

APPENDIX K

VDOT Stormwater Management Maintenance Program

VDOT STORMWATER MANAGEMENT FACILITIES MAINTENANCE PROGRAM

1. Background

The Virginia Stormwater Management Regulations are mandatory for all state agency land development projects which disturb greater than one acre. These regulations require that appropriate actions be taken to prevent an increase in the 2-year and 10-year discharge as a result of land disturbing activities such as highway construction and maintenance. The regulations also require the capture and treatment of the first half inch of run-off during a storm event. A further regulatory requirement mandates that all stormwater management facilities must be maintained in perpetuity.

2. Maintenance Program

I. Regulatory Information

The regulations require:

- 1) A description of the requirements for maintenance of stormwater management facilities and a recommended schedule of inspection and maintenance.
- 2) The identification of a person or persons who will be responsible for the maintenance of these facilities.
- 3) VDOT is permitted to annually submit its stormwater management standards, specifications and criteria for approval by the Regulatory Agency. This annual submission must address the above noted maintenance aspects.

II. Types of Facilities

There are 3 basic types of stormwater management facilities that will be constructed and must be maintained. Each facility is basically site specific and, therefore, the maintenance requirements for each will be tailored to the specific situation.

- 1) A description of the requirements for maintenance of stormwater management facilities and a recommended schedule of inspection and maintenance.
- 2) Detention facilities usually consist of an impounding structure (dam) and a holding basin. Detention facilities are "dry" basins that contain stormwater only during the run-off event and for a comparatively short period (2 days) after the run-off event. The outlet works in the impounding structure are carefully designed to meet the water outflow requirements of the regulations. It is essential that the function of the outlet works and the volume of the holding basin be maintained as designed.
- 3) Retention facilities structurally resemble detention facilities but are "wet" basins, that is, they maintain a permanent pool of water in the holding basin.

- 4) Infiltration facilities are stormwater management facilities which temporarily impound run-off and discharge it via infiltration through the surrounding soil. While an infiltration facility may also be equipped with an outlet structure to discharge impounded run-off, such discharge is normally reserved for overflow and other emergency conditions. Since an infiltration facility impounds run-off only temporarily, it is normally dry during non-rainfall periods.

III. Maintenance and Inspection Requirements

- 1) Inspection

Stormwater management facilities must be inspected semiannually and after any storm event which causes the capacity of the facility to be exceeded. The inspection shall determine the capability of the facility to perform as originally designed. Where the inspection indicates that the structure has been damaged, the facility has collected excessive sediment, or the facility is overgrown with vegetation etc., maintenance will be performed in an expeditious manner to preserve the operating characteristics of the facility.

- 2) Documentation

Three separate Operations and Maintenance Checklists are provided as attachments to this document. Each Checklist corresponds to the specific facility type requiring inspection and/or maintenance.

IV. Implementation

- 1) Responsibility

- (a) The Resident Engineer shall be responsible party for the maintenance of stormwater management facilities in each respective Residency.
- (b) The Resident Engineer's identification will be furnished to the Regulatory Agency in accordance with the requirements of the Regulations.
- (c) Field personnel are encouraged to work cooperatively with the Regulatory Agency's field personnel in resolving individual questions concerning the maintenance of stormwater management facilities.
- (d) Questions concerning the applicability of the Regulations or design features of stormwater management facilities should be directed to the District Hydraulics Engineer in the respective District Office and/or the State Hydraulics Engineer in the Central Office.

- (e) Questions concerning the inspection, performance, inventory, and maintenance of stormwater management facilities should be directed to the District Maintenance Engineer in the respective District Office and/or the Roadside Operations Program Manager in the Central Office.

2) Schedule

- (a) Stormwater management facilities shall be inspected semiannually and after any storm event which causes the capacity of the facility to be exceeded.
- (b) Accumulated sediment in stormwater management facilities will be removed when it reaches the designated volume specified on the SWM Facility Maintenance Inspection Checklist.
- (c) Vegetation will be controlled so that it does not inhibit the operation of the stormwater management facility. Debris resulting from vegetation control shall be removed from the facility and disposed of in an approved manner.
- (d) VDOT will be responsive to the request of the field agents of the Regulatory Agency in the maintenance of its stormwater management facilities.

Operation and Maintenance Checklist

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	YES / NO	REPAIR	INVESTIGATE	Inspector Name: _____ _____ Inspection Date: _____ _____ Type of BMP: _____ _____
Item				Comments
I. EMBANKMENT				
A. Crest				
1. Visual settlement				
2. Misalignment 3.				
4. Cracking				
B. Upstream slope				
1. Erosion				
2. Adequate groundcover				
3. Trees, shrubs or other				
5. Cracks, settlements or bulges 6. Rodent holes				
C. Downstream slope				
1. Erosion				
2. Adequate groundcover				
3. Trees, shrubs or other				
4. Cracks, settlements or bulges 5. Rodent holes				
D. Abutments				
1. Erosion				
2. Seepage				
3. Cracks				

Operation and Maintenance Checklist

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	YES / NO	REPAIR	INVESTIGATE	Inspector Name: _____ _____ Inspection Date: _____ _____ Type of BMP: _____ _____
E. Drainage, seepage control				
1. Internal drains flowing				
2. Seepage at toe				
II. EMERGENCY SPILLWAY				
1. Eroding or backcutting				
2. Obstructed				
3. Leaking				
4. Operational				
III. PRINCIPAL SPILLWAY BARREL				
1. Seepage into conduit				
2. Debris present				
3. Displaced or offset joints				
IV. OUTLET PROTECTION/ STILLING BASIN				
1. Obstructed				
2. Adequate riprap				
3. Undercutting at outlet				
4. Outlet channel scour				
V. BASIN & UPLAND BUFFER AREA				
A. Low flow channel				
1. Erosion				
2. Adequate vegetation				
3. Obstructed				

Operation and Maintenance Checklist

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	YES / NO	REPAIR	INVESTIGATE	Inspector Name: _____ _____ Inspection Date: _____ _____ Type of BMP: _____ _____
B. Basin bottom & side slopes				
1. Erosion				
2. Adequate stabilization				
3. Sediment accumulation				
4. Floating debris				
5. High water marks				
6. Shoreline protection				
C. Inflow channels/pipes				
1. Erosion				
2. Adequate stabilization				
3. Undercutting				
D. Sediment forebay				
1. Sediment accumulation				
2. Stable overflow into basin				
E. Upland landscaping				
F. Aquatic landscaping				

Operation and Maintenance Inspection Checklist

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Date _____ **Time** _____

Project _____ **Site Plan / SUP Number** _____

Location _____

Date Placed in Service: _____ **Date of Last Inspection:** _____

Individual Conducting the Inspection _____

(Owner) _____

"As Built" Plans available: Y / N

Bioretention Facility

Type: _____ **Infiltration;** _____ **Filter;** _____ **Green Alley**

Warning: If filtration facility has a watertight cover; be careful regarding the possibility of flammable gases within the facility. Care should be taken lighting a match or smoking while inspecting facilities that are not vented. If filtration facility is in a completely enclosed vault, OSHA Confined Space Entry Procedures must be followed

	Satisfactory	Unsatisfactory
1. Debris cleanout		
Contributing areas clean of debris	_____	_____
Bioretention facility clean of debris	_____	_____
Inlets and outlets clear of debris	_____	_____
2. Drainage Area Stabilization		
Contributing drainage area stabilized	_____	_____
No evidence of erosion	_____	_____
Area mowed and clippings removed	_____	_____
3. Oil and grease		
No evidence of filter surface clogging	_____	_____
Activities in drainage area minimize oil & grease entry	_____	_____
4. Overflow Structure		
Overflow grate/throat clear of debris	_____	_____
Any grates are in good condition	_____	_____
No evidence of erosion (if draining into a natural channel)	_____	_____

Operation and Maintenance Inspection Checklist

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Site Plan / SUP Number _____ Date: _____

5. Bioretention Planting Soil

	Satisfactory	Unsatisfactory
No evidence of planting soil erosion	_____	_____
Bioretention basin clean of sediments	_____	_____

6. Organic Layer

Mulch covers entire area (NO voids) and to specified thickness	_____	_____
Mulch is in good condition	_____	_____

7. Plants

Specified number and types of plants still in place	_____	_____
No dead or diseased plants	_____	_____
No evidence of plant stress from inadequate watering	_____	_____
No evidence of deficient stakes or wires	_____	_____

NOTE: Diseased plants must be treated by a qualified professional. Deficient stakes or wires must be replaced. Dead plants or plants diseased beyond treatment must be replaced by plants meeting original design specifications. New plants must be watered every day for the first 14 days after planting. Reinspections must be scheduled to occur following this period.

Action to be taken:

If any of the answers to the above items are checked unsatisfactory, a time frame shall be established for their correction or repair.

No action necessary. Continue routine inspections
 Correct noted facility deficiencies by

Facility repairs were indicated and completed. Site reinspection is necessary to verify corrections or repairs

Site reinspection accomplished on

Site reinspection was satisfactory. Next routine inspection is scheduled for approximately:

Signature of inspector

Operation and Maintenance Checklist

Page 1 of 2

Date _____

Project _____ Site Plan / SUP Number _____

Location _____ Date Placed in Service: _____

Date of Last: _____ Inspector _____

Owner/Owner's Representative _____

"As Built" Plans available: Y / N

1. Debris cleanout	Satisfactory	Unsatisfactory
Contributing areas clean of debris	_____	_____
Bioretention facility clean of debris	_____	_____
Inlets and outlets clear of debris	_____	_____
2. Vegetation		
Contributing drainage area stabilized	_____	_____
No evidence of erosion	_____	_____
Area mowed and clippings removed	_____	_____
3. Clogging		
Overflow grate/throat clear of debris	_____	_____
Observation well clear of water within 48 hrs of storm event	_____	_____
4. Structural components		
No evidence of structural deterioration	_____	_____
Any grates are in good condition	_____	_____
No evidence of spalling or cracking of structural parts	_____	_____

Operation and Maintenance Checklist

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Site Plan / SUP Number _____ Date: _____

5. Outlets/overflow spillway Satisfactory Unsatisfactory

Good condition, no need for repair	_____	_____
No evidence of erosion (if draining into a natural channel)	_____	_____

6. Overall function of facility

No evidence of flow bypassing facility	_____	_____
No standing water	_____	_____

Action to be taken:

If any of the answers to the above items are checked unsatisfactory, a time frame shall be established for their correction or repair.

No action necessary. Continue routine inspections _____
 Correct noted facility deficiencies by _____

Facility repairs were indicated and completed. Site reinspection is necessary to verify corrections or repairs

Site reinspection accomplished on _____

Site reinspection was satisfactory. Next routine inspection is scheduled for approximately: _____

Signature of inspector

ENVIRONMENTAL POLICY

FOR MAINTENANCE OF DITCHES AND SHOULDERS

§1.1 General Provisions:

- 1) As maintenance for ditch and shoulder operations are planned, it is strongly recommended that the soil disposal areas be pre-selected, the property owner agreements be obtained, and erosion and sediment control sketches and narrative be prepared.
- 2) Any maintenance activity disturbing more than 2,500 square feet (232 m²) (length of ditch or shoulder x width of ditch or shoulder = sq. ft.) within any consecutive 30 calendar day period within the area of Tidewater, Virginia, as defined in the Virginia Chesapeake Bay Preservation Act, must have a project specific erosion and sediment control plan and narrative developed for review and approval by the district environmental section and implemented in accordance with the VDOT standards and specifications. Tidewater, Virginia is defined as the counties of Accomack, Arlington, Caroline, Charles City, Chesterfield, Essex, Fairfax, Gloucester, Hanover, Henrico, Isle of Wight, James City, King George, King and Queen, King William, Lancaster, Matthews, Middlesex, New Kent, Northhampton, Northumberland, Prince George, Prince William, Richmond, Spotsylvania, Stafford, Surry, Westmoreland and York and the Cities of Alexandria, Chesapeake, Colonial Heights, Fairfax, Falls Church, Fredericksburg, Hampton, Hopewell, Newport News, Norfolk, Petersburg, Poquoson, Portsmouth, Richmond, Suffolk, Virginia Beach and Williamsburg.
 - If operations are performed in localities not listed above the E&S Plan is required for land disturbance greater than 10,000 sq. ft.
 - The E&S controls must be installed prior to or concurrent with the land disturbing operation.
 - Where original root systems are disturbed Ditches and shoulders shall be stabilized as recommended by the District Roadside Manager.
 - If the disposal occurs within the same drainage area as the excavation, the square footage impacted by both activities shall be added to determine E&S requirements.
 - The E&S plan for the disposal area must consider minimum standard #19 of the Virginia Erosion and Sediment Control Regulations where appropriate, for receiving channels.
- 3) The district environmental section shall review the disposal area site when there is the possibility wetlands or stream impacts
- 4) Unless the excavated materials are going directly to a landfill, all visible trash shall be removed from the ditch both prior to excavation and following disposition of

materials. Consideration should be made in coordinating operations with local Adopt-a-Highway volunteers or prison inmates

- 5) If obviously contaminated soils are encountered, the district Environmental Section must be notified immediately. Such contamination might include dark or unnaturally stained areas, chemical/petroleum-type odors, or the presence of broken or leaking containers of hazardous materials.
- 6) Materials shall not be placed within 100-feet of any stream, wetland, or other body of water.

§2.0 Specific Provisions:

§2.1 Stockpiling of Excavated Materials at VDOT Maintenance Facilities

- 1) If excavated soil is to be stockpiled at the maintenance facility for later use:
 - A sign shall be erected on the stockpile to prevent dumping of unacceptable materials on the stockpile.
 - The stockpile need not be permanently stabilized until soil is removed. However, if material is left undisturbed for more than 15-days it shall be stabilized with a temporary seed mix as recommended by the District Roadside Manager. Once removed, the area shall be permanently stabilized with a seed mix recommended by the District Roadside Manager unless the stockpile is placed on an impervious surface.

§2.2 Disposal of Excavated Materials on VDOT rights-of-way:

- Soil or rock being disposed of shall be established on a maximum 2:1 slope and permanently stabilized with a seed mix recommended by the District Roadside Manager.

§2.3 Disposed of Excavated Materials on Private Property:

- The maintenance superintendent shall ensure that materials are not placed on the site until all approvals are received. These approvals may include permits from local government and local E & S reviews.
 - "The boundaries (perimeter) of the disposal site shall be clearly marked. Acceptable marking methods are stakes, ribbons, flags, spray paint, etc."
- A property owner agreement must be executed prior to placement of any material. The agreement and other related documentation shall remain on file at the residency for 3-years after completion.
- Maintenance superintendent or district environmental section shall photograph the site before materials are placed and as final permanent stabilization is complete.

- Soil or rock being disposed of shall be established on a maximum 3:1 slopes and permanently stabilized with a seed mix recommended by the District Roadside

§2.4 *Disposal of Excavated Materials at a licensed landfill:*

- Disposal of excavated materials at landfill is allowable, however, consideration should be made as to disposal costs. Attempts should be made to have the landfill accept the materials at no charge for use as daily cover.

**PROPERTY OWNER AGREEMENT
MAINTENANCE DISPOSAL SITE**

Location of Project: Route(s) _____ County _____
Date _____ Property Owner _____

I hereby grant permission to dispose of material which consists of topsoil, dirt, and gravel from the above referenced maintenance project onto my property at the following location

and grant the right of ingress and egress to the disposal area as needed for completion of this project and periodic reviews to ensure compliance with the Virginia Erosion and Sediment Control Law.

I will be responsible for any and all grading of the disposal material. VDOT will be responsible for the control of erosion in compliance with the Virginia Erosion and Sediment Control Law and Regulations for the disposal area and haul road, if any unless otherwise specified below.

I also agree to release and hold harmless the Virginia Department of Transportation, the Commonwealth of Virginia, and its employees from responsibility for damages and all liabilities arising from the use of my property to dispose of excess material from the above reference maintenance project.

Owner or Authorized Agent of the
Owner

Date

Witness

The following to be completed by the property owner in the presence of a VDOT representative:
I agree to provide and maintain the following erosion and sediment control measures to comply with the Virginia Erosion and Sediment Control Law (§10.1-560 et seq. of the Code of Virginia and §4VAC50-30-40 Minimum Standards of the Virginia Erosion and Sediment Control Regulations):

- Apply permanent or temporary soil stabilization to all denuded areas within seven days after grading is complete or if left for more than 30-days without working on the site.
- During placement of material place and maintain erosion and sediment control measures.
- Apply permanent stabilization within one year if left dormant unless used for agricultural purposes.
- Install perimeter trapping devices as a first step in the deposit of material.
- Remove all temporary erosion and sediment control measures within 30-days of establishment of permanent stabilization.

Any items not checked will be the responsibility of VDOT.

Disposal Areas
Based on Memorandum of Agreement with
Virginia Department of Environmental Quality
And Current Solid Waste Regulations

Materials that cannot be disposed of in a disposal area:

- Antifreeze
- Asphalt (liquid)
- Building forms
- Concrete with exposed rebars
- Curing compound
- Fuel
- Hazardous materials
- Limbs
- Lubricants
- Metal
- Metal pipe
- Oil
- Paint
- Stumps
- Tree trunks
- Wood or metal from building demolition

Materials that may be disposed of in an approved disposal area:

- Asphalt (solid)
- Brick
- Cinder block
- Concrete (without exposed rebars)
- Dirt
- Rock

Disposal areas located on VDOT rights-of-way must be covered with 2-feet of clean material, placed on a maximum 2:1 slope, and seeded with the seed mix recommended on the Roadside Development Sheet or with a recommendation from the Transportation Roadside Development Manager. If the area is predominately wet or has plants that appear to be wetland species – have the District Environmental Section look at it before placement of materials.

Disposal areas located on private property must be covered with 2-feet of clean material placed on a maximum 3:1 slope and seeded with the seed mix recommended on the Roadside Development Sheet or with a recommendation from the Transportation Roadside Development Manager. If the area is predominately wet or has plants that appear to be wetland species avoid placement of material.

Stumps should not be buried either on or off state rights of way. However, if they are buried solid and vegetative waste regulations must be followed. These include:

- Notification of all adjoining property owners 14-days prior to opening the vegetative waste disposal site.
- Survey of site before material is buried and record in local courthouse.
- Survey at time of closure showing location of all materials buried, recording with property information in local courthouse.
- Notification of all adjoining property owners within 48-hours of closure.
- Installation of groundwater and methane gas monitoring wells.
- Monitoring materials collected in wells and reporting annually to Virginia Department of Environmental Quality on findings.
- Providing corrective measures should pollutants be detected in wells.

Stumps and tree trunks (non-merchantable timber) may be ground into mulch, stockpiled, and beneficially used. If stockpiled, the pile must be reduced by 75% within 12-months. Ground chips may be given away for use as mulch or fuel. Ground chips may be used to stabilize bare areas, however, they should not be piled more than 2-inches in depth if used for this purpose.