

## Design Manual VSMP Sections

### Introduction

This manual is intended for citizens, property owners, design professionals, and developers to assist them in understanding and meeting the Town of Christiansburg Ordinance requirements. The policies and guidance provided are intended to provide clarity for the preparation and review of development plans in line with the Town's obligations to its citizens, to VSMP authority responsibilities, and MS4 permit responsibilities that include TMDL implementation plan goals.

### Review of Stormwater Management Plan; Review of Stormwater Management Concept Plan

The following time frame for review of Stormwater Management plans and the procedures for the communication of decision to the applicant are applicable to Stormwater Management Plan submittals.

1. The completeness of the plan must be determined and applicant notified of determination within 15 days of receipt.
  - a. If incomplete, applicant must be notified in writing.
  - b. If determination of completeness is made, 60 days from date of communication is allowed for review.
  - c. If determination of completeness is not made and communicated within 15 days, the plan shall be deemed complete as of date of submission and 60 days from date of submission will be allowed for review.
  - d. Any plan previously disapproved must be reviewed within 45 days of resubmission.
2. Decision to approve or disapprove plan must be provided in writing; if not approved reasons must be provided in writing.
3. If a plan meeting all requirements of 9VAC25-870 and the Town VSMP regulations is submitted and no action is taken within appropriate time frame, the plan will be deemed approved.
4. **[The Policies and Procedures document outlining designees will be referenced or inserted]**

### Stormwater Management Plan Requirements

The Stormwater Management Plan must apply the stormwater management technical criteria set forth in this section of the manual to the entire land-disturbing activity. As codified in ordinance section 16-55, Individual lots in new residential, commercial, or industrial developments shall not be considered separate land-disturbing activities. The plan shall consider all sources of surface runoff and all sources of subsurface and groundwater flows converted to subsurface runoff, and include the following information:

1. A completed final stormwater management plan checklist. This checklist is provided in the appendix and details the plan and narratives requirements.
2. Contact information. The name, address, and telephone number of all persons having a legal interest in the property and the tax reference number and parcel number of the property or properties affected.
3. Existing and Proposed Conditions
  - a. Existing Conditions A minimum 1" = 20' to a maximum 1" = 50' topographic base map of the site which extends a minimum of 50 feet beyond the limits of the proposed development (or farther if necessary in order to provide sufficient information on adjoining parcels to assess the impacts of stormwater from the site on these parcels). Dedicated drainage area maps may use a scale in excess of 1" = 50' when existing drainage areas are large and a smaller scale is not practical.
    - (i) Contributing drainage areas;
    - (ii) Existing streams, ponds, culverts, ditches, wetlands, other water bodies, including all State Waters or other jurisdictional information, floodplains;

- (iii) Soil types, geologic formations if karst features are present in the area, forest cover, other vegetative areas;
  - (iv) Current land use including existing structures, roads, locations of known utilities and easements, and other significant natural and manmade features not otherwise listed;
  - (v) Current land cover including forest, open space, managed turf, or impervious cover;
  - (vi) Sufficient information on adjoining parcels to assess impacts of stormwater from the site on these parcels;
- b. Proposed Conditions. A minimum 1" = 20' to a maximum 1" = 50' plan view of the site which extends a minimum of 50 feet beyond the limits of the proposed development (or farther if necessary in order to provide sufficient information on adjoining parcels to assess the impacts of stormwater from the site on these parcels). Dedicated drainage area maps may use a scale in excess of 1" = 50' when proposed drainage areas are large and a smaller scale is not practical.
- (i) Contributing drainage areas;
  - (ii) Limits of clearing and grading, proposed drainage patterns on the site;
  - (iii) Proposed buildings, roads, parking areas, utilities, stormwater management facilities;
  - (iv) Proposed land use with tabulation of percentage of surface area to be adapted to various uses, including but not limited to forest, open space, managed turf, or impervious cover, planned locations of utilities, roads and easements.
4. Calculations. Hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in this Article. Such calculations shall include:
- (i) description of the design storm frequency, intensity and duration;
  - (ii) time of concentration;
  - (iii) Soil Curve Numbers or runoff coefficients;
  - (iv) peak runoff rates and total runoff volumes for each watershed area;
  - (v) infiltration rates, where applicable;
  - (vi) culvert capacities;
  - (vii) flow velocities;
  - (viii) data on the increase in rate and volume of runoff for the specified design storms;
  - (ix) documentation of sources for all computation methods and field test results;
  - (x) documentation and calculations verifying compliance with the water quality and quantity requirements of this Article, and;
  - (xi) A narrative that includes:
5. A description of current site conditions and final site conditions; Information on type/ location of stormwater discharges, information on features to which stormwater is being discharged, including surface waters or karst features if present, and predevelopment/post development drainage areas.

6. A description of the proposed stormwater management facilities, including the type of facility, the location (including geographic coordinates), acres treated, the surface waters (or karst feature, if applicable) that the facility drains to.
7. Soils information. Geotechnical properties for the hydrologic and structural properties of soils, especially for dam embankments, shall be described in a soils report. The submitted report shall include boring depth, sampling frequency & types and associated laboratory testing with results and conclusions and follow the criteria in the Virginia Stormwater Management Handbook and BMP Clearinghouse design specifications. Soil properties for infiltration facilities shall also conform to the guidance and specification outlined in the Virginia Stormwater Management Handbook.
8. Maintenance plan. The design and planning of all stormwater management facilities shall include detailed maintenance procedures to ensure their continued function. These plans will identify the parts or components of a stormwater management facility that need to be maintained and the equipment and skills or training necessary. Provisions for the periodic review and evaluation of the effectiveness of the maintenance program and the need for revisions or additional maintenance procedures shall be included in the plan. The maintenance plan shall also specify the minimum frequency at which specific maintenance actions and inspections shall occur.
9. Maintenance agreement. The applicant must execute and record a formal maintenance agreement binding on all subsequent owners of land served by an on-site stormwater management measure in accordance with the specifications of this Article. This agreement shall give the Town permission to access the site as the Town deems necessary for the inspection and or repair of the stormwater management facilities.
10. Landscaping plan. The applicant must present a detailed landscaping plan describing the woody and herbaceous vegetative stabilization and management techniques to be used within and adjacent to the stormwater practice. The landscaping plan must also describe who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved. This plan must be prepared by a qualified individual familiar with the selection of emergent and upland vegetation appropriate for the selected BMP.
11. Other environmental permits. The applicant is responsible and shall be able to show to the Town's satisfaction, that all other applicable environmental permits have been acquired for the site prior to approval of the final stormwater management plan.

#### **Stormwater Management Concept Plan Requirements**

From time to time the Town may request or an applicant may offer a Stormwater Management Concept Plan. The stormwater management concept plan shall be used to evaluate the environmental characteristics of the project site, the potential impacts of all proposed development of the site, both present and future, on the water resources, and the effectiveness and acceptability of the measures proposed for managing stormwater generated at the project site. The concept plan should be prepared at the time of the preliminary plan of subdivision in accordance with Chapter 26 "Subdivisions" or other early step in the development process, to identify the type of stormwater management measures necessary for the proposed project. The intent of this conceptual planning process is to ensure adequate planning for management of stormwater runoff from future development. To accomplish this goal the following information shall be included in the concept plan:

1. A map (or maps) indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural stormwater management and sediment control facilities. The map(s) will also clearly show proposed land use with tabulation of the percentage of surface area to be adapted to various uses; drainage patterns; locations of utilities, roads and easements; and the limits of clearing and grading. A written description of the site plan and justification of proposed changes in natural conditions may also be required.

2. Sufficient engineering analysis to show that the proposed stormwater management measures are capable of addressing water quantity and quality requirements for runoff from the site in compliance with this Article and the specifications of the Virginia Stormwater Management Handbook and BMP Clearinghouse design specifications.
3. A written or graphic inventory of the natural resources at the site and surrounding area as it exists prior to the commencement of the project and a description of the watershed and its relation to the project site. This description should include a discussion of soil conditions, forest cover, topography, wetlands, and other native vegetative areas on the site. Particular attention should be paid to environmentally sensitive features that provide particular opportunities or constraints for development including all State Waters or other jurisdictional information. Information on type/ location of stormwater discharges, information on features to which stormwater is being discharged, including surface waters or karst features if present, and predevelopment/post development drainage areas.
4. A written description of the required maintenance burden for any proposed stormwater management facility.
5. The Town of Christiansburg may also require a concept plan to consider the maximum development potential of a site under existing zoning, regardless of whether the applicant presently intends to develop the site to its maximum potential.

#### **Stormwater Pollution Prevention Plan Contents**

The Stormwater Pollution Prevention Plan (SWPPP) shall include the content specified by Section 9VAC25-870-54 and must also comply with the requirements and general information set forth in Section 9VAC25-880-70, Section II, of the general permit.

1. At a minimum the SWPPP must include:
  - a. A copy of signed Town of Christiansburg Preconstruction Meeting Notes or Town of Christiansburg signed Waiver for a Preconstruction Meeting;
  - b. A copy of the Notice of Construction Commencement sent by the Operator or his designee to the Town;
  - c. An erosion and sediment control plan;
  - d. A stormwater management plan;
  - e. A pollution prevention plan;
  - f. Town of Christiansburg SWPPP inspection forms as provided in this manual; and
  - g. Any additional control measures necessary to address a TMDL.
2. The SWPPP shall be amended by the operator whenever there is a change in design, construction, operation, or maintenance.
3. The SWPPP must be maintained by the operator at a central location onsite. If an onsite location is unavailable, notice of the SWPPP's location must be posted near the main entrance at the construction site. Operators shall make the SWPPP available for public review in accordance with Section II of the general permit, either electronically or in hard copy.
4. Operators must develop, implement, and maintain a SWPPP that minimizes the pollutants of concern (i.e., sediment or a sediment-related parameter or nutrients) when discharging to surface waters identified as impaired on the 2012 305(b)/303(d) Water Quality Assessment Integrated Report or for which a TMDL has been approved prior to the term of this general permit. Implementation and maintenance of erosion and sediment controls in accordance with an approved Erosion and Sediment Control Plan or an "agreement in lieu of an erosion and sediment control plan" will minimize (i.e., reduce or eliminate) the discharge of (i) sediment or a sediment-related parameter or (ii) nutrients from construction activities.
  - a. Upon obtaining coverage under the 2014 Construction General Permit, DEQ will determine if the land disturbing activity will discharge to a TMDL water body and identify any additional measures needed to address the TMDL.
  - b. In addition, operators must also.

- i. apply permanent or temporary soil stabilization to denuded areas within 7 days after final grade is reached on any portion of the site,
- ii. apply nutrients in accordance with manufacturer's recommendations or and approved nutrient management plan and not during rainfall events, and
- iii. perform site inspections at a frequency of at least once every 4 business days or, at least once every 5 business days and no later than 48 hours following a measurable storm event.

### **Pollution Prevention Plan Requirements**

As required under 9VAC25-870-56, the minimum plan requirements are detailed below.

1. A plan for implementing pollution prevention measures during construction activities shall be developed, implemented, and updated as necessary. The pollution prevention plan shall detail the design, installation, implementation, and maintenance of effective pollution prevention measures as specified in 40 CFR 450.21(d) to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented, and maintained to:
  - a. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
  - b. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater; and
  - c. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.
2. The pollution prevention plan shall include effective best management practices to prohibit the following discharges in accordance with 40 CFR 450.21(e):
  - a. Wastewater from washout of concrete, unless managed by an appropriate control;
  - b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;
  - c. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
  - d. Soaps or solvents used in vehicle and equipment washing.
3. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls in accordance with 40 CFR 450.21(c).

### **Requirements for Preconstruction Meeting(s)**

1. An initial meeting will be held at the Town Hall.
  - a. A meeting agenda template is contained in the appendices. Town staff will provide a project specific agenda for the meeting.
  - b. Design professional provide TOC with word version of construction sequence prior to meeting
  - c. TOC will distribute an agenda prior to the meeting.
  - d. Meeting discussions will typically lead to notes and revisions to the agenda.
  - e. All attendees will sign meeting notes and the preconstruction document will become an enforceable part of the SWPPP and VSMP Authority permit conditions.
  - f. The preconstruction meetings will identify requirements for critical inspections.
2. Necessity of a 2<sup>nd</sup> on site meeting will be determined at the first meeting
  - a. 2<sup>nd</sup> meeting, if required, shall be held at the project after initial measures installed (TBD at time of 1<sup>st</sup> meeting and inserting into sequence of construction)

### **Notice of Construction Commencement**

Permittee shall notify in writing 72 hours prior to the commencement of land disturbance. The written notice will become part of the SWPPP. Failure to notify will be a violation of the VSMP Authority Permit conditions.

**VSMP Permit Inspections**

In accordance with section 16-61 of the Town Ordinance, inspections for compliance with VSMP Authority Permit conditions will be performed by the Administrator or his duly authorized agent.

The Administrator or any duly authorized agent of the Administrator shall perform routine inspections of the land-disturbing activity during construction for:

1. Compliance with the approved erosion and sediment control plan;
2. Compliance with the approved stormwater management plan;
3. Development, updating, and implementation of a pollution prevention plan; and
4. Development and implementation of any additional control measures necessary to address a TMDL.

In addition, the applicant shall notify the Town of Christiansburg in advance of construction of critical components of the SWM facility. The preconstruction meetings will identify requirements for critical inspections. The following are examples of, but not limited to or representing all BMPs, critical components:

1. Before installing a stormwater pond embankment;
2. Before installing pond outlet structures;
3. Before setting any concrete BMP structures, this does not include precast drop inlets or manholes;
4. Before installing energy dissipation structures and any outlet structure into a jurisdictional stream (perennial or intermittent flow);
5. Before installing any infiltration or bioretention BMP; or
6. Any other key BMP component as determined by the Town during plan review, the preconstruction meeting, or at the time of agreed upon plan changes

If the Town of Christiansburg determines that there is a failure to comply with the plan, notice shall be served upon the permittee or person responsible for carrying out the plan.

**Record Drawing and Documentation Requirements and Procedures**

Prior to final acceptance of the project the permittee is required to submit to the Town as-built documentation for review and approval, confirming that the storm drainage systems and stormwater management facilities and practices that have been constructed conform to the approved Stormwater Management Plan. In addition, once the as-built documentation has been submitted, a final inspection will be conducted by the Town to confirm that the as-built documentation conforms to the actual construction.

As-built documentation shall include the following:

1. As-built survey conducted following construction, certified by a registered land surveyor or professional engineer. The survey shall include enough information to verify that storage capacities in ponds and other stormwater management structures are no less than the storage volume required by the approved Stormwater Management Plan. For retention and detention structures, a stage-storage summary table with design values and as-built values shall be included. The survey shall verify inverts and sizes of pipes, culverts, and outlet structures. Maximum tolerance shall be +/- 0.1 feet for structures and +/- 0.5 feet for finished grades.
2. The permittee's inspection log records with copies of all inspection test results documenting compliance with the approved Stormwater Management Plan.
3. Redline revision of approved Stormwater Management Plan. Place a check mark where design values agree with actual constructed values. For changed values enter the constructed value in red.

4. Certification statement, signed by the permittee and a Professional Engineer or Professional Land Surveyor, registered in the Commonwealth of Virginia, indicating conformance with the approved Stormwater Management Plan.
5. Digital location data shall be provided to the Town for any publicly maintained components of the storm drainage system, referenced to the Virginia State Plane coordinate system, South Zone, US Survey Feet, NAD83 horizontal datum, North American Vertical Datum of 1988 (NAVD88). Digital data shall be submitted in AutoCAD or ESRI (geodatabase or shapefile) format compatible with the current versions of Town software, or in an alternate format if approved by the Administrator or his designee.

If it is determined from the as-built documentation that the storm drainage systems and the stormwater management facilities have not been constructed in accordance with the approved Stormwater Management Plan, then corrective action will be taken to comply with the approved Plan or the permittee shall provide studies and information as required by the Town to demonstrate that the constructed systems will function equivalent to the approved Stormwater Management Plan. Requirements may include, at the discretion of the Town, meeting all flow, velocity, and regulatory requirements and that the approved elevation-storage requirement is maintained.

#### **Stormwater Facility Maintenance Agreements**

1. Maintenance of all stormwater management facilities shall be ensured through the maintenance agreement recorded with the Montgomery County clerk of circuit court.
2. A draft maintenance agreement is included in the appendix.
3. The agreement includes provisions of long-term responsibility for and maintenance of stormwater management facilities and other techniques specified to manage the quality and quantity of runoff. This instrument shall be recorded prior to general permit termination or earlier as required by the Administrator and shall at a minimum:
  - a. Be submitted to the Administrator for review and approval. Approval is required prior to permit issuance.
  - b. Be stated to pass to any successor in title;
  - 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 Administrator; and
  - e. Be enforceable by all appropriate governmental parties.
4. The maintenance agreement shall provide for access to stormwater management facilities at reasonable times for periodic inspection by the town, or its contractor or agent or other designee, and for regular assessments to ensure that the facility is maintained in proper working condition to meet design standards and any other provisions established by this ordinance.
5. Maintenance of all stormwater management facilities shall be ensured through the maintenance agreement. The agreement shall identify the responsible party for carrying out the maintenance, including the owner, governmental agency or other legally established entity to be permanently responsible for maintenance.
6. The operation and maintenance of stormwater management facilities, unless assumed by a governmental agency, shall remain with the responsible party and shall pass to any successor in title. Any changes to the maintenance agreement shall be reviewed and approved by the town prior to plan approval.
7. The maintenance agreement will include provisions to follow the stormwater management facility maintenance and inspection schedules in the approved plans to ensure proper function of the facilities. Records shall be held for at least eight (8) years. The agreement shall also include "failure to maintain" provisions, and shall include provisions for submission of inspection and maintenance reports to the Administrator upon reasonable request by the Town.

**VSMP Authority Permit Fees****Fee Table 1: Fees for permit issuance [Fees for Single Family Detached Residential Structures]**

<b>Fee type</b>	<b>Total fee to be paid by Applicant (includes both VSMP authority and Department portions where applicable)</b>	<b>Department portion of "total fee to be paid by Applicant" (based on 28% of total fee paid*)</b>
Small Land-Disturbing Activity (not subject to General Permit coverage land-disturbance acreage equal to or greater than 10,000 square feet and less than 1 acre)	\$290 [\$209 <sup>1</sup> ]	\$0
General / Stormwater Management - Small Construction Activity/Land Clearing (Areas within common plans of development or sale with land disturbance acreage less than 1 acre.)	\$290 [\$209 <sup>1</sup> ]	\$81 [\$0]
General / Stormwater Management - Small Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 1 acre and less than 5 Acres)	\$2,700 [\$209 <sup>1</sup> ]	\$756 [\$0]
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 5 acres and less than 10 acres)	\$3,400 [\$2,448]	\$952 [\$0]
General / Stormwater Management – Large Construction Activity/Land Clearing [Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 10 acres and less than 50 acres]	\$4,500 [\$3,240]	\$1,260 [\$0]
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 50 acres and less than 100 acres)	\$6,100 [\$4,392]	\$1,708 [\$0]
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 100 acres)	\$9,600 [\$6,912]	\$2,688 [\$0]

\* If the project is completely administered by the Department such as may be the case for a state or federal project or projects covered by individual permits, the entire applicant fee shall be paid to the Department.

<sup>1</sup> Fees for single family homes within or outside a common plan of development or sale that disturb 1-5 acres shall be \$209.00.

**Fee Table 2: Fees for the modification or transfer of registration statements for the General Permit for Discharges of Stormwater from Construction Activities**

Type of Permit	Fee Amount
General / Stormwater Management – Small Construction Activity/Land Clearing (Areas within common plans of development or sale with land disturbance acreage less than 1 acre)	\$20
General / Stormwater Management – Small Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 1 and less than 5 acres)	\$200
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 5 acres and less than 10 acres)	\$250
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 10 acres and less than 50 acres)	\$300
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 50 acres and less than 100 acres)	\$450
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 100 acres)	\$700

**Fee Table 3: Permit Maintenance Fees**

Type of Permit	Fee Amount
Agreement in Lieu of Plan Annual Maintenance	\$50
Small Land-Disturbing Activity (not subject to General Permit coverage land-disturbance acreage equal to or greater than 10,000 square feet and less than 1 acre)	\$50
General / Stormwater Management – Small Construction Activity/Land Clearing (Areas within common plans of development or sale with land disturbance acreage less than 1 acre)	\$50
General / Stormwater Management – Small Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance equal to or greater than 1 acre and less than 5 acres)	\$400
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 5 acres and less than 10 acres)	\$500
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 10 acres and less than 50 acres)	\$650
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater than 50 acres and less than 100 acres)	\$900
General / Stormwater Management – Large Construction Activity/Land Clearing (Sites or areas within common plans of development or sale with land disturbance acreage equal to or greater 100 acres)	\$1,400

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**Erosion and Sediment Control Inspections Fees**

There is currently no weekly fee schedule for erosion and sediment control inspections. A fee schedule may be established at a later date to cover the reasonable costs of inspection activities