ANNUAL STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT

Revision 3
July 2020

I certify under penalty of law that all documents and all attachments related to the submission and updating of the MetroDuct Systems VA LLC's Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management have been prepared under my direction or supervision in a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of a fine and imprisonment for knowing violations.

MetroDuct Systems VA LLC

Name: Kenneth E. Katz

Signature:

Title: Vice President

Date: 7/8/2020

Table of Contents

1.0 INTRODUCTION 3

2.0 OVERVIEW 4

3.0 PROGRAM ADMINISTRATION 7

4.0 APPLICABILITY AND THRESHOLD CRITERIA 9

5.0 TECHNICAL CRITERIA FOR REGULATED LAND-DISTURBING ACTIVITIES 12

6.0 EROSION AND SEDIMENT CONTROL PLAN 15

7.0 STORMWATER MANAGEMENT PLAN 21

8.0 SEQUENCE OF CONSTRUCTION 25

9.0 ESC AND SWM MAINTENANCE AND INSPECTIONS 27

10.0 STORMWATER POLLUTION PREVENTION PLANS 30

11.0 EXCEPTIONS AND VARIANCES 31

12.0 E-NOTIFICATION 34

13.0 REPORTS AND RECORDKEEPING 34

14.0 HORIZONTAL DIRECTIONAL DRILL INADVERTENT RETURN PLAN 35

Appendix A EROSION AND SEDIMENT CONTROL PLAN AND NARRATIVE CHECKLIST

Appendix B STORMWATER MANAGEMENT PLAN AND NARRATIVE CHECKLIST

Appendix C CONSTRUCTION SITE INSPECTION FORM

Appendix D STABILIZATION SEEDING AND INVASIVE SPECIES GUIDANCE

Appendix E VESCH STANDARD DETAILS

Appendix F CERTIFICATIONS LOG

1.0 INTRODUCTION

MetroDuct Systems VA LLC (MDS) was founded in 2016 with a mission to serve high bandwidth/high fiber county consumers in Northern Virginia. MDS is a registered CLEC in Virginia and provides open architecture infrastructure that serves both public and private sectors.

The Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management, hereafter referred to as Annual Standards and Specifications (AS&S), will guide compliance of MDS's utility installation and maintenance with Virginia erosion and sediment control (ESC) and stormwater management (SWM) laws and regulations. The AS&S has been prepared for use by MDS and its contractors to identify the means and methods for controlling erosion of surface soils and to reduce the runoff of sediment to the greatest extent reasonably achievable during and after construction of duct bank installation projects. The AS&S will apply to all planning, design, construction, and maintenance activities undertaken by owners and operators, either by internal personnel or by contracted personnel, where these activities will be regulated by the Virginia ESC and SWM laws and regulations. Unless specifically stated, the controls and specifications from the Virginia Erosion and Sediment Control Handbook (VESCH), along with accompanying technical documents and guidance, have been adopted and included for use.

Compliance of the AS&S will be enforced by environmental regulatory agencies having jurisdiction, such as (but not limited to) the Virginia Department of Environmental Quality (VDEQ) and U.S. Environmental Protection Agency (EPA). The AS&S shall be submitted to VDEQ for review and approval annually, and the approved version will be made available and utilized as an operational guide by all appropriate MDS owners and operators and VDEQ personnel. MDS's owners and operators will administer, coordinate, enforce, and verify the preparation and implementation of project-specific plans in accordance with the approved AS&S.

Unless otherwise noted in site-specific ESC Plans and SWM Plans, the AS&S meets all applicable requirements of the following:

- Virginia Erosion and Sediment Control Law (Va. Code §§ 62.1-44.15:51 et seq., as amended);
- Virginia Erosion and Sediment Control Regulations (9VAC25-840, as amended);
- Virginia Erosion and Sediment Control and Stormwater Management Certification Regulations (9VAC25-850, as amended);
- Virginia Stormwater Management Act (Va. Code §§ 62.1-44.15:24 et seq., as amended); and
- Virginia Stormwater Management Program Regulations (9VAC25-870, as amended).

2.0 OVERVIEW

2.1 Abbreviations

AS&S	Annual Standards and Specifications
BMP	Best Management Practices
CBPA	Chesapeake Bay Preservation Area
ESC	Erosion and Sediment Control
ESC Plan	Erosion and Sediment Control Plan
MDS	MetroDuct Systems VA LLC
RLD	Responsible Land Disturber
SWM	Stormwater Management
SWM Plan	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VESCH	Virginia Erosion and Sediment Control Handbook
VESCP	Virginia Erosion and Sediment Control Program
VSMP	Virginia Stormwater Management Program

2.2 General Definitions

"**Board**" means the Virginia State Water Control Board.

"**CBP Act**" means the Chesapeake Bay Preservation Act (Va. Code §§ 62.1-44.15:67 et seq.)

"**CBP Regulations**" means the Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830)

"**ESC/SWM Certification Regulations**" means the Erosion and Sediment Control and Stormwater Management Certification Regulations (9VAC25-850).

"**Classification**" means the four specific certificate of competence classifications within the areas of ESC or SWM that make up activities being performed under this AS&S: program administrator, plan reviewer, project inspector, and combined administrator.

"ESC Law" means the Virginia Erosion and Sediment Control Law (Va. Code §§ 62.1-44.15:24 et seq.).

"**ESC Regulations**" means the Virginia Erosion and Sediment Control Regulations (9VAC25-840).

"**Minimum Standards**" means the criteria, techniques, and methods with which all VESCPs, including this AS&S, shall be consistent, as defined by Chapter 9VAC25-840-40.

"**SWM Act**" means the Virginia Stormwater Management Act (Va. Code §§ 62.1-44.15:51 et seq.).

"**VDEQ Linear Utility Project SWM Guidance**" means VDEQ Memorandum 15-2003 dated April 23, 2015, as may be amended or superseded.

"**VSMP Regulations**" means the Virginia Stormwater Management Program Regulations (9VAC25-870).

2.3 MDS' Roles and Responsibilities under the AS&S Program

All roles in the AS&S defined below shall be performed by individuals certified by the Board in accordance with the ESC/SWM Certification Regulations. All individuals in these roles shall meet the training, certification, and recertification requirements of the ESC/SWM Certification Regulations.

2.3.1 **"Combined ESC Administrator"** means anyone who is responsible for performing the combined duties of ESC Program Administrator, ESC Plan Reviewer, and ESC Project Inspector under this AS&S. Responsibilities of the Combined ESC Administrator under the AS&S shall be performed by an individual who has obtained a certificate of competence for "combined administrator for ESC" as defined in 9VAC25-850-40.

2.3.2 **"Combined SWM Administrator"** means anyone who is responsible for performing the combined duties of SWM Program Administrator, SWM Plan Reviewer, and SWM Project Inspector under this AS&S. Responsibilities of the Combined SWM Administrator under the AS&S shall be performed by an individual who has obtained a certificate of competence for "combined administrator for SWM" as defined in 9VAC25-850-40.

2.3.3 **"ESC Plan Reviewer"** means anyone who is responsible for determining the accuracy of ESC Plans and supporting documents for approval by the ESC Program Administrator. Responsibilities of the ESC Plan Reviewer under the AS&S shall be performed by an individual who has obtained a certificate of competence for "plan reviewer for ESC" as defined in 9VAC25-850-40.

2.3.4 **"ESC Program Administrator"** means the person or persons responsible for administering and enforcing the ESC requirements of this AS&S. Responsibilities of the ESC Program Administrator under the AS&S shall be performed by an individual who has obtained a certificate of competence for "program administrator for ESC" as defined in 9VAC25-850-40.

2.3.5 **"ESC Project Inspector"** means anyone who, as a representative of MDS, is responsible for periodically examining the ESC activities and premises of a land-disturbing activity for compliance with the Erosion and Sediment Control Act and Regulations or the Stormwater Management Act and Regulations as may be applicable. Responsibilities of the ESC Project Inspector under the AS&S shall be performed by an individual who has obtained a certificate of competence for "project inspector for ESC" as defined in 9VAC25-850-40.

2.3.6 **"Responsible Land Disturber (RLD)"** means an individual holding a certificate issued by the department who is responsible for carrying out land-disturbing activity in accordance with the approved ESC Plan. The RLD may be the owner, applicant, permittee, designer, superintendent, project manager, contractor, or any other project or development team member. The RLD must be designated on the ESC Plan or permit as a prerequisite for engaging in land disturbance. All RLDs shall be certified by the Board as defined in 9VAC25-850-40.

2.3.7 **"SWM Plan Reviewer"** means anyone who is responsible for determining the accuracy of SWM Plans and supporting documents for approval by the SWM Program Administrator. Responsibilities of the SWM Plan Reviewer under the AS&S shall be performed by an individual who has obtained a certificate of competence for "plan reviewer for SWM" as defined in 9VAC25-850-40.

2.3.8 **"SWM Program Administrator"** means the person or persons responsible for administering and enforcing the SWM requirements of this AS&S. Responsibilities of the SWM Program Administrator under the AS&S shall be performed by an individual who has obtained a certificate of competence for "program administrator for SWM" as defined in 9VAC25-850-40.

2.3.9 **"SWM Project Inspector"** means anyone who, as a representative of MDS, is responsible for periodically examining the SWM activities and premises of a land-disturbing activity for compliance with the Virginia Erosion and Sediment Control Law and Regulations or the Stormwater Management Act and Regulations as may be applicable. Responsibilities of the SWM Project Inspector under the AS&S shall be performed by an individual who has obtained a certificate of competence for "project inspector for SWM" as defined in 9VAC25-850-40.

2.4 Board and VDEQ Oversight

2.4.1 In addition to MDS internal plan review, VDEQ may, at its discretion, require MDS to submit individual project-specific plans to the VDEQ for review and approval.

2.4.2 The Board and VDEQ shall have the authority to enforce approved specifications and charge fees equal to the lower of (i) $1,000.00 or (ii) an amount sufficient to cover the costs associated with standard and specification review and approval, projection inspections, and compliance. Costs associated may include VDEQ plan review and inspection.

2.4.3 VDEQ is the VESCP and VSMP authority for AS&S holders and may perform random site inspections or inspections in response to a complaint to assure compliance with the associated laws/regulations and these AS&S.

2.4.4 VDEQ may take enforcement actions.

2.4.5 Inspection reports conducted by MDS, as well as complaint logs and complaint responses, may be required to be submitted to VDEQ.

2.4.6 MDS may be required to provide weekly e-reporting to VDEQ's applicable regional office including:

- Inspection reports;
- Pictures;
- Complaint logs and complaint responses; and
- Other compliance documents.

2.4.7 MDS shall resubmit the AS&S annually for VDEQ review and approval.

2.4.8 Details of borrow areas and support activities will be included with the two-week notice submitted to VDEQ. See Section 12.0 for notification requirements.

2.5 Reference Documents and Guidance

2.5.1 All ESC measures used in projects under this AS&S shall be constructed to meet or exceed the specifications in the VESCH.

2.5.2 All stormwater BMPs used in projects under this AS&S shall be constructed to meet or exceed the specifications in the Virginia Stormwater BMP Clearinghouse.

2.5.3 Nutrient management for all land-disturbing activities shall adhere to the specifications present in VDEQ ESC Technical Bulletin #4.

2.5.4 Projects applying for SWM Plan waivers shall adhere to guidance stated in the VDEQ **Linear Utility Project SWM Guidance**.

2.5.5 Projects applying for an ESC minimum standard condition variance shall adhere to guidance in the VDEQ Memorandum Variance Request Guidance for Telephone, Cable, Electric, Natural Gas Pipeline, and Railroad Companies dated August 2003, as may be amended or superseded.

3.0 PROGRAM ADMINISTRATION

3.1 General

3.1.1 All MDS projects involving land-disturbing activities that are subject to the ESC Regulations shall be bound by the AS&S.

3.1.2 MDS shall authorize AS&S roles and responsibilities using a memorandum directed to such personnel. Such authorization memorandum will not be issued until the person to be authorized has received or is to receive all requisite training and certifications required for their respective roles, but in any case such authorization memorandum may not authorize such personnel to act on behalf MDS until he or she is fully qualified in accordance with applicable law and regulations. New or modified authorization memoranda will be issued if and when there is a change in personnel or change in role of personnel performing such activities.

3.1.3 As needed, MDS may enter into agreements or contracts with soil and water conservation districts, adjacent localities, or other public or private entities to assist with carrying out the provisions of this article, including the review and determination of adequacy of ESC Plans and SWM Plans submitted for land-disturbing activities on a unit or units of land, as well as for monitoring, reports, inspections, and enforcement where authorized in this article, of such land-disturbing activities.

3.1.4 ESC Plan Reviewers, ESC Project Inspectors, ESC Program Administrators, ESC Combined Administrators, SWM Plan Reviewers, SWM Project Inspectors, SWM Program Administrators, and SWM Combined Administrators authorized by MDS, as defined in the roles and responsibilities of this AS&S (Subsection 2.3), shall be certified in accordance with the ESC/SWM Certification Regulations.

3.1.5 RLDs authorized by MDS shall be certified in accordance with the ESC Law.

3.1.6 MDS shall submit variance requests to VDEQ in accordance with ESC Regulations for projects that request variances to the ESC Minimum Standards defined in 9VAC25-840-40.

3.1.7 The ESC Program Administrator will act as the point of contact for all projects constructed under the AS&S.

3.1.8 Projects will operate under the AS&S, or under the project's own site-specific ESC and SWM Plans. ESC Project Inspectors and SWM Project Inspectors shall confirm adherence to these plans while conducting site inspections, and the project manager for the individual project shall be held responsible for maintaining and observing the guidance set in these specifications.

3.1.9 ESC Project Inspectors and SWM Project Inspectors, once certified by VDEQ, shall have the authority to order correction of any acts that violate the conditions in the AS&S or any permit conditions associated with the project.

3.1.10 MDS shall resubmit standards and specifications on an annual basis for VDEQ review and approval.

3.2 Disturbance and Inspection

3.2.1 A RLD shall be named for each regulated land-disturbing activity prior to initiating such activity.

3.2.2 ESC Project Inspectors and SWM Project Inspectors shall inspect project sites as set forth in Section 9.0 for compliance with AS&S requirements and any site-specific requirements (e.g., site-specific ESC Plan or SWM Plan). ESC Project Inspectors and SWM Project Inspectors shall be certified in accordance with the ESC/SWM Certification Regulations prior to conducting site inspections. Necessary inspection report documents and details are in Section 9.0.

3.2.3 The ESC Project Inspector shall inspect the land-disturbing activity during construction for:

- Compliance with the approved ESC Plan;
- Compliance with the approved SWM Plan;
- Development, updating, and implementation of a pollution prevention plan; and
- Development and implementation of any additional control measures necessary to address any applicable TMDL.

4.0 APPLICABILITY AND THRESHOLD CRITERIA

4.1 Applicability

4.1.1 All MDS projects involving land-disturbing activities that are subject to the Virginia Erosion and Sediment Control Regulations shall be bound by the AS&S.

4.1.2 Per Va. Code § 62.1-44.15:51 of the ESC Law, the current definition of "land-disturbing activity," which incorporates relevant exclusions, is as follows:

"Land-disturbing activity" means any man-made change to the land surface that may result in soil erosion from water or wind and the movement of sediments into state waters or onto lands in the Commonwealth, including, but not limited to, clearing, grading, excavating, transporting, and filling of land, except that the term shall not include:

1. Minor land-disturbing activities such as home gardens and individual home landscaping, repairs, and maintenance work;
2. Individual service connections;
3. Installation, maintenance, or repair of any underground public utility lines when such activity occurs on an existing hard surfaced road, street, or sidewalk, provided the land-disturbing activity is confined to the area of the road, street, or sidewalk that is hard surfaced;
4. Septic tank lines or drainage fields unless included in an overall plan for land-disturbing activity relating to construction of the building to be served by the septic tank system;
5. Permitted surface or deep mining operations and projects, or oil and gas operations and projects conducted pursuant to Title 45.1;
6. Tilling, planting, or harvesting of agricultural, horticultural, or forest crops, livestock feedlot operations, or as additionally set forth by the Board in regulation, including engineering operations as follows: construction of terraces, terrace outlets, check dams, desilting basins, dikes, ponds, ditches, strip cropping, lister furrowing, contour cultivating, contour furrowing, land drainage, and land irrigation; however, this exception shall not apply to harvesting of forest crops unless the area on which harvesting occurs is reforested artificially or naturally in accordance with the provisions of Va.

Code §§ 10.1-1100 et seq. or is converted to bona fide agricultural or improved pasture use as described in subsection B of § 10.1-1163;

7. Repair or rebuilding of the tracks, rights-of-way, bridges, communication facilities, and other related structures and facilities of a railroad company;

8. Agricultural engineering operations, including but not limited to the construction of terraces, terrace outlets, check dams, desilting basins, dikes, ponds not required to comply with the provisions of the Dam Safety Act (Va. Code § 10.1-604 et seq.), ditches, strip cropping, lister furrowing, contour cultivating, contour furrowing, land drainage, and land irrigation;

9. Disturbed land areas of less than 10,000 square feet in size or 2,500 square feet in all areas of the jurisdictions designated as subject to the CPB Regulations; however, the governing body of the program authority may reduce this exception to a smaller area of disturbed land or qualify the conditions under which this exception shall apply;

10. Installation of fence and signposts or telephone and electric poles and other kinds of posts or poles;

11. Shoreline erosion control projects on tidal waters when all of the land-disturbing activities are within the regulatory authority of and approved by local wetlands boards, the Marine Resources Commission, or the United States Army Corps of Engineers; however, any associated land that is disturbed outside of this exempted area shall remain subject to this article and the regulations adopted pursuant thereto; and

12. Emergency work to protect life, limb, or property, and emergency repairs; however, if the land-disturbing activity would have required an approved erosion and sediment control plan, if the activity were not an emergency, then the land area disturbed shall be shaped and stabilized in accordance with the requirements of the VESCP authority.

4.1.3 Per Va. Code § 62.1-44.15:24 of the SWM Act, "Land disturbance" or "land-disturbing activity" is defined as “a man-made change to the land surface that potentially changes its runoff characteristics including clearing, grading, or excavation, except that the term shall not include those exemptions specified in Va. Code § 62.1-44.15:34.” Va. Code § 62.1-44.15:34.C sets of the exemptions from regulated land disturbing activity as including the following:

1. Permitted surface or deep mining operations and projects, or oil and gas operations and projects conducted under the provisions of Title 45.1;

2. Clearing of lands specifically for agricultural purposes and the management, tilling, planting, or harvesting of agricultural, horticultural, or forest crops, livestock feedlot operations, or as additionally set forth by the Board in regulations, including engineering operations as follows: construction of terraces, terrace outlets, check dams, desilting basins, dikes, ponds, ditches, strip cropping, lister furrowing, contour cultivating, contour furrowing, land drainage, and land irrigation; however, this exception shall not apply to harvesting of forest crops unless the area on which harvesting occurs is

reforested artificially or naturally in accordance with the provisions of Va. Code§§ 10.1-1100 et seq. or is converted to bona fide agricultural or improved pasture use as described in subsection B of Va. Code § 10.1-1163;

3. Single-family residences separately built and disturbing less than one acre and not part of a larger common plan of development or sale, including additions or modifications to existing single-family detached residential structures. However, localities subject to the provisions of the CBP Act may regulate these single-family residences where land disturbance exceeds 2,500 square feet;
4. Land-disturbing activities that disturb less than one acre of land area except for land-disturbing activity exceeding an area of 2,500 square feet in all areas of the jurisdictions designated as subject to the CBP Regulations or activities that are part of a larger common plan of development or sale that is one acre or greater of disturbance; however, the governing body of any locality that administers a VSMP may reduce this exception to a smaller area of disturbed land or qualify the conditions under which this exception shall apply;
5. Discharges to a sanitary sewer or a combined sewer system;
6. Activities under a state or federal reclamation program to return an abandoned property to an agricultural or open land use;
7. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original construction of the project. The paving of an existing road with a compacted or impervious surface and reestablishment of existing associated ditches and shoulders shall be deemed routine maintenance if performed in accordance with this subsection; and
8. Conducting land-disturbing activities in response to a public emergency where the related work requires immediate authorization to avoid imminent endangerment to human health or the environment. In such situations, the VSMP authority shall be advised of the disturbance within seven days of commencing the land-disturbing activity, and compliance with the administrative requirements of subsection A is required within 30 days of commencing the land-disturbing activity.

4.2 Threshold Criteria

Land-disturbing activities as defined by the ESC Law and VSM Act may require development of an ESC Plan, SWM Plan, SWPPP, and coverage under the Virginia Pollutant Discharge Elimination System (VPDES) Construction General Permit (CGP).

4.2.1 For any regulated land disturbing activity of at least 10,000 square feet (sf), or at least 2,500 sf in a CBPA, an ESC Plan shall be developed. The ESC Plan shall be reviewed and approved by the ESC Plan Reviewer prior to commencement of land-disturbing activities. An erosion impact area is defined as an area of land not associated with current land-disturbing activity but subject to persistent soil erosion resulting in the delivery of sediment onto neighboring properties or into state waters. This definition shall not apply to any lot or parcel of land of 10,000 sf or less used for residential purposes or to shorelines where the erosion results from wave action or other coastal processes. ESC Plans shall be created for any land disturbance meeting any of these thresholds in accordance with 9VAC25-840.

4.2.2 For any land disturbing activity one (1) acre or greater, a SWM Plan shall be developed. The SWM Plan shall be reviewed by the SWM Plan Reviewer and shall meet water quality and quantity standards set in 9VAC25-870. Any land disturbance occurring within a CBPA 2,500 sf or greater in area but which is less than one (1) acre in area shall comply with the criteria set forth in 9VAC25-870-51.

4.2.3 Any land disturbance 2,500 sf in area or greater and occurring within a CBPA shall adhere to the standards set in 9VAC25-830.

4.2.4 Any project that requires a SWM Plan shall also require coverage under the VPDES CGP. Any project that requires a SWM Plan shall also require development of a SWPPP in accordance with Section 10.0 of this AS&S.

4.2.5 A Pollution Prevention Plan shall be prepared for projects for which total land disturbance is one (1) acre or greater. The Pollution Prevention Plan shall at a minimum meet the requirements set forth in 9VAC25-880 Part II.B.4 (regardless of coverage under the CGP).

5.0 TECHNICAL CRITERIA FOR REGULATED LAND-DISTURBING ACTIVITIES

5.1 Technical Criteria

5.1.1 In order to protect the quality of state waters and to control the discharge of stormwater pollutants from regulated activities, the AS&S shall follow the minimum design criteria for water quality and water quantity in accordance with 9VAC25-870-63 and 9VAC25-870-66.

5.1.2 Any land-disturbing activity taking place in a locality with a local ESC program with more stringent regulations than those of the state program shall be consistent with the requirements of the local program.

5.1.3 The use of VESCH control measures is recommended. If non-VESCH control measures or specifications are used, their use shall be reviewed and approved by the applicable VDEQ Regional Office on a project-specific basis prior to use.

5.1.4 Projects under this AS&S are typically linear utility projects. As such, each project shall be reviewed for consistency with the VDEQ **Linear Utility Project SWM Guidance**. The guidance document provides a number of conditions which must be satisfied for linear projects in order to obtain a waiver from developing a SWM Plan. Specifically, the following conditions must be met:

- The project does not significantly alter the predevelopment runoff characteristics of the land surface after completion of construction and final stabilization.
- The project is managed so that less than one (1) acre of land disturbance occurs on a daily basis.
- The disturbed land where work has been completed is stabilized on a daily basis.
- The environment is protected from erosion and offsite sedimentation associated with the land-disturbing activity.
- The owner or operator designs, installs, and implements pollution prevention measures to:
    - Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other waters;
    - Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and materials present on site to precipitation and to stormwater;
    - Minimize the discharge of pollutants from spills and leaks, and implement chemical spill and leak prevention and response procedures;
    - Prohibit the discharge of wastewater from concrete washout pits;
    - Prohibit the discharge of wastewater from chemicals, from release oil, curing compounds, and other construction materials, and
    - Prohibit the discharge of fuels, oils, and other pollutants used in equipment and vehicle operation or maintenance.
- The specific requirements above shall be incorporated into the site-specific ESC Plan.
- For linear projects requesting a SWM Plan waiver, information shall be submitted that reasonably demonstrates that the project will not significantly change the predevelopment runoff characteristics of the land surface after the completion of construction and final stabilization. Information to be submitted includes:
    - Pre- and post-construction drainage areas land cover conditions;
    - Limits of disturbance;
    - Plan for restoring land cover to predevelopment conditions; and
    - ESC Plan.

5.1.5 Waiver information will be submitted to VDEQ with a transmittal letter that specifically requests a SWM Plan waiver. VDEQ will evaluate each request on an individual basis.

5.1.6 If VDEQ grants the waiver from developing a SWM Plan, the waiver will also exclude the following SWM requirements:

- Stormwater Quality under 9VAC25-870-63 and 9VAC25-870-65;
- Stormwater Management Quantity under 9VAC25-870-66; and
- ESC Minimum Standard 19.

5.2 Non-VESCH Control Measures

5.2.1 The use of the VESCH, along with accompanying technical documents and guidance, control measures, is strongly preferred. Non-VESCH control measures, BMPs, and specifications may be included in the AS&S submission, but their use may be further reviewed and approved by the applicable VDEQ regional office on a project-specific basis. Submissions may be made with the submittal of the project two-week notification.

5.2.2 For all non-VESCH and proprietary control measures, the approval request shall include all applicable practical information including definition, purpose, conditions, where the practice will be used, planning considerations, design criteria, construction specifications, and maintenance and inspection requirements. Non-VESCH and proprietary control measures shall be installed and maintained per manufacturer's instructions

5.2.3 Should non-VESCH control measures fail to effectively control soil erosion, sediment deposition, and non-agricultural runoff, then VESCH control measures shall be used.

5.2.4 MDS will employ its own Horizontal Directional Drilling (HDD) Inadvertent Return Plan as set forth in Section 14.0 as supplemental to VESCH measures to ensure control of potential unintended discharge of drilling water used in HDD for installation of conduit under rights-of-way, streams, and other utility line crossings.

6.0 EROSION AND SEDIMENT CONTROL PLAN

6.1 ESC Plan and Narrative Requirements

6.1.1 The ESC Plan Reviewer shall approve an ESC Plan prior to any land-disturbing activity that meets or exceeds the threshold criteria for ESC in Section 4.0. AS&S-related plans and any site-specific ESC Plans shall be developed under the supervision of a professional engineer licensed to practice engineering in the Commonwealth of Virginia. The plans shall adhere to ESC Regulations (9VAC25-840-40), VSMP Regulations (9VAC25-870-55), and ESC/SWM Certification Regulations (9VAC25-850-50). The ESC Plan, ESC narrative, and a completed Erosion and Sediment Control Plan and Narrative Checklist (Appendix A) shall be submitted for review by the ESC Plan Reviewer.

6.1.2 At a minimum, ESC Plans shall contain all items in the Erosion and Sediment Control Plan and Narrative Checklist (Appendix A). ESC Plans shall also meet the minimum standards in 9VAC25-840-40 (see Section 6.3 of the AS&S for the minimum standards). ESC Plans shall use the measures and details included in the VESCH and the AS&S to control soil erosion and offsite sedimentation. If an ESC Plan proposes to use measures not found in the VESCH or the VDEQ-approved version of the AS&S, the ESC Plan shall be submitted to VDEQ for project-specific approval of the measure. The ESC Plan shall be sealed by a professional engineer.

6.1.3 ESC Plans shall be accompanied by a completed ESC narrative that describes the nature of the project and measures that will be taken to minimize erosion and offsite sedimentation. At a minimum, the ESC narrative shall contain the items specified in the Erosion and Sediment Control Plan and Narrative Checklist (Appendix A). The ESC narrative shall be signed by the same professional engineer who seals the ESC Plan.

6.1.4 A completed Erosion and Sediment Control Plan and Narrative Checklist (Appendix A) shall also accompany the ESC Plan and ESC narrative.

6.2 ESC Plan Review

6.2.1 The ESC Plan Reviewer shall review proposed site-specific ESC Plans and any proposed amendments to previously approved site-specific plans for consistency with applicable provisions of the ESC Law, the ESC Regulations, the SWM Act, the VSMP Regulations, the CBP Act, and the CBP Regulations to ensure the proposed plans or amendments are compliant with such laws and regulations and make or cause to be made any changes to such plans or amendments as necessary to ensure their compliance in this regard.

6.2.2 Upon review of such proposed plans or amendments, the ESC Plan Reviewer shall provide in writing comments on and suggested changes to the proposed plans or amendments and coordinate such changes to the proposed plans or amendments with the plan preparer until they are approved by the ESC Plan Reviewer as provided above.

6.2.3 A final ESC Plan or any amendments to an approved ESC Plan shall be stamped by the preparing engineer and shall be accompanied by a final approval memorandum on MDS letterhead signed by the ESC Program Administrator indicating that the proposed plans or amendments have been reviewed and approved as required herein.

6.2.4 The approved ESC Plan or any approved amendments shall be included as part of any SWPPP for the project, be delivered to the project site promptly, and be included in project SWPPP records at the site. The ESC Plan shall be made available for inspection, included in the project records, and maintained as required by 9VAC25-870-126.

6.2.5 Based on the criteria for VESCP Authority review of changes to ESC Plans, under either of the following circumstances, proposed revisions to the ESC Plan shall be submitted to the ESC Plan Reviewer for consideration and approval pursuant to the requirement of the AS&S:

- Where inspection has revealed that the plan is inadequate to satisfy applicable regulations; or
- Where the person responsible for carrying out the approved plan finds that because of changed circumstances or for other reasons the approved plan cannot be effectively carried out.

6.2.6 Proposed amendments to the ESC Plan shall be prepared as soon as practicable after such circumstances arise and shall be consistent with the requirements of the ESC Law and the ESC Regulations as a condition for their approval by the ESC Plan Reviewer. Revised parts of the ESC Plan shall be delivered to the project site promptly and be available for inspection.

- As needed, approved changes to the ESC Plan shall also be coordinated with or provided to the locality to ensure consistency with any local land disturbance, grading, or building permit requirements for project activities.
- Redline markups of ESC Plans shall be checked and signed off on by the ESC Project Inspector, and, if such modifications require submittal to the ESC/SWM Plan Reviewer as provided above, they shall be reviewed and reapproved.
- In compliance with the ESC Law, Va. Code § 62.1-44.15:55, onsite changes to the individual project specific plan may occur when adequate documentation of the changes are shown on the individual project specific plan and the SWPPP, if required.

6.3 Minimum Standards for Erosion and Sediment Control

All land disturbing activities undertaken on private and public lands in the Commonwealth of Virginia must meet the 19 Minimum Standards for ESC in 9VAC25-840-40 of the ESC Regulations (Minimum Standards).

The ESC Plan Reviewer and/or SWM Plan Reviewer (as appropriate) must review and approve the project-specific plans prior to implementation. The applicant is responsible for ensuring compliance with the Minimum Standards that apply to the specific project activities.

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 fourteen 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 stockpiles 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 to and 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. Non-erodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by non-erodible 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 non-erodible 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 on to 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 ESC measures shall be removed within thirty 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:

        i. The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is 100 times greater than the contributing drainage area of the project in question;

        ii. (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:

        i. 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;

        ii. Improve the pipe or pipe system to a condition where the 10-year storm is contained within the appurtenances;

        iii. Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the pre-development peak runoff rate from a 10-year storm to increase when runoff outfalls into a man-made channel; or

        iv. 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.

l. 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 Va. Code § 62.1-44.15:54 or 62.1-44.15:65 of the SWM Act.

m. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 62.1-44.15:52.A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the SWM Act (Va. Code § 62.1-44.15:24 et seq.) and attendant regulations, unless such land-disturbing activities (i) are in accordance with provisions for time limits on applicability of approved design criteria in 9VAC25-870-47 or grandfathering in 9VAC25-870-48 of the VSMP Regulation, in which case the flow rate capacity and velocity requirements of § 62.1-44.15:52 A of the Act shall apply, or (ii) are exempt pursuant to Va. Code § 62.1-44.15:34.C.7 of the SWM Act.

n. Compliance with the water quantity minimum standards set out in 9VAC25-870-66 of the VSMP Regulation shall be deemed to satisfy the requirements of this subdivision 19.

7.0 STORMWATER MANAGEMENT PLAN

SWM Plans describe how stormwater from a site post-construction will meet VDEQ water quality and water quantity requirements in Part II B of the Virginia Stormwater Management Program Regulations (9VAC25-870-62 et seq.). A SWM Plan approved by the SWM Plan Reviewer shall be required for any land-disturbing activity that meets or exceeds the threshold criteria in Section 4.0. AS&S-related plans and any site-specific SWM Plans shall be developed under the supervision of a professional engineer licensed to practice engineering in the Commonwealth of Virginia. The plans shall adhere to Virginia ESC Regulations (9VAC25-840-40), VSMP Regulations (9VAC25-870-55), and ESC/SWM Certification Regulations (9VAC25-850-50). The SWM Plan, SWM narrative containing hydrologic calculations for pre- and post-development conditions, and a completed Stormwater Management Plan and Narrative Checklist (Appendix B) shall be submitted to the SWM Plan Reviewer for review.

7.1 SWM Plan and Narrative Requirements

7.1.1 At a minimum, SWM Plans shall contain all items in the Stormwater Management Plan and Narrative Checklist (Appendix B). SWM Plans shall meet the requirements in Part II B of the VSMP Regulation (9VAC25-870-62 et seq.). Any BMPs used to meet stormwater management requirements shall meet the specifications in the Virginia Stormwater BMP Clearinghouse.

7.1.2 SWM Plans shall be accompanied by a completed SWM narrative that describes the nature of the project, measures that will be taken to meet State water quality and water quantity requirements, hydrologic calculations of pre-development site stormwater runoff and post-development site stormwater runoff, calculations of water quantity and water quality requirements, and calculations for water quality and water quantity treatment volumes provided by each BMP used on site. At a minimum, the SWM narrative shall contain the items specified in the Stormwater Management Plan and Narrative Checklist (Appendix B). The SWM narrative shall be signed by the same professional engineer who seals the SWM Plan.

7.1.3 A completed Stormwater Management Plan and Narrative Checklist (Appendix B) shall also accompany the SWM Plan and SWM narrative.

7.1.4 Projects applying for a waiver from SWM Plan development shall request a waiver pursuant to the VDEQ **Linear Utility Project SWM Guidance** when submitting the Entity Information Sheet to VDEQ.

7.2 Stormwater Nutrient Impact Process

7.2.1 For any project that meets the threshold for a SWM land disturbing activity, stormwater nutrient (phosphorus) impacts must be assessed using the Virginia Runoff Reduction Method (VRRM) spreadsheet (See VDEQ Guidance Memo 16-2001). Land cover under the VRRM falls into three categories: impervious cover (includes graveled areas), managed turf (most mowed or landscaped areas including rights-of-way), and forested/open space (represents 'natural' conditions). The nutrient (phosphorus) impact is calculated using the VRRM and the changes in the types of land cover to determine a "pounds per year" unit. When BMPs are not feasible, nutrient impact requirements may then be offset through the purchase of nutrient credits from a nutrient credit bank servicing the project location's existing HUC8 watershed or an adjoining watershed. SWM Plans otherwise shall be developed in accordance with 9VAC25-870-55 requirements.

7.2.2 All areas that will be considered forest/open space for stormwater purposes must have documentation that prescribes that the area will remain in a natural, vegetated state, or else nutrient reduction controls or offsets will be required. Appropriate documentation for such controls includes subdivision covenants and restrictions, deeded operation and maintenance agreements and plans, parcel of common ownership with maintenance plan, third-party protective easement, within public right-of-way or easement with maintenance plan, or other documentation approved by the local program authority.

7.2.3 Nutrient impacts may also be off set through the installation of stormwater best management practices (BMPs). The 15 non-proprietary BMPS approved by VDEQ are:

1. Rooftop disconnection
2. Sheetflow to conservation area/vegetated filter strip
3. Grass channel
4. Soil amendments
5. Vegetated roof
6. Rainwater harvesting
7. Permeable pavement
8. Infiltration
9. Bioretention
10. Dry swale
11. Wet swale
12. Filtering practice
13. Constructed wetland

14. Wet pond
15. Extended detention pond

7.2.4 Typically, BMP use is not an option for utility projects due to multiple land requirements (size, covenants, and ownership considerations) for the BMPs. This option should be considered for each project, however.

7.2.5 For projects where nutrient credits are purchased to offset increases in nutrient loads in runoff from the post-development project site, MDS will contact nutrient banks servicing the project location to determine availability of sufficient credits. When credits are located, a letter of availability will be acquired and be presented to VDEQ (on a case by case basis) for review. Upon confirmation of availability (and in appropriate cases, approval from VDEQ), MDS will enter a contract with the nutrient bank to purchase the credits. Upon completion of the contract and transfer of funds for purchase of the credits, MDS will be provided with an affidavit of sale from the nutrient bank consummating the transaction. Once the transaction is complete, the project-related land-disturbing activities may commence.

7.2.6 For projects where the land disturbance exceeds five (5) acres, nutrient credits can only be utilized to offset a portion of the impact. That percentage should be confirmed with VDEQ prior to completing the stormwater review for the project.

7.2.7 Under the regulations at 9VAC25-870-69 for offsite compliance options, offsite options can be utilized under the following conditions:

1. Less than five (5) acres of land will be disturbed;
2. The post-construction phosphorus control requirement is less than ten pounds per year; or
3. At least 75% of the required phosphorus nutrient reductions are achieved on-site. If at least 75% of the required phosphorus nutrient reductions cannot be met on-site, and the operator can demonstrate to the satisfaction of the VSMP authority that (i) alternative site designs have been considered that may accommodate on-site BMPS, (ii) on-site BMPs have been considered in alternative site designs to the maximum extent practicable, (iii) appropriate on-site BMPS will be implemented, and (iv) full compliance with post-development non-point nutrient runoff compliance requirements cannot practicably be met on-site, then the required phosphorus nutrient reductions may be achieved, in whole or in part, through the use of off-site compliance options.

7.2.8 While purchasing nutrient credits focuses on stormwater quality, Minimum Standard 19 under the Virginia Erosion and Sediment Control Regulations (9VAC25-840-40.19) and Minimum Standards for channel protection and flood protection in 9VAC25-870-66 provide criteria on stormwater quantity and adequate channels downstream of a construction site. These standards protect downstream impacts such as sediment deposition, erosion, and damage due to increases in volume, velocity, and peak flow rate from stormwater runoff.

7.3 SWM Offsite Compliance Options

Offsite compliance options in 9VAC25-870-69 may be utilized, as necessary, to meet any required nutrient (phosphorous and nitrogen) control, reduction or offset requirements and will be included in the SWM Plan as needed. The offsite compliance options may only be considered when the criteria set forth in 9VAC25-870-69 are met. For most MDS projects, the preferred offsite compliance option will be the purchase of nonpoint source nutrient credits from an approved nutrient credit bank servicing the location of the project.

7.4 SWM Plan Review

7.4.1 The SWM Plan Reviewer shall review proposed site-specific SWM Plans and any proposed amendments to previously approved site-specific plans for consistency with applicable provisions of the ESC Law, the ESC Regulations, the SWM Act, the VSMP Regulations, the CBP Act, and the CBP Regulations to ensure the proposed plans or amendments are compliant with such laws and regulations and make or cause to be made any changes to such plans or amendments as necessary to ensure their compliance in this regard.

7.4.2 Upon review of such proposed plans or amendments, the SWM Plan Reviewer shall provide in writing comments on and suggested changes to the proposed plans or amendments and coordinate such changes to the proposed plans or amendments with the plan preparer until they are approved by the SWM Plan Reviewer as provided above.

7.4.3 A final SWM Plan or any final amendments to such plans shall be stamped by the preparing engineer and shall be accompanied by a final approval memorandum on MDS letterhead signed by the SWM Program Administrator indicating that the proposed plans or amendments have been reviewed and approved as required herein.

7.4.4 The approved SWM Plan or any approved amendments shall be included as part of any SWPPP for the project, be delivered to the project site promptly and included in project SWPPP records at the site, be made available for inspection, and be included in the project records and maintained as required by 9VAC25-870-126.

7.4.5 If any of the conditions or elements of the SWM Plan change or become inaccurate due to findings of an inspection or other changes in circumstances associated with the land disturbing activity or the project in question, as soon as practicable after such change or inaccuracy is discovered, proposed revisions to the SWM Plan shall be prepared and submitted to the SWM Plan Reviewer for consideration and approval. Proposed amendments to the SWM Plan shall be consistent with the requirements of the SWM Act and the VSMP Regulations as a condition for their approval by SWM Plan Reviewer.

7.4.6 Alternatively, the SWM Plan Reviewer shall review any projects requesting a SWM Plan waiver under VDEQ **Linear Utility Project SWM Guidance** to ensure that they comply with the requirements of VDEQ **Linear Utility Project SWM Guidance**.

8.0 SEQUENCE OF CONSTRUCTION

8.1 Before commencement of a new project land-disturbing activity, the ESC Program Administrator (and, if a SWM Plan is required, the SWM Program Administrator also) shall discuss the AS&S requirements for the project with the MDS project site superintendent and RLD to ensure that all such requirements are understood at that time.

8.2 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.

8.3 As needed and described below, construction entrances, sediment barriers, diversion terraces, and/or equipment crossings shall be installed prior to the excavation work or topsoil segregation. All applicable soil ESC measures shall be implemented in accordance with the guidelines contained herein and the VESCH prior to excavation work. All measures shall be maintained during and after excavation work, until final site stabilization is achieved. Upon achieving ground cover that is uniform, mature enough to survive, and able to inhibit erosion in the disturbed area, all temporary soil ESC measures shall be removed.

a. Construction Access: The site excavation locations would be accessed from the nearest public road or other approved access/field road. The excavation equipment would be transported to the site. The equipment may be unloaded at a staging area (if sufficient area is available) adjacent to the public road or other access. No surface disturbance should be made to the staging area. Due to the short duration of the utility excavation work, equipment traffic is normally limited.

b. 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 in accordance with Minimum Standard 17. Where sediment is transported onto a public road surface or other paved area by equipment or vehicles accessing the site, sediment shall be removed immediately from the road by sweeping, shoveling, or scraping, and shall be removed transported to a sediment-controlled disposal area. Road washing shall be allowed only after the sediment is removed in above manner. Other means of cleaning vehicles prior to entering roads or driveways may include hand removal of mud or tire washing. Whenever sediment tracking onto road surfaces is a potential or if required by VDEQ (1-800-592-5482), construction entrances, Detail "CE", shall be installed. Where access to the site is down and along the utility right-of-way corridor, a minimum access pathway for equipment passage shall be cleared of brush, grubbed, and/or mowed. Most sites will require mowing. All cleared and grubbed brush debris shall be removed and needed.

c. Preparation of Work Area: The excavation area shall be clearly staked by MDS surveyors. All existing pipelines, utilities, and/or drain lines shall be marked by calling Miss Utility at 811. The minimum area necessary shall be cleared of brush and other vegetation or mowed. The appropriate soil erosion control measures shall be installed prior to any land disturbance or excavation work. All topsoil shall be segregated in residential areas, wetland areas (except in areas where standing water or saturated soils are present), all actively cultivated agricultural areas, and where requested by the landowner or other local agency. Where appropriate, soil stockpiles and borrow areas shall be stabilized or protected with ESC measures.

8.4 The spoils shall be placed on the upslope side of the duct bank excavation trench to prevent sediment runoff from the soil stockpiles. If possible, duct bank excavation, visual inspection, repair, recoating, and backfilling should be limited to that which can normally be completed in one day.

8.5 Final grading and clean up shall be performed upon completion of duct bank excavation work. All disturbed areas shall be restored to their original contours and conditions. If necessary, the disturbed area shall be plowed, tilled, or scarified to achieve the satisfactory soil compaction.

8.6 After completion of the final grading, the disturbed area will be revegetated, chatted, or paved (as appropriate based on location and pre-work conditions).

8.7 Repeat steps 8.1 through 8.6 for each excavation site.

8.8 All temporary soil ESC measures shall be inspected, maintained, and/or repaired in accordance with the VESCH criteria for each individual control measure to assure continued performance of their intended function until removal after a permanent vegetative cover is established per Minimum Standard 3. All excavation sites shall be inspected after a runoff producing storm event until final site stabilization is achieved. All measures shall be disposed of within 30 days after the final site stabilization is achieved or after the temporary measures are no longer needed.

8.9 The ESC Project Inspector shall provide for and document inspections in accordance with the Virginia Erosion and Sediment Control Regulations at the following frequency: during or immediately following initial installation of ESC measures, at least once every two-week period, within 48 hours following any runoff producing storm event, and at the completion of the project.

8.10 The SWM Project Inspector, in accordance with Va. Code § 62.1-44.15:37, shall provide for periodic inspections of the installation of SWM measures, may require monitoring and reports from the person responsible for meeting the permit conditions to ensure compliance with the permit and to determine whether the measures required in the permit provide effective stormwater management, and shall conduct such investigations and perform such other actions as are necessary to carry out the provisions of the AS&S.

8.11 ESC Project Inspectors and SWM Project Inspectors shall document all inspections and findings and report such findings verbally if practical to do so and in writing to the project site superintendent and RLD and review any needed corrective actions, a copy of which will also be provided to the ESC Program Administrator and the SWM Program Administrator as applicable.

8.12 Corrective actions identified during project site inspections shall be completed during the time of the inspection if readily feasible to so or otherwise in accordance with applicable corrective action deadlines set forth in the ESC Regulations and the VSMP Regulations. If corrective actions within such timelines are made impossible, impractical or unsafe by conditions reasonably beyond the control of MDS, then such extenuating conditions will be documented, and corrective action shall be taken as soon as feasible after such conditions are resolved or alleviated. ESC Project Inspectors and SWM Project Inspectors shall re-inspect the project site as appropriate to ensure that corrective actions are taken in a timely manner and are completed as required. Any continuing deficiencies will be reported to the site superintendent, RLD, ESC Program Administrator, and the SWM Program Administrator for appropriate actions or oversight to ensure compliance.

8.13 Trenching and related safety considerations shall be performed and accounted for in accordance with Minimum Standard MS-16. Variances from Minimum Standard MS-16 shall be reviewed by VDEQ on a project-specific basis in accordance with Virginia Department of Conservation and Recreation (DCR) titled Variance Request Guidance for Telephone, Cable, Electric, Natural Gas Pipeline, and Railroad Companies dated August 2003.

8.14 Upon conclusion of trench backfilling operations, any remaining trench spoils shall be hauled offsite by a contractor certified in solid waste transport, for use or disposal, in accordance with the Virginia Solid Waste Management Regulations (9VAC20-81).

9.0 ESC AND SWM MAINTENANCE AND INSPECTIONS

9.1 Maintenance and Inspections

All ESC structures and systems shall be maintained, inspected and repaired as needed to ensure continued performance of their intended function. A statement describing the ESC maintenance responsibilities of the AS&S holder shall be included in the approved erosion and sediment control plan. ESC Inspections shall be documented using the Construction Site Inspection Checklist (Appendix C).

The ESC Project Inspector, in accordance with Va. Code 62.1-44.15:58, shall provide for periodic inspections of the land-disturbing activity and require that an individual holding a certificate, as provided by Va. Code 62.1-44.15:52, will be in charge of and responsible for carrying out the land-disturbing activity and may require monitoring and reports from the person responsible for carrying out the ESC Plan to ensure compliance with the approved plan and to determine whether the measures required in the plan are effective in controlling erosion and sediment.

Periodic inspections are required on all projects subject to the AS&S. MDS shall, as a condition of the AS&S, provide inspections as follows:

- Immediately following initial installation of ESCs;
- At least once every two-week period;
- Within 48 hours following any runoff producing storm event; and
- And at the completion of the project prior to release of any performance bonds.

As part of the inspection, the ESC Inspector shall:

1. Record the date and time of the inspection and when applicable the date and rainfall amount of the last measurable storm event.
2. Record the information and a description of any discharges occurring at the time of the inspection.
3. Record any land-disturbing activities that have occurred outside of the approved ESC Plan.
4. Inspect the following for installation in accordance with the approved ESC Plan, identification of any maintenance needs, and evaluation of effectiveness in minimizing sediment discharge, including whether the control has been inappropriately or incorrectly used:
    a. All perimeter ESC controls, such as silt fence;
    b. Soil stockpiles, when applicable, and borrow areas for stabilization or sediment trapping measures;
    c. Completed earthen structures, such as dams, dikes, ditches, and diversions for stabilization;
    d. Cut and fill slopes;
    e. Sediment basins and traps, sediment barriers, and other measures installed to control sediment discharge from stormwater;
    f. Temporary or permanent channel, plume, or other slope drain structures installed to convey concentrated runoff down cut and fill slopes;
    g. Storm inlets that have been made operational to ensure that sediment laden stormwater does not enter without first being filtered or similarly treated; and
    h. Construction vehicle access routes that intersect or access paved roads for minimizing sediment tracking.
5. Inspect areas that have reached final grade that will remain dormant for more than fourteen days to ensure:
    a. Initialization of stabilization activities have occurred immediately, as defined in 9VAC25-880-1; and
    b. Stabilization activities have been completed within seven days of reaching grade or stopping work.
6. Inspect for evidence that the approved ESC Plan or "agreement in lieu of a plan" has not been properly implemented. This includes but is not limited to:
    a. Concentrated flows of stormwater in conveyances such as rills, rivulets, or channels that have not been filtered, settled, or similarly treated prior to discharge, or evidence thereof;
    b. Sediment laden or turbid flows of stormwater that have not been filtered or settled to remove sediments prior to discharge;

c. Sediment deposition in areas that drain to unprotected stormwater inlets or catch basins that discharge to surface waters. Inlets and catch basins with failing sediments controls due to improper installation, lack of maintenance, or inadequate design are considered unprotected;

d. Sediment deposition on any property (including public and private streets) outside of the construction activity covered by this AS&S;

e. Required stabilization has not been initiated or completed on portions of the site;

f. Sediment basins without adequate wet or dry storage volume or sediment basins that allow the discharge of stormwater from below the surface of the wet storage portion of the basin;

g. Sediment traps without adequate wet or dry storage or sediment traps that allow the discharge of stormwater from below the surface of the wet storage portion of the trap; and

h. Land disturbance outside of the approved area to be disturbed.

7. Inspect pollutant generating activities identified in the pollution prevention plan for the proper implementation, maintenance and effectiveness of the procedures and practices.

8. Identify any pollutant generating activities not identified in the pollution prevention plan.

9. Identify and document the presence of any evidence of the discharge of pollutants prohibited by this general permit.

9.2 SWM Periodic Inspections

The SWM Project Inspector, in accordance with Va. Code § 62.1-44.15:37, shall provide for periodic inspections of the installation of SWM measures, may require monitoring and reports from the person responsible for meeting the permit conditions to ensure compliance with the permit and to determine whether the measures required in the permit provide effective stormwater management, and shall conduct such investigations and perform such other actions as are necessary to carry out the provisions of the AS&S.

The SWM Project Inspector, in accordance with 9VAC25-870-114, shall inspect the land-disturbing activity during construction for:

- Compliance with the approved ESC Plan;
- Compliance with the approved SWM Plan;
- Development, updating, and implementation of a pollution prevention plan; and
- Development and implementation of any additional control measures necessary to address any applicable TMDL.

9.3 Long-Term Maintenance of Permanent SWM Facilities (9VAC25-870-112)

9.3.1 When required pursuant to applicable law and VSMP regulations, MDS shall provide long-term responsibility for and maintenance of SWM facilities and other techniques specified to manage the quality and quantity of runoff. Such requirements shall be set forth in an instrument recorded in the local land records prior to state permit termination or earlier as required:

a. Be submitted to VDEQ for review and approval prior to the approval of the SWM Plan;

b. Be stated to run with the land;

c. Provide for all necessary access to the property for purposes of maintenance and regulatory inspections;

d. Provide for inspections and maintenance and the submission of inspection and maintenance reports to the VSMP authority; and

e. Be enforceable by all appropriate governmental parties.

9.3.2 At the discretion of VDEQ, such recorded instruments need not be required for SWM facilities designed to treat stormwater runoff primarily from an individual residential lot on which they are located, provided it is demonstrated to the satisfaction of the VSMP authority that future maintenance of such facilities will be addressed through an enforceable mechanism at the discretion of the VSMP authority.

9.3.3 Maintenance agreements will be reviewed during MDS internal plan review and submitted at the time of project termination to VDEQ. The most recent draft maintenance agreements can be found on VDEQ's website: (https://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/ConstructionGeneralPermit.aspx).

10.0 STORMWATER POLLUTION PREVENTION PLANS

Stormwater Pollution Prevention Plans (SWPPPs) are required for all MDS land disturbance projects that require a SWM Plan or an assessment of the stormwater impacts per Section 7.0. All documentation of the stormwater assessment, calculation, and nutrient purchase should be included in the SWM Plan and the corresponding section of the SWPPP. SWM Plans and other SWPPP components shall be updated accordingly. The SWPPP shall be developed in accordance with 9VAC25-880-70 Part II.

1. A SWPPP is required for any land-disturbing activity with an area one (1) acre or greater.
2. A SWPPP shall include, but not be limited to, an approved ESC Plan, an approved SWM Plan, a pollution prevention plan for regulated land-disturbing activities, additional regulatory requirements associated with the project (e.g. permits, federal/state/local clearances), and a description of any additional control measures necessary to address any applicable TMDL.
3. An ESC Plan approved by the ESC Plan Reviewer and consistent with the requirements of the Virginia ESC Law and Regulations must be implemented during construction.

4. A SWM Plan approved by the SWM Plan Reviewer and consistent with the requirements of the Virginia SWM Act and Regulations must be implemented during construction activities.
5. A pollution prevention plan that identifies potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges from the construction site and describe control measures that will be used to minimize pollutants in stormwater discharges from the construction site shall be included in the SWPPP and must be developed before land disturbance commences. For projects where SWM Plans are not required, pollution prevention plan language shall be added to the site-specific ESC Plan for the project.
6. If a specific waste load allocation (WLA) for a pollutant has been established in an approved TMDL and is assigned to stormwater discharges from a construction activity, additional control measures must be identified and implemented by the operator so that discharges are consistent with the assumptions and requirements of the WLA.
7. The SWPPP must be maintained at a central location onsite. If an onsite location is unavailable, notice of the SWPPP's location must be posted near the main entrance of the construction site. The SWPPP shall be made available for inspection at the request from VDEQ.
8. The SWPPP shall be amended whenever there is a change in design, construction, operation, or maintenance that has significant effect on the discharge of pollutants to state waters and that has not been previously addressed in the SWPPP.

11.0 EXCEPTIONS AND VARIANCES

11.1 Exceptions (9VAC25-870-122)

VDEQ may grant exceptions to the provisions of the technical criteria for regulated land-disturbing activities found in Part II B of the VSMP Regulation (9VAC25-870). An exception may be granted provided that (i) the exception is the minimum necessary to afford relief, (ii) reasonable and appropriate conditions shall be imposed as necessary upon any exception granted so that the intent of the Stormwater Management Act and this chapter are preserved, (iii) granting the exception will not confer any special privileges that are denied in other similar circumstances, and (iv) exception requests are not based upon conditions or circumstances that are self-imposed or self-created. Economic hardship alone is not sufficient reason to grant an exception from the requirements. Exceptions to requirements for phosphorus reductions shall not be allowed unless offsite options available through 9VAC25-870-69 have been considered and found not available. A record of all exceptions granted shall be maintained by the VSMP authority in accordance with 9VAC25-870-126.

Exception requests will be considered freestanding of this AS&S submission and on a site-specific basis.

1. For projects requesting a waiver under Guidance Memo No. 15-2003, VDEQ requires that a complete ESC Plan and additional water quality calculations be submitted for review. ESC Plans and calculations shall be submitted to VDEQ's Central Office for review with a transmittal letter specifically requesting a SWM Plan waiver. VDEQ

will evaluate each project on an individual basis. This information must reasonably demonstrate that the project will not significantly change the predevelopment runoff characteristics of the land surface after the completion of construction and final stabilization. If non-significance is determined, then VDEQ, at their discretion, may waive the requirement for the preparation and implementation of a SWM Plan.

2. For projects with a land disturbance one (1) acre or more, the construction of above ground or underground linear utilities may be conducted without requiring coverage under the general Virginia Pollutant Discharge Elimination System (VPDES) permit for discharges of stormwater from construction activities (construction general permit) provided that:

   a. The project does not significantly alter the predevelopment runoff characteristics of the land surface after the completion of construction and final stabilization;

   b. The disturbed land where work has been completed is adequately stabilized on a daily basis;

   c. The environment is protected from erosion and sedimentation damage associated with the land disturbing activity;

   d. The owner and/or construction activity operator designs, installs, implements, and maintains pollution prevention measures to:

      v. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters;

      vi. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present onsite to precipitation and to stormwater;

      vii. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures;

      viii. Prohibit the discharge of wastewater from the washout of concrete;

      ix. Prohibit the discharge of wastewater from the washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials; and

      x. Prohibit the discharge of fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.

   e. The owner and/or construction activity operator provided reasonable assurance to VDEQ or the local VSMP authority that all of the above conditions will be satisfied.

   f. The above conditions shall be incorporated into the ESC Plan developed for the project.

11.2 Variances (9VAC25-840-50)

VDEQ authority may waive or modify any of the requirements that are deemed inappropriate or too restrictive for site conditions, by granting a variance. A typical variance requested for linear utility installation projects is from Minimum Standard 16 (as defined by the Erosion and Sediment Control Regulations Minimum Standards 9VAC25-840-40) for a project that proposes to open more than 500 feet of trench at one time. Guidance for linear utility variance requests can be found in guidance from Virginia Department of Conservation and Recreation (DCR) titled *Variance Request Guidance for Telephone, Cable, Electric, Natural Gas Pipeline, and Railroad Companies* dated August 2003. Variances shall be reviewed by VDEQ on a project-specific basis.

A variance may be granted under the following conditions:

1. At the time of plan submission, an applicant may request a variance to become part of the approved ESC Plan. The applicant shall explain the reasons for requesting variances in writing. Specific variances which are allowed by VDEQ shall be documented in the plan.
2. During construction, the person responsible for implementing the approved plan may request a variance in writing from VDEQ. VDEQ shall respond in writing either approving or disapproving such a request. If VDEQ does not approve a variance within ten days of receipt of the request, the request shall be considered to be disapproved. Following disapproval, the applicant may resubmit a variance request with additional documentation.
3. VDEQ shall consider variance requests judiciously, keeping in mind both the need of the applicant to maximize cost effectiveness and the need to protect off-site properties and resources from damage.
4. All variance requests submitted to VDEQ shall include the following:
    a. Introduction;
    b. Project description;
    c. Description of what Minimum Standard variance is requested;
    d. Existing conditions and adjacent areas;
    e. Soil characterization;
    f. Critical and sensitive areas;
    g. Mitigation strategies for:
        i. ESC measures;
        ii. Permanent stabilization;
        iii. Vegetative restoration;
        iv. Maintenance; and
        v. Critical and sensitive areas; and
    h. Plans for self-inspection, reporting, and use of VDEQ certified personnel.

12.0 E-NOTIFICATION

12.1 At VDEQ's discretion, MDS may be required to provide weekly e-reporting to the department's applicable regional office.

12.2 A list of all proposed projects planned for construction will be submitted to standardsandspecs@deq.virginia.gov. The following information will be submitted for each project:

- Project name and project number (any associated construction general permit (CGP) permit number);
- The location and description of the activity (including nearest intersection, latitude, and longitude);
- Scheduled start and finish date of the activity;
- Any variances, exceptions, waivers, or deviations associated with the project;
- Any offsite compliance options (nutrient credits);
- The acreage of disturbance for the project;
- The onsite project manager name and contact information; and
- The contact information for the onsite RLD.

12.3 Project information must be provided to VDEQ two (2) weeks in advance of land disturbing activities by e-mail at standardsandspecs@deq.virginia.gov. An electronic copy of this notification will be kept for project tracking purposes.

12.4 MDS will provide VDEQ with project tracking reports on an annual basis. However, if MDS has at least 10 active projects underway in any given calendar year, then MDS shall provide VDEQ with tracking reports on a semi-annual basis. A project is considered to be a contracted project for a customer and not each individual route for a particular project. Annual tracking reports shall be submitted to VDEQ no later than January 31 following the end of the project reporting calendar year; semi-annual tracking reports shall be submitted to VDEQ no later than July 31 for the first six months of the project reporting calendar year and no later than the next January 31 for the last six months of project reporting calendar year.

13.0 REPORTS AND RECORDKEEPING

13.1 MDS shall keep records in accordance with the following:

- Project records, including approved SWM Plans, shall be kept for three (3) years after state permit termination or project completion.
- SWM facility inspection records shall be documented and retained for at least five (5) years from the date of inspection.

13.2 Construction record drawings shall be maintained in perpetuity or until a SWM facility is removed.

13.3 The AS&S holder shall maintain, either onsite or in AS&S files, a copy of the approved ESC Plan and a record of inspections for each active land-disturbing activity.

14.0 HORIZONTAL DIRECTIONAL DRILL INADVERTENT RETURN PLAN

The entirety of this Section of the AS&S, Section 14.0, is applicable only to inadvertent returns encountered during HDD activities.

The horizontal directional drill (HDD) process involves the use of drilling fluid (also referred to as drilling mud or mud), which is made up primarily of water and bentonite. Bentonite is a naturally occurring, non-toxic, inert substance that meets National Sanitation Foundation/American National Standards Institute (NSF/ANSI) Standard 60 and 61 Drinking Water Additives Standards and is frequently used for drilling potable water wells. Therefore, the environmental impact of an inadvertent release of drilling fluid in a waterbody is anticipated to be limited, i.e.-localized turbidity. However, even localized turbidity has the potential to adversely impact aquatic species.

14.1 What is an Inadvertent Return?

An "Inadvertent Return" is the unintentional return of drilling fluids to the surface during HDD activities. An inadvertent return is also commonly referred to as a frac-out.

The purpose of an Inadvertent Return plan is to:

- Minimize the potential for an inadvertent return associated with HDD activities;
- Provide for timely detection of inadvertent returns;
- Protect areas considered environmentally sensitive (streams, wetlands, other biological resources, cultural resources);
- Ensure an organized, timely, and "minimum-impact" response in the event that an Inadvertent return and release of drilling mud occurs; and
- Ensure that all appropriate notifications are made to managing personnel immediately. Managers will then make notifications to the appropriate regulatory agencies.

14.2 Minimizing the Potential and Impact of Inadvertent Returns

To minimize the potential of inadvertent returns and impact of any inadvertent returns that occur, the following steps shall be taken:

- Onsite briefings shall be conducted with all field personnel prior to initiation of HDD activities to identify and locate sensitive resources at the site; and
- All field employees shall be briefed on proper protocol for notification in the event an inadvertent return occurs.
- Straw bales, silt fences, and other ESC controls shall be installed prior to the start of any land-disturbing activity, including drilling. ESC controls installed prior to drilling activity shall include protection of the bore hole;
- Drill rates and pump pressures will be monitored and controlled. Pressure levels shall be maintained at a minimum level to prevent inadvertent returns;

- While pulling drill heads, reamers, tools, and finally the pipes or conductors themselves through the bore, pull speeds will be controlled to allow for pressure equalization within the bore during pull back. This will allow the drill mud to stay within the bore itself without being pushed in the surrounding soil/water/wetlands. By controlling drilling operations from drilling through final pipe pulling, inadvertent returns should also be controlled;

14.3 HDD Contractor Responsibilities and Requirements

14.3.1 The HDD contractor is responsible for execution of the HDD operation, including actions for detecting and controlling the inadvertent discharge of drilling fluid. Actions for detecting inadvertent returns include visual monitoring along the length of the bore.

14.3.2 The following is a list of tools that may be used in response to an inadvertent return:

- Tracked hydraulic excavator;
- Straw bales (VESCH standard 3.04);
- Silt fence (VESCH standard 3.05-2);
- Silt fence with wire support (VESCH standard 3.05-1);
- Soil stabilization blankets and matting (VESCH standard 3.36);
- Sand bags;
- Dirt bags;
- Riprap (VESCH standard 3.19);
- Seed and mulch (VESCH standards 3.31, 3.32, and 3.35);
- Shovels;
- Plastic sheeting;
- Flocculent (use is only permitted during an inadvertent return);
- Flocculent Logs (use is only permitted during an inadvertent return);
- Flexible plastic piping for potential mitigation where small creeks or watercourses are involved; and
- Pumps.

14.3.3 Note that any ESC measures listed in Paragraph 14.3.2 not found in the VESCH are only permitted for use during an inadvertent return. ESC measures listed in 14.3.2 that are not in the VESCH shall not be used as an ESC measure for any other land-disturbing unless first approved by VDEQ on a project-specific basis.

14.3.4 In addition to the above-referenced items and equipment that may be utilized to control an inadvertent discharge:

- Plans will be in place to secure a vacuum truck if needed in the event of an inadvertent return; and
- Plan will be in place to secure a portable light tower, if needed, in case cleanup operations are needed after dark.

14.3.5 The Site Supervisor shall ensure that:

- All equipment and vehicles are checked and maintained daily to prevent leaks of hazardous materials;
- Spill kits and spill containment materials are available on-site at all times and that the equipment is in good working order;
- Equipment required to contain and clean up an inadvertent return will either be available at the work site or readily available at an offsite location;
- If equipment is required to be operated near a riverbed, absorbent pads and plastic sheeting for placement beneath motorized equipment shall be used to protect the riverbed from engine fluids; and
- All waste materials are properly containerized, labeled, and removed from the site to an approved disposal facility by personnel experienced in the removal, transport, and disposal or drilling mud.

14.4 Corrective Action for an Inadvertent Return

14.4.1 In the event of an inadvertent return to the surface at locations other than the borehole location, mud circulation should cease immediately, as practical, recognizing circulation maintains pressure in the hole. Maintaining circulation may also be necessary if the native material does not have the frictional characteristics necessary to maintain hole stability without the presence of mud provided under pressure.

14.4.2 For discharges on land, the drilling contractor may use straw bales, silt fences, sand bags, and if necessary, earth berms to prevent the drilling mud from migrating or flowing from the immediate area of the discharge. If there is a threat to a sensitive resource, HDD activities will cease immediately until a plan to proceed is discussed and agreed to by the managing staff. Sump pumps or vacuum trucks shall be used to remove and dispose of any drilling mud as needed.

14.4.3 In cases of inadvertent discharges in shallow waters, a pump-around system utilizing sandbags and appropriate filter media may be used to contain the discharge. Clean-up shall include removal of all visible drilling mud located in accessible areas. Removal methods will vary based on the volume of the release and the site specific conditions. Removal equipment may include vacuum trucks, loader and track hoe buckets, small pumps, shovels, and buckets. If the release occurs in a sensitive area, it may be necessary to pump the mud into an upland area for additional containment and disposal.

14.4.4 After removal of the discharged drilling mud, the discharge area will be returned as close to the original condition as possible.

14.4.5 In all cases, the drilling contractor will also proceed as follows:

1. Contain any drilling mud that has surfaced.
2. Notify the RLD and/or Site Superintendent immediately of any inadvertent return in sensitive areas.

3. Reduce circulation pressure and evaluate the circumstances leading to the inadvertent return.
4. If the inadvertent return is easily-contained and not in an environmentally sensitive area (wetlands or streams), drilling operations may continue following removal of drilling fluids.

Appendix A

Erosion and Sediment Control Plan and Narrative Checklist

Metro Duct Systems VA LLC (MDS) Annual Standards and Specifications
Erosion and Sediment Control Plan and Narrative Checklist

Instructions: The checklist shall be completed if an ESC Plan is required per the MDS Annual Standards and Specifications for ESC and SWM. The completed checklist shall be provided with the ESC Plan and ESC Narrative to the ESC Plan Reviewer. The ESC Plan and Narrative submitted for review shall be signed and sealed by a licensed professional. This checklist is intended to only be used as a guide. The licensed professional is responsible for ensuring plans address ESC laws and regulations.

Yes	No	N/A	ESC *Narrative* Requirement
			Completed ESC Checklist provided in ESC Narrative.
			Project description including the nature and purpose of the land-disturbing activity.
			Description of the existing site conditions, including topography, ground cover, and drainage (include information for on-site and receiving channels).
			Description of adjacent areas such as residential developments, agricultural areas, streams, lakes, roads, etc., that might be affected by the land disturbance.
			Description of off-site land disturbing activities that may occur (borrow sites, disposal areas, easements, etc.). Identify the Owner of the off-site area and the locality responsible for plan review.
			Include a statement that any off-site land-disturbing activity associated with the project must have an approved ESC Plan. Submit documentation of the approved ESC Plan for each of these sites.
			Description of the site soils conditions, including hydrologic soils group, mapping unit, erodibility, permeability, surface runoff, and a brief description of depth, texture and soil structure. Mapping of soil variations should be provided in the narrative or on the plans.
			Description of critical areas that have potentially serious erosion problems or that are sensitive to sediment impacts (e.g., steep slopes, channels, etc.).
			Description of the structural and vegetative ESC measures that will be used to control erosion and sedimentation on the site. Controls should be consistent with the standards and specifications in Chapter 3 of the Virginia Erosion and Sediment Control Handbook (VESCH), latest edition. Variations and proprietary measures require a variance by VDEQ. Approval from DEQ of variances shall be maintained in the narrative.
			Detailed sequence of construction, that includes the phasing of installation of ESC measures.
			Description of permanent stabilization for the entirety of the site, including specifications, of how the site will be stabilized after construction is completed (permanent stabilization).
			Schedule of maintenance requirements for ESC measures including inspections frequency, maintenance concerns, and methods for repair or prevention of need for repair (i.e. removal of sediment buildup).
			Description of stormwater runoff considerations that includes describing any increase in peak runoff rates and the effects on downstream erosion and flooding. The description shall include the strategy to control stormwater runoff.
			Calculations for temporary sediment basins, diversions, channels, stormwater facilities to address MS19, etc. Where applicable. including pre- and post-development runoff calculations, drainage area maps, time of concentration paths and computations, rainfall source and documentation, weighted runoff coefficients and computations, runoff and routed hydrographs or peak computations (as applicable), adequate onsite channel (MS-19) and culvert computations, etc.

Project Name: _____ MDS Project Number: _____

Yes	No	N/A	ESC *Plan* Requirement
			Vicinity map locating the site in relation to the surrounding area. Include any landmarks and road information that might assist in locating the site.
			Location on the ESC Plan cover sheet for identification of the Responsible Land Disturber (RLD).
			Existing conditions including existing contours, surface waters and other surface features, existing tree lines, grassed areas, or unique vegetation.
			Where applicable, a demolition plan with identification of features to be demolished and measures to address ESC for the demolition.
			Proposed conditions, including proposed contours and features.
			Delineation of the limits of disturbance.
			A description of any variance approved by DEQ described on the cover sheet of the ESC Plans.
			North arrow provided on all plan sheets.
			Legend with a complete listing of all ESC measures used, including the VESCH uniform code symbol and the standard and specification number. Include any other items necessary to identify pertinent features in the plan.
			Identification of any off-site land disturbing activities (e.g., borrow sites, disposal areas, etc.) and appropriate ESC controls.
			Identification of critical areas and appropriate protections.
			Inclusion of erosion and sediment control notes (ES-1 through ES-9) found in Table 6-1 on page VI-15 of the 1992 Virginia Erosion and Sediment Control Handbook.
			Identification of property and easement lines. For each adjacent property, list the deed book and page number and the property owner's name and address.
			Finished floor elevation of all buildings on site, including basements.
			The locations of erosion and sediment control and stormwater management practices used on the site. Use the standard symbols and abbreviations in Chapter 3 of the VESCH.
			Existing drainage patterns including dividing lines and directions of flows with the total area for each drainage area.
			A schedule of regular inspections, maintenance, and repair of temporary erosion and sediment control structures and permanent stormwater management facilities.
			Storm sewer profiles of all storm drains except roof drains.
			Site-specific details for all ESC measures. Where applicable, details shall include site-specific dimensions. Proprietary measures with an approved variance shall include site-specific details with dimensions and other information for construction per manufacturer's specifications.
			Specifications for stormwater and stormwater management structures (i.e. pipe materials, pipe bedding, stormwater structures etc.).
			Minimum Standard (MS) 1 through 19 provided on the plan with a description for each that describes how the minimum standard is addressed with the plan.
			Permanent or temporary soil stabilization shown where required on plans using standard symbols and abbreviations in Chapter 3 of the VESCH (MS-1, MS-3, and MS-5).
			Stabilization and/or protection measures for soil stock piles and borrow areas. (MS-2).
			Detailed sequence of construction, that includes the phasing of installation of ESC measures with sediment trapping measures as a first step prior to upslope land disturbance. (MS-4).
			Drainage areas to sediment traps and sediment basins shown on plans. (MS-6).
			Stabilization measures provided for slopes steeper than 3:1. (MS-7).
			Measures to prevent concentrated flow from flowing down cut or fill slopes (i.e. slope drains) (MS-8).

Yes	No	N/A	ESC *Plan* Requirement
			Measures to address water seeping from a slope face (MS-9).
			Inlet protection provided for all operational storm drain and culvert inlets (MS-10).
			Outlet protection and/or channel linings provided for all stormwater conveyance channels and receiving channels prior to being made operational (see sequence of construction) (MS-11).
			Measures to minimize encroachment and minimize sediment transport for work in a live watercourse (MS-12).
			Temporary stream crossings of non-erodible material where a live watercourse must be crossed by construction vehicles more than twice in any six-month period (MS-13).
			Applicable federal, state and local regulations pertaining to working in or crossing live watercourses are addressed and summarized on the plan (MS-14).
			Stabilization measures for bed and banks of live watercourse subject to disturbance. (MS-15) Measures shown on plan (i.e. Construction entrance) to minimize sediment transport onto public and otherwise paved roads (MS-17).
			MS-19 satisfied for each receiving channel per 9VAC25-840-40(19).
			Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property are diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.
			If the project impacts any wetlands or surface waters, is all correspondence and permits concerning any proposed impacts to jurisdictional wetlands, stream and channels included (i.e. COE 404 permit). Note that the plan cannot be approved without proper documentation or necessary permits for jurisdictional impacts.

Appendix B

Stormwater Management Plan and Narrative Checklist

Metro Duct Systems VA LLC (MDS) Annual Standards and Specifications
Stormwater Management Plan and Narrative Checklist

Instructions: This checklist shall be completed if a SWM Plan is required per the MDS Annual Standards and Specifications for ESC and SWM. The completed checklist shall be provided with the SWM Plan and SWM Narrative to the SWM Plan Reviewer. The SWM Plan and Narrative submitted for review shall be signed and sealed by a licensed professional. This checklist is intended to only be used as a guide. The licensed professional is responsible for ensuring plans address the SWM laws and regulations.

Yes	No	N/A	SWM Plan/Narrative Requirement
General Plan Information (Plan)			
			North arrow.
			Legend.
			Location and vicinity map.
			Delineation of the site area and property lines in the vicinity of the project.
			Existing and proposed contours (2' interval minimum).
			Locations of test borings.
			Earthwork specifications.
			Compaction requirements specified.
			Sequence of construction.
			Limits of clearing and grading.
			Existing and proposed features including buildings, roads, parking areas, utilities, stormwater management facilities and any other physical attributes.
			SWM Facility Certification - Plans shall list all SWM facilities and critical construction inspection timeframes (i.e., liner, underdrain and outlet pipe installation).
			The following note is on the plan: "A certified construction record drawing for permanent SWM facilities shall be submitted to MDS for approval. Construction inspections and surveys, performed by a licensed professional, shall be required at each stage of installation (construction) as necessary to certify that the SWM facility has been built in accordance with the approved plan and design specifications. The Contractor shall provide a minimum of 2 business days' notice to the certifying professional to allow for critical inspections."
			BMP Inspection and maintenance plan for each permanent SWM facilities. For manufactured permanent BMPs, the construction drawings shall include manufacturer's recommendation on maintenance and inspection.
			Specifications for construction/installation of proprietary BMPs per the manufacturer's specifications.
			Cross sections for stormwater conveyance channels with maximum water surface elevations for design storms (1-, 10-, and 100-year).
			Where applicable, outlet protection with dimensions at points of concentrated discharge.
Site Information (Narrative)			
			Description of existing and proposed site conditions.
			Summary table with pre- and post-development land cover conditions (i.e. forest, managed turf, and impervious areas).
			Discussion of the stormwater management strategy to address water quantity and quality criteria.
			Information on the type and location of stormwater discharges, including information on the features to which stormwater is being discharged including surface waters or karst features if present.

Project Name: _____ MDS Project Number: _____

Yes	No	N/A	SWM Plan/Narrative Requirement
			If the project impacts any wetlands or surface waters, is all correspondence and permits concerning any proposed impacts to jurisdictional wetlands, stream and channels included (i.e. COE 404 permit). Note that the plan cannot be approved without proper documentation or necessary permits for jurisdictional impacts.
			A general description of the proposed stormwater management facilities and the mechanism through which the facilities will be operated and maintained after construction is complete Information on the proposed stormwater management facilities, including (i) the type of facilities; (ii) location, (iii) impervious and pervious acres treated; and (iv) the surface waters or karst features into which the facility will discharge.
			Discussion of possible stormwater impacts on downstream properties including mapping with sufficient information on adjoining parcels to assess the impacts.
			Geotechnical report when applicable (include infiltration rates when required for a BMP).
			Boring locations: borrow area, basin pool area and embankment area (centerline principal spillway, emergency spillway, abutments).
			Boring logs with Unified Soils Classifications, soil descriptions, depth to seasonal high groundwater table, etc.
			Additional geophysical investigation and recommendations in Karst environment.
			Description of inclusion of the locality's additional technical requirements into the plan, if any, and how they were addressed to the maximum extent practicable.
Hydrologic Computations (Narrative)			
			Mapping that supports computations and includes, at a minimum the following: • Pre- and post-development development contours; • Existing streams, ponds, culverts, ditches, wetlands, other water bodies, and floodplains; • Current land use including existing structures, roads, and locations of known utilities and easements; • Limits of clearing and grading; • Proposed drainage patterns on the site; • Proposed buildings, roads, parking areas, utilities, and stormwater management facilities.
			Pre-development drainage area mapping that includes all contributing drainage areas, CN labels, depiction of time of concentration flow paths, slopes and lengths used for runoff hydrographs.
			Post-development drainage area mapping that includes all contributing drainage areas, CN labels, depiction of time of concentration flow paths, slopes and lengths used for runoff hydrographs.
			Rainfall precipitation frequency data recommended by the U.S. National Oceanic and Atmospheric Administration (NOAA) Atlas 14. Partial duration time series shall be used for the precipitation data. Summary table for determination of runoff curve numbers.
			Time of concentration calculations.
			Pre-development runoff hydrographs.
			Post-development runoff hydrographs
Hydraulic Computations (Narrative and Plans, as indicated)			
			Routing computations for each proposed stormwater management facility for each applicable design storm provided in narrative.
			Stage-storage data used in routing computations in the narrative.
			Control structure information used in routing computations in the narrative.
			Summary table of pre- and post-development peak runoff rates for each point of discharge from the site provided in narrative.

Yes	No	N/A	SWM Plan/Narrative Requirement
			Maximum water surface elevations for design storms shown in sections or profiles on the plans for each stormwater management facility.
			Impoundments designed to convey the 100-year storm as demonstrated in computations in the narrative.
			Adequate freeboard is provided for impoundments as shown on the plans based on computations in the narrative.
			Hydraulic grade line computations in the narrative with indication of locations of surcharge or inadequacy.
			Storm sewer design computations in the narrative.
			Culvert calculations in the narrative.
			Gutter spread calculations in the narrative.
			Provide profiles of all storm conveyances (except roof drains) on plans. Profiles should include existing and proposed grade, structure types, pipe materials and sizes, slopes, inverts, etc.
Water Quality Computations (Narrative and Plans, as indicated)			
			Per 9VAC25-870-63 and -65, provide Virginia Runoff Reduction Method spreadsheet output including: • Site loadings to include the drainage area and land cover conditions draining to each BMP. • Required reductions • Input for each BMP employed and reductions achieved by each BMP • Compliance worksheet • Adjusted CN worksheet, when applicable.
			Treatment volume calculations for sizing BMPs.
			Stage-storage information indicating the treatment volume required and volume provided.
			All proposed SWM design follows the Virginia BMP Clearinghouse design specifications.
			A BMP-type specific checklist from Appendix 8-A of the Virginia Stormwater Management Handbook, latest edition, is completed and provided in the narrative for each proposed BMP.

Appendix C

Construction Site Inspection Checklist

Metro Duct Systems VA LLC (MDS) Construction Site Inspection Form

Instructions: All sites regulated by the MDS Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management (AS&S) shall be inspected per AS&S requirements and all applicable State erosion and sediment control and stormwater management laws and regulations referenced therein. This Construction Site Inspection Form shall be used to document all construction site inspections for compliance with the erosion and sediment control and stormwater management requirements in the AS&S.

General Information			
Project Name:		MDS Project Number:	
VAR10 Permit # (where applicable):		Location:	
Date of Inspection:		Start / End Time:	
Contact Information for Responsible Parties			
Site Representative*:		Representative's email and phone:	
Inspector's Name(s):		Inspector's email and phone:	
Inspector's DEQ Certification(s):		Other contact information (if required):	
* Project Manager, Contractor, RLD, or other individual with responsibility for implementation of the ESC Plan and SWPPP, where applicable.			
Inspection Type (check all that apply)			
After installation of initial ESC measures * Within 48 hours of runoff event (rainfall greater than 0.25" over 24 hours) Contractor's self-inspection as required by SWPPP		Periodic SWM inspection Final stabilization Two-week inspection	
* If inspection is for post-runoff event, provide date of event: and rainfall amount (inches):			
Weather conditions (circle all that apply)			
☐ Clear ☐ Sunny ☐ Partly Cloudy ☐ Cloudy ☐ Snowing ☐ Raining		Temperature (approx.): °F	
Are discharges occurring from the site at the time of inspection or is there evidence of off-site sediment transport? ☐ Yes ☐ No If yes, describe:			

Construction Inspection Checklist					
Part I – ESC Plan Inspection *Instructions:* Complete Part I of the Construction Inspection Checklist for all MDS projects.					
	Inspection Item	***Yes***	***No***	***N/A***	***Location of Concern / Recommended Corrective Action / Notes***
1	Have deficiencies identified during previous inspections been corrected? Notify Project Manager if a specific deficiency has been identified and not been corrected during the past three inspections.				
2	Are all land-disturbing activities within the limits of disturbance identified on approved ESC plan?				
3	Are all erosion and sediment controls maintained, properly repaired and functional? [9VAC25-840-60]				
4	Are site ESC operations consistent with the ESC phasing plan or have modifications to the plan been appropriately approved and documented?				
5	Are temporary or permanent stabilization measures applied within allowable time frames (7 days after final grade or where dormant for more than 14 days)? [9VAC25-840-40]				
6	Are disposal/borrow areas and stockpiles (on-site and off-site) stabilized or protected with sediment trapping measures? Are off-site areas on plan or have separate approved ESC plan?				
7	Are all temporary ESC measures that are no longer needed removed and applicable site areas permanently stabilized?				

Project Name: _____ MDS Project Number: _____

Construction Inspection Checklist

Part I – ESC Plan Inspection

Instructions: Complete Part I of the Construction Inspection Checklist for all MDS projects.

	Inspection Item	***Yes***	***No***	***N/A***	***Location of Concern / Recommended Corrective Action / Notes***
8	Are initial ESC measures, including perimeter controls,(i.e. silt fence, sediment basins and traps, perimeter dikes) intended to trap sediment installed and functional prior to upslope land disturbance?				
9	Are earthen structures, such as dams, dikes, diversions, and cut/fill slopes, stabilized or protected with functioning sediment trapping measures?				
10	Are sediment basins/traps constructed according to the plans/specifications, functional and maintained?				
11	Are cut/fill slopes protected from concentrated runoff with channel flumes or slope drains?				
12	Are slopes with water seeps protected with adequate drainage and stabilization?				
13	Do operational storm sewer and culvert inlets have inlet protection according to the plans/specifications?				
14	Are constructed stormwater conveyance channels and ditches stabilized with the appropriate channel lining and/or outlet protection according to the plans/specifications?				
15	Is non-erodible material or cover provided for all causeways and cofferdams where work is performed in a live watercourse?				
16	Is a live watercourse crossed by construction vehicles more than twice in a 6- month period, and if so, is the temporary stream crossing used for crossing constructed of non-erodible materials?				
17	Where work is performed in a live watercourse, are applicable federal and state permits available?				
18	Where work is performed in a live watercourse, have the bed and banks been stabilized immediately and per the plan/specifications?				
19	Are underground utilities installed with less than 500' of trench open, sediment trapping controls for excavated material, filtering of effluent from dewatering, and compaction and restabilization of backfill?				
20	Are construction entrances properly located, installed and maintained?				
21	Does sediment tracked onto adjacent roadways appear to be removed each day?				
22	If the site is stabilized, have ESC measures been removed and trapped sediment been stabilized or appropriately removed?				
23	Is there evidence of downstream or other off-site sediment transport? (Provide locations and description of impacts if applicable.)				
24	Are adjacent properties and waterways adequately protected from accidental land disturbance, potential pollutant discharge, erosion, flooding, and sedimentation from the project site?				
25	Do all locations concentrated of concentrated runoff leaving the site discharge to a channel (i.e. stream, storm sewer, or ditch)?				
26	Are any ESC measures to protect SWM practices (i.e. infiltration basin, bioretention) that are shown on the plans to prevent compaction or clogging installed?				
27	Is runoff and other discharges (dewatering) that contain sediment or other pollutants being properly treated prior to discharging from the site?				
28	Are permanent stormwater measures (basins, etc.) properly installed/converted, stabilized and functional?				

Construction Inspection Checklist					
Part II – Pollution Prevention Plan Inspection *Instructions:* Complete Part II of the Construction Inspection Checklist for all MDS projects with land-disturbing activity of one acre or greater.					
	Inspection Item	***Yes***	***No***	***N/A***	***Location of Concern / Recommended Corrective Action / Notes***
1	Are functional measures in place to prevent and respond to leaks, spills and other pollutant releases including procedures for expeditiously stopping, containing, cleaning up spills and reporting?				
2	Are functional measures in place to prevent the release of soaps, solvents, detergents, wash water from construction materials, paint clean-up and other pollutants and/or also from contact with stormwater?				
3	Are wash waters from vehicles, equipment, construction materials and the like prevented from release and/or properly treated before leaving the site?				
4	Is the concrete wash-out waste directed into a properly installed leak- proof container? Is the treatment mechanism properly maintained and utilized?				
5	Are construction products, materials, and wastes being properly stored, handled, labeled? Are loose trash and debris properly contained?				
6	Are other potential pollutant-generating activities not listed above being properly managed to prevent exposure to precipitation/runoff?				
7	Have all pollutant generating activities present on the site been identified in the Pollution Prevention Plan?				

Construction Inspection Checklist					
Part III –Stormwater Pollution Prevention Plan (SWPPP) Inspection *Instructions:* Complete Part III of the Construction Inspection Checklist for all projects where a SWPPP is required.					
	Inspection Item	***Yes***	***No***	***N/A***	***Location of Concern / Recommended Corrective Action / Notes***
1	Has a copy of the notice of coverage letter and information for public access to the SWPPP been posted near main entrance of the site?				
2	Is there a copy of the complete SWPPP available onsite for operators and inspectors?				
3	Is the SWPPP being amended, modified, updated and appropriately signed?				
4	Are dates when major grading activities occurred properly recorded?				
5	Are SWPPP inspections conducted by contractor at required frequency, summarized including corrective actions, appropriately signed and retained with the SWPPP?				

Certification Inspection

This Inspection Form is not complete without the completion of the appropriate certification(s) by the individual(s) listed below.

Reports conducted by an MDS or MDS representative shall be provided to the Operator or Duly Authorized Representative within 48 hours by (check all that apply): ☐ Hardcopy ☐ Email ☐ Other _____ .

CERT-1 and CERT-2 certification is required for all MDS inspections.

CERT-2 certification is required by the VAR10 operator for all inspections, including self-inspections required by the VAR10.

CERT-1: Inspection Certification Statement

"I certify under penalty of law that I performed the inspection described in this form as a Certified Project Inspector for ESC and SWM per the Virginia Erosion and Sediment Control and Stormwater Management Certification Regulations (9VAC25-850). I certify that the inspection described in the form reflects site conditions to the best of my knowledge and belief and is true, accurate and complete. On inspection forms where no corrective action is identified, the construction activity is in compliance with the project SWPPP. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations and falsifying inspections (reports)."

Inspector's Name: _____

Signature: _____ Date: _____

CERT-2: Operator (Or Duly Authorized Representative) Certification Statement

"I certify under penalty of law that I have read and understand this document and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." The inspection form shall be maintained in the project SWPPP. Corrections to incidents of noncompliance identified on this form will be corrected within 7 days or as otherwise identified per incident.

Operator's (Or Duly Authorized Representative's) Name:_____

Signature: _____ Date: _____

Appendix D

Stabilization Seeding and Invasive Species Guidance

Seeding mixtures shall comply with the VESCH and Virginia department of conservation and recreation's native vs. Invasive plant species FAQ.

TABLE 3.31-B

ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS

"QUICK REFERENCE FOR ALL REGIONS"

Planting Dates	Species	Rate (lbs./acre)
Sept. 1 - Feb. 15	50/50 Mix of Annual Ryegrass (Lolium multi-florum) & Cereal (Winter) Rye (Secale cereale)	50 - 100
Feb. 16 - Apr. 30	Annual Ryegrass (Lolium multi-florum)	60 - 100
May 1 - Aug 31	German Millet (Setaria italica)	50

Source: Va. DSWC

Source:
https://www.deq.virginia.gov/portals/0/deq/water/publications/nativeinvasivefaq.pdf

TABLE 3.31-C

TEMPORARY SEEDING PLANT MATERIALS, SEEDING RATES, AND DATES

SPECIES	SEEDING RATE		NORTH[a]			SOUTH[b]			PLANT CHARACTERISTICS
	Acre	1000 ft^2	3/1 to 4/30	5/1 to 8/15	8/15 to 11/1	2/15 to 4/30	5/1 to 9/1	9/1 to 11/15	
OATS (Avena sativa)	3 bu. (up to 100 lbs., not less than 50 lbs.)	2 lbs.	X	-	-	X	-	-	Use spring varieties (e.g., Noble).
RYE[d] (Secale cereale)	2 bu. (up to 110 lbs., not less than 50 lbs.)	2.5 lbs.	X	-	X	X	-	X	Use for late fall seedings, winter cover. Tolerates cold and low moisture.
GERMAN MILLET (Setaria italica)	50 lbs.	approx. 1 lb.	-	X	-	-	X	-	Warm-season annual. Dies at first frost. May be added to summer mixes.
ANNUAL RYEGRASS[c] (Lolium multi-florum)	60 lbs.	1½ lbs.	X	-	X	X	-	X	May be added in mixes. Will mow out of most stands.
WEEPING LOVEGRASS (Eragrostis curvula)	15 lbs.	5½ ozs.	-	X	-	-	X	-	Warm-season perennial. May bunch. Tolerates hot, dry slopes and acid, infertile soils. May be added to mixes.
KOREAN LESPEDEZA[c] (Lespedeza stipulacea)	25 lbs.	approx. 1½ lbs.	X	X	-	X	X	-	Warm season annual legume. Tolerates acid soils. May be added to mixes.

[a] Northern Piedmont and Mountain region. See Plates 3.22-1 and 3.22-2.
[b] Southern Piedmont and Coastal Plain.
[c] May be used as a cover crop with spring seeding.
[d] May be used as a cover crop with fall seeding.
X May be planted between these dates.
\- May not be planted between these dates.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Virginia Department of Conservation & Recreation

REVISED: April 2017

FREQUENTLY ASKED QUESTIONS (FAQ)
NATIVE VS. INVASIVE PLANT SPECIES FOR EROSION & SEDIMENT CONTROL

DCR's Natural Heritage Program and other conservation agencies and organizations recognize as "invasive non-natives" certain plant species referenced by DEQ in the *Virginia Erosion and Sediment Control Handbook*. This FAQ provides information regarding Virginia native and invasive non-native plant species and guidance for using natives in lieu of invasive Non-natives for vegetative stabilization of land-disturbing activities regulated by the Virginia Erosion and Sediment Control Law and Regulations. This document promotes sound ecological stewardship, while ensuring erosion control and compliance with the law and regulations. Visit DCR's website for further information about native and invasive plant species and for information about erosion and sediment control visit DEQ's website.

What is a Native Species?
Native species are those that naturally occur in the region in which they evolved. Plants evolve in specific habitats over extended periods of time in response to physical and biotic habitats processes that are characteristic of that place: the climate; the soils; the seasonal rainfall, drought, and frost; and interactions with other species occupying those habitats. Native species thus possess certain traits that enable them to thrive under local conditions.

What Are Invasive Non-Native Species and Why Are They of Concern?
Non-native plants, also known as exotic or non-native, are species that have been introduced intentionally or accidentally by human activity into a region in which they did not evolve. Many non-native species are well known and economically important in agriculture and horticulture, such as wheat, soybeans, and tulips. However, while some non-native plants are beneficial and have little capacity to spread in the natural environment, a few are *invasive* and pose serious threats to both natural communities and rare species. Because of a lack of natural controls like insect pests and competitors, some invasive non-native plants may escape cultivation, displace native plant species, reduce wildlife habitats, and alter ecosystem processes. The majority of invasive non-native plants are problematic due to their ability to easily and rapidly disperse across the landscape. Given this possibility of colonization, use of these species for erosion and sediment control should be avoided when possible.

How Many Invasive Non-Native Plant Species Have Been Identified in Virginia?
DCR's Natural Heritage Program and the Virginia Native Plant Society, in cooperation with land managers and agencies, nurserymen, landscape architects, horticulturalists, and other partners, have identified 90 (DCR 2014) invasive non-native plant species that threaten natural areas, forests, parks, and other conservation areas in Virginia. A complete list of invasive non-native plants for Virginia is available on DCR's website.

Why is Vegetative Stabilization of Land-Disturbing Activities Required?
Virginia Erosion and Sediment Control Law defines a land-disturbing activity as any land change of 10,000 sq. ft. or greater that involves clearing, grading, excavating, transporting, and filling of land. The Virginia Erosion and Sediment Control Regulations and local ordinances that implement the Law delineate strict requirements for timely temporary or permanent stabilization of land-disturbing activities, including denuded areas, soil stockpiles, earthen structures, cut and fill slopes, and watercourses, to prevent soil erosion from occurring in the first place. Planting vegetation, namely grasses or other herbaceous plants, is an effective and economic method for achieving expedient site stabilization. A copy of the Law and Regulations are available on DEQ's website.

Should Invasive Plants Referenced in the DCR Handbook Be Avoided?
Yes. DCR strongly discourages the use of the highly invasive **Common Reed** and **Chinese Lespedeza**. There are equally effective alternatives that are less problematic. It is especially important to avoid using these species in stormwater channels and on streambanks, as planting in these habitats may facilitate their wider distribution. Eight plant species considered invasive non-natives are referenced within the following sections of the *E&S Handbook*: Temporary Seeding (STD&SPEC 3.31), Permanent Seeding (STD&SPEC 3.32), Stormwater Conveyance Channels

(STD&SPEC 3.17), Vegetative Streambank Stabilization (STD&SPEC 3.22), and Sodding (STD&SPEC 3.33). However, DCR encourages using native plants whenever feasible as described in the remainder of this FAQ.

What Criteria Should Be Met For Native Species To Be Used for Stabilization?

The plant species chosen for stabilization must always be matched to the characteristics (climate, soils, etc.) of the site/region and must be commercially available in that region. Further, because interest in using native species for erosion and sediment control is relatively recent, alternative native species may not have been thoroughly field-tested to document their efficacy for erosion and sediment control. DCR recommends native plants for vegetative stabilization if the following criteria are met:

- Slopes < 15% slope gradient
- Soils with K factors < 0.36 (soils are not highly erodible)
- For use along roadways, species height must comply with Virginia Department of Transportation visibility requirements and not have characteristics that are highly attractive to birds and mammals
- For use on stormwater conveyance channels and streambanks, species must have proven effectiveness at the expected maximum stormwater flow volume and velocity

Generally, flat to gently sloping, open areas where there is little traffic are appropriate locales for planting most of the alternatives species suggested below. Utility easements or rights-of-way, park like areas, greenways, and other open tracks of land are excellent places to propagate native plants. However, natives may be considered even if one of these criteria is not met if there is sufficient evidence that the species is effective for erosion control.

What are Some Alternative Native Species to the Invasive Plants in the Handbook?

The table below provides a list of alternative Virginia native plants with similar attributes to the invasive non-native plants. These alternatives are offered as suggestions if the criteria listed above are met. Fact sheets for 30 invasive plant species and five brochures on using native plants for restoration and landscaping are available on DCR's website.

Invasive Non-Native Species	***Alternative Virginia Native***	
Common Name	*Common Name*	*Scientific Name*
Common Reed	Great bulrush	*Schoenoplectus tabernaemontani*
	Common Cattail	*Typha latifolia*
Chinese Lespedeza **Birdsfoot Trefoil** **Orchard Grass** **Redtop** **Weeping Lovegrass**	Roundheaded bushclover	*Lespedeza capitata*
	Patridge pea	*Chamaecrista fasciculata*
	Butterflyweed	*Asclepias tuberosa*
	Joe-pye weed	*Eutrochium dubium*
	Black-eyed Susan	*Rudbeckia fulgida*
	Big blue stem	*Andropogon gerardii*
	Indian grass	*Sorghastrum nutans*
	Side oats grama	*Bouteloua curtipendula*
Crownvetch	Roundheaded bushclover	*Lespedeza capitata*
	Patridge pea	*Chamaecrista fasciculata*
	Big blue stem	*Andropogon gerardii*
	Little blue stem	*Schizachyrium scoparium*
	Indian grass	*Sorghastrum nutans*
	Switchgrass	*Panicum virgatum*
Tall Fescue	Big blue stem	*Andropogon gerardii*
	Little blue stem	*Schizachyrium scoparium*
	Indian grass	*Sorghastrum nutans*
	Switchgrass	*Panicum virgatum*
	Broomsedge	*Andropogon virginicus*
	Deertongue	*Dichanthelium clandestinum*
	Side oats grama	*Bouteloua curtipendula*
	Canadian wildrye	*Elymus canadensis*
	Bottlebrush grass	*Elymus hystrix*
	Virginia wildrye	*Elymus virginicus*

Are There Other Considerations When Employing Alternative Native Plants? Yes. The following potential issues should also be considered when employing alternative native plants:

- Always using a native seed mix is desirable for two reasons:
  - Some natives take several seasons to fully establish, so a seed mix including some non-competing annual plant species is recommended
  - To prevent establishing a "monoculture" and encourage biodiversity, multiple natives species should be established on site when possible
- Some natives have new/unique maintenance requirements (weeding, mowing, herbicides, etc.)
- Adding compost to raise the organic content of the soil will greatly enhance the success of vegetation
- Always coordinate with and educate local government officials, property owners, and the citizenry about the benefits of natives – many natives don't produce lush green lawns, and are perceived as weeds

Who Must Approve Use of Alternative Native Plants?

Users should work with the local Native Plant Society chapter or equivalent and the erosion and sediment control program authority to select appropriate native plant species. Note that the selection of plant species for vegetative stabilization **must always** be approved by the program authority as a part of the erosion and sediment control plan.

Virginia Invasive Plant Species List

Tree-of-heaven

Phragmites

Wavyleaf Grass

The Virginia Invasive Plant Species List comprises species that are established — or may become established — in Virginia, cause economic and ecological harm, and present ongoing management issues.

The list is for educational purposes only and has no regulatory authority.

To be included on the list, there must be demonstrable evidence that a species poses a threat to Virginia's forests, native grasslands, wetlands or waterways.

The Virginia Department of Conservation and Recreation's Invasive Species Assessment Protocol, approved by the Virginia Invasive Species Working Group, May 2015, was used to conduct a risk assessment for each listed species. Species were ranked as exhibiting **high**, **medium** or **low** levels of invasiveness based on their threat to natural communities and native species.

Scientific Name	Common Name	Virginia Invasiveness Rank	REGION: Mountain	Piedmont	Coastal
Ailanthus altissima	**Tree-of-heaven**	High	•	•	•
Alliaria petiolata	**Garlic Mustard**	High	•	•	•
Alternanthera philoxeroides	**Alligator-weed**	High			•
Ampelopsis brevipedunculata	**Porcelain-berry**	High		•	•
Carex kobomugi	**Japanese Sand Sedge**	High			•
Celastrus orbiculatus	**Oriental Bittersweet**	High	•	•	•
Centaurea stoebe ssp. micranthos	**Spotted Knapweed**	High	•	•	•
Cirsium arvense	**Canada Thistle**	High	•	•	•
Dioscorea polystachya	**Cinnamon Vine**	High	•	•	•
Elaeagnus umbellata	**Autumn Olive**	High	•	•	•
Euonymus alatus	**Winged Euonymus**	High	•	•	
Ficaria verna	**Lesser Celandine**	High		•	•
Hydrilla verticillata	**Hydrilla**	High	•	•	•
Iris pseudacorus	**Yellow Flag**	High	•	•	•
Lespedeza cuneata	**Chinese Lespedeza**	High	•	•	•
Ligustrum sinense	**Chinese Privet**	High	•	•	•
Lonicera japonica	**Japanese Honeysuckle**	High	•	•	•
Lonicera maackii	**Amur Honeysuckle**	High	•	•	•
Lonicera morrowii	**Morrow's Honeysuckle**	High	•	•	
Lythrum salicaria	**Purple Loosestrife**	High	•	•	•
Microstegium vimineum	**Japanese Stiltgrass**	High	•	•	•
Murdannia keisak	**Marsh Dewflower**	High	•	•	•
Myriophyllum aquaticum	**Parrot Feather**	High	•	•	•
Myriophyllum spicatum	**Eurasian Water-milfoil**	High	•	•	•
Persicaria perfoliata	**Mile-a-minute**	High	•	•	•
Phragmites australis ssp. australis	**Common Reed**	High	•	•	•
Pueraria montana var. lobata	**Kudzu**	High	•	•	•
Reynoutria japonica	**Japanese Knotweed**	High	•	•	•
Rosa multiflora	**Multiflora Rose**	High	•	•	•
Rubus phoenicolasius	**Wineberry**	High	•	•	•
Sorghum halepense	**Johnson Grass**	High	•	•	•
Urtica dioica	**European Stinging Nettle**	High	•	•	•
Acer platanoides	**Norway Maple**	Medium	•	•	•
Agrostis capillaris	**Colonial Bent-grass**	Medium	•	•	•
Akebia quinata	**Five-leaf Akebia**	Medium		•	•
Albizia julibrissin	**Mimosa**	Medium	•	•	•
Arthraxon hispidus var. hispidus	**Joint Head Grass**	Medium	•	•	•
Berberis thunbergii	**Japanese Barberry**	Medium	•	•	•
Cirsium vulgare	**Bull Thistle**	Medium	•	•	•
Dipsacus fullonum	**Wild Teasel**	Medium	•	•	•
Egeria densa	**Brazilian Waterweed**	Medium	•	•	•
Euonymus fortunei	**Winter Creeper**	Medium	•	•	•
Glechoma hederacea	**Gill-over-the-ground**	Medium	•	•	•
Hedera helix	**English Ivy**	Medium		•	•

continued

Invasiveness rank is higher for species that:

- Alter ecosystem processes, such as succession, hydrology or fire regime.
- Are capable of invading undisturbed natural communities.
- Cause substantial impacts on rare or vulnerable species or natural communities or high-quality examples of more common communities.
- Are found widely distributed and generally abundant where present.
- Disperse readily to new areas.
- Are difficult to control.

Early detection species

The list includes a subcategory of invasive plants that are considered early detection species. These are species not yet established or, if established, are not yet widespread in Virginia but known to be highly invasive in habitats similar to those found here. If discovered in Virginia, these species need to be quickly mapped, photographed and reported to DCR. The management goal for early detection species is eradication, as preventing the establishment and spread of newly arrived species will save valuable natural and economic resources.

INFORMATION

For more information, or to report early detection species, contact Stewardship Biologist Kevin Heffernan with the Virginia Department of Conservation and Recreation at 804-786-9112 or kevin.heffernan@dcr.virginia.gov

Photo credits:
Tree-of-heaven, Chuck Bargeron, University of Georgia, Bugwood.org. Phragmites, Jil M. Swearingen, USDI National Park Service, Bugwood.org. Wavyleaf grass, Kerrie L. Kyde, Maryland Department of Natural Resources, Bugwood.org.

Citation:
Heffernan, K., E. Engle, C. Richardson. 2014. Virginia Invasive Plant Species List. Virginia Department of Conservation and Recreation, Division of Natural Heritage. Natural Heritage Technical Document 14-11. Richmond.

DCR
Virginia Department of Conservation & Recreation

www.dcr.virginia.gov/natural_heritage/invspinfo.shtml

			REGION		
Scientific Name	**Common Name**	**Virginia Invasiveness Rank**	Mountain	Piedmont	Coastal
Holcus lanatus	**Common Velvet Grass**	Medium	•	•	•
Humulus japonicus	**Japanese Hops**	Medium	•	•	•
Ligustrum obtusifolium var. obtusifolium	**Border Privet**	Medium	•	•	•
Lonicera tatarica	**Tartarian Honeysuckle**	Medium	•	•	
Lysimachia nummularia	**Moneywort**	Medium	•	•	•
Miscanthus sinensis	**Chinese Silvergrass**	Medium	•	•	•
Najas minor	**Brittle Naiad**	Medium	•	•	•
Paulownia tomentosa	**Royal Paulowina**	Medium	•	•	•
Persicaria longiseta	**Long-bristled Smartweed**	Medium	•	•	•
Phyllostachys aurea	**Golden Bamboo**	Medium	•	•	•
Poa compressa	**Flat-stemmed Bluegrass**	Medium	•	•	•
Poa trivialis	**Rough Bluegrass**	Medium	•	•	•
Pyrus calleryana	**Callery Pear**	Medium	•	•	•
Rhodotypos scandens	**Jetbead**	Medium	•	•	•
Rumex acetosella	**Sheep sorrel**	Medium	•	•	•
Spiraea japonica	**Japanese Spiraea**	Medium	•	•	
Stellaria media	**Common Chickweed**	Medium	•	•	•
Veronica hederifolia	**Ivy-leaved Speedwell**	Medium	•	•	•
Viburnum dilatatum	**Linden arrow-wood**	Medium		•	
Wisteria sinensis	**Chinese Wisteria**	Medium	•	•	•
Commelina communis	**Asiatic Dayflower**	Low	•	•	•
Elaeagnus pungens	**Thorny Olive**	Low	•	•	•
Lespedeza bicolor	**Shrubby Bushclover**	Low	•	•	•
Lonicera fragrantissima	**Winter Honeysuckle**	Low	•	•	•
Melia azedarach	**Chinaberry**	Low		•	•
Morus alba	**White Mulberry**	Low	•	•	•
Perilla frutescens	**Beefsteak Plant**	Low	•	•	•
Phleum pratense	**Timothy**	Low	•	•	•
Populus alba	**Silver Poplar**	Low	•	•	•
Rumex crispus ssp. crispus	**Curly Dock**	Low	•	•	•
Securigera varia	**Crown-vetch**	Low	•	•	•
Trapa natans	**European Water Chestnut**	Low			•
Ulmus pumila	**Siberian Elm**	Low	•	•	
Vinca major	**Greater Periwinkle**	Low	•	•	•
Vinca minor	**Periwinkle**	Low	•	•	•
Wisteria floribunda	**Japanese Wisteria**	Low		•	•
EARLY DETECTION SPECIES - not yet widely established in Virginia					
Aldrovanda vesiculosa	**Waterwheel**	High			•
Eichhornia crassipes	**Water Hyacinth**	High			•
Imperata cylindrica	**Cogon Grass**	High			•
Ludwigia grandiflora ssp. hexapetala	**Large Flower Primrose Willow**	High	•	•	•
Oplismenus hirtellus ssp. undulatifolius	**Wavyleaf Grass**	High	•	•	
Vitex rotundifolia	**Beach Vitex**	High			•
Heracleum mantegazzianum	**Giant Hogweed**	Medium	•	•	
Ipomoea aquatica	**Water Spinach**	Medium	•	•	•
Salvinia molesta	**Giant Salvinia**	Medium	•	•	•
Solanum viarum	**Tropical Soda Apple**	Medium		•	•

Appendix E

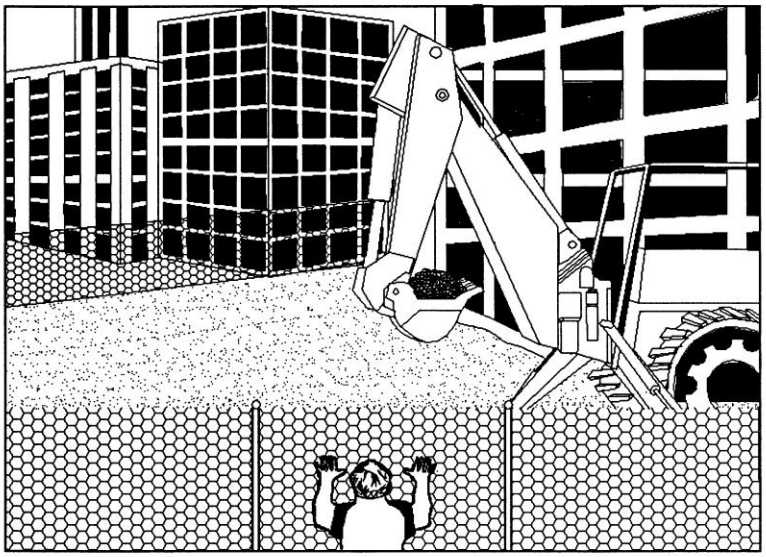
VESCH Standard Details

The following Construction details are taken from the Virginia Erosion and Sediment Control Handbook, (VESCH) Third Edition. Specific details and guidelines are covered more completely in Chapter 3 of the VESCH.

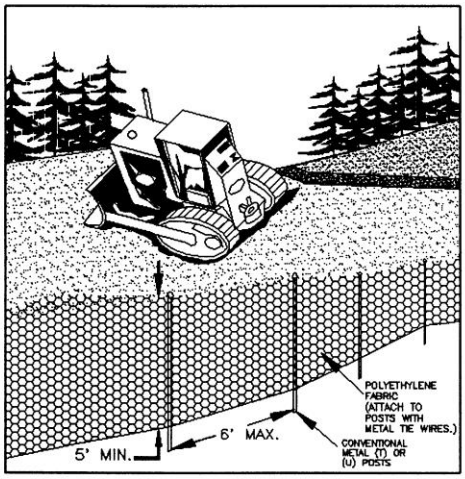
The Contractor shall go to the VESCH to reference practices that are covered in the specification but not listed below.

Practice	**Title**	**Key**
3.01	Safety Fence	SAF
3.02	Temporary Stone Construction Entrance	CE
3.04	Straw Bale Barrier	STB
3.05	Silt Fence	SF
3.07	Storm Drain Inlet Protection	IP
3.08	Culvert Inlet Protection	CIP
3.09	Temporary Diversion Dike	DD
3.10	Temporary Fill Diversion	FD
3.11	Temporary ROW Diversion	RWD
3.12	Diversion	DV
3.18	Outlet Protection	OP
3.19	Rip Rap	RR
3.20	Rock Check Dams	CD
3.24	Temporary Vehicular Stream Crossing	SC
3.25	Utility Stream Crossing	USC
3.26	Dewatering Structure	DS
3.36	Soil Stabilization Blankets & Matting	B/M

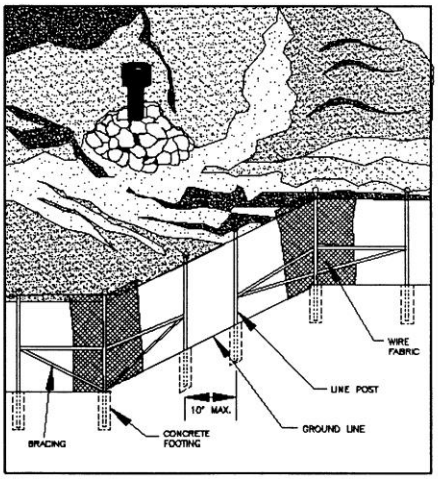
SAFETY FENCE



PERSPECTIVE VIEW



PERSPECTIVE VIEW
PLASTIC FENCE

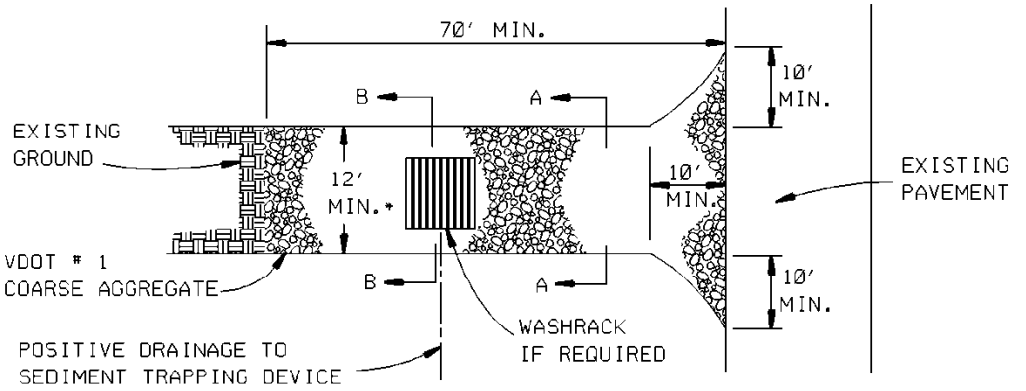


PERSPECTIVE VIEW
METAL FENCE

Source: Adapted from Conwed Plastics and VDOT Road and Bridge Standards

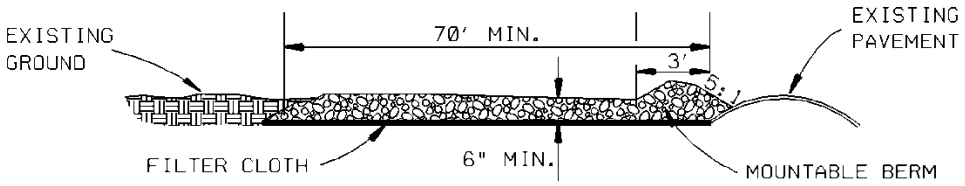
Plate 3.01-1

STONE CONSTRUCTION ENTRANCE - 3.02

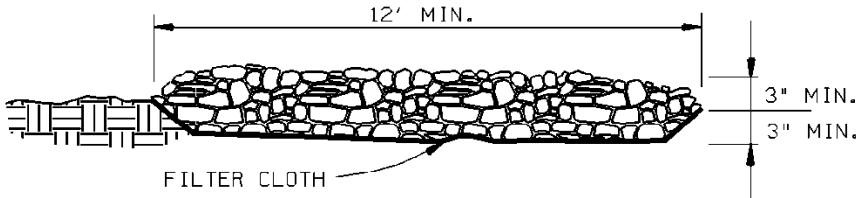


* MUST EXTEND FULL WIDTH OF INGRESS AND EGRESS OPERATION

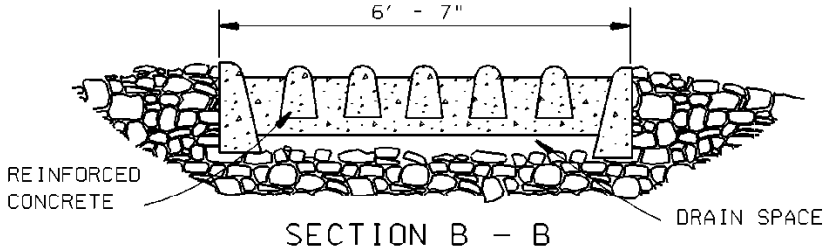
PLAN VIEW



ELEVATION



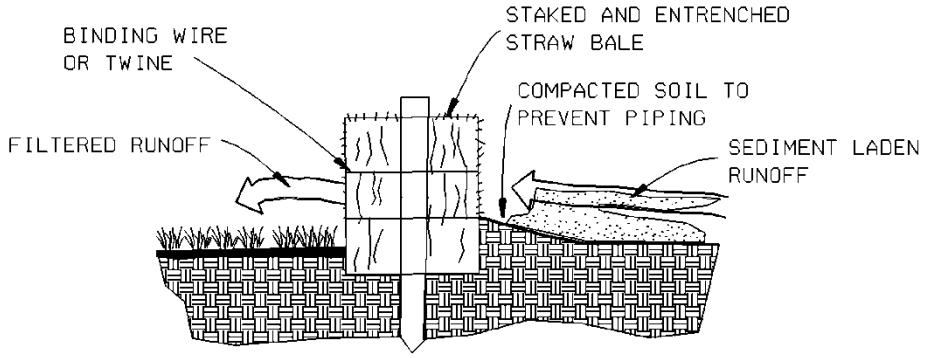
SECTION A - A



SECTION B - B

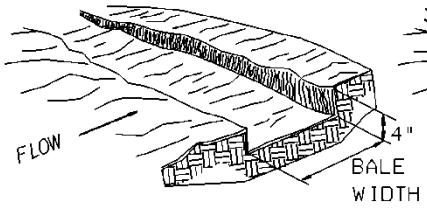
ves302.dgn

STRAW BALE BARRIER - 3.04

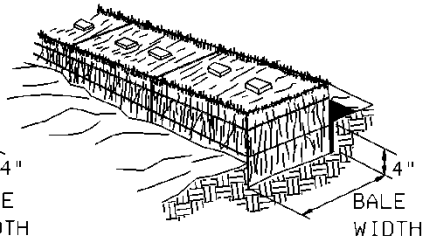


PROPERLY INSTALLED STRAW BALE CROSS SECTION

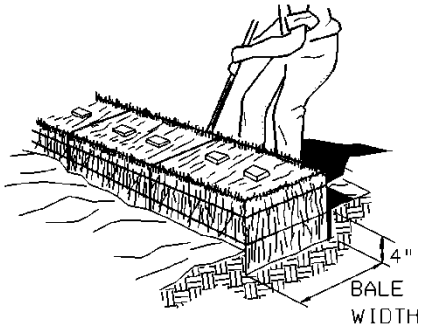
1. EXCAVATE THE TRENCH



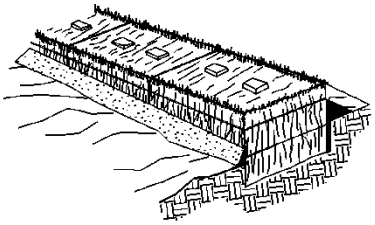
2. PLACE AND STAKE STRAW BALES



3. WEDGE LOOSE STRAW BETWEEN BALES



4. BACKFILL AND COMPACT THE EXCAVATED SOIL

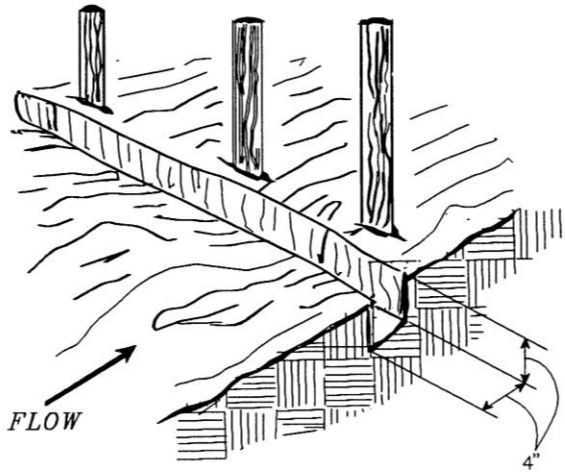


CONSTRUCTION OF STRAW BALE BARRIER

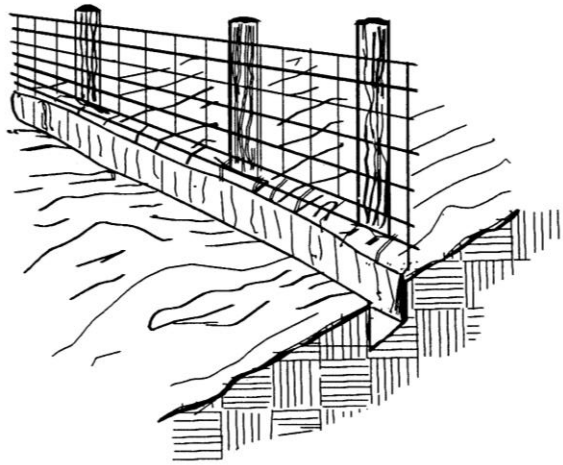
va6304.dgn

CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)

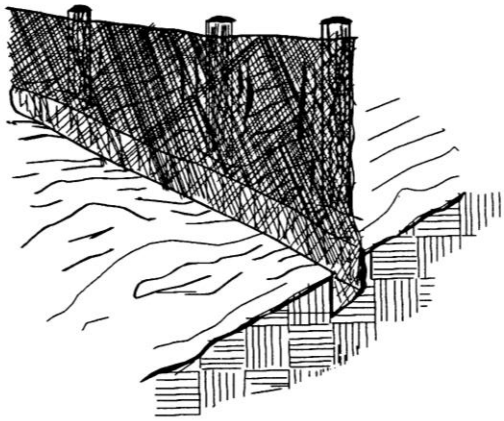
1. SET POSTS AND EXCAVATE A 4"X4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.



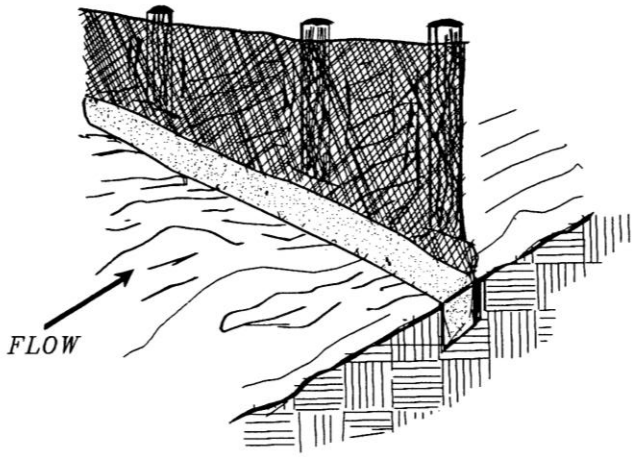
2. STAPLE WIRE FENCING TO THE POSTS.



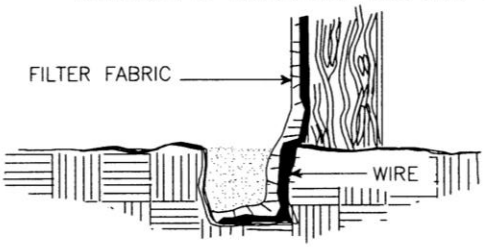
3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.

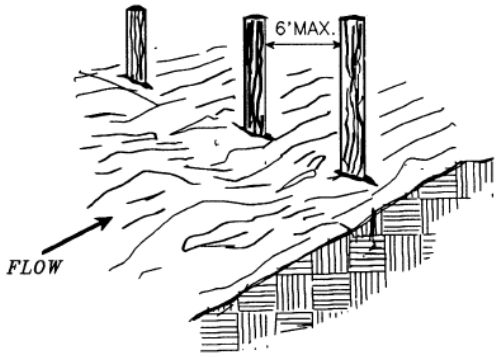


EXTENSION OF FABRIC AND WIRE INTO THE TRENCH.

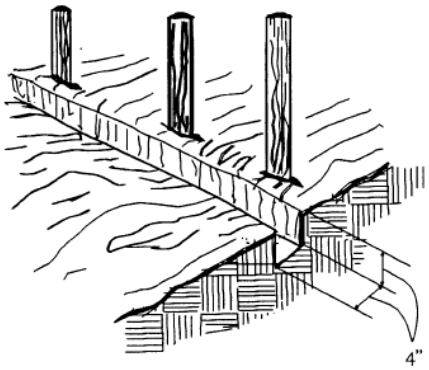


CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)

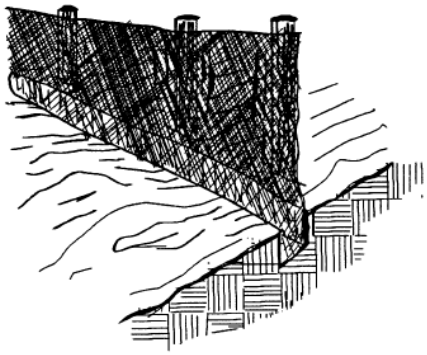
1. SET THE STAKES.



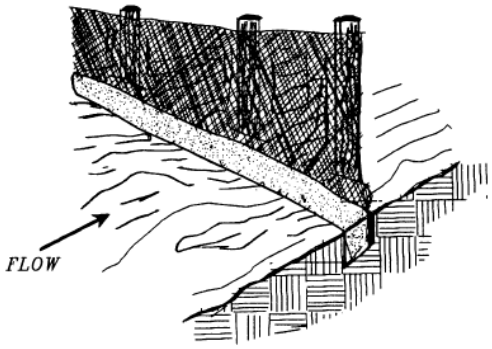
2. EXCAVATE A 4"X 4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.



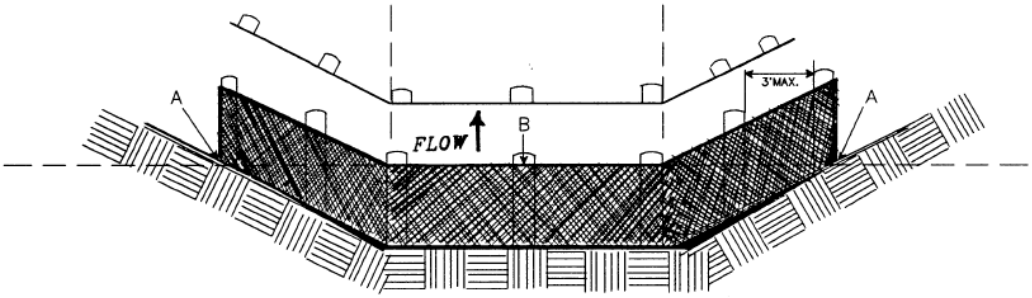
3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



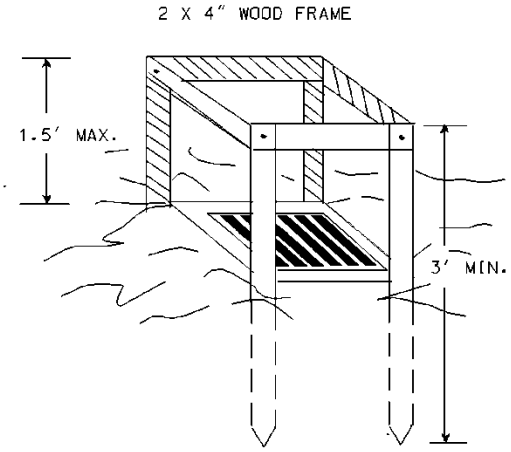
SHEET FLOW INSTALLATION
(PERSPECTIVE VIEW)

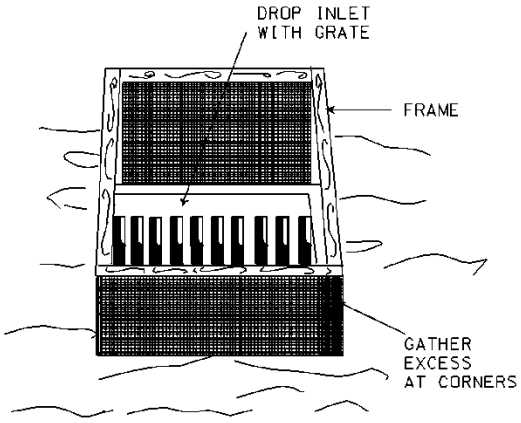


POINTS A SHOULD BE HIGHER THAN POINT B.

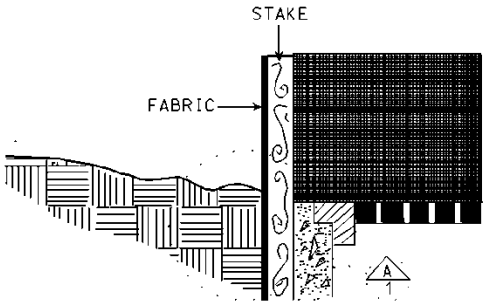
DRAINAGEWAY INSTALLATION
(FRONT ELEVATION)

SILT FENCE DROP INLET PROTECTION - 3.07-1

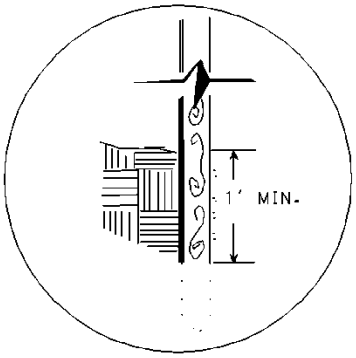




PERSPECTIVE VIEWS



ELEVATION OF STAKE AND FABRIC ORIENTATION

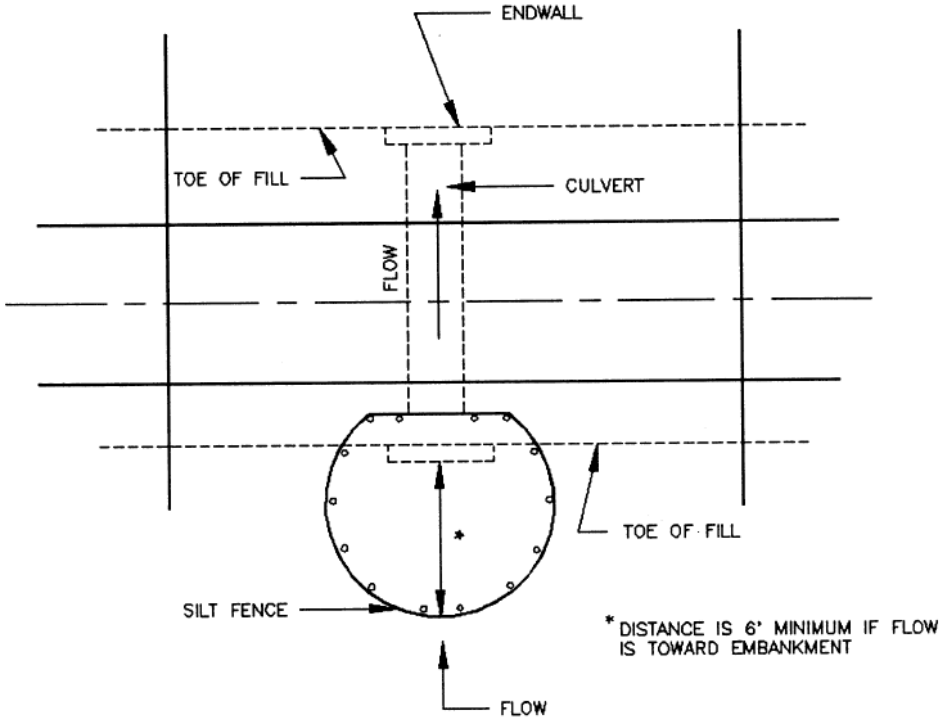


DETAIL A

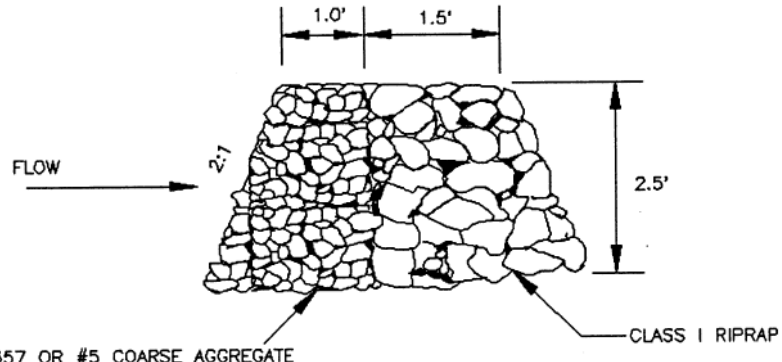
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%) WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 C.F.S.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

SILT FENCE CULVERT INLET PROTECTION

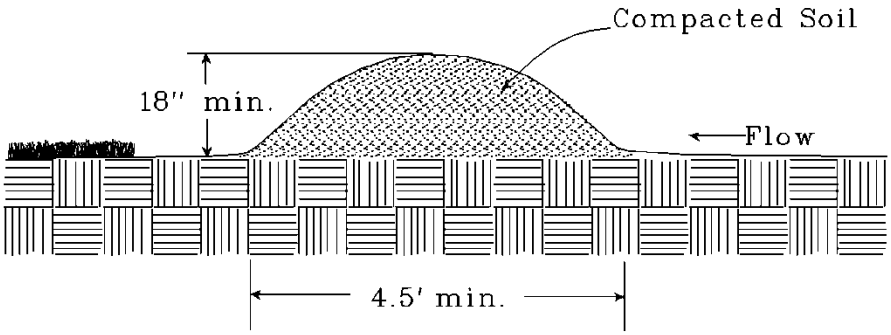


OPTIONAL STONE COMBINATION**

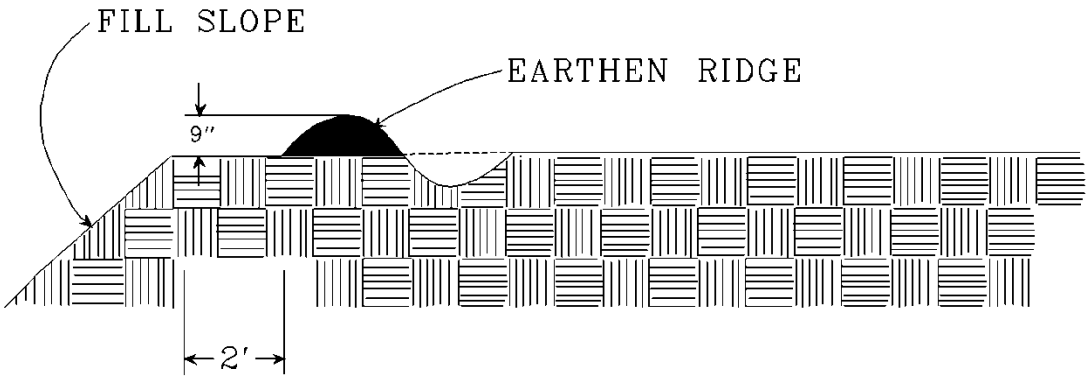


** VDOT #3, #357 OR #5 COARSE AGGREGATE TO REPLACE SILT FENCE IN " HORSESHOE " WHEN HIGH VELOCITY OF FLOW IS EXPECTED

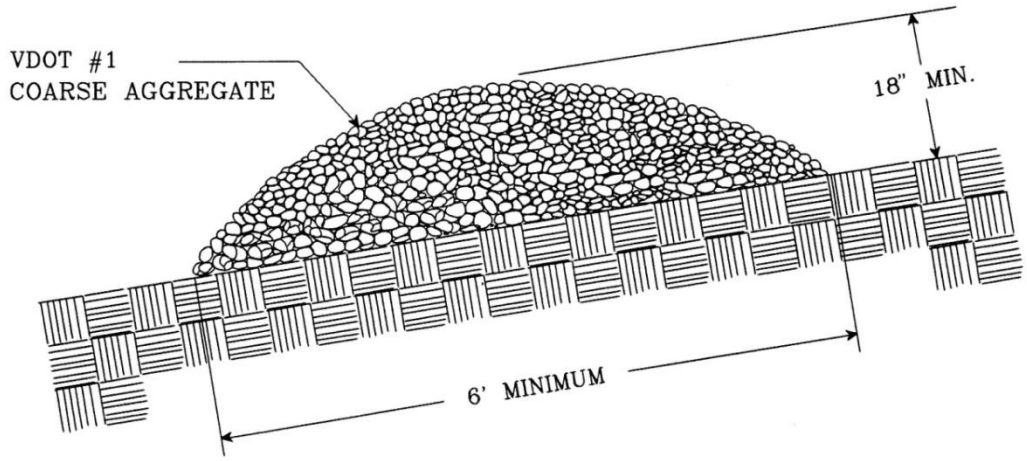
TEMPORARY DIVERSION DIKE - 3.09



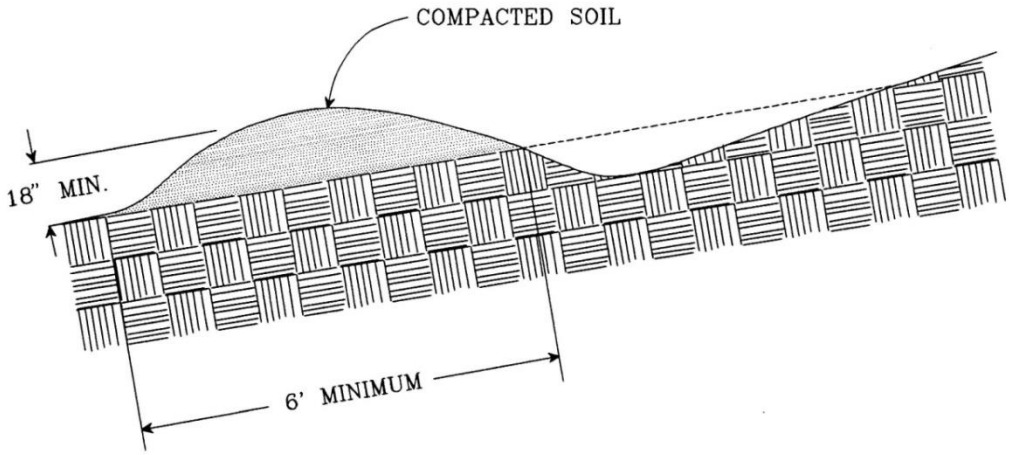
TEMPORARY FILL DIVERSION - 3.10



TEMPORARY RIGHT-OF-WAY DIVERSIONS

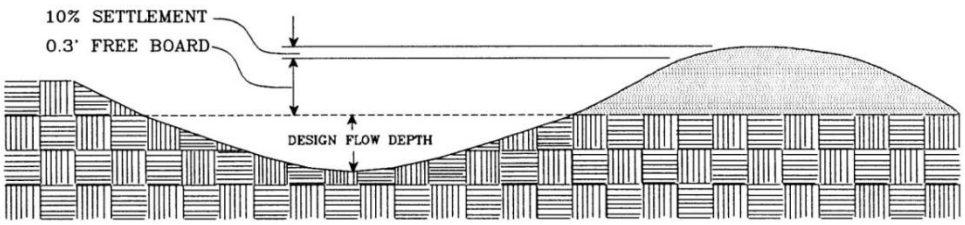


TYPICAL GRAVEL STRUCTURE

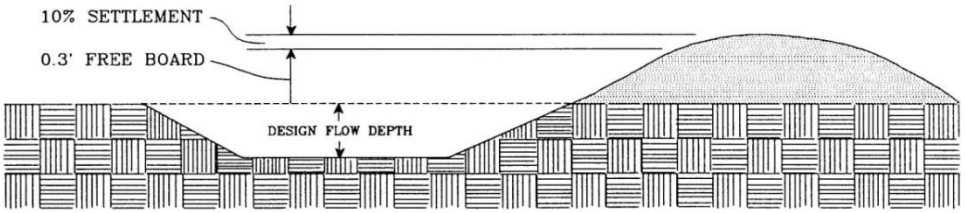


TYPICAL EARTHEN STRUCTURE

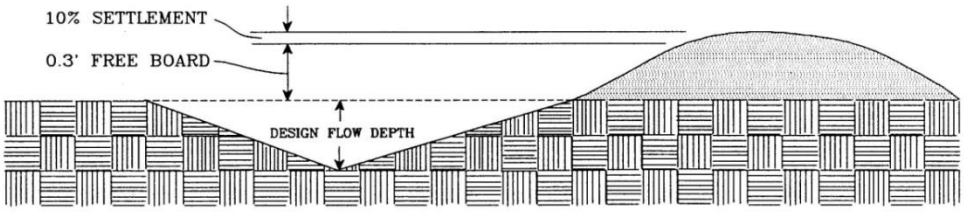
DIVERSIONS



TYPICAL PARABOLIC DIVERSION



TYPICAL TRAPEZOIDAL DIVERSION



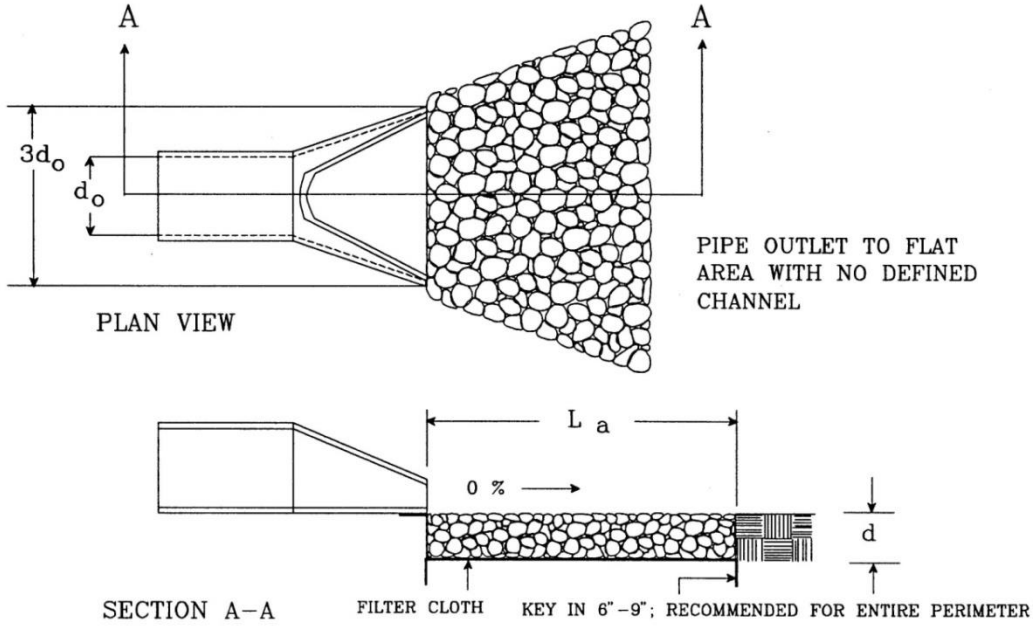
TYPICAL VEE-SHAPED DIVERSION

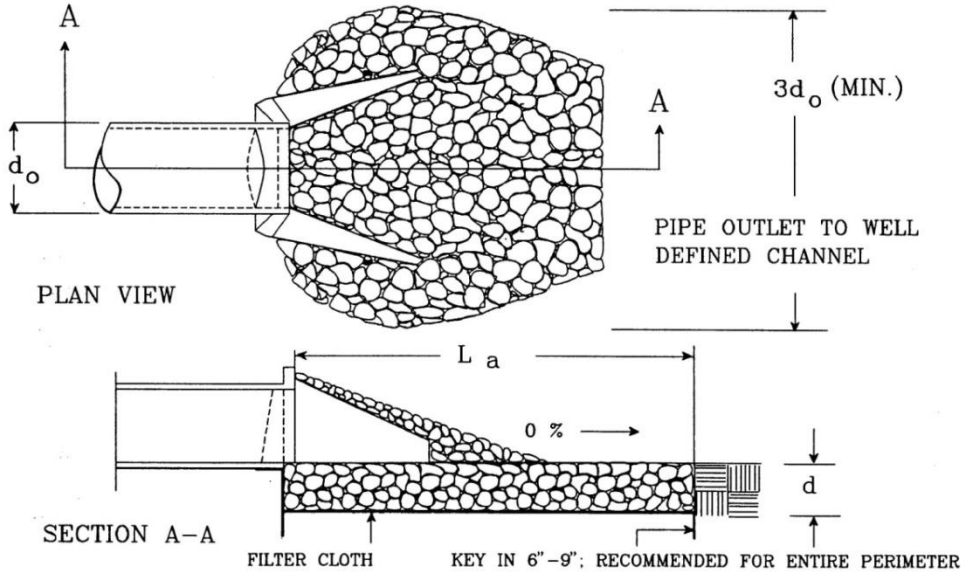
TABLE 3.11-A

SPACING OF RIGHT-OF-WAY DIVERSIONS

% Slope	Spacing (ft.)
Less than 7%	100
Between 7% and 25%	75
Between 25% and 40%	50
Greater than 40%	25

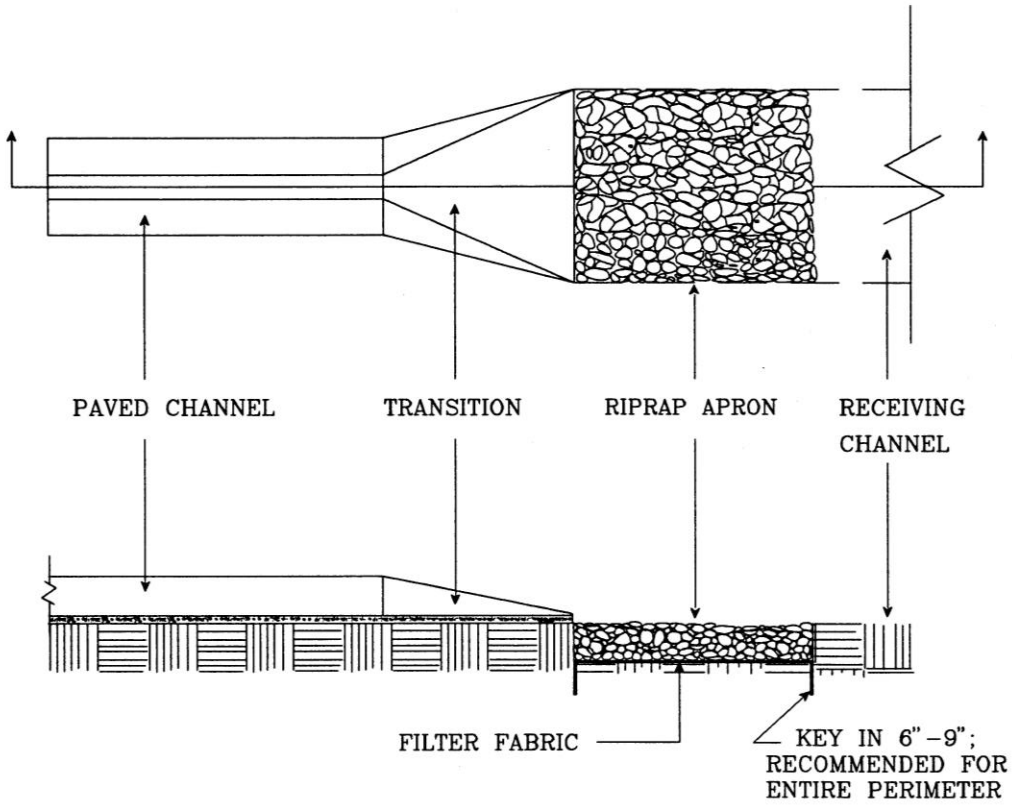
PIPE OUTLET CONDITIONS





NOTES:
1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, GABION BASKET, OR CONCRETE.
2. La IS THE LENGTH OF THE RIPRAP APRON AS CALCULATED USING PLATES 3.18–3 AND 3.18–4.
3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER, BUT NOT LESS THAN 6 INCHES.

PAVED CHANNEL OUTLET



NOTES:

1. RIPRAP APRON REDUCES THE FLOW VELOCITY BELOW THE PERMISSIBLE VELOCITY OF THE NATURAL RECEIVING CHANNEL.
2. TRANSITION SIDE DIVERGENCE IS 1 IN 3F, WHERE

$$F = \text{FROUDE NUMBER} = \frac{V}{\sqrt{gd}}, \text{ WHERE}$$

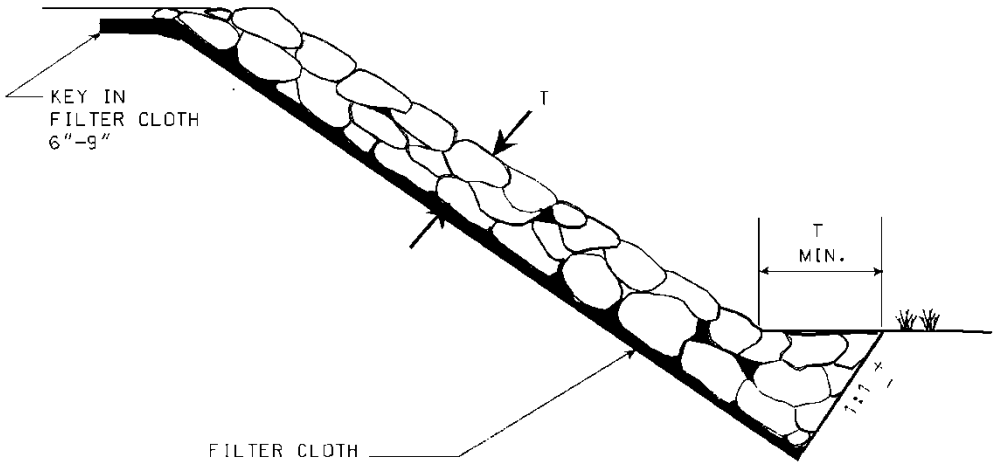
V = VELOCITY AT THE BEGINING OF THE TRANSITION
d = DEPTH OF FLOW AT THE BEGINING OF THE TRANSITION

$g = 32.2 \text{ ft./sec.}^2$

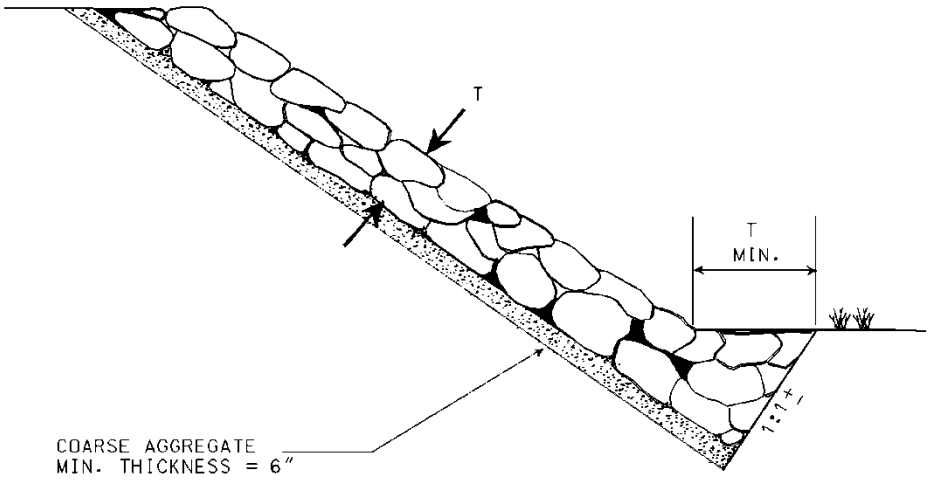
TOE REQUIREMENTS FOR BANK STABILIZATION - 3.19

FILTER CLOTH UNDERLINER

(PREFERRED)

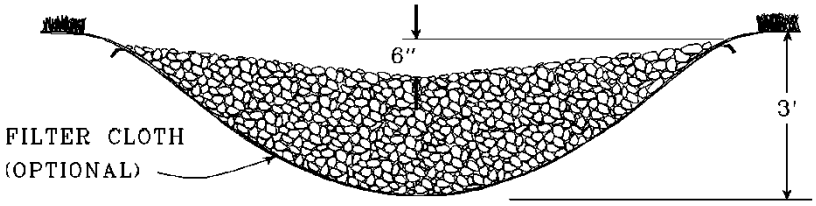


GRANULAR FILTER

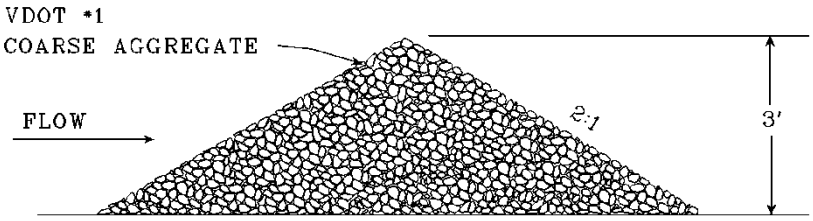


ROCK CHECK DAM - 3.20

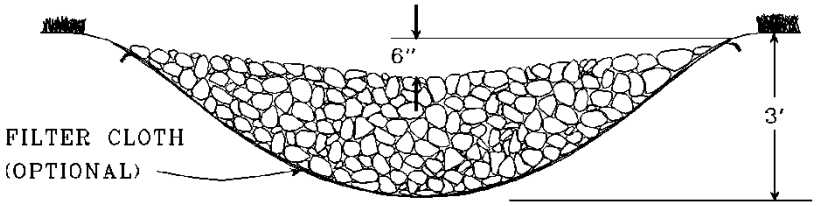
2 ACRES OR LESS OF DRAINAGE AREA:



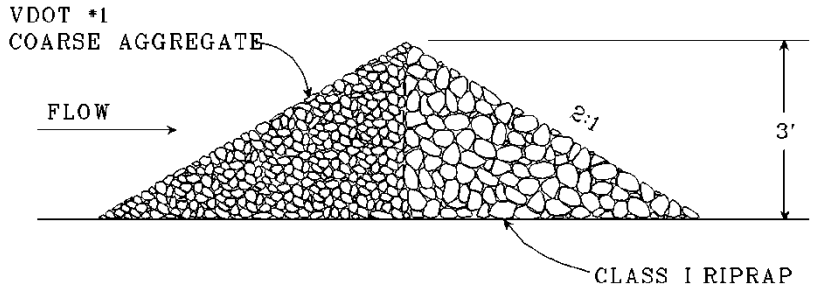
(DOWNSTREAM VIEW)



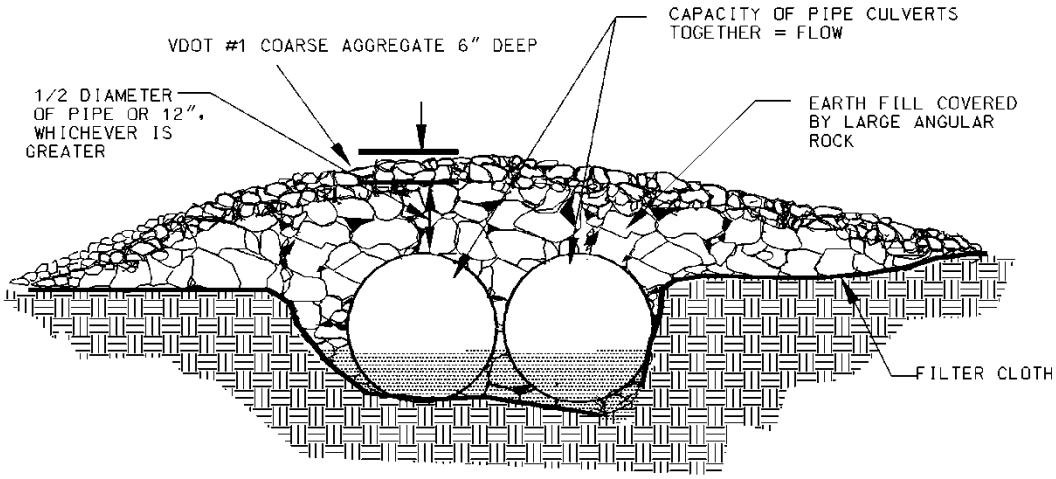
2-10 ACRES OF DRAINAGE AREA:



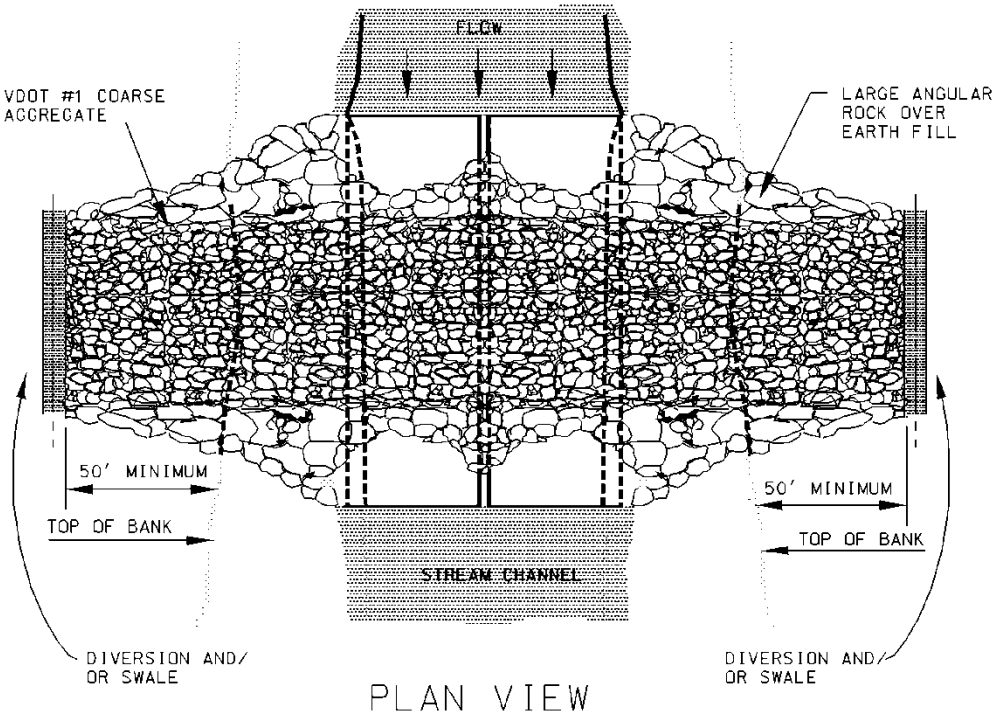
(DOWNSTREAM VIEW)



TEMPORARY CULVERT CROSSING - 3.24

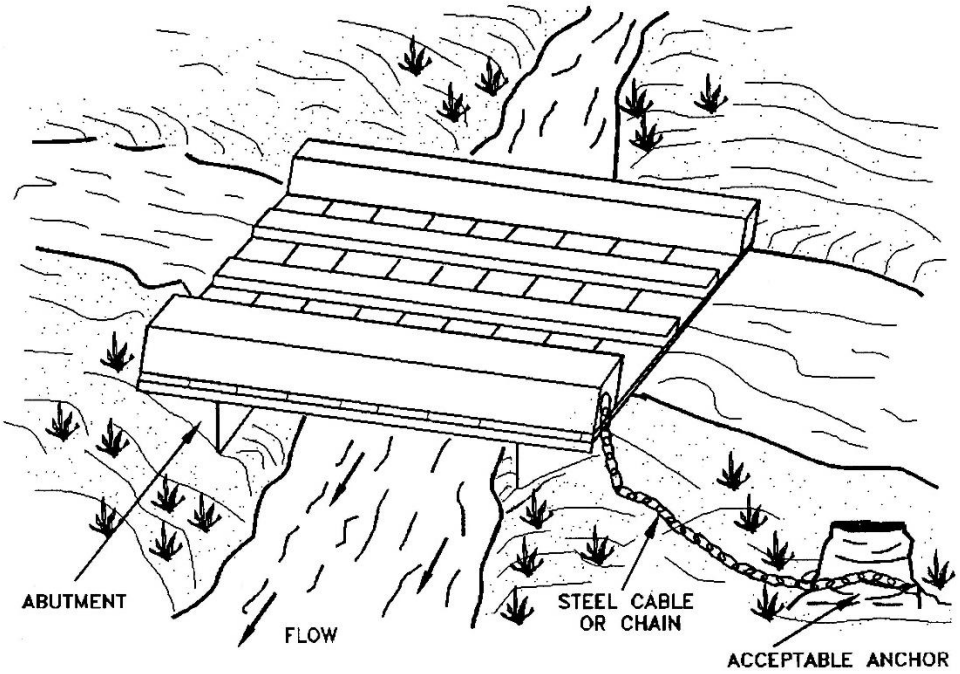


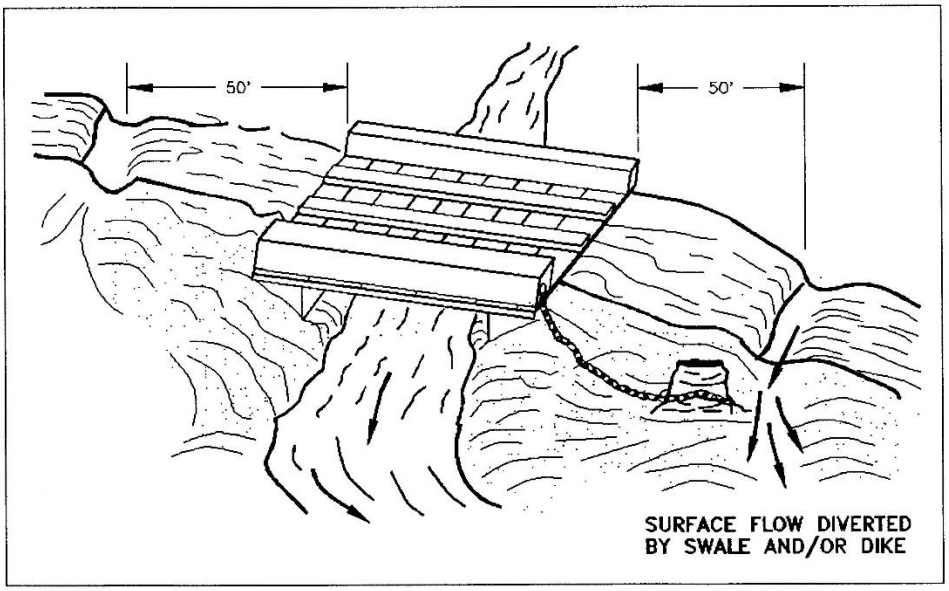
ELEVATION

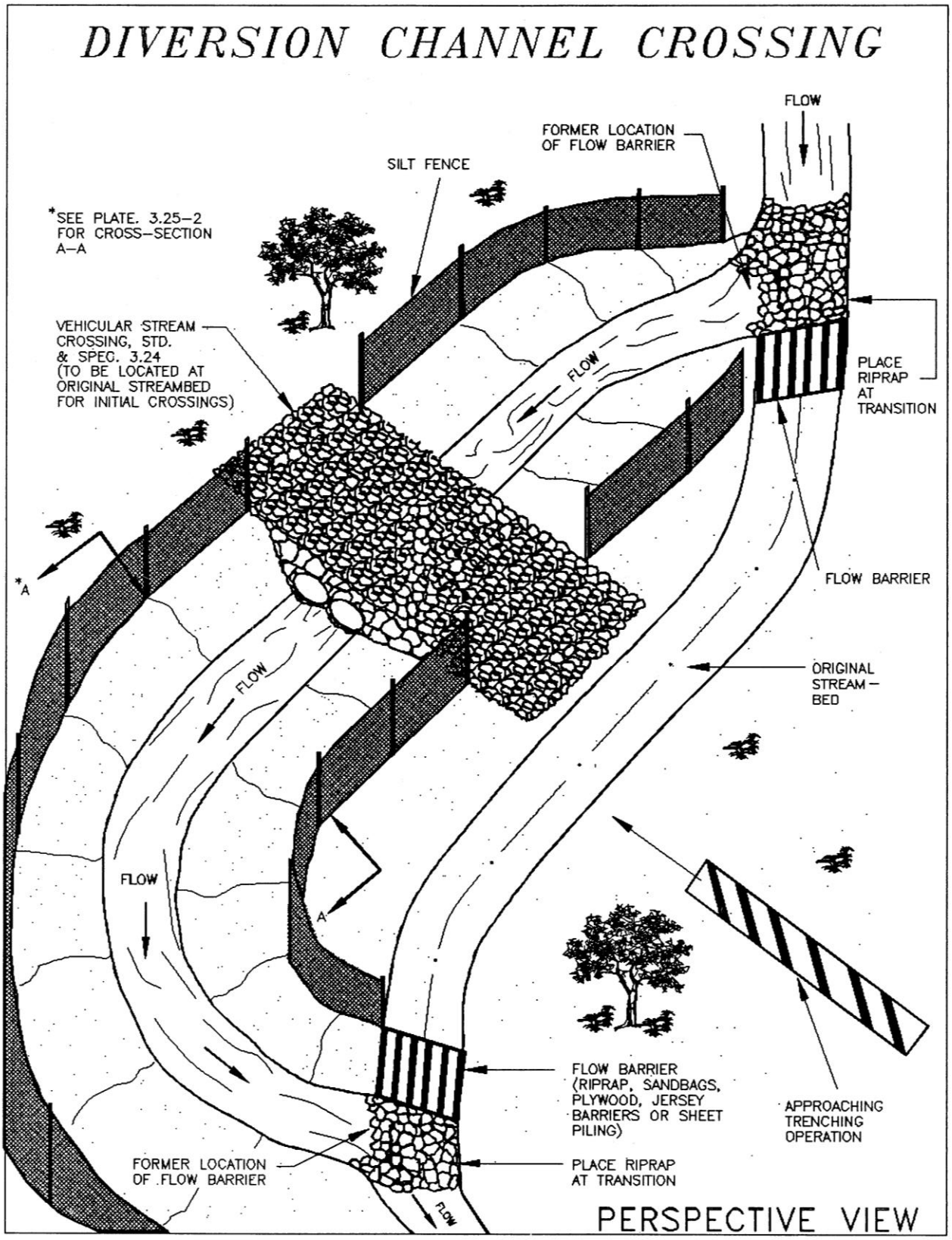


PLAN VIEW

TEMPORARY BRIDGE CROSSING





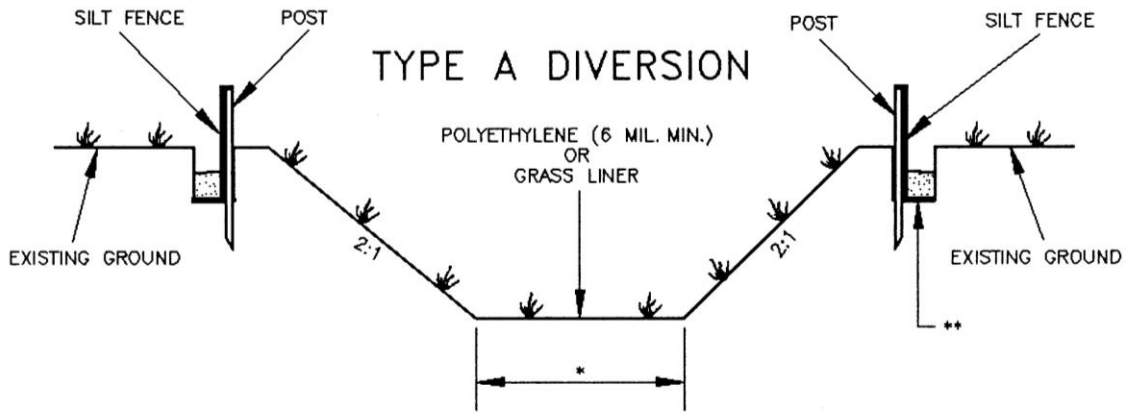


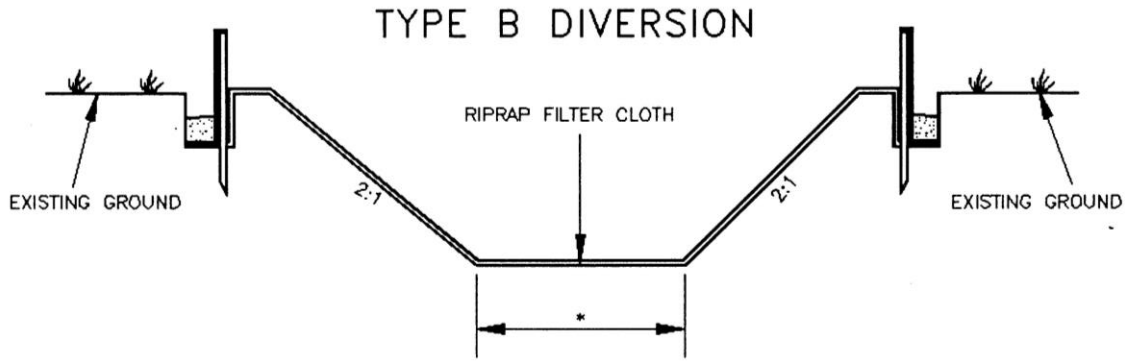
Source: Va. DSWC

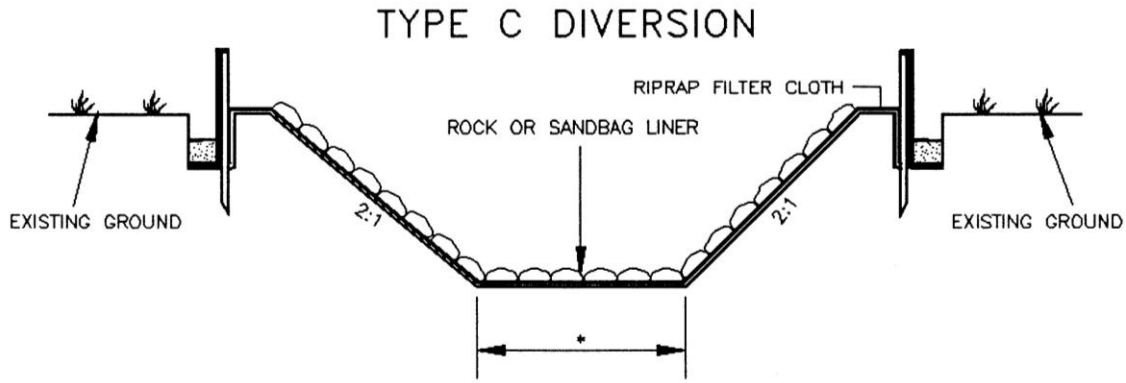
Plate 3.25-1

DIVERSION CHANNEL CROSSING

ACCEPTABLE LININGS
(CROSS SECTION A–A OF PLATE 3.25–1)







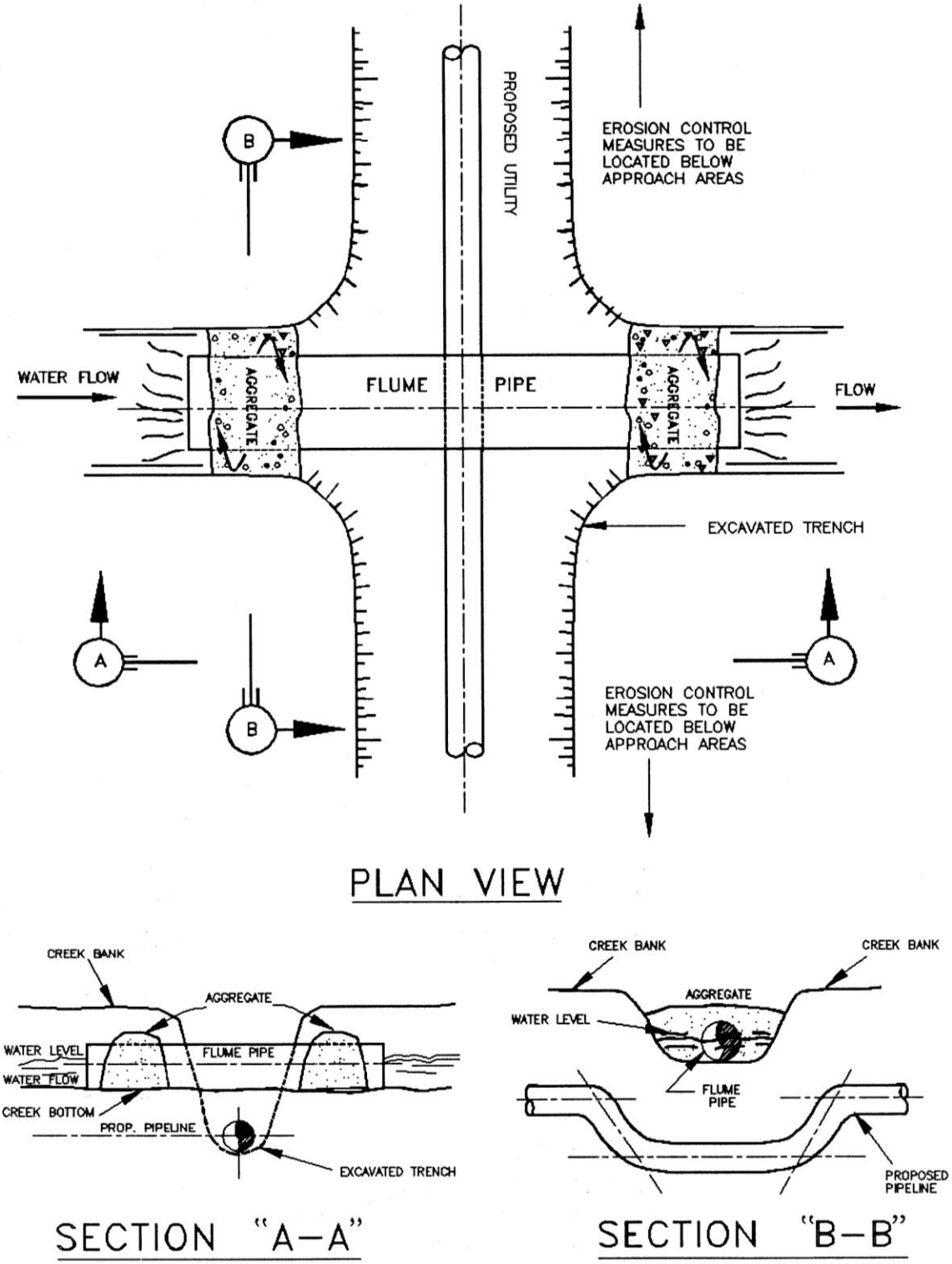
* 6' MINIMUM OR WIDTH OF EXISTING STREAM WHICHEVER IS LESS

** ENTRENCH SILT FENCE AND FILTER CLOTH IN SAME TRENCH

Source: Adapted from VDOT Standard Sheets

Plate 3.25-2

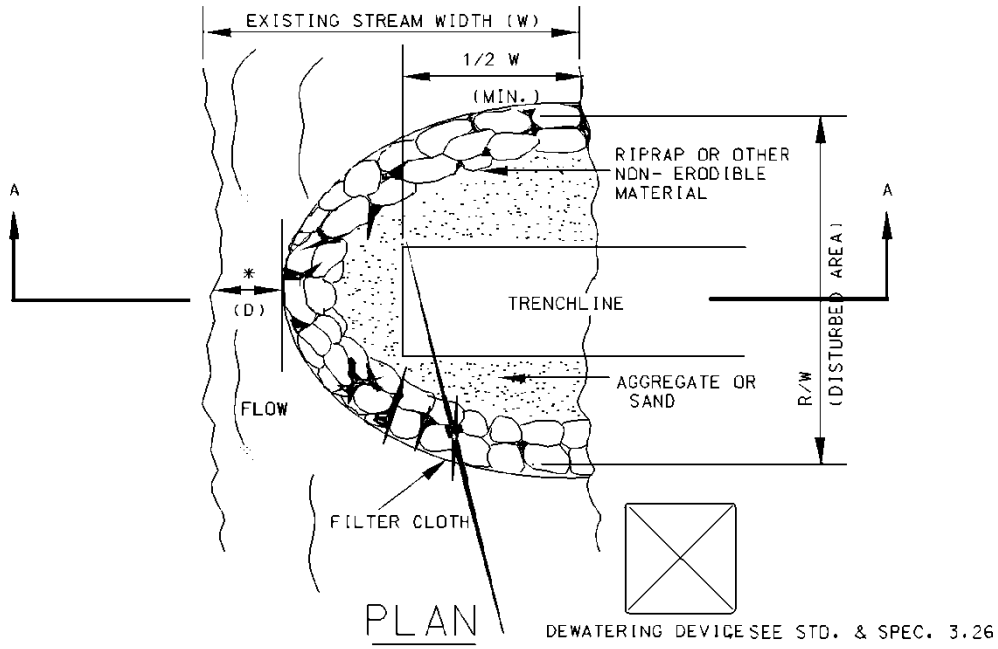
FLUME PIPE CROSSING



Source: Va. DSWC

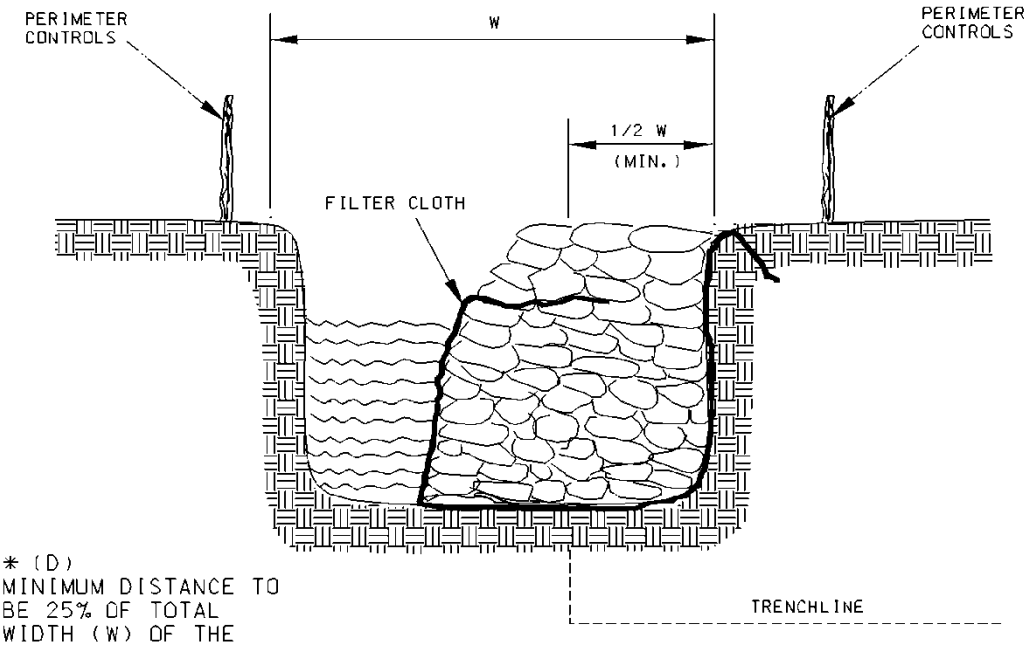
Plate 3.25-3

COFFERDAM CROSSING - 3.25



PLAN

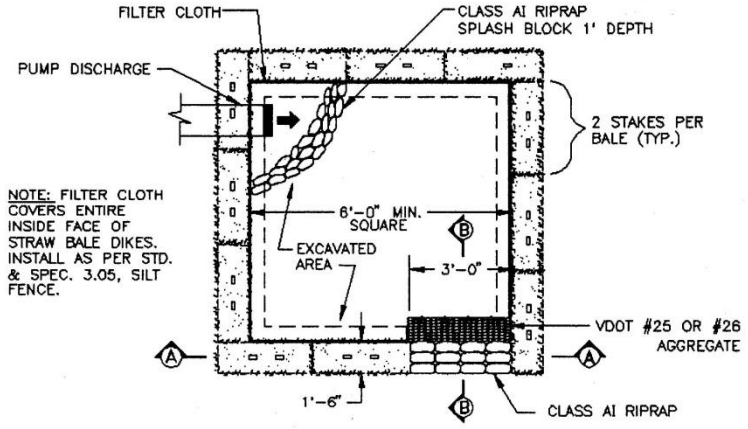
DEWATERING DEVICE SEE STD. & SPEC. 3.26



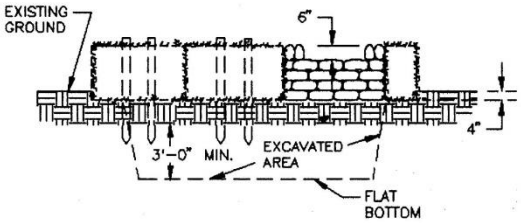
* (D)
MINIMUM DISTANCE TO
BE 25% OF TOTAL
WIDTH (W) OF THE
STREAM.

SECTION A-A

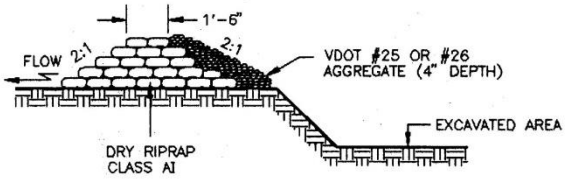
STRAW BALE/SILT FENCE PIT



PLAN VIEW



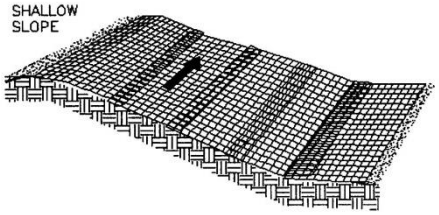
CROSS-SECTION A-A



CROSS-SECTION B-B

TYPICAL ORIENTATION OF TREATMENT – 1 (SOIL STABILIZATION BLANKET)

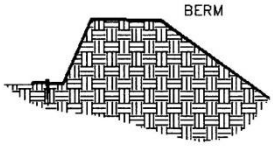
SHALLOW SLOPE



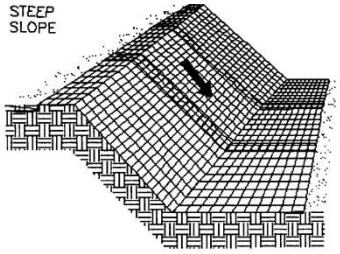
ON SHALLOW SLOPES, STRIPS OF NETTING PROTECTIVE COVERINGS MAY BE APPLIED ACROSS THE SLOPE.

WHERE THERE IS A BERM AT THE TOP OF THE SLOPE, BRING THE MATERIAL OVER THE BERM AND ANCHOR IT BEHIND THE BERM.

BERM

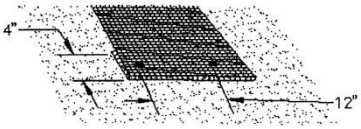


STEEP SLOPE

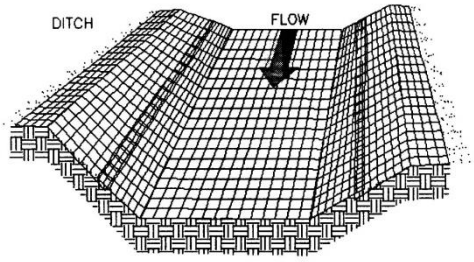


ON STEEP SLOPES, APPLY PROTECTIVE COVERING PARALLEL TO THE DIRECTION OF FLOW AND ANCHOR SECURELY.

BRING MATERIAL DOWN TO A LEVEL AREA BEFORE TERMINATING THE INSTALLATION. TURN THE END UNDER 4" AND STAPLE AT 12" INTERVALS.

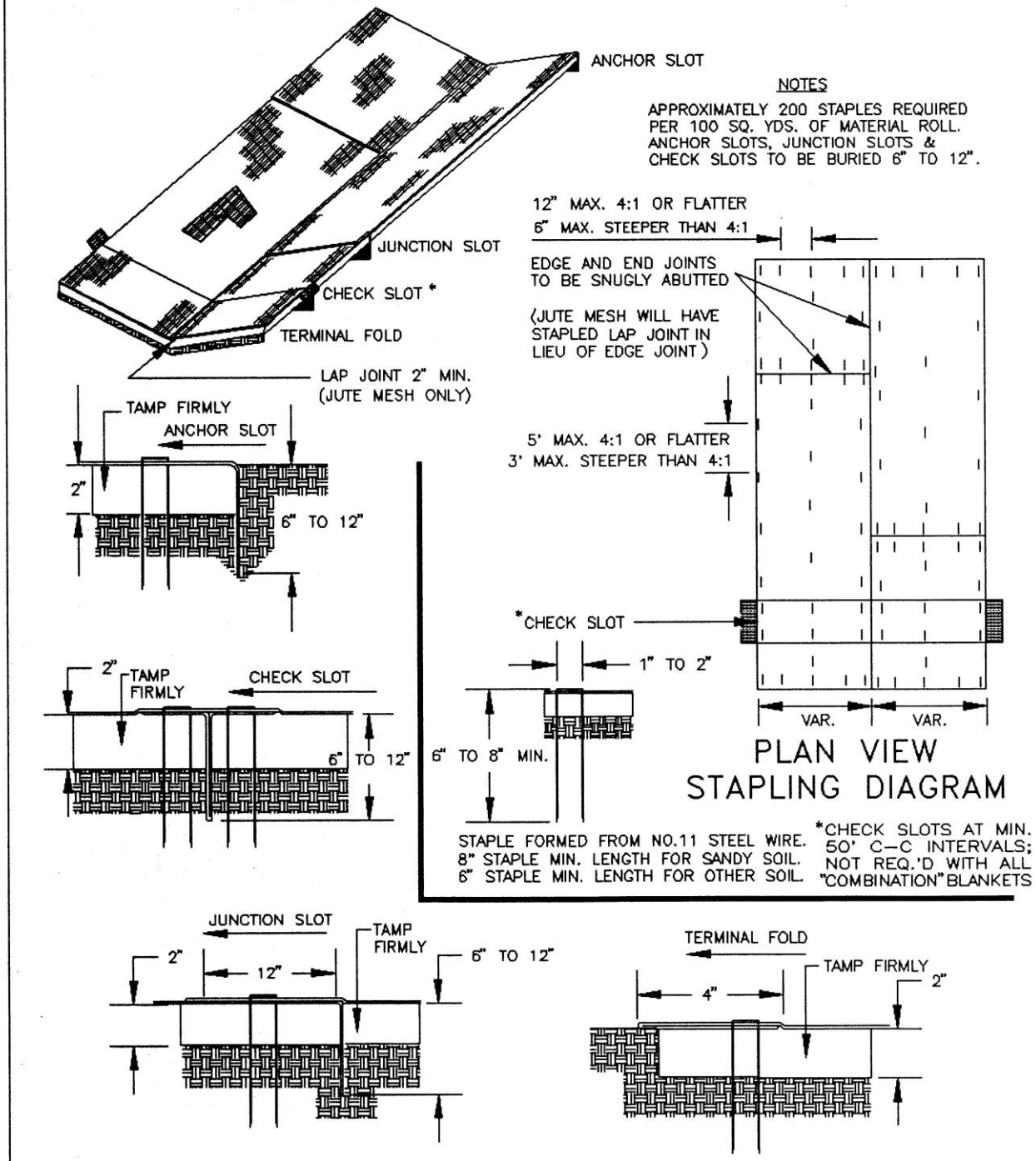


DITCH



IN DITCHES, APPLY PROTECTIVE COVERING PARALLEL TO THE DIRECTION OF FLOW. USE CHECK SLOTS AS REQUIRED. AVOID JOINING MATERIAL IN THE CENTER OF THE DITCH IF AT ALL POSSIBLE.

TYPICAL TREATMENT – 1 (SOIL STABILIZATION BLANKET) INSTALLATION CRITERIA

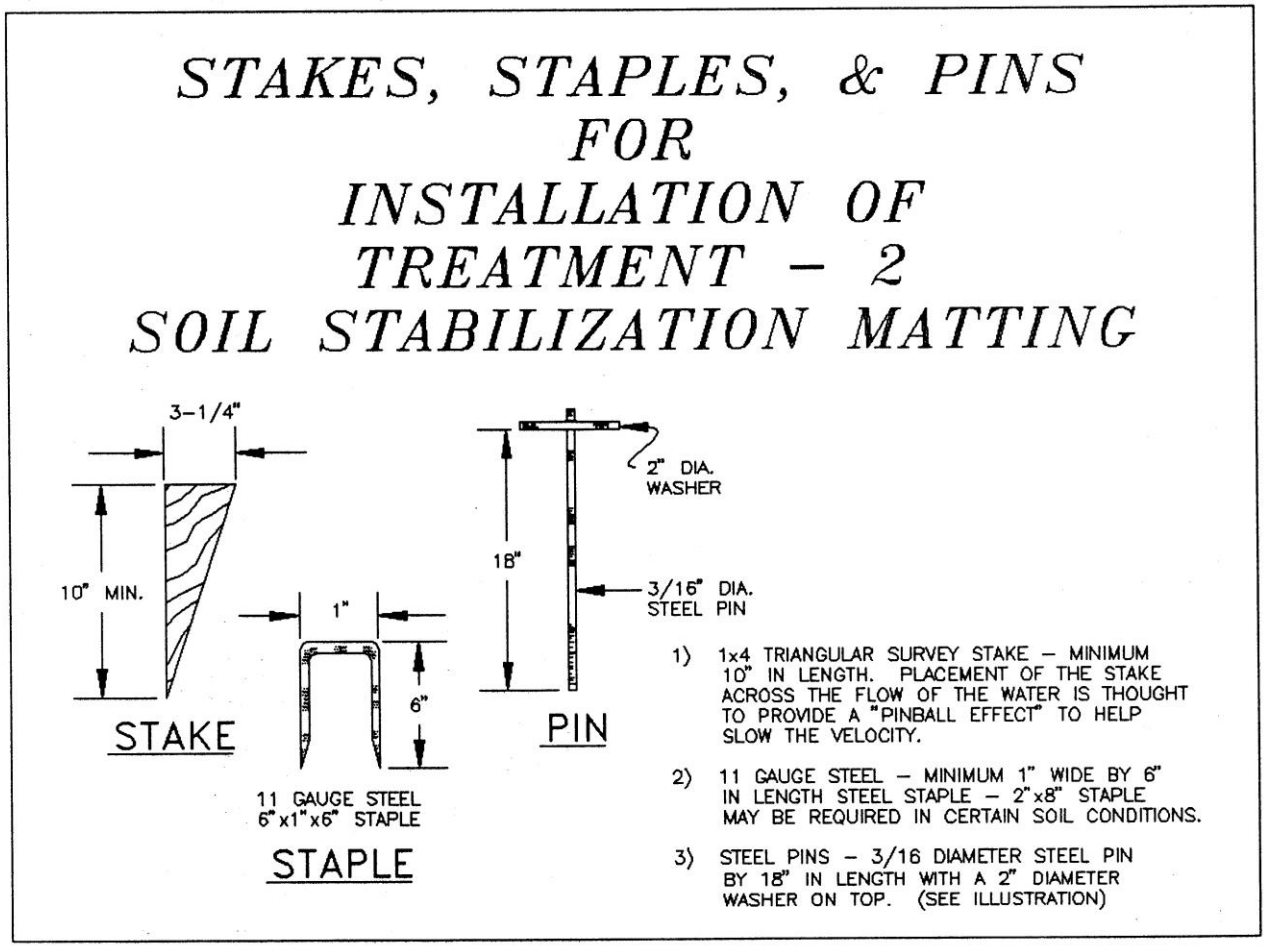


Source: VDOT Road and Bridge Standards

Plate 3.36-2

evaluation of performance data to ensure proper selection of a soil stabilization matting are also essential. Although many manufacturers claim their products may inhibit erosion associated with channel velocities of up to 20 ft./sec., it is recommended that any velocities that exceed 10 ft./sec. be properly protected with some form of structural lining (see Std. & Spec. 3.17, STORMWATER CONVEYANCE CHANNEL).

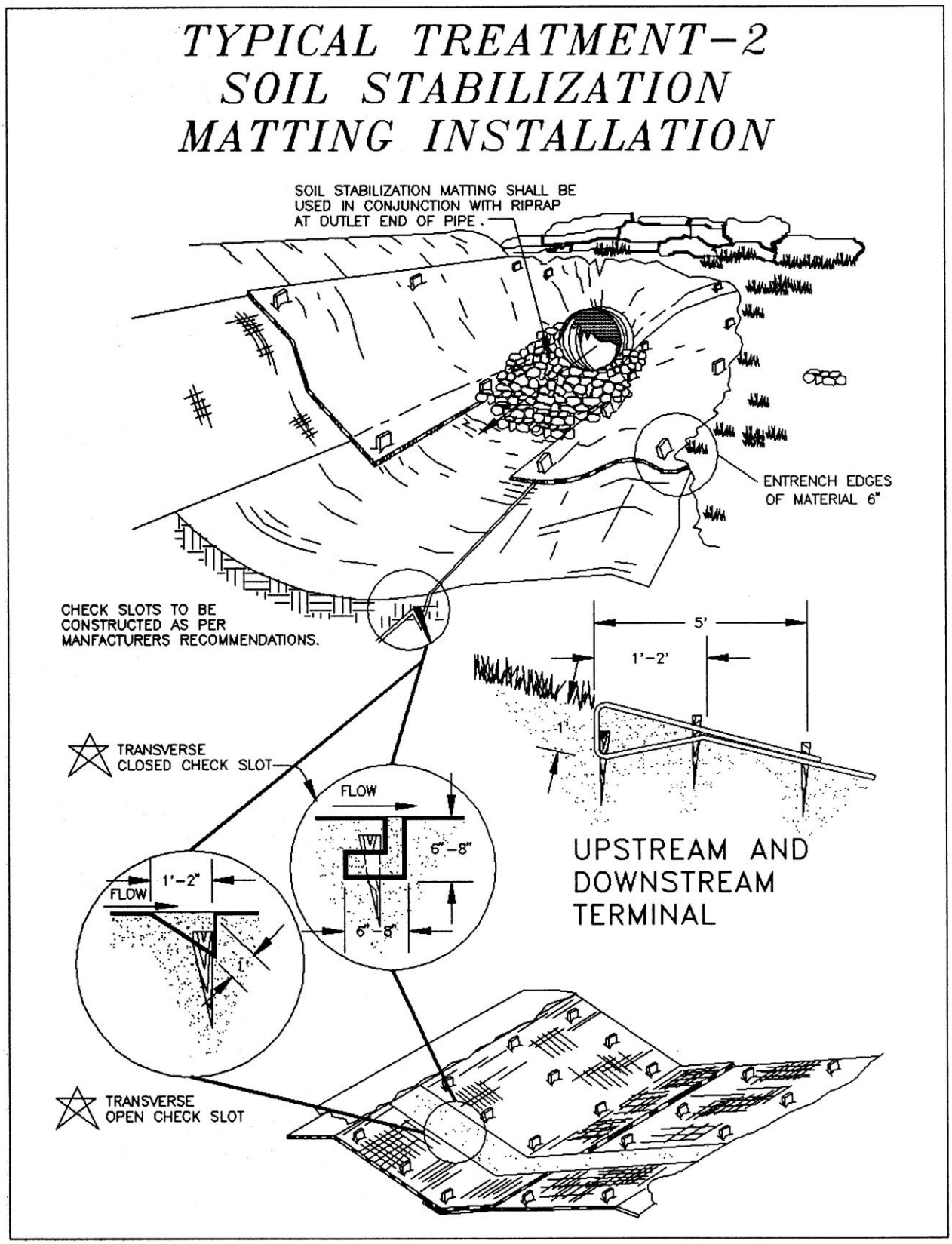
Staples - Staples or anchoring methods and recommendations vary by manufacturers. The expectation of high velocities should dictate the use of more substantial anchoring. Some of the typically recommended stakes, staples and pins are depicted in Plate 3.36-3



Source: Product literature from Greenstreak, Inc. Plate 3.36-3

Installation Requirements

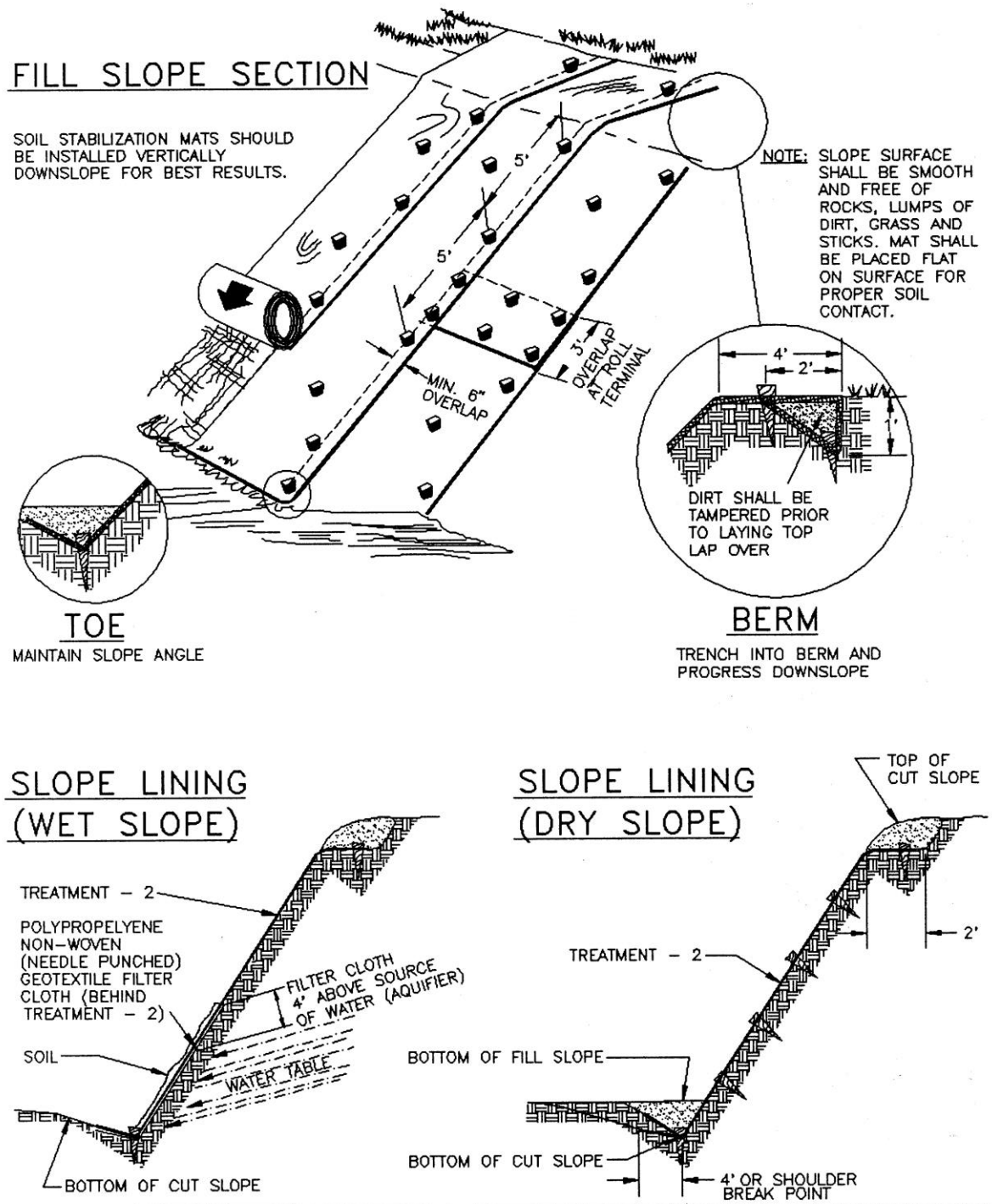
Site Preparation - After site has been shaped and graded to approved design, prepare a friable seedbed relatively free from clods and rocks more than 1 inch in diameter, and any foreign material that will prevent contact of the soil stabilization mat with the soil surface. If necessary, redirect any runoff away from the ditch or slope during installation.



Source: VDOT Road and Bridge Standards

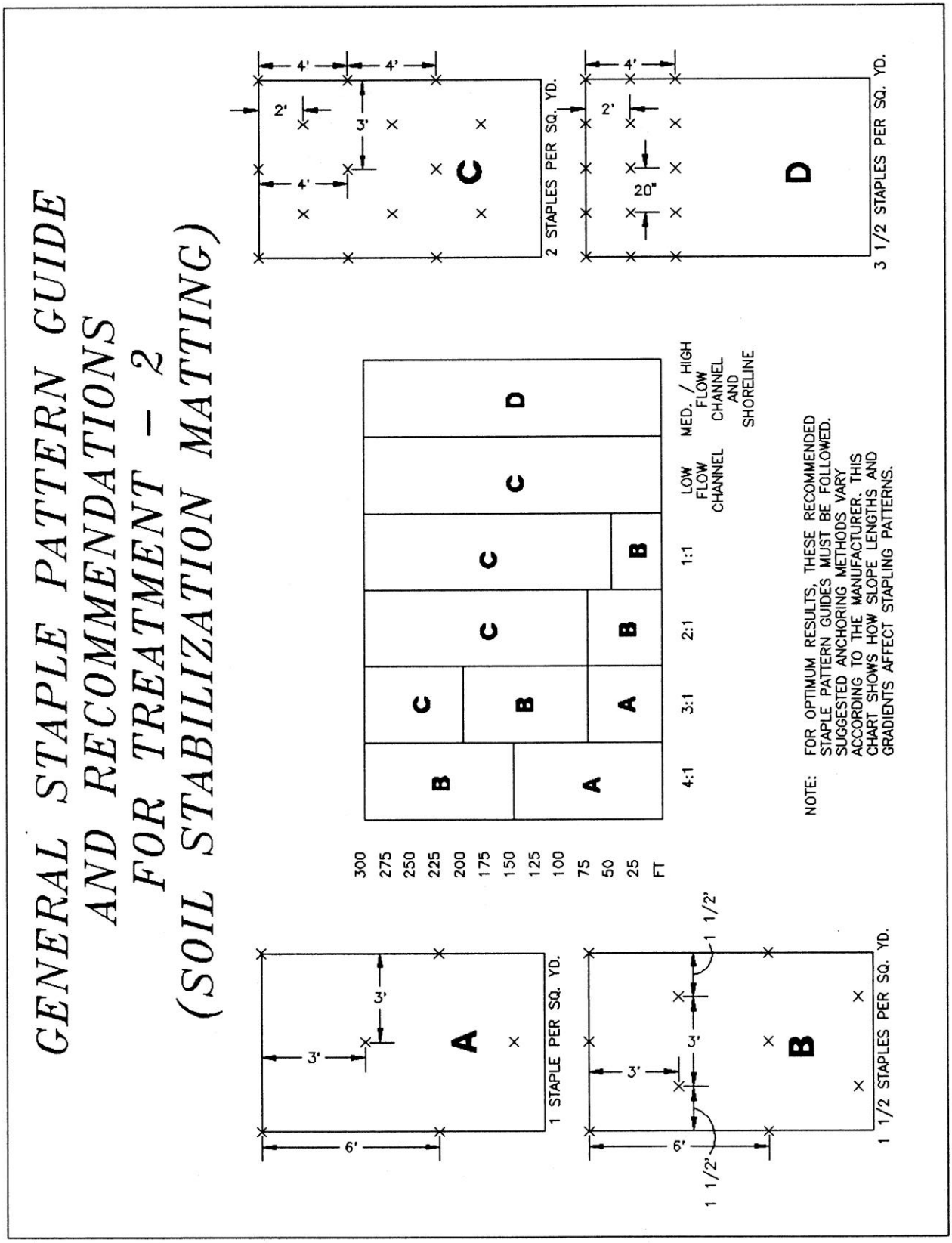
Plate 3.36-4

TYPICAL TREATMENT – 2
SOIL STABILIZATION MATTING SLOPE INSTALLATION



Source: VDOT Road and Bridge Standards

Plate 3.36-5



Source: Product literature from North American Green

Plate 3.36-6

Appendix F

Certifications Log

Appendix F – AS&S Certifications Log

Name	Certification	Certificate Number	Certification Expiration Date
Lesslie Long-Leatherwood	Responsible Land Developer	RLD08872	02/22/2021
Travis Walter	Responsible Land Developer	38083	07/27/2021
Connor Bass	Responsible Land Developer	RLD13899	11/15/2022
Adam Jacobs	Responsible Land Developer	RLD13831	11/09/2022
Louis Neira	Plan Reviewer for Stormwater (Provisional)		07/06/2021