CED-EE personnel who hold a certificate of competence from the Virginia Soil and Water Conservation Board in the area of plan review as defined in 9VAC25-850 et. seq.

3.3 Pre-Construction Conference

A pre-construction conference shall be held prior to commencement of a land disturbance in order to clarify roles, responsibilities, and obligations of all parties involved with the land disturbing activity. At a minimum, the pre-construction conference shall be attended by the project manager, construction contractor, and a CED-EE representative.

3.4 Inspections

Site inspections shall be conducted by qualified CED-EE personnel who hold a certificate of competence from the Virginia Soil and Water Conservation Board in the area of project inspection as defined in 9VAC25-850 et. seq.

Land disturbing activities shall be inspected immediately following the initial installation of ESC measures prior to the land disturbace, at least once during every two-week period, within 48 hours of any runoff-producing storm event, and upon completion of the project.

The ESC Inspection Report provided in Appendix D shall be used to record each inspection visit. All ESC measures shown on the plan shall be inspected, and any problems or violations shall be documented in the report. Required or recommended corrective actions for each problem or violation shall be noted on the report along with a date by which all corrective actions must be completed. A signed and dated copy of the report shall be provided to all parties involved with the land disturbing activity within 24 hours of the inspection. The inspection report will not be considered complete unless it includes all names, signatures and dates.

3.5 Enforcement

The project manager or construction contractor shall be responsible for ensuring that corrective action is taken in response to problems and violations listed on the inspection report. If the listed violation(s) constitute non-compliance and/or required corrective actions are not completed by the deadline noted on the report, a Notice to Comply, Stop Work Order, and/or other enforcement actions may be issued.

3.6 Changes and Amendments to Approved Plans

Amendments to approved ESC plans must be reviewed and approved by the CED-EE and shall not be considered approved until written notice is provided.

3.7 Variances and Exceptions

A variance or exception may be granted if any requirements are deemed inappropriate or too restrictive for site conditions. An applicant may request a variance or exception at the time of plan submission or during construction.

The applicant shall submit a written request to CED-EE for a variance or exception with an explanation and description of the specific condition necessitating the request. The request must also include a detailed description of the alternative practice and justification that the practice meets the intent of the regulation for which the variance is sought.

CED-EE shall respond in writing either approving or disapproving the variance or exception request. All requests shall be considered unapproved until written approval from the CED-EE has been received. Furthermore, all approved variances or exceptions shall be documented in the ESC plan.

4.0 EROSION AND SEDIMENT CONTROL PLAN REQUIREMENTS

A description of items to be included in the ESC plan is listed in the sub-sections below. Detailed requirements of specific items to be included in the ESC plan are located in *Appendix: C Checklist for Erosion and Sediment Control Plans* and *Appendix: E General Erosion and Sediment Control Notes*.

4.1 Minimum Standards

Plans shall address all applicable minimum standards identified in 9VAC25-840 et. seq. of the Virginia ESC Regulations.

4.2 Narrative

The narrative shall include a description of the nature and purpose of the land-disturbing activity and a description of the existing site conditions, including environmentally sensitive areas, soils information, and adjacent areas such as streams, lakes, residential areas, and roads. The narrative shall also include a description of the temporary and permanent ESC measures to be used on the site as well as supporting stormwater calculations (if applicable).

4.3 Site Plan

The site plan shall include the following items:

- North Arrow and Scale Plans shall indicate the direction of north in relation to the site as well as the scale of the drawing.
- Existing and Proposed Site Features Plans shall include existing and proposed contours, existing and proposed site features or structures, existing vegetation, environmentally sensitive areas, adjacent streams, lakes, residential areas, and roads.
- Limits of Disturbance Plans shall identify the limits of disturbed area and provide the total amount of disturbed area for the project as well as the amount of disturbed area for each phase.
- Construction Sequence The construction sequence related to ESC shall be provided on the plans. The construction sequence shall include the installation of critical measures prior to the initiation of the land-disturbing activity and removal of measures after the areas they serve are permanently stabilized.
- Off-Site Areas Stockpile/lay-down areas or any off-site land disturbing activities (e.g., borrow sites, waste areas) shall be identified on the plans with appropriate ESC measures.

- Location of ESC Measures The location of temporary and permanent ESC measures for each phase shall be clearly identified on the plans.
- Vegetative Stabilization The temporary and permanent seeding schedule shall be provided on the plans including the areas to be stabilized with vegetation, seed type and rates, method of soil preparation, fertilizer and lime type withrates, and mulch type withrates.
- General ESC Notes Plans shall include the general ESC notes provided in *Appendix E: General Erosion and Sediment Control Notes*.
- Maintenance Requirements Plans shall include the maintenance requirements of temporary and permanent ESC measures as well as the contact person responsible for maintenance. Air Force Engineering Technical Letter (ETL) 14-1, *Construction and Operation and Maintenance Guidance for Storm Water Systems*, provides guidance on maintenance of ESC measures.
- Detail Drawings Construction drawings and details for temporary and permanent ESC measures shall be included in the plans.

5.0 EROSION AND SEDIMENT CONTROL MEASURES

The following section provides general guidelines for structural and vegetative ESC measures used on small projects (less than 10,000 square feet) under typical site conditions. Exceptions to these guidelines may be made for sites with unusual site conditions based on professional judgement. Additional guidelines on the design and use of ESC measures can be found in *Chapter 3, State Minimum Standards and Specifications*, of the *Virginia Erosion and Sediment Control Handbook* as amended.

The ESC measures described below are not intended to stand alone. Rather, they should be employed as a system to effectively control erosion and sedimentation throughout all phases of the land disturbing activities. Changing site conditions and requirements should be considered when selecting the appropriate ESC measures as well as when determining the sequence of which measures are to be implemented.

5.1 Temporary Construction Entrance

A temporary construction entrance is a stabilized stone pad located at points where vehicles enter and leave construction sites. Its purpose is to provide a buffer area where vehicles can remove tire mud and sediment to reduce the amount of sediment transported onto public roads by motor vehicles or runoff.

Aggregate size Virginia Department of Transportation (VDOT) #1 Coarse Aggregate (2- to 3-inch stone) should be used. The aggregate layer must be at least 6 inches thick and extend the full width of the vehicular ingress and egress area and have a minimum 12-foot width. The length of the entrance must be at least 70 feet.

Additional guidelines can be found in Standard and Specification 3.02 of the *Virginia Erosion and Sediment Control Handbook* as amended.

5.2 Silt Fence

Silt fence is a temporary sediment barrier consisting of a synthetic geotextileburied at the bottom, stretched, and attached to supporting posts. Its purpose is to intercept and retain sediment from small disturbed areas by reducing velocity of sheet flows to allow sediment deposition.

Locate silt fence where the drainage area is no more than one-quarter acre per 100 feet of silt fence length. The maximum slope length behind the barrier should be 100 feet and the maximum gradient behind the barrier should be 50 percent or 2:1 (Horizontal:Vertical). Silt fence should be located at least 5 to 7 feet beyond the base of disturbed slopes with grades greater than 7 percent.

Provide a non-erosive outlet for any point where flow may overtop the silt fence, such as natural depressions or swales.

Additional guidelines can be found in Standard and Specification 3.05 of the Virginia Erosion and Sediment Control Handbook as amended.

5.3 Storm Drain Inlet Protection

Storm drain inlet protection is a sediment filter or an excavated area in the approach to a storm drain drop inlet or curb inlet to prevent sediment from entering permanent storm drainage systems.

There are several types of storm drain inlet protection devices that may be used to prevent sediment from entering storm drainage systems. Design criteria specific to each particular inlet protection device can be found on Plates 3.07-1 through 3.07-8 of the *Virginia Erosion and Sediment Control Handbook* as amended. The inlet protection devices include, but are not limited to:

- Silt Fence Drop Inlet Protection
- Gravel and Wire Mesh Drop Inlet Sediment Filter
- Block and Gravel Drop Inlet Sediment Filter
- Excavated Drop Inlet Sediment Trap
- Sod Drop Inlet Sediment Filter
- Gravel Curb Inlet Sediment Filter
- Block and Gravel Curb Inlet Sediment Filter

For the inlet protection devices which utilize stone as the main ponding/filtering medium, VDOT #3, #357, or #5 Coarse Aggregate should be used.

For the inlet protection devices which utilize a wire mesh support as the filtering mechanism, the stone should be completely wrapped with the wire mesh to improve stability and provide easier cleaning.

Additional guidelines can be found in Standard and Specification 3.07 of the *Virginia Erosion and Sediment Control Handbook* as amended.

5.4 Temporary Diversions

A temporary diversion is an excavated channel with a supporting ridge constructed across and down grade of sloping land. Its purpose is to reduce slope length and to intercept and divert sediment-laden water to traps or stabilized outlets.

The cross section of the diversion channel may be parabolic, trapezoidal, or vee-shaped and shall have a minimum capacity to carry the runoff expected from a 10-year frequency storm with a freeboard of at least 0.3 feet. The channel side slopes should be 2:1 (H:V) or flatter. The ridge shall have side slopes no steeper than 2:1 (H:V) and the width at the design water elevation shall be a minimum of 4 feet.

The ridge and channel shall be seeded and mulched or seeded and stabilized through the use of soil stabilization blankets and matting immediately following their construction.

A uniform or gradually increasing grade is preferred, and the outlet should be designed to accept flow from the diversion and any other contributing areas.

Additional guidelines can be found in Standard and Specification 3.12 of the Virginia Erosion and Sediment Control Handbook as amended.

5.5 Outlet protection

Outlet protection is a structurally lined apron or energy dissipating device placed at the outlet of a channel or conduit to prevent erosion and scour by reducing flow velocity and dissipating energy.

The design capacity of the outlet protection device should be the 10-year, peak runoff or the design discharge of the water conveyance structure, whichever is greater.

The apron length and width should be determined according to the ratio of the tail-water condition immediately below the outlet pipe to the diameter of the pipe using Plate 3.18-3 (tail-water depth is less than half the pipe diameter) and Plate 3.18-4 (tail-water depth is greater than half the pipe diameter) of the *Virginia Erosion and Sediment Control Handbook* as amended. When the conveyance structure discharges into a well-defined channel, the apron shall extend across the channel bottom and up the channel banks to an elevation of 0.5 foot above the maximum tail-water depth or to the top of the bank, whichever is less.

The median sized stone for riprap shall be determined from the curves in Plates 3.1-3 and 3.18-4 of the *Virginia Erosion and Sediment Control Handbook*. A filter cloth shall be placed between the riprap and the underlying soil to prevent soil movement through the openings in the riprap.

Additional guidelines can be found in Standard and Specification 3.18 of the *Virginia Erosion and Sediment Control Handbook* as amended.

5.6 Rock Check Dams

A rock check dam is a stone dam constructed across a swale or drainage ditch to reduce channel grade. Its purpose is to reduce the velocity of stormwater flows and prevent erosion of a channel that results from excessive grade.

The maximum dam height shall be 3.0 feet and the stone should extend to the top of the channel banks. The center of the dam must be at least 6 inches lower than the outer edges.

The maximum spacing between dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

For drainage areas less than 2 acres, use VDOT #1 Coarse Aggregate stone. A geotextile may be used under the stone to provide a stable foundation.

Additional guidelines can be found in Standard and Specification 3.20 of the *Virginia Erosion and Sediment Control Handbook* as amended.

5.7 Wattles

Wattles are tubular products consisting of excelsior fibers encased in natural or synthetic netting. Wattles can be used to reduce the velocity of stormwater flows on slopes and channels and prevent erosion that results from excessive grade.

Wattles shall consist of 100 percent curled wood (excelsior) fibers with a minimum density of 2.5 lb./ft.³ \pm 10 percent and minimum weight of 20 lbs. \pm 10 percent per 10 ft. length. The net openings should be 1 in. x 1 in. and should totally encase the excelsior fibers.

Wattles should be secured to the soil by wire staples every 2 linear feet and wood stakes installed on the downstream (minimum of 4) and upstream side (minimum of 2).

Additional guidelines for wattle specifications and installation can be found at the following web pages: <u>http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/soil_water/pdf/Wattle.pdf</u>, <u>http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/soil_water/pdf/Wattledetail.pdf</u>

5.8 Level Spreader

A level spreader is a non-erosive outlet for concentrated flows from diversion channels to disperse flow uniformly across a slope. Its purpose is to convert concentrated flow to sheet flow and release it evenly onto stabilized areas.

Design capacity of the level spreader should be based on the peak flow expected from a 10-year storm. For design flows less than 10 cfs, the spreader should have a minimum depth of 0.5 ft., a width of 6 ft., and a length of 10 ft. For design flows greater than 10 cfs, the spreader should have a minimum depth of 0.6 ft., a width of 6 ft., and a length of 20 ft.

The grade of the level spreader shall be 0 percent and the stormwater should be released over the level lip onto an undisturbed well-vegetated area with maximum slope of 10 percent. The grade of the diversion channel for the last 20 feet should be less than or equal to 1 percent.

Additional guidelines can be found in Standard and Specification 3.21 of the Virginia Erosion and Sediment Control Handbook as amended.

5.9 Temporary Seeding

Temporary seeding is the establishment of vegetative cover by planting rapid growing annual grasses, small grains, or legumes to temporarily stabilize disturbed areas that will not be brought to final grade for a period of more than 14 days. Temporary seeding controls runoff and erosion, and provides protection to bare soils until permanent vegetation or other erosion and sediment control measures can be established.

Plant selection should be appropriate to the season as listed below:

- September 1 February 15
 - Plant 50/50 mix of Annual Ryegrass and Winter Rye at a rate of 50-100 lbs./acre.
- ➢ February 16 − April 30
 - Plant Annual Ryegrass at a rate of 60-100 lbs./acre.
- May 1 August 31
 - Plant German Millet at a rate of 50 lbs./acre.

Seedbed preparation is essential for plant germination and establishment. The seedbed should be wellpulverized, loose, and uniform before planting.

In most cases, liming a temporary site is not necessary. If it is determined that lime should be applied for temporary seeding, agricultural limestone should be applied according to soil test recommendation. If the pH of the soil is not known, agricultural limestone should be applied at a rate of 1-1.5 tons/acre on course textured soils and at a rate of 2-3 tons/acre on fine-textured soils.

Fertilizer should be applied according to soil test recommendations. When this information is not available apply fertilizer at 600 lbs./acre of 10-20-10 or equivalent nutrients. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil.

Additional guidelines can be found in Standard and Specification 3.31 of the Virginia Erosion and Sediment Control Handbook as amended.

5.10 Permanent Seeding

Permanent seeding is the establishment of permanent vegetative cover by planting perennial seed to reduce erosion and decrease sediment yield from disturbed areas and to permanently stabilize disturbed areas.

Plant selection should be based on climate, topography, soils, land use, and planting season. Site specific seeding mixtures and application rates for the coastal plain area are listed below:

- Minimum Care Lawn, select one
 - Kentucky 31 or Turf-Type Tall Fescue: 175-200 lbs./acre,
 - Common Bermudagrass: 75 lbs./acre
 - \circ May through October, use hulled seed. All other seeding periods, used unhulled seed.
- ➢ High-Maintenance Lawn, select one
 - Kentucky 31 or Turf-Type Tall Fescue: 200-250 lbs./acre,

- Hybrid Bermudagrass (seed): 40 lbs./acre (un-hulled) or 30 lbs./acre (hulled).
 - May through October, use hulled seed. All other seeding periods, used unhulled seed.
- General Slope
 - Kentucky 31 Tall Fescue: 93-108 lbs./acre
 - Red Top Grass: 2 lbs./acre
 - Seasonal Nurse Crop*: 20 lbs./acre
- ► Low Maintenance Slope (Steeper than 3:1 (H:V))
 - Kentucky 31 Tall Fescue: 93-108 lbs./acre
 - Common Bermudagrass: 0-15 lbs./acre
 - Red Top Grass: 2 lbs./acre
 - Seasonal Nurse Crop*: 20 lbs./acre
 - Sericea Lespedeza: 20 lbs./acre

*Seasonal nurse crops should be used in accordance with the seeding dates below:

- February through April
 - Annual Rye
- May through August
 - Foxtail Millet
- September through November 15th
 - Annual Rye
- November 16th through January
 - Winter Rye

Seedbed preparation is essential for plant germination and establishment. The seedbed should be wellpulverized, loose, and uniform before planting.

Lime and fertilizer needs should be determined by soil tests. When this information is not available apply fertilizer as 10-20-10 (or equivalent nutrients) at a rate of 1000 lbs./acre and agricultural limestone at a rate of 2 tons/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil.

All permanent seeding must be mulched or have a soil stabilization blanket installed immediately upon completion of seed application.

Additional guidelines can be found in Standard and Specification 3.32 of the *Virginia Erosion and Sediment Control Handbook* as amended.

5.11 Sodding

Sodding is permanently stabilizing disturbed areas with established grass stands to prevent erosion and damage from sediment and runoff.

Sod shall be inspected and certified by the Virginia Crop Improvement Association or the certifying agency in other states. Sod selection should be based on the adaptability of the plants to the region. Guidance for selection of sod best suited for the area and use can be found in Table 3.33-A of the *Virginia Erosion and Sediment Control Handbook*.

Prior to sod installation, soil tests should be made to determine the exact requirements for lime and fertilizer. When this information is not available apply fertilizer at 10-10-10 (or equivalent nutrients) in the fall or 5-10-10 (or equivalent nutrients) in the spring at a rate of 1000 lbs./acre and agricultural limestone at a rate of 2 tons/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil.

Additional guidelines can be found in Standard and Specification 3.33 of the Virginia Erosion and Sediment Control Handbook as amended.

5.12 Mulching

Mulching is the application of plant residues or other suitable material to the soil surface as a protective blanket to protect the soil surface from the raindrop impact and overland flow and to foster growth of vegetation by increasing water holding capacity, providing insulation, and weed control.

Organic mulches should be applied according to the following rates and restrictions:

- Straw or hay
 - 1.5-2 tons/acre
 - Free from weeds, dry, un-chopped, and un-weathered
 - Spread by hand or with mulch blower
- ➢ Fiber mulch
 - 1,500 lbs./acre
 - Do not use in hot, dry weather
 - Apply as slurry
- Corn stalks
 - 4-6 tons./acre
 - Cut or shredded in 4-6" lengths, air-dried
 - Apply by hand or with mulch blower
- ➢ Wood chips

- 4-6 tons/acre
- Free of coarse matter, air-dried, treat with 12 lbs. nitrogen per ton
- Apply by hand or with mulch blower
- Bark chips or shredded bark
 - 50-70 cu.yds./acre
 - Free of coarse matter, air dried
 - Apply by hand or with mulch blower

Straw, hay, and corn stalk mulch must be anchored immediately after spreading to prevent displacement. The following mulch anchoring methods may be used:

- Straw mulch crimping
 - Limit to slopes 3:1 (H:V) or flatter
- ➢ Fiber Mulch
 - Apply at a rate of 500-750 lbs./acre over top of straw much or hay
- Synthetic mulch binders
 - Use as recommended by the manufacturer to anchor mulch

Additional guidelines can be found in Standard and Specification 3.35 of the Virginia Erosion and Sediment Control Handbook as amended.

5.13 Soil Stabilization Blankets and Matting

Soil stabilization blankets and matting are protective coverings or soil stabilization mats designed to reduce soil erosion and assist in the growth, establishment, and protection of vegetation. Soil stabilization blankets and mats are designed to protect soil and hold seed and mulch in place on slopes and in channels to promote vegetation establishment.

The *Virginia Erosion and Sediment Control Handbook* describes two general types of blankets and mats. However, a variety of soil stabilization products are available on the market today. The design professional should have a thorough understanding of the manufacturer's instructions and recommendations to determine the appropriateness of a product to meet specific site requirements.

Treatment-1 (also referred to as EC-2 in the VDOT Drainage Manual) is a degradable soil stabilization blanket which consists of a plastic netting intertwined with a natural organic man-made mulch. The Treatment-1 matting can also be a jute mesh which is homogeneous in design and can act alone as a soil stabilization blanket. Treatment-1 matting should be used to help establish vegetation and on problem slopes of 3:1 (H:V) or flatter and should not be used where concentrated flow velocities may exceed 4 ft./s.

Treatment-2 (also referred to as EC-3 in the VDOT Drainage Manual) is a non-degradable soil stabilization matting with a three-dimensional plastic structure which can be filled with soil prior to planting. Treatment-2 matting can be used on problem slopes of 3:1 (H:V) or steeper, in permanent conveyance channels, and can withstand concentrated flow velocities up to 10 ft./s.

Prior to selection of a blanket or matting, consult the VDOT "Approved Products List" for products approved for a certain range of flow velocities. The "Approved Products List" can be found at the following web page: <u>http://www.vdot.virginia.gov/business/resources/Materials/Approved_Lists.pdf</u>

Additional guidelines can be found in Standard and Specification 3.36 of the *Virginia Erosion and Sediment Control Handbook* as amended.

6.0 **REFERENCES**

- Code of Virginia. 2016. *State Waer Control Law*. §62.1-44 et. seq. Accessed 21 March 2016 from http://law.lis.virginia.gov/vacode/title62.1/chapter3.1/
- NCDOT. 2008. Wattle Special Provision, Wattle Detail. Accessed 21 March 2016 from http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/soil_water/pdf/Wattle.pdf

http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/soil_water/pdf/Wattledetail.pdf

- U.S. Air Force, Engineering Technical Letter (ETL) 14-1, *Construction and Operation and Maintenance Guidance for Storm Water Systems*. Accessed 21 March 2016 from https://www.wbdg.org/ccb/browse_cat.php?c=125
- VCIA. 2016. Virginia Crop Improvement Association website. Accessed 21 March 2016 from http://www.virginiacrop.org/
- VDEQ.1992. Virginia Erosion and Sediment Control Handbook. Third Edition. Accessed 21 March 2016 from http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications/ESCHandbo ok.aspx
- VDOT. 2016. Virginia Department of Transportation Approved Materials Lists. Accessed 21 March 2016 from http://www.vdot.virginia.gov/business/resources/Materials/Approved_Lists.pdf
- VDOT. 2016. Virginia Department of Transportation Drainage Manual. Accessed 21 March 2016 from http://www.virginiadot.org/business/resources/LocDes/DrainageManual/START_VDOT_Draina ge_Manual.pdf
- Virginia Administrative Code. 2016. *Erosion and Sediment Control Regulations*. 9VAC25-840. Accessed 21 March 2016 from http://law.lis.virginia.gov/admincode/title9/agency25/chapter840/
- Virginia Administrative Code. 2016. Erosion and Sediment Control and Stormwater Management Certification Regulations. 9VAC25-850 et. seq. Accessed 21 March 2016 from http://law.lis.virginia.gov/admincode/title9/agency25/chapter850/

APPENDIX A:

Flow-Chart to Determine Erosion and Sediment Control Requirements for Land-Disturbing Activities at JBLE – Eustis



Figure 1. Flow-chart to Determine Erosion and Sediment Control Requirements for

Land-disturbing Activities at JBLE – Eustis

APPENDIX B:

9VAC25-840-40. Minimum Standards

9VAC25-840-40. Minimum Standards.

A VESCP must be consistent with the following criteria, techniques and methods:

1. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.

2. During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrow areas and soil intentionally transported from the project site.

3. 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.

4. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.

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

6. Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.

a. The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.

b. Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.

7. Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.

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

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

10. All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

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

12. When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials.

13. When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of nonerodible material shall be provided.

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

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

16. 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 promote stabilization.

e. Restabilization shall be accomplished in accordance with this chapter.

f. Applicable safety requirements shall be complied with.

17. 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. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities.

18. All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the VESCP authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.

19. Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:

a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.

b. Adequacy of all channels and pipes shall be verified in the following manner:

(1) The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or

(2) (a) Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks.

(b) All previously constructed man-made channels shall be analyzed by the use of a 10-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and

(c) Pipes and storm sewer systems shall be analyzed by the use of a 10-year storm to verify that stormwater will be contained within the pipe or system.

c. If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:

(1) Improve the channels to a condition where a 10-year storm will not overtop the banks and a two-year storm will not cause erosion to the channel, the bed, or the banks; or

(2) Improve the pipe or pipe system to a condition where the 10-year storm is contained within the appurtenances;

(3) Develop a site design that will not cause the pre-development peak runoff rate from a twoyear storm to increase when runoff outfalls into a natural channel or will not cause the predevelopment peak runoff rate from a 10-year storm to increase when runoff outfalls into a manmade channel; or

(4) Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the VESCP authority to prevent downstream erosion.

d. The applicant shall provide evidence of permission to make the improvements.

e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.

f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.

g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.

h. All on-site channels must be verified to be adequate.

i. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.

j. In applying these stormwater management criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.

k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.

1. Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels

shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to § 62.1-44.15:54 or 62.1-44.15:65 of the Act.

m. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § <u>62.1-44.15:52</u> A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ <u>62.1-44.15:24</u> et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with <u>9VAC25-870-48</u> of the Virginia Stormwater Management Program (VSMP) Regulation or are exempt pursuant to subdivision C 7 of § <u>62.1-44.15:34</u> of the Act.

n. Compliance with the water quantity minimum standards set out in <u>9VAC25-870-66</u> of the Virginia Stormwater Management Program (VSMP) Regulation shall be deemed to satisfy the requirements of this subdivision 19.

APPENDIX C:

Checklist for Erosion and Sediment Control Plans

Checklists for Erosion and Sediment Control Plans

Minimum Standards

□ <u>Minimum Standards</u> – Plans shall address all applicable minimum standards identified in 9VAC25-840 et. seq. of the Virginia ESC Regulations.

Narrative

- □ <u>Project Description</u> A description of the nature and purpose of the land-disturbing activity.
- \Box <u>Area of Disturbance</u> The total area (acres) to be disturbed.
- □ Existing Site Conditions A description of the existing topography, vegetation, drainage patterns, environmentally sensitive areas, soils information, and adjacent areas such as streams, lakes, residential areas, and roads.

Site Plan

- □ <u>North Arrow and Scale</u> Plans shall indicate the direction of north in relation to the site as well as the scale of the drawing.
- □ Existing and Proposed Site Features Plans shall include existing and proposed contours, existing and proposed site features or structures, existing vegetation, environmentally sensitive areas, adjacent streams, lakes, residential areas, and roads.
- □ <u>Limits of Disturbance</u> Plans shall identify the limits of disturbed area and provide the total amount of disturbed area for the project as well as the amount of disturbed area for each phase.
- □ <u>Construction Sequence</u> The construction sequence related to ESC shall be provided on the plans. The construction sequence shall include the installation of critical measures prior to the initiation of the land-disturbing activity and removal of measures after the areas they serve are permanently stabilized.
- □ <u>Off-Site Areas</u> Stockpile/lay-down areas or any off-site land disturbing activities (e.g., borrow sites, waste areas) shall be identified on the plans with appropriate ESC measures.
- □ <u>Location of ESC Measures</u> The location of temporary and permanent ESC measures for each phase shall be clearly identified on the plans.
- □ <u>Vegetative Stabilization</u> The temporary and permanent seeding schedule shall be provided on the plans including the areas to be stabilized with vegetation, seed type and rates, method of soil preparation, fertilizer and lime type with rates, and mulch type and rates.

- □ <u>General ESC Notes</u> Plans shall include the general ESC notes provided in *Appendix E: General Erosion and Sediment Control Notes*.
- □ <u>Maintenance Requirements</u> Plans shall include the maintenance requirements of temporary and permanent ESC measures as well as the contact person responsible for maintenance.
- Detail Drawings Construction drawings and details for temporary and permanent ESC measures shall be included in the plans.

APPENDIX D:

Erosion and Sediment Control Inspection Report

DEPARTMENT OF THE AIR FORCE HEADQUARTERS, 733D MISSION SUPPORT GROUP JOINT BASE LANGLEY-EUSTIS FORT EUSTIS, VIRGINIA

Reply To: Ronald Holcomb CED-EE 1407 Washington Blvd. Joint Base Langley Eustis 23604-5332 Phone: (757) 878-5218 Fax: (757) 878-4589/DSN: 826-4589

INSPECTION REPORT

Project Name: RLD Name: Project Location: Inspector Name:				Authority:				
				RLD No Project No:				
				Pre	e-Constructior Clearing Ro	n Confe g & Gru bugh Gr	rence [_ Ibbing [_ ading [_	STAGE OF CONSTRU Building Construc Finish Grad Final Stabiliza
Item #	State/Local Regulation ⁽¹⁾	Violation		Description and Location of Pr Corrective Actio		roblem/Violation ⁽²⁾ , Required or Recommended		
(1)	Refers to applica 840), <i>Stormwate</i> <i>Eustis, Virginia,</i> Note whether or	able regu er Manage or local E not off-s	llation four ement Reg SC/SWM ite sedime	nd in the most recent publication of the gulations (9VAC25-870), Standards ar ordinance. ant damage resulting from the problem	Virginia E nd Specific n/violation v	rosion and Sediment ations for Erosion and vas evident during the	Control Regulation Sediment Contro inspection.	ns (9VAC25 ol for JBLE -
REQUIR The required constitut WORK (project.	ED CORRECT uired corrective te non-compliar ORDER, and/or	IVE AC action (ace and/ r other e	TION <u>DE</u> deadline for require enforceme	ADLINE DATE: (DD/MM/YY) date applies to <u>all problems/violatic</u> ed corrective actions are not comp ent actions may be issued to the e	Re-ins	spection Date: I on this report. If list the deadline, a NOT ponsible for ensuring	(DD/MM/YY) sted violation(s) TICE TO COMPL compliance on	currently _Y, STOP the above
Inspecto	r: Signature			Date				
Acknow	ledgementofon	site repo	ort receipt.	Print Name	Signa	ture	Da	te
This rep	oort will be provid	led to the	e following	parties via mail, fax, or e-mail within 2	24 hours of	f inspection:		

INSPECTION REPORT

Project Name:

Inspection Date:

Item #	State/Local Regulation ⁽¹⁾	Violation		Description and Location of Problem/Violation ⁽²⁾ , Required or Recommended Correctiv				
		Initial	Repeat	Actions, and Other Comments/Notes				

 Refers to applicable regulation found in the most recent publication of the Virginia Erosion and Sediment Control Regulations (9VAC25-840), Storm water Management Regulations (9VAC25-870), Standards and Specifications for Erosion and Sediment Control for JBLE – Eustis, Virginia, or local ESC/SWM ordinance.

(2) Note whether or not off-site sediment damage resulting from the problem/violation was evident during the inspection.

Sheet ____ of ____

APPENDIX E:

General Erosion and Sediment Control Notes

General Erosion and Sediment Control Notes to be Included on All Site Specific ESC Plans (VDEQ, 1992)

- 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 <u>Virginia Erosion and Sediment Control</u> <u>Handbook</u> and Virginia Erosion and Sediment Control Regulations.
- ES-2. The plan approving authority must be notified one week prior to the preconstruction 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 and sediment control measures periodically and after each runoff-producing rainfall event. Any necessary repairs or cleanup to maintain effectiveness of the erosion and control devices shall be made immediately.