

# ARTICLE 4 – STORMWATER MANAGEMENT

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## ARTICLE 4 – STORMWATER MANAGEMENT

In accordance with and except as provided in 9VAC25-870-48, this part establishes the minimum technical criteria that shall be utilized to protect the quality and quantity of state waters from the potential harm of unmanaged stormwater runoff resulting from land-disturbing activities.

### 4-1 Stormwater Management

Spotsylvania County actively uses all methods available to preserve the water quality and quantity that has become polluted over the years from all forms of land disturbance and development.

The Chesapeake Bay Division's Environmental Engineer reviews all designs for stormwater management.

The County uses the expertise of many (but not limited to) the following resources listed below.

#### 4-1.1 State design and regulatory documents

- A. The current edition of the Virginia DCR/DEQ - Stormwater Management Handbooks.
- B. The Virginia Stormwater Act (Code of Virginia 62.1-44.15:24)
- C. The Current Virginia Administrative Code for Stormwater Management Regulations and the Virginia Stormwater Management Program (VSMP).
- D. The current VDOT Drainage Manual, subdivision street design manual and entrance standard manuals.

#### 4-1.2 County design and regulatory documents

- A. Chapter 6A of the County Code entitled Chesapeake Bay Act

- B. Chapter 19A of the County Code entitled Stormwater Management Ordinance

### 4-2 Stormwater detention can be achieved through some of the following methods:

- (1) Roof top storage
- (2) Parking lot storage including porous materials, ponding and percolation trenches
- (3) Retention and detention ponds; Note any facility designed to provide ponding water with a depth of 2 inches or greater must provide a safety fence if facility is located within 300 feet of a residence, daycare, or active recreational area. Unless an approved aquatic bench is provided in accordance with the Virginia Administrative Code 9VAC25-870-93
- (4) Recreation area storage, landscaping, vegetative buffers
- (5) Road embankment storage if approved by VDOT.
- (6) Street and secondary drainage system storage during extreme intensity storms
- (7) Underground detention structures

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### 4-3 WATER QUALITY

Contact the Environmental Engineer to schedule a pre application meeting to explain your project. Water quality practices and principals are not just for developments but also for single family homes.

The design and specific standards that are to be used for water quality are explained in detail and can be found in the Virginia Administrative code sections as follows

9VAC25-870-63 – water quality design criteria requirements  
9VAC25-870-65 – water quality compliance and  
9VAC25-870-96 – water quality for Part 2C and will be included with the above listed sections after July 1, 2014.

The following practices are identified as the leading practices to be used for water quality controls. These practices do not represent all that are available. If an innovative method is being considered it must be approved and ranked by DEQ and Virginia Stormwater BMP Clearinghouse before the County Environmental Engineer can consider its use.

1. Vegetated Roof
2. Rooftop Disconnection
3. Rainwater Harvesting
4. Soil Amendments
5. Permeable Pavement
6. Grass Channel
7. Bioretention
8. Infiltration
9. Dry Swale
10. Wet Swale
11. Sheet Flow to Filter/Open Space
12. Extended Detention Pond
13. Filtering Practice
14. Constructed Wetland

### 15. Wet Pond

### 4-4 WATER QUANTITY

Water quantity is to provide protection from an increase in flows through runoff and to provide downstream and/or offsite channel and flood protection. Spotsylvania County's definition for the original Low Impact Development (LID) design criteria is still applicable;

LID: The ability to infiltrate or re-infiltrate the stormwater back into the ground as it had been doing before any form of land disturbance had occurred.

In the Virginia Administrative Code section 4VAC50-60-66 the design calculations and guidelines can be found to provide the required information that needs to be submitted for all land disturbance activity to determine what BMP if any will be required for water quantity.

### 4-5 PLAN AND DESIGN

In addition to the information detailed within the County's Chapter 19A Stormwater Management Ordinance additional provisions for the submission of plans will be found under the Virginia Administrative Code sections as follows;

9VAC25-870-55 Stormwater management plans  
9VAC25-870-72 Design Storms and Hydrologic methods  
9VAC25-870-85 Stormwater management impoundment structure or facilities

Alternative sections that may be used for design criteria

9VAC25-870-69 Offsite compliance option  
9VAC25-870-74 Stormwater harvesting  
9VAC25-870-92 Comprehensive stormwater management plans  
9VAC25-870-99 Regional (watershed-wide) stormwater management plans

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### 4-6 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

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 must be developed before land disturbance commences. The following Administrative code sections offer specific details that are required to be identified.

9VAC25-870-54 Stormwater pollution prevention plan requirements  
 9VAC25-870-56 Pollution prevention plans

### 4-7 LINEAR PROJECTS

Linear projects that do not meet the annual plan of work criteria to be reviewed and

approved by DEQ shall submit a plan to the County that will provide control of the post development stormwater runoff in accordance with 9VAC25-870-76

### 4-8 STREAM CHANNEL EROSION

Properties and receiving waterways downstream of any land-disturbing activity shall be protected from erosion and damage due to changes in runoff rate of flow and hydrologic characteristics, including, but not limited to, changes in volume, velocity, frequency, duration, and peak flow rate of stormwater runoff in accordance with the minimum design standards set out in this section. Ref 9VAC25-870-97.

### 4-9 MINIMAL EASEMENT WIDTHS FOR SPECIFIC DRAINAGE FEATURE

Minimum Easement Widths / Pipe Size for Storm Systems	
Easement Width, Feet	Pipe Size, Inches
12	15 – 18
16	21 – 33
20	36 – 48
24	54 – 72

Minimum Easement Widths for Open Ditches and Channels	
Top Width of Channel (Feet)	Easement Width (Feet)
Less than 2	10
2 – 4	10-greater than top width of channel with minimum of 5' on one side
Greater than 4	15-greater than top width of channel with minimum of 5' on one side

### 4-10 PIPE AND CULVERT MATERIALS

Due to highly acidic soils inherent within the County, the County will only allow concrete pipes and special acid rated or resistant plastic pipes with acid rated seals. For all commercial temporary entrances such as logging roads and temporary construction entrances, corrugated metal pipes may be used as

a temporary measure only. The appropriate acid rated pipes must be installed as a permanent measure. Homeowner's single family entrance pipes can be corrugated metal in accordance to VDOT standards.

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### 4- 11 BMP SAFETY FEATURE DESIGNS

All water retention facilities within 300' of a single family residence, daycare, educational facility or active recreational facility that will have a pooling water depth of 2 inches for 24 hours or greater period of time shall install a safety fence.

The safety fence can be as follows:

1. Chain Link Fence – Top of the fence shall be a minimum of 4' high, with no gap between ground and wire fencing, fence posts shall be a maximum of 8' to 10' apart, with a minimum 8' wide gate.
2. Split Rail Fencing – The top of the fence shall be a minimum of 4' high, fence posts shall be between 8' to 10' apart, when wire gauge fence (maximum of 2"x4" wire opening) is required it shall be stapled to the front (outside) of the split rail fence with no gap between ground and wire fencing, with minimum 8' wide access gate.
3. Board on Board Fencing – The top of the fence shall be a minimum of 4' high with a maximum of 16" between boards, when wire gauge fence (maximum of 2"x4" wire opening) is required it shall be stapled to the front (outside) of the fence and the fence posts with no gap between ground and wire fencing, fence posts shall be between 8' to 10' apart, with a minimum 8' wide access gate.

There is an acceptable alternative that will be allowed in accordance with the state criteria found under 9VAC25-870-93.1. The alternative provides for the use of innovative designs with safety benches and vegetative shelves. Follow the design guidelines under Aquatic Bench definition of the above referenced code section.

### 4-12 FLOODING AND FLOODPLAIN MANAGEMENT

Flooding:

Downstream properties and waterways shall be

protected from damages from localized flooding due to changes in runoff rate of flow and hydrologic characteristics, including, but not limited to, changes in volume, velocity, frequency, duration, and peak flow rate of stormwater runoff in accordance with the minimum design standards set out in this section. Ref 4VAC50-60-98

Floodplain Management:

The floodplain Manager and the Zoning Administrator regulate the encroachment and uses permitted within the floodplain overlay district. Reference County regulations under Code Sec. 23-7.2 Floodplain Overlay District and State regulations under Code of Virginia §10.1-602 Virginia's laws - floodplain management.

### 4-13 DESIGN AND CONSTRUCTION OF DAMS

All dams in Virginia are subject to the Dam Safety Act and Dam Safety Regulations unless specifically excluded.

Department of Conservation and Recreation Dam Safety Division regulate dams and floodplain management within Virginia through the Virginia Dam Safety Act, Article 2, Chapter 6, Title 10.1 (10.1-604 et seq) of the Code of Virginia and Dam Safety Impounding Structure Regulations (Dam Safety Regulations). The Chesapeake Bay Division's Environmental Engineer reviews all designs for dams and submits comments to the DCR dam safety division accordingly.

### 4-14 STORMWATER DRAINAGE PIPE & UNDERGROUND STORMWATER MANAGEMENT

**Underground stormwater drainage pipe & underground stormwater management facility installations shall follow these guidelines;**

1. All underground pipes & stormwater facility will be installed in accordance to ASTM standards as well as any specified installation criteria and guidelines set forth by the manufacturer.

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2. All underground pipes & stormwater facility shall be video inspected and certified by a Virginia Licensed Professional showing the entire length of pipe/facility to assess for seals, joint adequacy and installation per manufacturer's specifications. The video tape/CD will be presented to and verified by the Sr. Environmental Engineer for acceptance as part of the As-built process.

### 4-15 TYPE OF PIPES FOR STORMWATER MANAGEMENT

Due to the low pH soils throughout the County specific pipe types and their connections are required to withstand the adverse effect of the highly acidic soils. The specific conditions for cross pipes and stormwater management conveyance systems to a specified SWM, BMP, IMP facility are;

1. All stormwater conveyance pipes in every respect shall be concrete meeting ASTM SEC. C76 Standards except all joints of said pipes shall conform to ASTM C443 standards.
2. The installation of the above referenced pipes shall meet the ASTM C1479 standards, or
3. Acid rated plastic pipes (examples are HDPE and PVC A-2000) shall meet the following ASTM Standards:
  - a. ASTM F2306 Standard Specification for 12 to 60 in (300 to 1500 mm) Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications
  - b. ASTM F949 Standard Specification for Polyvinyl Chloride Corrugated Sewer Pipe with Smooth Interior and Fittings
4. The joints shall be acid rated and conform to ASTM D3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals. Seals shall meet the requirements of ASTM F477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
5. The installation of the above referenced pipes shall meet ASTM D2321 Standard

Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

### 4-16 INSPECTIONS OF BEST MANAGEMENT PRACTICES FOR AS-BUILT SURVEYS

Inspection reports for the Installation of Best Management Practices (BMP) facilities to be presented with As-built surveys.

1. All BMP type facility (landscaping, Bioretention and/or structural) that require a BMP agreement shall be inspected and digitally photographed to certify the proper installation of the facility. The photographic documentation will prove proper layered installation to verify material placement. The details will include under-drain, stone, sand, fabric soil media, etc. as required by the specific engineers design approved by the County.
2. If there is the placement of multiple units (layers) that require separation the photos shall include a measuring device such as a ruler or tape that will clearly show the separation distance to meet the manufacturers' specifications. The digital photos will be presented in a document format to the Sr. Environmental Engineer and must be approved for acceptance as part of the As-Built process before Release of the Erosion & Sediment Control Bond.
3. The certification document shall be approved and certified by a Virginia Licensed Professional.
4. The outfall of each BMP leaving the site will be identified with a GPS point

### 4-17 AS-BUILT CERTIFICATIONS

This certification is for Temporary and Final Erosion acceptance for commercial projects being performed by the original plan designer. (See attachment A)

1. Create a sample document to be used for review and approval by the County.
2. The Temporary Erosion Certification will be to establish that the SWM feature will

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function to retain and disburse the water and will not provide for degradation downstream of the project site area.

3. The Final Erosion Certification is to certify that the SWM and/or BMP structures are installed correctly and will function within the designed parameters. (See attachment A)

### 4-18 THIRD PARTY AS-BUILT CERTIFICATIONS

This certification is for Temporary and Final Erosion acceptance for commercial projects performed by professionals other than the original plan approval designer. (See attachment B)

1. Create a sample document to be used for review and approval by the County.
2. The Temporary Erosion Certification will be to establish that the SWM feature will function to retain and disburse the water and will not provide for degradation downstream of the project site area.
3. The Temporary SWM feature shall meet the minimum state of Virginia requirements at that time until the site meets final requirements.
4. The Final Erosion Certification is to certify that the SWM and/or BMP structures are installed correctly and will function within the designed parameters. (See attachment B)

### 4-19 ALTERNATIVES TO CURBS FOR USE WITH STORMWATER DESIGNS

With the introduction of better site designs that feature innovative stormwater management to prevent runoff from leaving any developed site the traditional use of curbs in parking lots and travel ways may be waived in site specific cases with approval from the planning director in agreement with the environmental engineer.

Within VDOT R/W the County recognizes the VDOT standards and specifications for specific curb cut designs that do not create a hazard to the traveling public.

In curb and gutter situation(s), a waiver from the Director of Planning is still required for the following conditions:

1. The waiver is for parking area(s) that has/have direct stormwater runoff flow into a BMP, IMP or Stormwater Management facility.
2. The curb waiver using tire blocks (wheel stops) for LID practices is for interior non traffic sections of a project.
3. The Curb waiver for traffic sections of a parking area or along a VDOT road or R/W will be the curb cut type not to exceed two (2) feet in total length.
4. For traffic sections curb cuts only will be approved with appropriate designs approved by the Environmental Engineer before the planning director will sign the waiver.
5. The curb section next to or within VDOT R/W and/or roadways may apply for a waiver if there is a separation from the traveling public by a facility that will not promote direct traffic access onto the roadway surface (DOES NOT INCLUDE GRADUAL DITCH OR GRASS SWALES). The curb cut type opening will be allowed with VDOT approval for separation.
6. The BMP, IMP or SWM facility must meet all of the current design guidelines and must be approved by the Environmental Engineer before the planning director will sign the waiver.

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**ATTACHMENT – A – As Built Certification Sample Letter**

**\*\*\*\*\*Sample Language\*\*\*\*\***

(Professional Company Letter Head)

(DATE)

County Program Administrator  
Zoning Department  
9019 Old Battlefield Blvd, Suite 310  
Spotsylvania, VA 22553

RE: As-Built Certification  
(Project Title W/ temporary or final)  
(TM & Pcl #/PIN)  
(Address w/Road name & Rt #)

(Dear Mr. \_\_\_\_\_):

In my professional opinion, based on field run elevations and my observations, I hereby certify that the (Stormwater management Facility/ Best Management Practice) constructed on the above referenced (Project Title Name) site will function as designed for Stormwater (Quality and/or Quantity) Management. Based on field run information, the facility has been constructed in general conformance with the approved plan. The size and volume of the facility meets and/or exceeds the design volume.

We have provided herewith (a minimum of 2) copies of the “AS-Built (Facility/Structure)” plans for your review and comment. In addition to the plans, we have enclosed a copy of our site visit report as required by the BMP Agreement for a (enter #) year inspection.

Should you have any questions, please do not hesitate to call us.

Sincerely,

(Original Signature of Certified Professional)

(Print Name & Title)

(Certification Seal

and Signature)

Area left open for county approval

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**ATTACHMENT – B – Third Party As-Built Certification Sample Letter**

**\*\*\*\*\*Sample Language\*\*\*\*\***

(Professional Company Letter Head)

(DATE)

County Program Administrator  
Zoning Department  
9019 Old Battlefield Blvd, Suite 310  
Spotsylvania, VA 22553

RE: Third Party As-Built Certification

(Project Title W/ temporary or final)

(TM & Pcl #/PIN)

(Address w/Road name & Rt #)

(Dear Mr. )::

In my professional opinion, based on field run elevations and my observations, I hereby certify that the (Stormwater management Facility/ Best Management Practice) constructed on the above referenced (Project Title Name) site will function as designed for Stormwater (Quality and/or Quantity) Management. Based on field run information, the facility will function in general accordance with the original design for stormwater quality and quantity management.

We have provided herewith (a minimum of 2) copies of the “AS-Built (Facility/Structure)” plans for your review and comment. In addition to the plans, we have enclosed a copy of our site visit report as required by the BMP Agreement for a (enter #) year inspection.

Should you have any questions, please do not hesitate to call us.

Sincerely,

(Original Signature of Certified Professional)

(Print Name & Title)

(Certification Seal

and Signature)

Area left open for county approval