

**Date of Council Work Session: January 13, 2014**

**TOWN OF LEESBURG  
TOWN COUNCIL WORK SESSION**

**SUBJECT:** Request for Council to authorize Staff to send the Virginia Department of Environmental Quality (DEQ) the most recent draft revisions of the Leesburg Town Code and the Town's Design and Construction Standards Manual (DCSM) along with a summary of all changes, applicable DEQ charts & checklists, the Town's proposed funding and staffing plan, a proposed Stormwater Management Fee Schedule, applicable staff standard operating procedures, deed language for privately maintained stormwater facilities, and other supporting data for their compliance review of these documents with the new Virginia Stormwater Management Program (VSMP) Regulations.

**Staff Contacts:** William R. Ackman, Jr. P.E.  
Charles A. Mumaw, P.E.

**Recommendation:** Staff recommends that Council authorize Staff to send DEQ the required stormwater compliance package including the most recent draft revisions of the Leesburg Town Code and the DCSM.

**Summary:** The Town of Leesburg is required by the Commonwealth of Virginia to submit a draft package directly to DEQ that demonstrates how the Town will comply with the new stormwater management minimum standards established by the Code of Virginia and the Virginia Administrative Code. DEQ has mandated that this draft package be received by January 15, 2014.

Staff has worked closely with AMEC to:

- Update the Town Code and the DCSM to meet or exceed the State's minimum standards;
- Prepare a summary of all Town Code and DCSM changes;
- Complete applicable DEQ charts & checklists;
- Develop the Town's proposed funding and staffing plan;
- Develop a proposed Stormwater Management Fee Schedule;
- Develop applicable staff standard operating procedures (SOPs) to meet DEQ requirements;
- Revise deed language for privately maintained stormwater facilities to meet DEQ requirements; and
- Prepare other supporting data for DEQ's compliance review of these documents with the new VSMP regulations.

Staff has met with both the EAC (August 30, 2013) and the private sector (December 3, 2013) to provide an overview of these changes and incorporated their comments to the extent possible while still meeting the minimum requirements of the State.

Once Staff forwards the package on to DEQ, they will provide comments for the Town to address no later than mid March 2014. Staff will then address all comments and meet with the EAC as well as the private sector and incorporate their comments (to the extent possible) before scheduling public hearings with the Planning Commission and the Town Council (in April 2014) for final adoption of these new regulations. By the Code of Virginia, these new regulations must be adopted no later than May 15, 2014 and be in effect no later than July 01, 2014.

### **Background:**

On September 13, 2011, the Virginia Soil and Water Conservation Board adopted new minimum standards and requirements for the regulation of stormwater in accordance with the amendments to the Virginia Stormwater Act, originally adopted by the General Assembly in 2004. These changes require all localities in Virginia to adopt more stringent stormwater management programs. Specifically, for the Town of Leesburg, this primarily means that applicable sections of Chapter 14 of the Town Code and Article 5 of the DCSM must be updated to comply with Virginia's new minimum standards for stormwater management.

The Virginia Department of Conservation and Recreation (DCR) was originally tasked with developing a statewide model stormwater ordinance. After several drafts and public input (Town Staff was represented by NVRC as well as AMEC), the Virginia Soil and Water Conservation Board approved a "final" draft of this model ordinance on December 13, 2012.

After a statewide reorganization, DEQ took over Virginia's stormwater program and the State Water Control Board replaced the Virginia Soil and Water Conservation Board as the regulatory authority. The State Water Control Board then adopted several additional changes to the new minimum standards for stormwater management at their meeting on December 17, 2013. These last minute changes are reflected in the draft amendments to the Town Code and DCSM.

Staff has worked closely with AMEC, NVRC and the private sector for over 2 years to develop and keep current through all the State's changes, the final draft documents attached hereto.

### **Attachments:**

1. Updated Town Code, Part II, Chapter 14, Article II – Stormwater Management (DEQ Attachment A)
2. Updated DCSM, Article 5 – Storm Drainage (DEQ Attachment N)
3. Complete summary of all Town Code and DCSM changes (DEQ Attachment N)
4. Applicable DEQ charts & checklists (Includes DEQ Attachment D)
5. Town's proposed funding and staffing plan (DEQ Attachment B)
6. Town's proposed Stormwater Management Fee Schedule (DEQ Attachment J)
7. Applicable staff SOPs (DEQ Attachments F, G, I, L & M)
8. Revised deed language for privately maintained stormwater facilities (DEQ Attachment H)
9. Town - County Ratified Stormwater MOU (DEQ Attachment C)
10. SLDR Division 6 (No Changes; FYI for DEQ only) (DEQ Attachment K)
11. DCSM Article 10 (No Changes; FYI for DEQ only) (DEQ Attachment E)



The Town of  
**Leesburg,  
Virginia**

WILLIAM R. ACKMAN, JR., P.E.  
Director  
Department of Plan Review

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January 15, 2014

Marian Carroll  
Stormwater Compliance Specialist  
Department of Environmental Quality  
Warrenton Satellite Office  
98 Alexandria Pike, Suite 33  
Warrenton, VA 20186

Re: Town of Leesburg  
VSMP Application Package

Dear Ms. Carroll,

In accordance with the requirements of Virginia Code § 62.1-44.15.27 and 9VAC25-870-150, the Town of Leesburg is pleased to submit the attached VSMP Application Package for review by the Department of Environmental Quality (DEQ).

To assist DEQ with their review, we have attached a completed “VSMP Required Elements Application Package Checklist” and a “VSMP Local Ordinance Checklist” in addition to the following attachments to supplement these checklists:

**Attachments:**

- A. Latest updated version of the Leesburg Town Code, Part II, Chapter 14, Article II – Stormwater Management (also included is Leesburg’s completed DEQ SWM Ordinance checklist);
- B. The Town’s proposed funding and staffing plan dated December 17, 2013;
- C. The Town’s ratified Memorandum of Understanding with Loudoun County regarding responsibility requirements for erosion and sediment control and stormwater management (SWM) reviews, inspections, enforcement of violations and maintenance;
- D. Summary of the Town’s grandfathered “more stringent” stormwater regulations;
- E. DCSM Article 10 (No Changes; FYI for DEQ only);
- F. Standard Operating Procedures (SOP) for Submittal and Review of SWM and Erosion and Sediment (E&S) Control plans;

- G. SOP for Construction Site Inspections;
- H. Revised deed language for privately maintained stormwater facilities;
- I. SOP for BMP Maintenance and Inspections;
- J. Town's proposed SWM Fee Schedule;
- K. Town's Subdivision and Land Development Regulations, Division 6 (No Changes; FYI for DEQ only);
- L. SOP for SWM and E&S Bond Release;
- M. SOP for SWM & Best Management Practice (BMP) Record Keeping
- N. Latest updated version of the Town's Design and Construction Standards Manual (DCSM), Article 5 – Storm Drainage. (Also includes a brief summary description of all Town Code and DCSM proposed changes); and
- O. The Town's existing Stormwater Management Master Plan.

I trust that this package provides DEQ with all the information required to show that the Town's proposed ordinances will meet or exceed all of the minimum Virginia Stormwater Management requirements. Should you have any questions or if I can provide you with any additional information, please do not hesitate to contact me at (703) 771-2740.

Sincerely,



William R. Ackman, Jr., PE  
Director, Department of Plan Review

Cc: Town Council  
Mr. John Wells, Town Manager  
Ms. Jeanette Irby, Town Attorney  
Mr. Thomas A Mason, P.E., Director of Public Works  
Mr. Charles A. Mumaw, P.E., Deputy Director of Public Works  
Mr. David Bulova, AMEC

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DCR Review Draft – March 25, 2013

December 18, 2013 Revisions in Yellow

**ARTICLE II. - STORMWATER MANAGEMENT** <sup>[12]</sup>

<sup>(12)</sup> **State Law reference** — Location regulation of stormwater, Code of Virginia, §§ ~~60.1-603.362.1-44.15.27,~~  
~~62.1-44.15:3340.1-603.7, 15.2-2114.~~

[Sec. 14-19. - Definitions.](#)  
[Sec. 14-20. - Purpose and findings.](#)  
[Sec. 14-21. - Authority.](#)  
[Sec. 14-22. - Administration.](#)  
[Sec. 14-23. - Program components.](#)  
[Sec. 14-24. - Violations.](#)  
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**Sec. 14-19. - Definitions.**

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

*Applicant* means any person requesting approval for a land-disturbing activity that is subject to the provisions of this article.

*Best management practice* or *BMP* means a practice, or combination of practices, that is determined by the director to be the most effective, practicable means of preventing or reducing nonpoint source pollution means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface waters and groundwater systems.

*Common plan of development or sale* means a contiguous area where separate and distinct construction activities may be taking place at different times on difference schedules.

*Conservation plan* means a document containing materials for the conservation of soil and water resources of a unit or group of units of land. It may include appropriate maps, an appropriate soil and water plan inventory and management information with needed interpretations, and a record of decisions contributing to conservation treatment. The plan will contain all major conservation decisions to ensure that the entire unit or group of units of land will be so treated to achieve the conservation objectives.

*Control measure* means any best management practice or stormwater facility, or other method used to minimize the discharge of pollutants to state waters.

*Clean Water Act* or *CWA* means the federal Clean Water Act (33 U.S.C §1251 et seq.), formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act

**Comment [d1]:** New VSMP requirements are integrated into the Town's existing stormwater requirements, which are provided in Town Code Chapter 14, Article II Stormwater Management.

The Town met with DCR staff (Ginny Snead and Joan Salvati) on January 17, 2013 to discuss the draft ordinance. **Note that the program is now transferred to DEQ.**

**Comment [d2]:** Most Code of Virginia sections dealing with stormwater were transferred from Title 10.1 to Title 62.1 by act of the 2013 General Assembly.

Note the reference to 15.2-2114 is deleted. While the title is "Regulation of Stormwater," it deals exclusively with the authority of a locality to adopt a stormwater utility for revenue generation purposes – something the Town is not proposing at this time.

**Comment [d3]:** The model ordinance has a definition of Administrator. It is not included since Sec. 14-21 clearly identifies the director as the person responsible for administering the regulations.

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Amendments of 1972, Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, and Public Law 97-117, or any subsequent revisions thereto.

*DCSM* means the most recent edition of the town's design and construction standards manual.

*Department or DEQ* means the Virginia Department of Environmental Quality.

*Development* means land-disturbance and the resulting landform associated with the construction of residential, commercial, industrial, institutional, recreation, transportation or utility facilities or structures or the clearing of land for non-agricultural or non-silvicultural purposes.

*Director* means the director of plan review, or his designee, except where the context clearly indicates otherwise.

*Discharge* means to dispose, deposit, spill, pour, inject, dump, leak, or place by any means, or that which is disposed, deposited, spilled, poured, injected, dumped, leaked, or placed by any means.

*Low-impact development* ~~Environmental site design~~ or *LID-ESD* means a design strategy with the goal of maintaining or replicating the predevelopment hydrologic regime through the use of design techniques to create a functionally equivalent hydrologic site design. Hydrologic functions that may be considered include storage volume, infiltration and ground water recharge through the use of integrated and distributed micro-scale stormwater retention and detention areas where the volume and frequency of discharges can be maintained through the reduction of impervious surfaces and/or the lengthening of runoff flow paths and flow time. Other strategies include the preservation of environmentally sensitive site features such as riparian buffers, wetlands, steep slopes, valuable (mature) trees, flood plains, woodlands, and highly permeable soils.

Comment [d4]: Amended to reflect the change in terms in the DCSM.

*Erosion impact area* means 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 waters of the state. The term "erosion impact area" does not mean and include any lot or parcel of land 10,000 square feet or less used for residential purposes or to shorelines where the erosion results from natural processes.

*General permit* means the state permit titled GENERAL PERMIT FOR DISCHARGES OF STORMWATER FROM CONSTRUCTION ACTIVITIES found in Part XIV (9VAC25-880-1 et seq.) of the Virginia Stormwater Management Regulations authorizing a category of discharges under the CWA and the Virginia Stormwater Management Act within a geographical area of the Commonwealth of Virginia.

*Highly erodible soil* means a soil (excluding vegetation) with an erodibility index from sheet and rill erosion equal to or greater than eight. The erodibility index for any soil is defined as the product of the formula  $RKLS/T$ , where K is the soil susceptibility to water erosion in the surface layer, R is the rainfall and runoff, LS is the combined effects of slope length and steepness, and T is the soil loss tolerance.

*Illicit discharge* means any discharge to the stormwater management system that is not composed entirely of stormwater, except discharges pursuant to either a VPDES permit or discharges resulting from firefighting activities. The term "illicit discharge" does not mean and include discharges listed in section 14-23(c), unless the town identifies such discharges as sources of pollutants to waters of the state.

*Impervious surface area* means a surface that is compacted or covered with material that is resistant to

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infiltration by water, including, but not limited to, most conventionally surfaced streets, roofs, sidewalks, parking areas, and other similar structures. Compacted gravel surfaces shall be considered impervious unless demonstrated to the contrary.

*Industrial waste* means liquid or other wastes resulting from any process of industry, manufacture, trade or business, or from the development of any natural resources.

*Intermittent stream* means a well defined natural or engineered channel that contains water for only part of the year, typically during winter and spring when the aquatic bed is below the water table. The flow may be heavily supplemented by stormwater runoff. An intermittent stream may lack some or all of the biological and hydrological characteristics commonly associated with the conveyance of water. The width of the intermittent stream extends from top-of-bank to top-of-bank of the channel. Acceptable methodologies for establishing the presence of intermittent flow are described in the DCSM.

*Land disturbance or land-disturbing activity* means 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 section 14-23(e)(6) of this article.

*Layout* means a conceptual drawing sufficient to provide for the specified stormwater management facilities required at the time of approval.

*Minor modification* means an amendment to an existing general permit before its expiration not requiring extensive review and evaluation including, but not limited to, changes in EPA promulgated test protocols, increasing monitoring frequency requirements, changes in sampling locations, and changes to compliance dates within the overall compliance schedules. A minor general permit modification or amendment does not substantially alter general permit conditions, substantially increase or decrease the amount of surface water impacts, increase the size of the operation, or reduce the capacity of the facility to protect human health or the environment.

*Municipal separate storm sewer* or *MS4* means the conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

- (1) Owned or operated by the state, the town or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity;
- (2) Designed or used for collecting or conveying stormwater;
- (3) Which is not a combined sewer; and
- (4) Which is not part of a publicly owned treatment works.

*Natural channel* means a nontidal waterway that is part of the natural topography and is generally characterized as being irregular in cross section with a meandering course. A natural channel does not include an engineered drainage swale or drainage ditch.

*Nonpoint source pollution* means pollution whose sources cannot be pinpointed, but rather is washed from the land surface in a diffuse manner by stormwater runoff.

*Operator* means the owner or operator of any facility or activity subject to regulation under this article.

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*Perennial stream* means a body of water that flows in a natural or engineered channel year around during a year of normal precipitation. Lakes and ponds, through which a perennial stream flows, are part of the perennial stream. Generally, the water table is located above the streambed for most of the year and groundwater is the primary source for stream flow. The width of the perennial stream extends from top-of-bank to top-of-bank of the channel or to the limits of the normal water level for a pond or lake when there is no definable top-of-bank. Acceptable methodologies for establishing the presence of perennial flow shall be provided by the director.

*Person means any individual, corporation, partnership, association, state, municipality, commission, or political subdivision of a state, governmental body, including federal, state, or local entity as applicable, any interstate body or any other legal entity.*

*Point source pollution* means pollution of state waters resulting from any discernible, defined or discrete conveyances.

*Pollution* shall be defined by Code of Virginia, § 62.1-44.3.

*Predevelopment* means the land use that exists at the time that plans for development are submitted to the town. Where phased development or plan approval occurs, the land use at the time the first item is submitted shall establish predevelopment conditions.

*Postdevelopment* means the land use that reasonably may be expected or anticipated to exist after completion of the development activity on a specific site or tract of land.

*Regulations or VSMP regulations means the Virginia Stormwater Management Program (VSMP) Regulations, 9VAC25-870, as amended.*

*Site means the land or water area where any facility or land-disturbing activity is physically located or conducted, including adjacent land used or preserved in connection with the facility or land-disturbing activity.*

*State means the Commonwealth of Virginia.*

*State permit means an approval to conduct a land-disturbing activity issued by the State Water Control Board in the form of a state stormwater individual permit or coverage issued under a state general permit or an approval issued by the State Water Control Board for stormwater discharges from an MS4. Under these state permits, the Commonwealth imposes and enforces requirements pursuant to the federal Clean Water Act and regulations, the Virginia Stormwater Management Act, and the VSMP regulations.*

*State waters means all water, on the surface and under the ground, wholly or partially within or bordering the state or within its jurisdiction, including wetlands.*

*State Water Control Law means Chapter 3.1 (§62.1-44.2 et seq.) of Title 62.1 of the Code of Virginia.*

*Stormwater means runoff from rain, snow, or other forms of precipitation and surface runoff and drainage-precipitation that is discharged across the land surface or through conveyances to one or more waterways and that may include stormwater runoff, snow melt runoff, and surface runoff and drainage.*

**Comment [d5]:** Based on discussions with DCR, the Town does not propose to create a new permit for implementation of the VSMP requirements. Rather, any land-disturbing activity, or the issuance of a permit that would allow a land-disturbing activity, is now contingent on meeting the requirements of this article.

**Comment [d6]:** Added per the model ordinance.

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*Stormwater maintenance agreement* means an agreement between a private property owner and the town that establishes the responsibilities for maintenance of stormwater management infrastructure.

*Stormwater management plan* means a document(s) containing material describing methods for complying with the requirements of section 14-23(g) of this article.

*Stormwater management system* means the series of structural and nonstructural stormwater infrastructure established to manage the quantity and or quality of stormwater runoff. The stormwater management system includes, but is not limited to, storm drains, catchbasins, inlets, pipes, open channels and ditches, facilities designed to control stormwater volume and velocity, and various BMPs designed to reduce stormwater pollution.

*Stormwater pollution prevention plan* or *SWPPP* means a document that is prepared in accordance with good engineering practices and that identifies potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges from the construction site, and otherwise meets the requirements of this article. In addition the document shall identify and require the implementation of control measures, and shall include, but not be limited to the inclusion of, or the incorporation by reference of, an approved erosion and sediment control plan, an approved stormwater management plan, and a pollution prevention plan.~~a plan consisting of steps and activities designed to identify potential sources of stormwater pollution or contamination and the establishment of practices that will prevent or reduce pollutants in stormwater runoff.~~

*Subdivision* means the same as defined in section 7.01 of the Subdivision and Land Development Regulations.

*Total Maximum Daily Load or TMDL* means the sum of the individual wasteload allocations for point sources, load allocations for nonpoint sources, natural background loading and a margin of safety. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. The TMDL process provides for point versus nonpoint source trade-offs.

*Virginia Erosion and Sediment Control Law* means Article 2.4 (§62.1-44.15:51 et seq.) of Chapter 3.1 of Title 62.1 of the Code of Virginia.

*Virginia Stormwater Management Act* means Article 2.3 (§62.1-44.15:24 et seq.) of Chapter 3.1 of Title 62.1 of the Code of Virginia.

*Virginia Stormwater BMP Clearinghouse website* means a website that contains detailed design standards and specifications for control measures that may be used in Virginia to comply with the requirements of the Virginia Stormwater Management Act and associated regulations.

*Virginia Stormwater Management Program or VSMP* means a program approved by the State Water Control Board after September 13, 2011, that has been established by a locality to manage the quality and quantity of runoff resulting from land-disturbing activities and includes such items as ordinances, rules, permit requirements, annual standards and specifications, policies and guidelines, technical materials, and requirements for plan review, inspection, enforcement, and evaluation consistent with the requirements of the Virginia Stormwater Management Act and associated regulations.

**Comment [d7]:** The term VSMP authority is left out since it is simply a reference to the Town.

*Water quality volume* or *WQV* means the volume equal to the first 0.5 inch of runoff multiplied by the total impervious area of the tax map parcel.

(Ord. No. 2007-0-21, § 1(21-4), 11-27-2007)

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**Sec. 14-20. - Purpose and findings.**

The health, safety, and welfare of the residents of the town depends on the design, development, improvement, operation, maintenance, and oversight of a program to effectively manage stormwater (quantity and quality) as well as illicit discharge to include, but not be limited to, the prevention of flood events, degradation of the town's waterways, and erosion of the town's lands. Therefore, to protect the health, safety, and welfare of residents, the town council has adopted the following stormwater quantity and quality management and erosion and sediment control program.

(Ord. No. 2007-0-21, § 1(21-1), 11-27-2007)

**Sec. 14-21. - Authority.**

This article is issued **as required by Code of Virginia §62.1-44.15:27** and under the **general** authority of **the State Water Control Law, the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and their attendant regulations. Code of Virginia, tit. 10.1, ch. 6, art. 1.1 (Code of Virginia, § 10.1-603.2 et seq.) and the state stormwater management program (VSMP) permit regulations (4 VAC 50-60 et seq.); and, the Code of Virginia, tit. 10.1, ch. 5, art. 4 (Code of Virginia, § 10.1-560 et seq.) and regulations (4 VAC 50-30 et seq.)**

**Comment [d8]:** The DEQ ordinance checklist requires a specific citation to this section of the Code of Virginia, which requires the establishment of local programs.

(Ord. No. 2007-0-21, § 1(21-2), 11-27-2007)

**Sec. 14-22. - Administration.**

The director of plan review, hereby referred to as the director, is charged with responsibility for the administration of this article. The director may, at his discretion, delegate authority to implement this article.

(Ord. No. 2007-0-21, § 1(21-4), 11-27-2007)

**Sec. 14-23. - Program components.**

(a) *Elements.* The town stormwater quantity and quality management and erosion and sediment control program shall consist of the following elements:

- (1) Illicit discharge detection and elimination;
- ~~(2)~~ **VSMP compliance;**
- ~~(3)~~ Construction site stormwater control;
- ~~(4)~~ Postconstruction stormwater control; and
- ~~(5)~~ Stormwater management system maintenance.

It shall be unlawful to cause a stormwater discharge from a municipal separate storm sewer or a land-disturbing activity without a permit from a permit issuing authority, unless such discharge is explicitly allowed without a permit under the provisions of this article.

(b) *Illicit discharge detection and elimination.* The following shall be the illicit discharge and detection and elimination requirements:

- (1) *Discharges to the stormwater management system.* It is the intent of the town to prohibit the

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entry of any substance other than stormwater, whether liquid or solid, into the stormwater management system. For illustrative purposes, prohibited substances include, but are not limited to: waste, trash, and garbage; food and kitchen waste; leakage from dumpsters or trash containers; gasoline, waste oil, lubricants, grease, antifreeze, or any other automotive, motor, or equipment fluids; fertilizers, grass clippings, mulch, and any yard waste; any chemical or solvent; soluble and non-soluble metals; wash water, detergents, and cleaning agents; paints; plastics; soot, ash, and sludge; animal waste; eroded soils and sediment; carcasses; chlorinated swimming pool water; and, any material that impedes or interferes with the free flow of stormwater.

- (2) *Unlawful.* It shall be unlawful to:
- a. Cause or allow illicit discharges to the town's stormwater management system;
  - b. Discharge materials other than stormwater to the stormwater management system by spills, dumping, or disposal without a VSMP permit;
  - c. Cause or allow industrial waste to be discharged into the stormwater management system without a VSMP permit;
  - d. Cause a connection to the stormwater conveyance system that will or has the potential to allow for an illicit discharge to enter the system; or
  - e. Violate any condition or provision of this article or any permit granted for stormwater discharges.

(c) ~~Not unlawful-illicit~~ discharge. The following activities shall not be unlawful as illicit discharges subject to the provisions in subsection (d) of this section:

- (1) Water line flushing;
- (2) Landscape irrigation;
- (3) Diverting stream flows or raising groundwater;
- (4) ~~Infiltration of u~~Uncontaminated groundwater infiltration;
- (5) Uncontaminated pumped groundwater;
- (6) Discharges from potable water sources;
- (7) Foundation drains;
- ~~(8) Pumping uncontaminated groundwater from potable water sources, foundation drains, irrigation waters, springs or water from crawl spaces or footing drains;~~
- (78) Air conditioning condensate;
- (89) Lawn watering~~Irrigation water~~;
- (10) Springs;
- (11) Water from crawl space pumps;

**Comment [d9]:** This section was adopted in 2007 as part of the Town's compliance with the discharge detection and elimination requirements of its MS4 permit. The section has been updated based on the draft MS4 Phase II regulations.

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~~(12) Footing drains;~~

~~(13) Lawn watering;~~

~~(14) Individual residential car washing on residential properties;~~

~~(15) Flows from riparian habitats and wetlands;~~

~~(16) Dechlorinated swimming pool discharges;~~

~~(11) Lawn fertilizer, provided it is applied in accordance with the manufacturer's recommendations;~~

~~(17) Street washing; and~~

~~(18) Discharges or flows from firefighting activities.~~

(d) *Written notice.* If any of the activities listed in subsection (c) of this section are found by the director to be a source of pollutants to the waters of the state, the director shall serve written notice to the person performing such activities and shall order that such activities be stopped or conducted in such manner as to avoid the discharge of pollutants. The notice shall state the date by which the activity shall cease or be conducted without pollution. Failure to comply with any such order within the time stated in the notice shall constitute a violation of this article.

(1) *Inspections and sampling.* The following shall be the procedure for inspection and sampling:

a. The director shall have authority to enter onto public and private property to carry out all inspections, surveillance, and sampling procedures necessary to determine compliance and noncompliance with the conditions of the town's VSMP permit and this article, including the prohibition of illicit discharges to the stormwater management system. The director may sample stormwater outfalls or other components of the stormwater management system as may be appropriate in the administration and enforcement of this article.

b. If an illicit discharge as defined herein is detected, it shall be a violation of this article and the owner shall be notified in writing of the actions that must be taken to correct deficiencies along with a specific time for taking corrective action. If the corrective action is not performed within the specified time, the town may perform the necessary corrections and bill the property owner. If the owner fails to reimburse the town within 30 days, the town shall have a lien against the property in the amount of such costs, plus interest at the legal rate, and may enforce same in the same manner as a lien for real property taxes may be enforced. Any relief obtained under this section shall not prevent the town from seeking other and further relief authorized under the provisions of section 14-24

c. The director is authorized to require immediate abatement of any violation of this article that constitutes an immediate threat to the health, safety or well-being of the public. If any such violation is not abated immediately as directed by the director, the town, or its designated contractor, is authorized to enter onto private property and take any and all measures required to remediate the violation. Any expense related to such remediation undertaken by the town shall be fully reimbursed by the property owner and/or responsible party. Any relief obtained under this section shall not prevent the town from seeking other and further relief authorized under the provisions of section 14-24

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d. If deemed necessary to prevent future occurrences of illicit discharges, the director shall have the authority to require a stormwater pollution prevention plan, as set forth in the DCSM, from any person whose discharge causes, or may cause, a violation of this article.

(2) *Erosion impact areas and environmentally sensitive areas.* The following shall be the provisions to determine erosion impact areas and environmentally sensitive areas:

a. The town council may designate portions of the town as erosion impact areas after conducting an investigation and a public hearing. The designated area may consist of a single parcel, or multiple parcels, and may include parcels where there is no active erosion, but where sheet flow from the parcel causes or significantly contributes to erosion on adjacent parcels.

b. The director may require the development of a conservation plan for any portion of the town designated as an erosion impact area.

c. Areas of the town consisting of slopes greater than 25 percent or consisting of highly erodible soils shall be designated as environmentally sensitive areas.

d. When a parcel in an erosion impact area or an environmentally sensitive area is subject to the construction site stormwater runoff controls of subsection (ef) of this section or the postconstruction stormwater runoff controls of subsection (fg) of this section, the director may, as a condition of approval, require the development and implementation of a conservation plan.

(e) VSMP compliance. Except as provided herein, no person may engage in any land-disturbing activity, and no grading, building, land disturbing, or similar permit shall be issued for a property, until the items required by this section are submitted to and approved by the director.

(1) VSMP compliance elements.

a. A permit application on a form provided by the director that includes a general permit registration statement;

b. Evidence of general permit coverage;

c. Compliance with construction site stormwater control requirements in subsection (f), including an approved erosion and sediment control plan and pollution prevention plan; and,

d. Compliance with postconstruction stormwater control requirements in subsection (g), including an approved stormwater management plan, and compliance with stormwater management system maintenance requirements in subsection (h).

(2) Stormwater pollution prevention plan.

a. The applicant must develop prior to a land-disturbing activity, implement, and keep at the site for inspection a stormwater pollution prevention plan that meets the requirements of this section.

b. The stormwater pollution prevention plan required by the general permit must comply with the requirements set forth in 9VAC25-870-54 and the terms of the general permit.

**Comment [d10]:** Based on discussions with DCR, this plan must be developed and be available at the site, but is not reviewed as part of the issuance of the permit in (e)(1) above.

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c. The stormwater pollution prevention plan must be amended whenever there is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to waters of the state and that is not addressed in the existing plan.

d. The stormwater pollution prevention plan must be maintained at a central location onsite. If an onsite location is unavailable, notice of the plan's location must be posted near the main entrance at the construction site. Operators must make the plan available for public review in accordance with the general permit, either electronically or in hard copy.

(3) Fees and bonds. All fees required to be paid pursuant to section 1.04 of the Subdivision and Land Development Regulations must be received and the performance bonding requirements pursuant to division 6 of the Subdivision and Land Development Regulations must be satisfied.

(4) Grandfathering. A land-disturbing activity as defined in 9VAC25-870-48 shall be grandfathered and meet the technical criteria in 9VAC25-870-93 through 9VAC25-870-99, except that the more stringent of the technical criteria in 9VAC25-870-93 through 9VAC25-870-99 or the Town Code in effect prior to July 1, 2014 shall apply to the land-disturbing activity.

(5) Monitoring and inspections.

a. The director shall inspect land-disturbing activities 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 the pollution prevention plan;
4. Development and implementation of any additional control measures necessary to address a TMDL.

b. The director, at reasonable times, and under reasonable circumstances, enter any establishment or upon any property, public or private, for the purpose of obtaining information or conducting surveys or investigations necessary in the enforcement of the provisions of VSMP compliance elements.

c. In accordance with a performance bond with surety, cash escrow, letter of credit, any combination thereof, or such other legal arrangement or instrument, the director may also enter any establishment or upon any property, public or private, for the purpose of initiating or maintaining appropriate actions which are required by the permit conditions associated with a land-disturbing activity when a permittee, after proper notice, has failed to take acceptable action within the time specified.

d. Pursuant to § 62.1-44.15:40 of the Code of Virginia, the director may require every person subject to VSMP compliance elements to furnish when requested such application materials, plans, specifications, and other pertinent information as may be necessary to determine the effect of his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of this article.

e. Post-construction inspections of stormwater management facilities required by the provisions of this article shall be conducted by the director pursuant to the town's adopted and State Water Control Board-approved inspection program, and shall occur, at minimum,

**Comment [d11]:** Refer to revised Town of Leesburg Land Development Review and Inspection Fee Schedule – Stormwater Management Fees.

**Comment [d12]:** This section was expanded from a simple reference to the grandfathering provisions to ensure that the project is subject to the more stringent of the requirements of 9VAC870-48 or the Town Code in effect prior to the effective date of these changes. It also makes explicit reference to the grandfathering technical criteria.

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at least once every five (5) years except as may otherwise be provided for in section (h).

(6) Exemptions. The following activities are exempt from the compliance elements in subsection (1) above unless otherwise required by town code or state or federal law:

a. Any land disturbance that requires only a site plan waiver or a standard zoning permit provided that the requirement for an erosion and sediment control plan in subsection (f) is met;

b. Any single-family residence separately built and disturbing less than one acre and not part of a common plan of development or sale, including additions or modifications to existing single-family detached residential structures, provided that the requirement for an erosion and sediment control plan in subsection (f) is met;

c. Any land disturbance that is less than one acre and is not part of a common plan of development or sale that will result in a land-disturbing activity of one acre or greater provided that the requirement for an erosion and sediment control plan in subsection (f) is met and that all postconstruction stormwater control requirements in subsection (g) are met with the exception of the requirements of 9VAC25-870-66;

d. Discharges to a sanitary sewer or a combined sewer;

e. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original construction of a project. The paving of existing road with a compacted or impervious surface and re-establishment of existing ditches and shoulders is deemed routine maintenance if performed in accordance with this subsection;

f. 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 director shall be advised of the disturbance within seven days of commencing the land-disturbing activity and compliance with this article shall be required within 30 days of commencing the land-disturbing activity;

g. Land disturbances associated with permitted or deep mining operations and projects, or oil and gas operations and projects conducted under the provisions of Title 45.1 of the Code of Virginia;

h. Land clearing for agricultural or silvicultural purposes, and related activities, in accordance with section 62.1-44.15:34.C.2 of the Code of Virginia; and,

i. Activities under a state or federal reclamation program to return an abandoned property to an agricultural or open land use.

(ef) *Construction site stormwater control.* The following shall be the construction site stormwater control provisions:

(1) *Minimum requirements.* Any proposed disturbance of the natural terrain of any subdivision or development where the disturbed area is greater than 500 square feet or includes the removal or addition of soil in excess of 12 inches in depth shall comply with the town's DCSM and land subdivision ordinance.

(2) *Erosion and sediment control plan.* All proposed land disturbance shall be subject to the

**Comment [d13]:** There are a number of exemptions that aren't applicable to the Town. These have been streamlined as appropriate.

**Comment [d14]:** While the Town can provide an exemption for all projects under one acre, this language exempts very small projects given that any new impervious cover adds to the Town's Chesapeake Bay TMDL requirements. A project must still meet the requirements for an erosion and sediment control plan; however, the Director has discretion under 10,000 SF of land-disturbing area to require a plan that is commensurate with the activity involved.

**Comment [d15]:** Based on a discussion with Troy Smith at DEQ, it was confirmed that the Town does not have the discretion to regulate a single-family residence that is not part of a common plan of development or sale. The authority to regulate these single-family homes is granted to Chesapeake Bay Act localities only. However, erosion and sediment control requirements still apply.

**Comment [d16]:** This section recognizes that for development under one acre, but not including (a) and (b) above, the Town still wants an erosion and sediment control plan and compliance with water quality requirements. The new more stringent water quantity requirements are not applied; rather, the adequate outfall and water quantity requirements of Minimum Standard 19 of the erosion and sediment control regulations will ensure that neighboring properties are protected.

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following construction site stormwater control requirements prior to any clearing of the site or issuance of any building, land use, or land development permit:

- a. An erosion and sediment control plan approved by the director and for disturbances over 500 square feet. In addition to director approval, for all disturbances 10,000 square feet or greater, a grading/land disturbance permit is required to be obtained from the county department of building and development.
- b. Documentation that any and all necessary permits and plans have been obtained including but not limited to permits required to meet the state pollution discharge elimination system permit regulations, wetlands permits, county grading permits as well as FEMA conditional letters of map revision.
- c. The erosion and sediment control plan shall be of sufficient detail to demonstrate, to the satisfaction of the director, compliance with the provisions of DCSM and the state erosion and sediment control handbook, whichever is more restrictive.

(3) Pollution prevention plan. A pollution prevention plan, required by 9VAC25-870-56, must detail the design, installation, implementation, and maintenance of effective pollution prevention measures to minimize the discharge of pollutants.

a. At a minimum, such measures must be designed, installed, implemented and maintained to achieve the following:

1. 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;
2. 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,
3. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

b. The pollution prevention plan shall include effective best management practices to prohibit the following discharges:

1. Wastewater from washout of concrete, unless managed by an appropriate control;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operations and maintenance; and,
4. Soaps or solvents used in vehicle equipment washing;

c. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls.

**Comment [d17]:** The pollution prevention plan is related to construction site activities. Therefore, to streamline review and ensure consistency, this requirement is proposed to be added in this section.

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(fg) *Postconstruction stormwater control.* The following shall be the postconstruction stormwater control provisions:

(1) *Minimum requirements.* All development, redevelopment, and ~~uses-land disturbing activities regulated pursuant to this article~~ within the town shall comply with the DCSM and ~~the technical criteria for land disturbing activities set forth in the regulations, as amended, whichever is greater, expressly to include 9VAC25-870-63 (water quality design criteria requirements), 9VAC25-870-65 (water quality compliance), 9VAC25-870-66 (water quantity), 9VAC25-870-72 (design storms and hydrologic methods), 9VAC25-870-74 (stormwater harvesting), 9VAC25-870-72 (linear development), 9VAC25-870-85 (stormwater management impoundment structures or facilities), and 9VAC25-870-92 (comprehensive stormwater management plans). the state stormwater management handbook, whichever is more restrictive.~~

(2) *Stormwater management plan.* ~~The stormwater management plan must apply the stormwater technical requirements of (1) above to the entire common plan of development or sale where applicable. Individual lots or parcels in a residential, commercial, or industrial common plan of development or sale shall not be considered to be separate land-disturbing activities. Instead, the common plan, as a whole, shall be considered to be a single land-disturbing activity. The plan must also consider all sources of surface runoff and all sources of subsurface and groundwater flows converted to subsurface runoff. The plan shall contain maps, charts, graphs, tables, photographs, narrative descriptions, explanations, calculations, and citations to supporting references as appropriate to communicate the information required by this article. At a minimum, the stormwater management plan must contain the following:~~

a. ~~Information on the type and location of stormwater discharges; information on the features to which stormwater is being discharged including surface waters, and the pre-development and post-development drainage areas. Any development, redevelopment, or use subject to the postconstruction stormwater control requirements contained here within shall be subject to a stormwater management plan being approved by the director prior to any clearing of the site or issuance of any building, land use, or land development permit.~~

b. ~~Contact information including the name, address, and telephone number of the owner and the tax reference and parcel number of the property or properties affected. The stormwater management plan shall be of sufficient detail to demonstrate, to the satisfaction of the director, compliance with the provisions of the DCSM and the state stormwater management handbook, whichever is more restrictive.~~

c. ~~A narrative that includes a description of current site conditions and final site conditions. The stormwater management plan shall include a copy of any and all permits and plans, including any individual or general permit for stormwater discharges associated with industrial activity, required to meet the state stormwater management program permit regulation set forth in 4 VAC 50-60-1170 et seq.~~

d. ~~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.~~

e. ~~Information on the proposed stormwater management facilities, including:~~

1. ~~The type of facilities;~~

**Comment [d18]:** This language was changed to reflect amendments to the regulations that were acted on by the SWCB on December 17, 2013.

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- 2. Location, including geographic coordinates;
- 3. Acres treated; and,
- 4. The surface waters into which the facility will discharge.
- f. Hydrologic and hydraulic computations, including runoff characteristics.
- g. Documentation and calculations verifying compliance with the water quality and water quantity requirements of (1) above.
- h. A map or maps of the site that depicts the topography of the site and includes:
  - 1. All contributing drainage areas;
  - 2. Existing streams, ponds, culverts, ditches, wetlands, other water bodies, and floodplains;
  - 3. Soil types, relevant geological formations, forest cover, and other vegetative areas;
  - 4. Current land use including existing structures, roads, and locations of known utilities and easements;
  - 5. Sufficient information on adjoining parcels to assess the impacts of stormwater from the site on these parcels;
  - 6. The limits of clearing and grading, and the proposed drainage patterns on the site;
  - 7. Proposed buildings, roads, parking areas, utilities, and stormwater management facilities; and,
  - 8. Proposed land use with tabulation of the percentage of surface area to be adapted to various uses, including but not limited to planned locations of utilities, roads, and easements.
- i. If an operator intends to meet the water quality requirements set forth in (1) above through the use of off-site credits in accordance with section (3), then a letter of availability from the off-site provider must be included. Approved off-site options must achieve the necessary reductions prior to the commencement of the applicant's land-disturbing activity except as otherwise allowed by section 10.603.8:1 of the Code of Virginia.
- j. Elements of the stormwater management plan that include activities regulated under Chapter 4 (§ 54.1-400 et seq.) of Title 54.1 of the Code of Virginia shall be appropriately sealed and signed by a professional registered in the Commonwealth of Virginia pursuant to Article 1 (§ 54.1-400 et seq.) of Chapter 4 of Title 54.1 of the Code of Virginia.
- k. A construction record drawing for permanent stormwater management facilities shall be submitted to the director. The construction record drawing shall be appropriately sealed and signed by a professional registered in the Commonwealth of Virginia certifying that the stormwater facilities have been constructed in accordance with the approved plan.

(3) Nutrient credit offsets.

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a. The director shall allow operators to utilize off-site compliance options in accordance with 9VAC25-870-69 under the following conditions:

1. Less than five acres of land will be disturbed;
2. The postconstruction phosphorus control requirement is less than 10 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 director that (i) alternative site designs have been considered that may accommodate on-site best management practices, (ii) on-site best management practices have been considered in alternative site designs to the maximum extent practicable, (iii) appropriate on-site best management practices will be implemented, and, (iv) full compliance with postdevelopment nonpoint 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.

b. The director may establish criteria for an operator to use nutrient credits in accordance with § 62.1-44.15:35 of the Code of Virginia to meet required phosphorus reductions that do not meet the conditions of subsection a of this section.

c. Notwithstanding subsections a and b of this section, offsite options shall not be allowed:

1. Unless the selected offsite option achieves the necessary nutrient reductions prior to the commencement of the operator's land-disturbing activity. In the case of a phased project, the operator may acquire or achieve offsite nutrient reductions prior to the commencement of each phase of land-disturbing activity in an amount sufficient for each phase.
2. In contravention of local water quality-based limitations at the point of discharge that are (i) consistent with the determinations made pursuant to subsection B of § 62.1-44.19:7 of the Code of Virginia, (ii) contained in the town's MS4 program plan accepted by the department, or (iii) as otherwise may be established or approved by the State Water Control Board.

**Comment [d19]:** This language provides the director with the flexibility to establish additional criteria for the use of nutrient credits. Such an approach may be used where the Town is looking to achieve higher densities or where on-site BMPs conflict with other Town plans and policies.

(4) Stormwater management plan review.

a. The director shall review stormwater management plans and shall approve or disapprove a stormwater management plan according to the following:

1. The director shall determine the completeness to review a plan in accordance with section (f)(2) of this section, and shall notify the applicant, in writing, of such determination, within 15 calendar days of receipt. If the plan is deemed to be incomplete, the above written notification shall contain the reasons the plan is deemed incomplete.
2. The director shall have an additional 60 calendar days from the date of the communication of completeness to review the plan, except that if a determination of

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completeness is not made within the time prescribed in subsection (a), then plan shall be deemed complete and the Administrator shall have 60 calendar days from the date of submission to review the plan.

3. The director shall review, any plan that has been previously disapproved, within 45 calendar days of the date of resubmission.

4. During the review period, the plan shall be approved or disapproved and the decision communicated in writing to the person responsible for the land-disturbing activity or his designated agent. If the plan is not approved, the reasons for not approving the plan shall be provided in writing. Approval or denial shall be based on the plan's compliance with the requirements of this chapter.

5. If a plan meeting all requirements of this article is submitted and no action is taken within the time provided above in subsection (b) for review, the plan shall be deemed approved.

b. Approved stormwater plans may be modified as follows:

1. Modifications to an approved stormwater management plan shall be allowed only after review and written approval by the director. The director shall have 60 calendar days to respond in writing either approving or disapproving such request.

2. The director may require that an approved stormwater management plan be amended, within a time prescribed by the Administrator, to address any deficiencies noted during inspection.

c. The director shall require the submission of a construction record drawing for permanent stormwater management facilities. The director may elect not to require construction record drawings for stormwater management facilities for which recorded maintenance agreements are not required pursuant to (h) below.

(5) Exceptions.

a. The director may grant exceptions to the technical requirements of (1) above provided that the exception is the minimum necessary to afford relief, reasonable and appropriate conditions are imposed so that the intent of this article is preserved, granting the exception will not confer any special privileges that are denied in other circumstances, and exception requests are not based on conditions or circumstances that are self-imposed or self-created. Economic hardship alone is not sufficient reason to grant an exception.

1. Exceptions to the requirement that the land-disturbing activity obtain a general permit shall not be given by the director, nor shall the director approve the use of a BMP not found on the Virginia BMP Clearinghouse website or any other control measure duly approved by the Department.

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2. Exceptions to requirements for phosphorus reductions shall not be allowed unless offsite options otherwise permitted pursuant to 9VAC25-870-69 have been considered and found not available.

b. The director may grant exceptions to the water quantity requirements of 9VAC25-870-66 in cases where stormwater detention would conflict with the town's flood management programs.

(gh) Stormwater management system maintenance. The following shall be the stormwater management system maintenance requirements:

(1) *Minimum maintenance requirements.* The owner of any component of the stormwater management system shall provide adequate maintenance to ensure that the system functions as designed. The following requirements apply to all existing and future facilities constructed in the town:

a. The owner shall enter into a maintenance agreement with the town that outlines facility-specific maintenance requirements. The maintenance agreement shall be set forth in an instrument recorded in the county land records and shall provide all necessary provisions to ensure compliance with this section. Maintenance agreement forms shall be prepared in a format acceptable to the ~~director~~ Director of Public Works and the town attorney.

b. On completion of construction and town approval of a new BMP or system of BMPs, the owner shall enter into a two-year performance for maintenance bond with the town in an amount approved by the ~~Director of Public Works~~ Director as being equivalent to two years of routine maintenance of the facility. Performance for maintenance bond forms shall be provided by the ~~Director of Public Works~~ Director. The performance for maintenance bond shall be released only after an inspection by the ~~Director of Public Works~~ Director determines that the facility has been maintained and functions as designed.

c. The owner shall prepare and submit an annual certification of maintenance to the town.

1. Certification shall be made by a registered engineer or licensed surveyor (qualified to perform such routine inspections) using a certification of maintenance form provided by the ~~Director of Public Works~~ Director.

2. Such certification shall state the general condition of the facility and also state whether the infrastructure is functioning properly as originally designed.

3. If the facility is not functioning as designed, a plan for proposed remedial actions and a timeline for completion shall be noted in the certification report. The plan and timeline for completion are subject to the approval of the ~~Director of Public Works~~ Director. If the ~~Director of Public Works~~ Director determines that the proposed plan and timeline for completion is insufficient to protect the public health, safety, and welfare, the owner of the facility must either submit a new plan and timeline, or alternatively, the director may take action in accordance with subsection (d)(2) of this section. Once remedial actions have been completed, the owner shall submit a new certification in accordance with subsections (g)(1)a and b of this section.

**Comment [d20]:** The Town has expressed concern to DCR that it needs to have the flexibility to waive requirements that conflict with flood control requirements and plans. In the meeting with DCR, it was agreed that DCR would provide additional guidance during the ordinance development process.

**Comment [d21]:** The new regulations require that each owner provides proof of maintenance and inspections. Since the Town already does this, no major revisions are needed.

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(2) *Inspections and access.* The owner shall provide the town with access to the facility to perform quality assurance and performance inspections. Failure to provide access shall be considered a violation of this article under section 14-24. If inadequate maintenance is observed by the town, the owner shall be notified in writing of the actions that must be taken to correct deficiencies along with a specific time for taking corrective action. If the corrective action is not performed within the specified time, the town may perform the necessary corrections and bill the property owner. If the owner fails to reimburse the town within 30 days, the town shall have a lien against the property in the amount of such costs, plus interest at the legal rate, and may enforce same in the same manner as a lien for real property taxes may be enforced. In addition to performing required maintenance, sanctions may be imposed as provided in section 14-24

~~(3) *Stormwater pollution prevention plans.* The owner shall, on an annual basis, provide the town with proof of compliance with any stormwater pollution prevention plan developed to comply with the state pollutant discharge elimination system permit regulation set forth in 9 VAC 25-31 et seq., or section 5-100 et seq., of the DCSM.~~

(43) *Applicable facilities.* The ~~Director of Public Works~~director shall have the ability to enforce the maintenance requirements noted herein for all stormwater systems within the town's corporate limits to include proposed facilities as well as existing facilities.

(Ord. No. 2007-0-21, § 1(21-5), 11-27-2007)

**Sec. 14-24. - Violations.**

(a) *Conflicting provisions.* If the penalties noted herein should ever contradict with ~~or be less than~~ future penalties implemented by the ~~state State soil and water conservation board~~Water Control Board, the penalties defined by the ~~state State soil and water conservation board~~Water Control Board shall govern and supersede those noted herein.

~~(b) *Civil penalty.* The following shall be the civil penalties for violation of this chapter:~~

~~(1) Any person who, intentionally or otherwise, commits any of the acts prohibited by section 14-23(b) shall be liable to the town for all costs of testing, containment, cleanup, abatement, removal, and disposal of any substance unlawfully discharged into the stormwater management system.~~

~~(2) Without limiting the remedies that may be obtained under this section, the town may bring a civil action against any person for violation of this article. The action may seek the imposition of a civil penalty of not more than \$2,000.00 against the person for each violation.~~

~~(3) The town may petition the circuit court to enjoin a violation or a threatened violation of this article without the necessity of showing that an adequate remedy at law does not exist.~~

~~(4) In lieu of section 14-24(b)(2), with the consent of any person who has violated or failed, neglected or refused to obey the provisions of this article, the town may provide, in an order issued by the director against such person, for the payment of civil charges for violations, in specific sums, not to exceed the limit specified in section 14-24(b)(2). Such civil charges shall be in lieu of any appropriate civil penalty, which could be imposed under section 14-24(b)(2).~~

~~(5) The remedies set forth in this section shall be cumulative, not exclusive, and it shall not be a~~

**Comment [d22]:** This section references the VPDES industrial SWPPPs. They are required to provide these to the Town in the industrial permits, so this is redundant.

**Comment [d23]:** The State Water Control Board now has authority over the Virginia Stormwater Management Regulations.

**Comment [d24]:** The Town's current enforcement section has been replaced with language from the model ordinance. .

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~~defense to any action that one or more of the remedies set forth in this section has been sought or granted.~~

~~(6) Civil penalties imposed as a result of this section shall be paid into the town's general fund, except that where the violator is the town itself or its agent, the civil charges shall be paid into the treasury of the commonwealth.~~

(b) Penalties.

(1) If the director determines that there is a failure to comply with the permit conditions, notice shall be served upon the permittee or person responsible for carrying out the permit conditions by registered or certified mail to the address specified in the permit application, or by delivery at the site of the development activities to the agent or employee supervising such activities.

a. The notice shall specify the measures needed to comply with the permit conditions and shall specify the time within which such measures shall be completed. Upon failure to comply within the time specified, a stop work order may be issued in accordance with subsection b or the permit may be revoked by the director. The director may also pursue enforcement in accordance with this section.

b. If a permittee fails to comply with a notice issued in accordance with this section within the time specified, the director may issue an order requiring the owner, permittee, person responsible for carrying out an approved plan, or the person conducting the land-disturbing activities without an approved plan or required permit to cease all land-disturbing activities until the violation of the permit has ceased, or an approved plan and required permits are obtained, and specified corrective measures have been completed.

Such orders shall become effective upon service on the person by certified mail, return receipt requested, sent to his address specified in the land records of the locality, or by personal delivery by an agent of the director. However, if the director finds that any such violation is grossly affecting or presents an imminent and substantial danger of causing harmful erosion of lands or sediment deposition in waters within the watersheds of the Commonwealth or otherwise substantially impacting water quality, it may issue, without advance notice or hearing, an emergency order directing such person to cease immediately all land-disturbing activities on the site and shall provide an opportunity for a hearing, after reasonable notice as to the time and place thereof, to such person, to affirm, modify, amend, or cancel such emergency order. If a person who has been issued an order is not complying with the terms thereof, the director may institute a proceeding for an injunction, mandamus, or other appropriate remedy in accordance with subsection 2.

(2) In addition to any other remedy provided by this article, if the director or his or her designee determines that there is a failure to comply with the provisions of this article, they may initiate such informal and/or formal administrative enforcement procedures in a manner that is consistent with the DCSM or other policies adopted by the director.

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(3) Any person violating or failing, neglecting, or refusing to obey any rule, regulation, ordinance, order, or any permit condition issued by the director or any provisions of this article may be compelled in a proceeding instituted in any appropriate court by the town to obey same and to comply therewith by injunction, mandamus or other appropriate remedy.

(4) Any person who violates any provision of this article or who fails, neglects or refuses to comply with any order of the town, the department, State Water Control Board, or court, shall be subject to a civil penalty not to exceed \$32,500 for each violation within the discretion of the court. Each day of violation of each requirement shall constitute a separate offense.

a. Violations for which a penalty may be imposed under this subsection shall include but not be limited to the following: i) no permit registration, ii) no stormwater pollution prevention plan, iii) incomplete stormwater pollution prevention plan; iv) stormwater pollution prevention plan not available for review; v.) no approved erosion and sediment control plan; vi) failure to install stormwater BMPs or erosion and sediment controls; vii) stormwater BMPs or erosion and sediment controls improperly installed or maintained; viii) operational deficiencies; ix) failure to conduct required inspections; x) incomplete, improper, or missed inspections.

b. The town may issue a summons for collection of the civil penalty and the action may be prosecuted in the appropriate court.

c. In imposing a civil penalty pursuant to this subsection, the court may consider the degree of harm caused by the violation and also the economic benefit to the violator from noncompliance.

d. Any civil penalties assessed by a court as a result of a summons issued by the town shall be paid into the treasury of the town to be used for the purpose of minimizing, preventing, managing, or mitigating pollution of the waters of the locality and abating environmental pollution therein in such manner as the court may, by order, direct.

(5) Notwithstanding any other civil or equitable remedy provided by this section, any person who willfully or negligently violates any provision of this chapter, any order of the town or the department, any condition of a permit, or any order of a court shall be guilty of a misdemeanor punishable by confinement in jail for not more than 12 months and a fine of not less than \$2,500 nor more than \$32,500, either or both.

(6) Any person who knowingly violates any provision of this chapter, any regulation or order of the State Water Control Board or the town, any condition of a permit or any order of a court as herein provided, or who knowingly makes any false statement in any form required to be submitted under this article or knowingly renders inaccurate any monitoring device or method required to be maintained under this article, shall be guilty of a felony punishable by a term of imprisonment of not less than one year nor more than three years, or in the discretion of the jury

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or the court trying the case without a jury, confinement in jail for not more than 12 months and a fine of not less than \$5,000 nor more than \$50,000 for each violation.

Any defendant that is not an individual shall, upon conviction of a violation under this subsection, be sentenced to pay a fine of not less than \$10,000. Each day of violation of each requirement shall constitute a separate offense.

(7) Any person who knowingly violates any provision of this chapter, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily harm, shall, upon conviction, be guilty of a felony punishable by a term of imprisonment of not less than two years nor more than 15 years and a fine of not more than \$250,000, either or both. A defendant that is not an individual shall, upon conviction of a violation under this subsection, be sentenced to pay a fine not exceeding the greater of \$1 million or an amount that is three times the economic benefit realized by the defendant as a result of the offense. The maximum penalty shall be doubled with respect to both fine and imprisonment for any subsequent conviction of the same person under this subsection.

(Ord. No. 2007-0-21, § 1(21-6), 11-27-2007)

**Sec. 14-25. - Hearings.**

(a) Any applicant, or person subject to this article aggrieved by any action of the town taken without a formal hearing, or by inaction of the town, may demand in writing a formal hearing by the town council, provided a petition requesting such hearing is filed with the director within 30 days after notice of such action is given by the director.

(b) The hearings held under this section shall be conducted by the town council at a regular or special meeting of the town council or by at least one member of the town council designated by the town council to conduct such hearings on behalf of the town council at any other time and place authorized by the town council.

(c) A verbatim record of the proceedings of such hearing shall be taken and filed with the town council. Depositions may be taken and read as in actions at law.

(d) The town council or its designated member, as the case may be, shall have power to issue subpoenas and subpoenas duces tecum, and at the request of any party shall issue such subpoenas. The failure of a witness without legal excuse to appear or testify or to produce documents shall be acted upon by the town whose action may include the procurement of an order of enforcement from the circuit court. Witnesses who are subpoenaed shall receive the same fees and reimbursements for mileage as in civil actions.

**Sec. 14-26. - Appeals.**

(a) Final decisions of the director under this article shall be in writing and be subject to review by the town manager. Any appeal shall be filed with the town manager within 30 days from the date of any written decision by the department of plan review which adversely affects the rights, duties, or

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privileges of the persons engaging in or proposing to engage in land disturbing activities.

(b) All appeals must be written and must contain sufficient information to acquaint the town manager with the facts involved.

(c) A final decision of the town manager may be appealed to the town council, provided that a written appeal is filed with the town manager within 30 days after the date of his decision.

(d) A final decision of the town is subject to review by the circuit court of Loudoun County, provided that the appeal is filed within 30 days of the town council's action.

## ARTICLE 5

### STORM DRAINAGE

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**Comment [d1]:** Merged into Section 5-300 since the state technical criteria and the Virginia Stormwater BMP Clearinghouse apply to both water quality and quantity control.

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DD-6	Intentionally Left Blank	
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DD-8	Intentionally Left Blank	
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**Comment [d2]:** Removed. Now referenced in the text as being available on the Town's web page.

## ARTICLE 5

### STORM DRAINAGE

#### SECTION 5-100 GENERAL INFORMATION

1. The overall drainage system will consist of a major and a minor drainage system.
  - A. ~~Minor-The minor~~ drainage systems ~~will consists~~ of open channels and/or closed storm sewer appurtenances and conduit drainage systems such as inlets, manholes, street gutters, roadside ditches, swales, underground pipe, and small channels from the point of interception to the point of discharge in all developments.
  - B. ~~Major-The major~~ drainage systems ~~will consists~~ of natural waterways, ~~stormwater management and or BMP ponds as well as some less-obvious~~ drainage ways such as overland relief swales and paths. The major system ~~includes not only natural waterways, stormwater management and or BMP ponds which receives the water from the minor system, but also~~ includes the natural backup system which functions in case of overflow from or failure of the minor system. Therefore, the major drainage system shall be designed to provide overland relief to convey the 100-year rainfall event as if the minor system has failed to function or did not exist.
  - C. Overland relief requirements ~~can be are~~ found in Section 5-200 ~~of this manual~~.
  - D. ~~Either system may also involve the use of stormwater management facilities, wet or dry, and may include the use of larger regional facilities may include stormwater quantity and/or quality management facilities, including regional stormwater management facilities,~~
2. ~~Equations presented herein are those that are most often used. Specific references for methods used are provided for the designer. The designer may choose to use other methods other than those provided; however, the validity and applicability of those methods must be demonstrated and references provided.~~

**Comment [d3]:** This language is redundant.

**Comment [d4]:** Section B and Section D seemed to conflict, with Section B stating that stormwater facilities were part of the major drainage system and Section D stating that they could be part of either. Removed the language from Section B and placed it in Section D assuming that stormwater facilities could be part of the major or minor systems.

Also, throughout the text, changed the older term BMP to the more frequently used term stormwater management facility.

**Comment [d5]:** Per discussions with the Town, the manual will reference equations rather than include them. This change is further highlighted in Section 5-120.

~~3-2.~~ When development proposes to:

- A. Relocate existing storm drainage lines/stormwater management facilities;
- B. Encroach upon existing storm drainage lines/stormwater management easements with physical improvements;
- ~~B-C.~~ Reduce cover over existing storm drainage lines to less than that specified by this ~~manual~~DCSM; or
- ~~C-D.~~ Increase cover over existing storm drainage lines to more than that specified by this ~~manual~~DCSM; then.

The ~~Developer~~developer shall be responsible for replacement of the storm drainage line/stormwater management facility on a new location during development of the property. Such replacement shall be to the standards and specifications set forth in this ~~manual~~DCSM, shall be approved by the Director, and shall be at no cost to the ~~town~~Town.

**5-110 Intent**

~~It is the~~ intent of this Article is to require that all components of the drainage system the design of as well as the performance of all drainage facilities meet or exceed applicable ~~drainage laws~~stormwater management laws and regulations.

**5-120 RemarksReferences**

~~The following documents are included by reference for storm drainage design within the Town of Leesburg limits~~The following regulations and technical documents are included by reference for storm drainage system design and performance standards within the Town of Leesburg. Applicable provisions of these regulations and technical documents are referenced as appropriate in this DCSM. Where there is a conflict between the standards presented in this DCSM and the regulations and technical documents reference in this section, the more stringent of the standards will apply unless otherwise modified by the Director:

1. Virginia Stormwater Management Program (VSMP) Permit Regulations, 9VAC25-870 et al.
2. Virginia Erosion and Sediment Control Regulations, 9VAC25-840 et al.

**Comment [d6]:** Standardized and expanded references as needed.

3. Virginia Chesapeake Bay Preservation Area Designation and Management Regulations, 9VAC25-830 et al.
- ~~1-4.~~ Virginia Erosion and Sediment Control Handbook, Virginia Department of Environmental Quality (DEQ), latest edition.
- ~~2-5.~~ ~~The~~ Virginia Department of Transportation Drainage Manual, Virginia Department of Transportation (VDOT), latest edition. ~~prepared by the Location and Design Division, Hydraulic Section, latest edition, as amended, Virginia Department of Transportation.~~
- ~~3-6.~~ ~~The~~ Virginia Department of Transportation Road and Bridge Specifications, VDOT, ~~Latest~~ latest edition.
- ~~4-7.~~ ~~The~~ Virginia Department of Transportation Road and Bridge Standards, VDOT, latest edition. ~~, Latest edition.~~
- ~~5-8.~~ Urban Hydrology for Small Watersheds (TR-55), Soil Conservation Services, Washington, D.C., National Technical Information Service, Springfield, Virginia 22161, latest edition, ~~Latest edition~~ or (NCRS version WIN TR-55, Latest latest edition.)
- ~~6-9.~~ TR-20 Project Formulation -- Hydrology Soil Conservation Service, Lanham, Maryland, National Technical Information Service, Springfield, Virginia 22161, Latest edition, or (NCRS version WIN TR-20, Latest latest edition.)
10. Virginia Stormwater Management Handbook, ~~Published by the Virginia Department of Conservation and Recreation (DCR)DEQ~~, ~~Latest~~ edition.
11. Virginia Stormwater BMP Clearinghouse, DEQ and the Virginia Water Resources Research Center (VWRRC) at Virginia Tech, latest edition.
12. Modern Sewer Design, American Iron and Steel Institute, latest edition.
13. Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe, ASTM Standard C76, 2013a, ASTM International, West Conshohocken, PA, 2013, DOI: 10.1520/C0076-31A.

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14. Design of Riprap Revetment, Federal Highway Administration (FHWA), Hydraulic Engineering Circular No. 11 (HEC 11), FHWA-IP-89-016, Washington, DC, 1989.
15. Hydraulic Design of Energy Dissipaters for Culverts and Channels, FHWA, Hydraulic Engineering Circular No. 14 (HEC 14), FHWA-NHI-06-086, Washington, DC, 2006.
16. Design of Roadside Channels with Flexible Linings, FHWA, Hydraulic Engineering Circular No. 15 (HEC 15), FHWA-NHI-05-114, Washington, DC, 2005.
17. Methodology for Identification of Intermittent and Perennial Streams and Their Origins, North Carolina Department of Environment and Natural Resources, Division of Water Quality, latest edition.
- 7-18. Other regulations and technical documents as approved by the Director.

~~8. 8Virginia Chesapeake Bay Preservation Area Designation and Management Regulations, Published by the Virginia Department of Conservation and Recreation (DCR) Latest edition~~

~~9~~For ~~Additional~~additional ~~References~~references and definition of terms used within this Article, refer to Article 11 of ~~the~~this DCSM.

(End of Section)

## SECTION 5-200 POLICY FOR ADEQUATE STORM DRAINAGE

### 5-210 General

1. An evaluation shall be performed for all proposed drainage systems to ensure adequate hydraulic capacity for conveyance of the minimum ten-year event including, but not limited to channels, stormwater management facilities, and conduits.
2. Hydraulic capacity must be verified with engineering calculations, in accordance with the procedures outlined in the Virginia Erosion and Sediment Control Handbook, the Virginia Department of Transportation Drainage Manual, the Virginia Stormwater Management Handbook, [the Virginia Stormwater BMP Clearinghouse](#), or other methods acceptable to the Director.
3. The drainage system must have the hydraulic capacity to accommodate the maximum expected flow of surface waters from a drainage area at a point of concentration for the duration and intensity of rainfall, as specified herein.
4. Determination of the size and capacity of the drainage system shall be based on the planned development, existing zoning, or Town Plan, whichever is greater, within the watershed.
5. Due consideration must be given to infrequent events (100-year) resulting in runoff quantities greater than minor system design capacity. ~~The Therefore,~~ [the](#) design for the major drainage system shall provide for overland relief of the 100-year event without flooding or damaging buildings and structures, generally without reliance upon the minor drainage system. Specifically, all construction plan sets shall contain provisions for the 100--year overland relief as follows:
  - A. If the area draining to a low point inlet is equal to or less than one (1) acre, a minimum of one (1) foot shall be provided from the lowest opening of any building to the ground elevation at the relief point along any point of the path of overland relief. The designer shall also have the option to use engineering calculations and cross sections to determine the actual 100--year water surface for any size drainage area and provide the required freeboard as noted below for drainage areas in excess of one (1) acre.

- B. If the area draining to a low point inlet is greater than one (1) acre, engineering calculations and cross sections shall be provided to verify that the lowest point of entry of all buildings will be a minimum of 6 inches vertically above the 100-year water surface at the relief point along the overland relief pathways (to a minimum 6 inches of freeboard). Where the area of overland relief is restricted and the applicant can prove that adjacent and downstream structures will not be flooded or damaged by the 100-year overland relief flow, the Director may, on a case by case basis reduce the amount of freeboard required for the 100-year overland relief water surface to zero (0) feet such that the 100-year water surface elevation is at the elevation of the lowest opening of the building or structure.
- C. Unless the construction drawings depict a minimum of one foot of freeboard has been provided from the 100-year water surface to the lowest opening of an adjacent building(s), an as-built drawing shall be provided, prior to issuance of an occupancy permit, to specifically depict the controlling elevation along the path of overland relief as well as the elevation of the lowest opening of any adjacent building(s) to ensure the site has been constructed in conformance with the approved plans and that the adjacent buildings will not flood during the 100-year rain storm event.
- D. On a case by case basis, the Director may approve a ~~\*~~modification to the requirements set forth in this section of the DCSM to permit calculations associated with the proposed development to consider a portion of the upstream and/or onsite 100-year “overland” relief flow to be routed through the underground storm pipe drainage system when:
- (1) The overland relief path is restricted by site constraints beyond the applicant’s control; and
  - (2) The underground storm drainage system consists of a RCP pipe 48 inches (or equivalent) and larger in diameter; and
  - (3) The storm inlets are designed to capture the portion of the 100-year storm event to be routed through the underground pipe; and

- (4) The underground storm system pipe has been designed to have capacity for the required 10--year flow plus the portion of the 100--year flow to be utilized in the underground pipe drainage system; typically, no more than 50% of the 100--year overland relief flow will be allowed to be routed through the underground pipe drainage system.

\*A modification request may not be required for overland relief calculations that only analyze offsite downstream properties.

6. The drainage system shall be designed:
  - A. To generally honor all natural drainage divides and create no adverse impact on downstream properties.
  - B. To account for all off-site and on-site surface water.
  - C. To manage, convey, and discharge surface waters as outlined in the Virginia Stormwater Management Handbook, to a natural watercourse, i.e., a natural watercourse at the natural elevation.
  - D. To manage, convey, and discharge surface waters to a stormwater detention-management facility of sufficient capacity and pollutant removal efficiency to ~~accommodate the design year event, as stipulated~~ meet the requirements of Section 5-300 "Policy for Stormwater Management." The Director may require additional design criteria based on the watershed's special requirements, as identified in the Town's Stormwater Master Plan.
  - E. To protect residences and other occupied structures from being inundated with stormwater.
  - F. To not increase stormwater sheet flow (non-concentrated) into a lower-lying property.
  - G. To preserve adequate natural channel characteristics to the extent practicable.
  - H. ~~To ensure that the post-development peak runoff rate is based on documentation and computations, including sheet flow, and does not~~

~~exceed the pre development peak rate where downstream adequate outfall does not exist.~~

H. To provide (if the above conditions are not met) a drainage system satisfactory to the Director, to provide ~~an acceptable adequate~~ outfall in accordance with ~~the stormwater requirements in this DCSM Section 5-311 of this Article,~~ and to preclude adverse impacts upon adjacent or downstream properties.

7. Except where prohibited by ~~Chapter 14 of the Town Code~~ Section 14-23 of the Town Code, the ~~Owner-owner~~ or ~~Developer-developer~~ may continue to discharge stormwater as sheet flow (non-concentrated) into a lower-lying property if at the same location:

A. The post-development peak runoff rate based on documentation and computations, including sheet flow, does not exceed the pre-development peak rate; ~~and/or~~

B. If the above conditions are not met, the developer must provide a drainage system satisfactory to the Director, to preclude adverse impacts upon adjacent or downstream properties.

8. The ~~Owner-owner~~ or ~~Developer-developer~~ may not discharge stormwater which has been artificially concentrated by a pipe, culvert, channel, or other drainage structure, onto or through lands of another without first obtaining and transferring to the Town a permanent storm drainage easement to guarantee continuity of an outfall from the point of discharge to the nearest ~~natural watercourse~~ stormwater conveyance system. Refer to Section 5-~~311-700~~ for Adequate Outfall.

**Comment [d7]:** Revised to "stormwater conveyance system" per AMEC recommendation and staff agreement.

9. If off-site downstream construction and easements are required to ~~construct an adequate~~ provide channel ~~outfall protection or flood protection~~, no plans shall be approved until such storm drainage easements, ~~extending to the nearest natural watercourse~~ have been obtained and recorded. It will be the responsibility of the ~~Developer-developer~~ to obtain all off-site easements.

10. Storm sewer systems shall be designed in a manner such that their outfalls:

A. Are designed to reduce erosion of surrounding soils.

B. Discharge at a natural watercourse:

- (1) Generally, it is better to discharge at the 100-year flood plain limits into an adequate channel leading to the main stream bed, rather than disturb the flood plain by extending the storm sewer system.
- (2) If there is no well-defined adequate receiving channel at the flood plain limits, one shall be constructed to the bed and banks of the main channel. If wetlands are encountered, the Director may on a case by case basis approve a modification to utilize a forebay or other type of an energy ~~dissipater~~ dissipation device at the pipe outfall to minimize the impact to existing wetlands areas.

C. Discharge at other locations:

- (1) Energy dissipation devices and/or friction channel linings shall be used when discharge velocities exceed the maximum permissible as defined by the Virginia Erosion and Sediment Control Handbook, or at the discretion of the Director where non-uniform channel linings are involved. -Generally, the use of natural rock located on the subject development site is encouraged when the equivalency can be met by a geotechnical engineer's written certification of the material.
  - a. 2 FPS to 5 FPS velocity: Sod protection (Kentucky Blue Grass or equally resistant sod or other material as approved by the Director) or VDOT CLI Rip Rap or current equivalent as noted above.
  - b. 5 FPS to 8 FPS velocity: VDOT CLI Rip Rap or current equivalent as noted above; Length of Rip Rap to be determined per-in accordance with the Virginia ~~E&S~~ Erosion and Sediment Control Handbook.
  - c. 8 to -18 FPS velocity: VDOT CL II dry Rip Rap (VDOT Specification 418.04) or current equivalent as noted above; Length of Rip Rap to be determined per-in

accordance with the Virginia E&S Erosion and Sediment Control Handbook.

- d. Velocities in excess of 18 FPS: Shall only be permitted with special design energy dissipaters dissipation devices or impact basins and only with the approval of the Director.
- D. Shall not discharge in the front yard of any single family detached or attached lot. The outfall shall discharge at the rear lot line and meet all criteria noted in this manua!DCSM.
- 11. Except as set forth in Section 5-420, paragraph two, Policy on Use in Flood Plain Areas, all drainageways, including overland relief pathways, must be separated from buildings as stated in this section of the-this DCSM.
- 12. Plans shall be prepared to preclude adverse impacts due to higher flow rates that may occur during construction. Refer to Article 6 of this ManualDCSM.
- 13. Drainage structures shall be designed and constructed in such a manner that they may be maintained at a reasonable cost and with methods and types of equipment currently used by the town.
  - A. To facilitate design, construction, and maintenance, drainage facilities shall meet and conform to the Town of Leesburg and Virginia Department of Transportation Standards.
  - B. Special alternative designs for reinforced concrete special structures and for reinforced concrete prefabricated pipe junctions (pipe 60" diameter and larger) shall be considered by the Director on a case-by-case basis provided they are designed and documented.
    - (1) All structures and pipe junctions shall be by use of VDOT standard reinforced concrete structures unless a specific alternative design is approved by the Director. Specific alternative designs will not be approved if a standard structure will perform the function.
    - (2) Alternative designs which have received VDOT pre-approval are required if the structure is located within a Town road right-

of-way and are preferred in other locations; however, an alternative design prepared by a structural engineer licensed to practice in the Commonwealth of Virginia is acceptable under the following conditions:

- a. The structure is not located within a Town road right-of-way.
  - b. The structure or junction is prefabricated by a manufacturer normally engaged in reinforced concrete pipe and structure manufacture.
  - c. All structural design, signed, sealed and dated (original seal affixed), is provided to the town. The structural design shall not be included on the construction drawings as the town will not review or approve the structural design which shall remain the responsibility of the engineer of record.
  - d. Construction details delineating how the special structure or the prefabricated pipe junction is to be incorporated into the drainage system, and detailing the assembly of the entire drainage structure shall be included in the construction drawings.
- (3) Manhole access shall be provided at each special structure and at each prefabricated pipe junction:
- a. Minimum 4' diameter manhole.
  - b. Manhole step side shall align with pipe springline to provide standard manhole steps and straight line access from pipe springline to ground surface. Manhole steps shall not span any pipe opening greater than 15".
- (4) Small diameter pipe (less than 60" diameter) which enter drainage structures which contain a prefabricated pipe junction shall:

- a. Enter the access manhole at the lowest elevation possible above the prefabricated pipe junction casting.

OR

- b. Shall be included as an integral part of the prefabricated pipe junction casting.
- c. In no case shall small diameter pipes be field connected into the prefabricated pipe junction.

14. In order to protect downstream properties from flooding, erosion, sedimentation, and/or other damages, the ~~Developer-developer~~ must show, with appropriate engineering calculations approved by the Director, that the existing off-site downstream drainage system can accommodate the drainage from the developing property without damage to existing facilities, properties, or buildings in accordance with Section 5-300 of this DCSM.

~~The Developer may choose to:~~

- ~~A. Install on-site storm water detention to minimize the downstream impacts. However, the town may require pro-rata share contributions in areas where downstream pro-rata share improvements have been installed and/or stormwater detention is not in the best interest of the overall drainage system as defined in the Stormwater Management Master Plan. The Developer must demonstrate that there is no increase of downstream flooding for the post developed managed peak discharge. Concentrated flow from management facilities must be enclosed in a public easement as required by this article.~~
- ~~B. Contribute his proportionate share toward the correction of off-site outfall deficiencies in those instances where pro-rata share policies have been adopted by the Town and construction of the downstream improvements is completed or where construction of the downstream improvements will occur concurrently with the subject development.~~
- ~~C. Construct or to provide the funds for the construction of more than his proportionate share of the downstream off-site drainage improvements, so that he may proceed with the improvement of his land without damaging the properties of others.~~

**Comment [d8]:** This section deals with pro-rata share for detention purposes and has been moved to Section 5-300.

~~In such cases, at the request of the Developer and based upon calculations prepared by the Developer's engineer and approved by the Director, the Town may establish a pro-rata share policy to collect, on a pro-rata basis, any excess funds expended beyond the Developer's proportionate share of the cost of such improvements from other properties within the watershed served by such drainage improvements when such properties are developed within a period of ten years from the date that the drainage improvements are financed or constructed, and to turn these funds without interest over to the initial developer or his assign(s).~~

~~D. — Delay development until the necessary off-site facilities or improvements are constructed by the Town or others. Other arrangements, specific to the site in question and subject to approval by the Director, may be proposed by the Developer.~~

~~5-220~~ **Easements**

~~1. — All storm sewer pipes or channels to be maintained by the Town of Leesburg shall be within storm drainage easements conveyed to the Town in a form approved by the Town Attorney. Easement widths as determined below shall be in one foot increments.~~

~~A. — Pipes~~

- ~~(1) — For single pipes 24 inches and less in diameter the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on both sides of the pipe.~~
- ~~(2) — For single pipes greater than 24 inches in diameter the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on both sides of the pipe plus the outside diameter of the pipe.~~
- ~~(3) — For multiple pipes at the same or different elevations the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation~~

**Comment [d9]:** All easement language has been consolidated into a new Section 5-700.

Subsequent sections have been renumbered.

~~of the proposed finished grade on the most outside pipe, plus the combined outside pipe diameters, plus the width of space between each pipe.~~

~~(4) — The minimum easement width for any storm sewer shall be 15 feet. The maximum easement width shall be 30 feet for single pipes or 15 feet each side for multiple pipes.~~

~~(5) — Refer to Standard WS 16 in Appendix A.~~

~~B. — Channels~~

~~(1) — The minimum easement width shall be 15 feet for channels with a designed top width of the channel bank of five feet or less.~~

~~(2) — The easement width shall be equal to the top width plus a ten-foot access strip immediately adjacent to the channel for channels with a designed top width of the channel bank between five and ten feet.~~

~~(3) — The easement width shall be equal to the top width plus a ten-foot access strip immediately adjacent to each side of the channel for channels with a designed top width greater than ten feet. Where the channel is designed with side slopes not exceeding 3:1 and a bottom width no greater than ten feet, or for paved channels, one ten-foot access strip immediately adjacent to either side of the channel is required.~~

~~C. — Yards Inlets and End Sections~~

~~(1) — The minimum easement width at all yard inlets and end sections (or head walls) shall be the limits of the ten-year water surface elevation.~~

~~D. — One hundred year overland relief. — The minimum easement width shall be the limits of the 100-year overland relief flow path. This does not include the ponded areas contiguous to the flow path.~~

~~E. — Natural water courses and drainageways. — The minimum easement width shall be the limits of the 100-year water surface.~~

**5-~~230~~220** **Hydrologic Design (For Stormwater Conveyance)**

**5-~~231~~221** **Rational Method**

1. This method is to be used for determining the design runoff for sizing all storm sewer systems, including but not limited to, culverts, conduits and man-made stormwater conveyance channels with drainage areas less than 200 acres. Refer to the Virginia Department of Transportation Drainage Manual for methodology. Refer to Detail DD-1 of this Article for "C" factors.

A. To estimate Time of Concentration (Tc), refer to Detail DD-2 of this Article.

B. Unless otherwise specified, the prescribed design storms are the one-year, ~~two-year, and 10-year 24 hour storms using the site specific 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. Use the~~ rainfall peak intensity charts for the Town of Leesburg, which can be found on the Town website. Refer to Detail DD 3 and DD 4 of this Article.

**5-~~232~~222** **USDA-~~SCS (or new NRCS) Methodology~~NRCS Methodology**

1. The NRCS method shall be employed for the determination of runoff for evaluation of all improvements to natural watercourses and storm sewer systems with drainage areas greater than 200 acres unless an alternative method is approved by the Director ~~via through a~~ DCSM ~~Modification~~modification. This methodology for estimating runoff is based on a more rigorous analysis of the factors affecting runoff rates, and was developed by the United States Department of Agriculture (USDA) – Soil Conservation Service (SCS). This method, now known as the Natural Resources Conservation Service (NRCS) method, is considered more accurate than the rational method for runoff determination because more drainage shed characteristics are considered in the analysis. There are several major methods of analysis with the NRCS method:

A. The old version TR-55 method (manual as well as computer-based) entitled "Urban Hydrology for Small Watersheds (Technical Release 55)" or new NRCS WIN TR-55 (Windows Based Program).

- B. The old version TR-20 (computer-based) method entitled "TR-20 Computer Program for Project Formulation-Hydrology (Technical Release 20)" or new NRCS WIN TR-20 (Windows Based Program).
- C. HEC-HMS (latest version accepted by the Corps of Engineers) may be approved by the Director on a case by case basis.
- D. Other programs which utilize the methodology of TR-55 or TR-20 may be approved by the Director on a case by case basis.
- E. Shed parameters to be considered and analyzed when using the NRCS method are as follows:
  - (1) Drainage area.
  - (2) Land use within the shed and associated imperviousness.
  - (3) For soil types, refer to Loudoun County Soils Maps.
  - (4) Shed response time(s).

**5-240230**      **Closed Conduit Systems**

**5-241231**      **General**

- 1. The closed drainage system will be referred to as a storm sewer system, and normally consists of curbs and/or gutters, drop inlet structures, laterals and trunk lines, junction chambers and manholes.
- 2. The purpose of a storm sewer system is to collect stormwater runoff within the on-site and off-site drainage divides and convey the runoff to an outfall.

**5-242232**      **Design Criteria**

- 1. Storm sewers with drainage areas up to 200 acres may be designed using the Rational Method only as outlined in the Virginia Department of Transportation Drainage Manual.

2. Pipe placed in public easements or that are under public maintenance, shall be manufactured of reinforced concrete. Other materials such as those listed below may be used in private systems. Materials other than those listed may be considered for use in private systems with the approval of the Director.

A. Pipe and culvert materials acceptable for storm drain construction with the accompanying Manning's roughness coefficients "n" are shown below:

Material	Manning "N"									
Reinforced Concrete Pipe (RCP)	0.013									
Vitrified Clay Pipe, Extra Strength (VCPX)	0.013									
Cast Iron Pipe (CIP)	0.013									
Polyvinyl Chloride Pipe (PVC)	0.011									
Annular Corrugated Metal Pipe (CMP) (Fully Paved to Unpaved)	0.02 <del>4</del> <sup>2</sup>									
Helical Corrugated Metal Pipe (HCMP), Corrugations are as follows:										
	2-2/3" x 1/2"								3" x 1"	
Diameter	18"	24"	36"	48"	60"	72"	84"	96"	All Diameters	
Plain or Coated	.014	.016	.019	.020	.021	.021	.021	.021	.024	
Paved Invert	NA	.015	.017	.018	.018	.018	.018	.018	.021	
Smooth Interior Fully Paved	NA	.012	.012	.012	.012	.012	.012	0.12	.012	
*The use of PVC is restricted to drains only.										
** NA = Not available.										

B. Reinforced concrete pipe shall conform to ASTM Designation C-76, III and IV; a minimum of Class III or equal is required under areas subject to vehicular traffic. Class IV is required with cover less than two feet, areas subject to impact loads, or where strength computation based on depth requires the higher pipe class.

3. Distance Requirements. The distance between points of access in storm sewer trunk lines shall be limited to 50 feet for 12-inch pipe; 300 feet for 15-inch to 42-inch pipe; and 500 feet for 48-inch and larger pipe. The distance between access points may be increased to 400 feet for 15-inch to 42-inch pipe if the flow velocity exceeds five feet per second and the depth of flow is a minimum 25 percent of the pipe diameter.

4. Minimum pipe size. The minimum acceptable size pipe for publicly maintained systems shall be 15-inch or its equivalent elliptical shape. For private system designs, it is permissible to use 12-inch (or equivalent) pipe as the initial pipe in a system, or as a lateral line when necessary, provided that the distance between access points is 50 feet or less.
5. Pipes 15 inches in diameter and larger may be constructed on horizontal curves with the prior approval of the Director. Refer to Detail DD-5 of this Article for geometric information to assist in the design of concrete pipes on horizontal curves. Prefabricated bend sections may also be used for this purpose. When this option is approved, the designer shall provide direction during construction to ensure the system's integrity. Refer to Standard DS-1 in Appendix A.
6. In general, there may not be a reduction in pipe size greater than one increment moving downstream along the direction of flow unless approved by the Director.
7. Minimum cover for all round, arch, elliptical etc. storm sewer pipe as well as all Box Culverts, Conspans and other closed conveyance systems shall be two feet vertically from finish grade to the outside top of pipe and conveyance systems listed herein, except where structural correction is provided, as approved by the Director. Requests for less than two feet of cover shall be recorded on the cover sheet.
8. Maximum cover is determined from the field supporting strength. Refer to Article 4, Section 4-140, of this ~~Manual~~DCSM.
9. Storm sewers should be designed based upon actual pipe flow to provide a minimum velocity of 2.5 feet per second. If this minimum velocity cannot be achieved utilizing the actual design flows, full flow may be assumed in the pipes to achieve a velocity when running full of not less than 2.5 feet per second.
10. Storm sewers shall be designed with a minimum slope of 0.5%. Slopes less than 0.5% may be considered in specific situations on a case by case basis with the approval of the Director.
11. Storm sewers shall generally be designed so as not to exceed a design or full velocity of 15 feet per second. Special designs shall be supported by hydraulic

grade line calculations and special design pipe to account for the additional velocity when approved by the Director.

12. The need for concrete anchors shall be investigated on storm sewer lines with slopes of 20 percent or greater. If anchors are required, the design engineer shall show a detail on the plans with spacing requirements.
13. Generally storm sewers shall not have an outfall within a lot used for residential purposes. If with specific approval of the Director, an existing storm sewer outfalls on a lot, or adjacent to a lot, on which a building exists and which will remain, the building must be shown with topography of the area between the building and the outfall. The 100-year water surface elevation, the lowest point of entry, and the floor elevations of the existing building shall be provided to demonstrate compliance with Section 5-210 of this ~~Manual~~DCSM.
14. When a trunk line passes through a structure, it shall generally match crowns and the pipes may be adjusted to match to energy gradient as a maximum. Where matching the energy gradient creates drops in excess of 2.5 feet, these will be reviewed and approved by the Director on a case-by-case basis. In no case shall the crown of the inlet pipe be lower than the crown of the outlet pipe.
15. The deflection angle from the forward projection of the centerlines of an inflow trunk line pipe to the outflow trunk line pipe at any junction shall not exceed 90 degrees.

**5-243233**      **Flow in Gutters**

1. Pavement gutter is defined, for purposes of this ~~Manual~~DCSM, as the portion of a roadway adjacent to the curb which conveys water during a storm runoff event; gutter in this sense would include a portion of a travel lane. Gutter cross sections generally have a triangular shape with the gutter of uniform cross slope and the curb forming the near-vertical leg of the triangle. Refer to Detail DD-6 and DD-7 of this Article.
2. The gutter pan is defined, for purposes of this ~~Manual~~DCSM, as the portion of integral concrete curb and gutter which slopes downward to the face of the curb.

3. Modification of Manning's Equation is necessary for use in computing flow in triangular channels because the hydraulic radius in the equation does not adequately describe the gutter cross section, particularly where the top width of the water surface may be more than 40 times the depth at the curb. To compute gutter flow, horizontal spread, or gutter depth, Manning's Equation is integrated for an increment of width across the section. Refer to the Virginia Department of Transportation Drainage Manual for methodology.

**5-244234**     **Inlet Design Criteria**

1. The spread of water on roadway pavements shall be limited to eight feet from the face of curb or one half of the travel lane (excluding curb and gutter) whichever is less. All design shall utilize a minimum rainfall intensity of 4.0 inches per hour. For runoff events resulting from greater rainfall intensities, the entire roadway section may be used for the conveyance of stormwater.
2. There are sites where it may reasonably be anticipated that the runoff from storms with rainfall intensities greater than 4.0 inches per hour will overtax the interception facility to the point that excess flow may result in damage to adjacent property and roadway right-of-way. In these instances, a check storm with a rainfall intensity of 6.5 inches per hour should be run. If all of the runoff is found to be contained within the roadway section, both at the site and "downstream", or if runoff escaping the road section is found to be non-damaging to adjacent property, the interception facility may be used as originally designed under the general criteria. If the interception facility fails to meet the check storm criteria, it must be redesigned to accommodate the check storm.
3. For spacing of inlets refer to Virginia Department of Transportation Drainage Manual.
4. Inlets located on continuous grade should be designed to intercept all of the gutter flow. There will be cases, however, where it is desirable to reduce the length (due to inlet inefficiency) through the use of runoff bypass. This does not infer that the bypass volume be neglected. Inlets which have bypass flows shall be clearly marked on the plans and bypass flow must be included in the total gutter flow contributing to the next downstream inlet. Generally, bypass flow should not exceed the capacity of the street gutter pan.

5. Where an inlet is located at the bottom of a sag vertical curve (referred to as a sump or low point) for roads classified as through collector or higher, all of the flow must be intercepted by the inlet.
6. To properly drain sag vertical curves, it is required on roads classified as through collector or higher to place three inlets in each curve; one inlet at the low point and one flanking inlet on each side of the low point. The flanking inlets should be placed so that they will limit the spread in the low (flatter) gradient approaches to the sag point and will act in relief of the sag inlet if it should become clogged. Refer to the Virginia Department of Transportation Drainage Manual for flanking inlet spacing.
7. Where the pavement on a continuous grade is warped in transition between super- elevated and normal sections, water conveyed along the curb shall be intercepted at the point in transition where the cross slope of the road section is equal to one percent to maintain spread requirements; further, road pavement with less than one percent cross slope towards a curb and gutter section shall not be utilized to convey flow. All flow in areas of less than one percent cross slope, except at median header curb, shall be confined to the gutter pan. Water concentrated in a pavement gutter shall not escape the gutter and cross the travelway before interception by an inlet.
8. No reverse curb and gutter (Virginia Department of Transportation CG-6R) shall be allowed in public rights-of-way without prior approval of the Director.
9. Inlets shall be placed on the high side of super-elevated sections such that flow does not leave the gutter pan.
10. Where curbs are used in cut slope areas, runoff shall be collected through a system of ditches and inlets at the top of the cut slope prior to the flow traversing the slope and entering the right-of-way.
11. No concentrated flow greater than two cubic feet per second based upon the two- year event shall cross a sidewalk or curb.
12. When stormwater is being conveyed along the pavement gutter of a street with a longitudinal slope of less than two percent, a maximum of two cubic feet per second may cross the intersection of a street with less than 500 vehicles per day. Where the longitudinal grade is two percent or greater, four cubic feet per

second may cross the intersection of a street with less than 500 vehicles per day.

13. No flows will be allowed to cross the intersections of streets with 500 or more vehicles per day.
14. When bridges are located adjacent to gutter sections, it will be necessary to coordinate the drainage design with the bridge designer. For bridges without deck drains, the flow from the entire bridge plus any flow crossing the bridge shall be collected in the storm sewer system. For bridges with deck drains, it will be necessary for the drainage designer to review each drain's size, type and location. The flow capacity of deck drains as well as their potential for clogging shall be fully considered and the storm sewer system designed accordingly.
15. The interception facilities for interstate highways, limited access highways and other major arterials should be designed so that the spread (based on a rainfall intensity of 4.0 in./hr.) does not exceed one-half of the running lane width, and there is no significant damage to adjacent property during a storm whose rainfall intensity is determined by a 50-year recurrence interval and the actual time of concentration.
16. Under certain circumstances, such as underpasses or depressed roadway sections, where ponded water can only be removed through the storm sewer system, the 50- year storm (using the actual time of concentration) should be used as the check storm and excessive depth of ponding should be avoided.

**5-245235**

**Grate Inlets and Yard Inlets**

1. Grate and yard inlets in a sump location shall be designed assuming 50 percent clogging. These inlets operate as weirs at shallow depths and as an orifice at greater depths. Grates of larger dimension and grates with more open area, i.e., with less space occupied by lateral and longitudinal bars, will operate as weirs to greater depths than smaller grates or grates with less open area. Refer to Virginia Department of Transportation Drainage Manual, for specific grate inlet design. Refer to Standards DS-2, and DS-3 in Appendix A.
2. Grate inlets outside the travelway of public roads on continuous grade shall be designed assuming 50 percent clogging. Flow passing over the grate, if

applicable, shall be collected at the next downstream inlet. Refer to the Virginia Department of Transportation Drainage Manual.

3. Grate inlets within roadway pavement, face of curb to face of curb of public roads, are prohibited. Standard VDOT DI-2 inlets are permitted within the parallel parking lanes within the Crescent Design District. All other applications for using DI-2 inlets may be used on a case by case basis with the prior approval of the Director.

**5-246236**      **Curb-Opening Inlets**

1. Interception capacity of a curb-opening inlet is largely dependent on flow depth at the curb and curb-opening length.
  - A. Effective flow depth at the curb and consequently, curb-opening inlet interception capacity and efficiency, is increased by the use of a local depression at the curb-opening or a depressed gutter to increase the proportion of the total flow adjacent to the curb. Local depression shall be two inches for curb inlets with CG-6 and one inch for curb inlets with Virginia Department of Transportation CG-2.
2. Curb-opening inlets in continuous grade situations are effective in the drainage of pavements where flow depth at the curb is sufficient for the inlet to perform efficiently. Curb-openings are relatively free of clogging tendencies and offer little interference to traffic operation. Curb-opening inlets are required in the public right-of-way. Refer to Detail DD-8 of this Article.
3. The required method for determining the length of a curb-opening inlet required for total interception of gutter flow is located in the Virginia Department of Transportation Drainage Manual.
4. For curb-opening inlets in a sump condition, refer to Detail DD-9 of this Article.

**5-247237**      **End Walls and End Sections**

1. End walls and end sections which have pipes 24 inches in diameter and larger which are installed in residential developments within the Town of Leesburg shall be provided with a minimum 42-inch high fence or protective railing.

2. The fence or protective railing shall be installed at the top of the end section or integrally on top of the end wall for the portion of the wall where the drop is greater than 18 inches.
3. The protective railing must have no opening greater than six inches.
4. The protective railing must be of corrosion resistant material and must not obstruct the overland relief.

**5-248238**      **General Pipe System Design**

1. Before starting the detailed design of the pipe line, the design engineer must consider various controls which will govern the subsequent location, alignment, depth, size, and cost of the systems.
  - A. Consideration should be given to the location of existing outfalls or natural watercourses which are to be utilized, natural drainage divides, proposed roadway design features such as low and high points in the grade, super- elevated curves, street intersections, existing and proposed utility lines; other existing and proposed storm drainage.
  - B. When an existing storm sewer is to be utilized, either partially or totally, it shall be necessary to ascertain the invert elevations for all pipes, drop inlets, catch basins, manholes, etc. This information should extend well beyond the limits of the proposed project, both laterally and longitudinally, at least to the next access structure, and continuing to the point of hydraulic adequacy. The invert elevation of each pipe in a drop inlet or manhole shall be ascertained, as well as the type of pipe. Information obtained shall be based upon an as-built survey of record or actual field run elevations.
  - C. It is essential that all utilities in the area of existing or proposed drainage facilities be located horizontally and all gravity utilities located vertically in order to avoid future conflicts. This is particularly important in the case of gravity sanitary sewers because adjustment of such facilities would be difficult and costly.
  - D. Test pits will be required for crossings which involve gas lines, water mains 6 inches in diameter and larger, sanitary sewer crossings which have minimum clearance, and all fiber optic telephone service lines.

- E. New storm sewers should generally be designed to convey the ten-year runoff without surcharge. However, the system should be checked for the 50-year runoff in situations where it would be necessary to prevent flooding of interstate highways, limited access highways, major arterials, and underpasses, or other depressed roadways where ponded water can only be removed through the storm sewer system.
  - F. The detailed design of the storm sewer pipe line can only proceed after taking into account the above parameters.
2. Size of storm sewer pipe shall be determined by the Manning's Equation. For explanation and use, refer to the Virginia Department of Transportation Drainage Manual and refer to Detail DD-17 of this Article.

**5-249239**    **Energy and Hydraulic Gradients**

- 1. The hydraulic gradient for a storm sewer system shall herein be defined as a line (water surface profile) connecting points to which water will rise in pipes, manholes and inlets throughout the system during the design flow. The energy gradient is a line drawn a distance  $V^2/2g$  above the hydraulic gradient of the pipes. Refer to Detail DD-10 of this Article.
  - A. At storm sewer junctions, the total energy loss at the junction, HL, is the difference in elevation between the energy grade lines of the upstream and downstream pipes. To establish these gradients for a system, it is necessary to start at a point where the hydraulic and energy gradients are known or can readily be determined.
  - B. When the energy and hydraulic gradients must be determined, the pipes are assumed to have uniform flow. For uniform gravity flow the friction loss in storm sewer pipes shall be determined by referring to the Virginia Department of Transportation Drainage Manual.
    - (1) If the junction incorporates surface inflow and the surface inflow comprises more than 20% of the total flow in the storm sewer, then the Ht should be increased by 30% and the adjusted value entered in column 17.

- (2) The 50% reduction for IS-1 shaping is not applicable at upper terminal structures.
  - C. Where a proposed drainage system is connected to an existing drainage system the hydraulic gradient shall be computed through the existing system until the stormwater contained within the system outfalls to daylight into an adequate conveyance channel or a natural watercourse to demonstrate hydraulic capacity.
    - (1) Information, including as-built information, as well as development plan system computations for the existing system, will be made available by the Town to the engineer for those systems for which the Town has this information.
    - (2) The Director may waive the requirements when it has been previously determined that the receiving system is known to have sufficient capacity.
2. Storm sewer systems should generally be designed to convey the design year storm as non-pressure systems.
  - A. However, in specific situations, primary trunk lines of storm sewer systems may be designed for pressure flow with the approval of the Director. All proposed pressure flow systems should be coordinated with the Department of Plan Review in the preliminary design stage when tying into existing storm drainage systems. The hydraulic gradient for the design flows shall not be above an elevation of one half foot below the established ground elevation nor more than five feet above the crown of the pipe. For curb opening inlets the gutter flow line is considered the established ground elevation.
  - B. The hydraulic gradient shall be determined by computations and then graphically depicted on the storm profiles within and shown on the construction plans for all storm sewer systems located within the Town or VDOT right-of-way and for all closed pipe systems located within Town storm drainage easements using VDOT methodology. Refer to Detail DD-18 of this Article.
  - C. In general, hydraulic grade line calculations will not be required for privately maintained lateral lines serving terminal inlets, and will not be

required for privately maintained secondary trunk lines which are flowing less than 80% of full capacity as determined by Manning's equation. Privately maintained storm sewer conveyance systems shall not be located within a publicly maintained storm sewer easement nor are they to be located within Town or VDOT right-of-way.

- D. Hydraulic grade line calculations shall be required for all storm sewer lines which are subject to pressure flow conditions.
3. In instances where the pressure flow is due to a restricted outfall condition entering a pond below water surface elevation, the hydraulic grade line shall not be higher than 0.5 foot below any manhole top or inlet throat opening. In cases where this design is unavoidable, the Director may approve an alternate design and allow less clearance.

**5-250240**     **Open Channels**

**5-251241**     **Natural Watercourses**

- 1. Natural watercourses are the primary facilities for conveying stormwater runoff. For purposes of this Section, the term natural watercourse shall refer to the total conveyance facility, the stream (or low flow channel) and the adjacent floodplain.
- 2. The policy of the Town of Leesburg relative to natural watercourses shall be as follows:
  - A. Generally, any encroachment into the floodplain is not permitted unless authorized by the Director.
  - B. Whenever a natural watercourse must be relocated or otherwise modified, the extent of channel reach and degree of modification shall be the minimum necessary to provide compatibility of the channel and development. Refer to Section 5-255 of this Article for specifics of stream modification.
  - C. A narrative describing the stream's morphology (form and structure) and environment shall be conducted and documented in addition to the economic and engineering alternatives available for the particular location.

- D. Refer to Section 5-400, Floodplain Policy, for processing and analysis requirements.
- E. Modified and relocated channels shall duplicate the existing stream and flood plain characteristics as nearly as possible. These characteristics shall include the stream width, depth, slope, flow regime, pool-riffle ratio, bank cover, side slopes and flow and velocity distribution.
- F. A hydraulic analysis of the 25 and 50-year, in addition to the 100-year frequency floods may be required by the Director to comply with the Town's Stormwater Management Master Plan or design criteria contained herein.

**5-252242      Man Made Stormwater Conveyance Channels**

- 1. Man-made channels are typically trapezoidal or other geometric sections and may be either natural or artificially lined. Hydraulic capacity shall be determined by the procedure outlined in the Virginia Erosion and Sediment Control Handbook. The computed velocity shall approximate the assumed velocity used to determine the Manning's "n" value.
- 2. All open channels shall be designed to contain the ten-year event. ~~Plans shall also account for overland relief resulting from the peak discharge of the 100-year storm events.~~
- 3. The velocity of flow in open channels including bends is determined through the use of Manning's Equation and "n" values, and Bernoulli's equation. Refer to the Virginia Department of Transportation Drainage Manual.
- 4. The need, type and dimensions of lining for erosion control shall be based on the velocity associated with the ten-year event. The lining selected shall be consistent throughout the channel until it outfalls to a natural watercourse. For various channel configurations, refer to the Virginia Department of Transportation Drainage Manual.
- 5. Depending upon the location, safety, damage risk and environmental considerations, a less frequent event may be required for the design of these channels at the discretion of the Director.

6. Where an access strip is provided, it shall have a maximum two percent cross slope within the required easement.
7. Maximum side slope for grass lined conveyance channels shall be three to one with a minimum longitudinal slope of one percent (two percent minimum recommended).
8. Conveyance channels with side slopes steeper than 3:1 shall be stabilized by paving, riprap, gabions or other approved measures.
9. Conveyance channels with longitudinal slopes less than one percent shall be paved.
10. Paved stormwater conveyance channels or channels with side slopes steeper than 3:1 are prohibited within or through residential subdivision building lots and in no case shall the top width of the channel be within 25 feet of a residential property line; except that twelve feet of the required 25-foot open area may be contained within a lot providing the additional square footage within the 12-foot area shall not be used in the computations for determining the minimum required lot area.
11. Stormwater conveyance channels conveying more than 15 cubic feet per second are prohibited within or through residential subdivision. Temporary stormwater conveyance channels conveying more than 15 cfs may be located on vacant lands which will become future residential development only if the channels are replaced by an underground storm drainage system when the lands are developed for residential uses.

In no case shall the top width of a permanent or temporary stormwater conveyance channel conveying more than 15 cfs channel on an adjacent property be within 25 feet of a residential property line.

12. The sides of all conveyance channels shall be extended until one foot of freeboard is provided above the ten-year event water surface elevation within the conveyance channel.

~~5-253-243~~ **Roadside and Median Ditches**

1. Roadside and median ditches shall meet the standards for stormwater conveyance channels.

2. Generally, side and median ditches shall be designed in accordance with prevailing geometric standards applicable to the particular class of roadway, with consideration of hydraulic capacity, erosion control and safety. Refer to the Virginia Department of Transportation Drainage Manual.
3. The ditch should provide sufficient hydraulic capacity to contain the estimated runoff from a ten-year frequency storm. The estimated runoff and attendant velocity for the two-year frequency storm is to be used for determining the needs, type and dimensions of special ditch lining for erosion control. Geometric configurations shall conform to appropriate safety standards.

**5-254244**      **Lot Drainage Swales**

1. Swales for lot drainage shall conform to the standards for grass-lined conveyance channels based on the ten-year event.
2. Within residential areas or subdivisions, an inlet shall be provided to intercept lot drainage flow when any of the following conditions apply:
  - A. The lot drainage swale extends across three lots.
  - B. The lot drainage swale extends more than 300 feet.
  - C. The lot drainage swale conveys more than two cubic feet per second. Additional flow up to 4 cubic feet per second may be permitted for large lot subdivisions (average lot size over half an acre) with the approval of the Director.
3. Lot drainage swales shall not discharge in excess of two cubic feet per second across any sidewalk or curb based on the two -year event.
4. Drainage swales located outside of residential areas or subdivisions shall be designed to carry the flow from a 10--year storm event and maintain a non--erosive velocity from a 2--year storm event. The drainage design shall also consider and provide overland relief for the 100--year storm event as per Section 5-200 of this ~~manual~~DCSM.

**5-255245**      **Stream Modification**

If stream and flood plain encroachment is unavoidable (i.e., highway embankment), a detailed evaluation by a registered Professional Engineer licensed in the Commonwealth of Virginia shall be made and sealed.

**5-256246**     **Flow Design**

1. The Manning equation shall be used for open channel analysis where uniform flow exists or can be reasonably assumed. The Bernoulli equation shall be used to analyze flow where changes in flow resistance, size, shape or slope of the channel occur. Refer to the Virginia Department of Transportation Drainage Manual.
2. The computation of water surface profiles for channels involving changes in roughness, slope, shape and discharge should not be based on a nomograph solution.

**5-257247**     **Water Surface Profile Computations**

1. The U.S. Army Corps of Engineers, HEC-RAS River Analysis System ~~–This~~ computer program may be used to model open channels, culverts, and bridges.
2. The Virginia Department of Transportation Drainage Manual method may also be used for the calculation of water surface profiles.
3. Other methods may be utilized with prior approval of the Director.

**5-258248**     **Riprap**

Riprap for channels shall be designed in accordance with the Virginia Department of Transportation Drainage Manual. Outlet protection shall be designed using Virginia Erosion and Sediment Control Handbook.

**5-260250**     **Culverts**

1. Culverts shall be designed to account for ultimate right-of-way widths.
2. Within embankments, culvert headwalls and endwalls shall be located a minimum of 30 feet outside the edge of pavement of traffic lanes unless traffic is separated from the walls by a guardrail that is required due to warrants other than the walls.

**5-261251**     **Design Criteria**

1. The design of culverts is dependent upon the type of control (inlet, outlet).
  - A. Inlet control. Deemed to be the discharge capacity of a culvert as controlled at the culvert entrance by the depth of headwater (HW) and the entrance geometry, including the barrel shape and cross section area, and the type of inlet edge.
  - B. Outlet Control. Culverts flowing with outlet control can flow with the culvert barrel full or partially full for part or the entire length of the barrel. If the entire cross section of the barrel is filled with water for the total length of the barrel, the culvert is said to be in full flow or flowing full.
  - C. Both inlet control and outlet control computations must be performed.
2. Culverts located beneath interstate highways, limited access highways, or major arterials shall be designed for the 50-year event without the headwater overtopping the roadways. The 25-year headwater shall be 18 inches below the elevation of the adjacent travel lane edge of pavement.
3. For actual culvert design procedures, refer to the current edition of the U.S. Department of Transportation Hydraulic Design of Highways Culverts (HDS-5). Culvert design procedures are also provided in the current Virginia Department of Transportation Drainage Manual.

(End of Section)

**SECTION 5-300 POLICY FOR STORMWATER MANAGEMENT**

**Comment [d10]:** This section has been modified heavily to set the stage for streamlining all of 5-300. Also, 5-300 has been merged with 5-600 so that stormwater quality and quantity requirements are in the same place.

**5-310 General**

1. ~~The design and construction~~ An evaluation shall be performed for each ~~proposed development~~ regulated land-disturbing activity to assure shall be in compliance with this DCSM, the Town Code, and applicable state and federal laws and regulations ~~State Law and Town Code~~ concerning stormwater management.
2. ~~The design and c~~Construction of all ~~Storm Water Management (SWM) and Best Management Practice (BMP)~~ stormwater management facilities for water quantity and water quality or modifications to existing channels shall comply with ~~all Federal, State, and Local regulations~~ the more stringent of the requirements contained in this DCSM, the Town Code, or applicable state and federal laws and regulations unless otherwise modified by the Director.
- ~~2.3.~~ Evidence shall be provided to the Town ~~Inspector~~ to verify all required state and federal permits have been obtained prior to the commencement of any ~~site construction~~ regulated land-disturbing activity.
- ~~3.~~ ~~Stormwater management for water quantity and water quality must be verified with engineering calculations for the design year event as defined herein, in accordance with the procedures outlined in the Virginia Erosion and Sediment Control Handbook, latest edition; and the Virginia Stormwater Management Handbook, latest edition; or other methods approved by the Director.~~
4. Technical guidance may be found in the Virginia Department of Transportation Drainage Manual, the Virginia Stormwater Management Handbook, and the Virginia Stormwater BMP Clearinghouse. Where conflicts ~~may arise between among~~ design criteria manuals, the more stringent of the ~~regulations requirements~~ shall apply unless modified by the Director.
- ~~5.~~ ~~Unless specifically waived in this manual or modified by the Director, all projects shall meet the minimum SWM and BMP standards for water quantity and water quality in accordance with the Virginia Storm Water Management Handbook and this manual. Justification for exemption requests to SWM and BMP requirements can be found in the Virginia Stormwater Management Handbook.~~

**5-311 Stormwater Management Requirements Applicability**

**Comment [d11]:** This section gets completely replaced with new Applicability.

1. The provisions of this section apply to all regulated land-disturbing activities governed by Chapter 14 of the Town Code.
2. The Director may grant exceptions only in accordance with the provisions of Section 14-23(g)(5) of the Town Code.
- ~~3.~~ Stormwater management **for water quantity and water quality** ~~must~~ shall meet the requirements of the Virginia Stormwater Management Program (VSMP) Permit Regulations (9VAC25-870) Part II B “Technical Criteria for Regulated Land Disturbing Activities” except as modified by this DCSM. ~~be verified with engineering calculations for the design year event as defined herein, in accordance with the procedures outlined in the Virginia Erosion and Sediment Control Handbook, latest edition; and the Virginia Stormwater Management Handbook, latest edition; or other methods approved by the Director.~~
4. Notwithstanding the subsection 3 above, regulated land-disturbing activities that are grandfathered pursuant to Section 14-23(e)(4) of the Town Code shall meet the applicable criteria found in the VSMP Permit Regulations Part II C “Technical Criteria for Regulated Land-Disturbing Activities Grandfathered Projects and Projects Subject to the Provisions of 9VAC25-870-47 B” as modified by more stringent requirements contained in the DCSM and the Town Code in effect on or before June 30, 2014.
- ~~2.~~ Stormwater management shall consist of the following:
  - A. ~~Discharging all concentrated flows into an adequate channel; or~~
  - B. ~~Demonstrating that the peak rate of runoff from the site will not be increased after development for the design year event such that the concentrated flows from the stormwater management facility are discharged into an adequate natural or manmade channel or to an adequate closed stormwater conveyance system; or~~
  - C. ~~A combination of A and B above will allow the peak discharge rate from the development to pass down stream without overtopping the channel banks or causing erosion.~~
  - D. ~~Where an adequate channel or an adequate closed stormwater conveyance system is not available adjacent to the site, the developer~~

**Comment [d12]:** Moved from 5-310 to place technical criteria in the same section.

**Comment [d13]:** This language has been moved to new Section 5-332.

~~shall provide a drainage system satisfactory to the Director to preclude an adverse impact (e.g. soil erosion; sedimentation; yard flooding; duration of ponding water; inadequate overland relief) on down stream properties and receiving channels. In addition, the Stormwater Management Facility shall be required at a minimum to restrict the flow to any outfall channel to predevelopment conditions. If the developer chooses to install a storm drainage system, the system shall be designed in accordance with established, applicable criteria for such systems such that:~~

- ~~(1) Concentrated stormwater runoff leaving a development site shall not aggravate or create a condition where an existing dwelling or a building constructed under an approved building permit floods from storms less than or equal to the 100 year storm event. If such a dwelling or building exists, detention for the 100 year storm event shall also be provided; and~~
- ~~(2) Concentrated surface waters shall not be discharged on adjacent or downstream property, unless an easement expressly authorizing such discharge has been granted by the owner of the affected land or unless the discharge is into a natural watercourse, or other appropriate discharge point as set forth above.~~

~~E. The selection of A, B, C or D above shall be as listed in the following paragraphs for the various watersheds.~~

~~3. An adequate outfall within the Town shall be defined as:~~

~~A. A well defined (i.e., with bed and banks) natural or man-made channel which is capable of conveying the post development runoff for the design year event, as defined herein for the particular shed in which the development is proposed, without eroding or overtopping its banks.~~

~~B. A well defined (i.e., with bed and banks) natural or man-made channel shall be considered adequate at any point where the total contributing drainage area is at least 100 times greater than the drainage area of the development site in question.~~

- C. ~~An analysis shall be performed downstream of the site subject to proposed development to verify the adequacy of the receiving system. This analysis shall be performed for a minimum distance of 300 feet downstream, and shall continue until the flow is discharged into a natural watercourse of sufficient capacity to convey the design year event without overtopping or eroding its banks.~~
  
- 4. ~~Concentrated stormwater leaving a development site shall only be discharged into a well defined (i.e., with bed and banks) natural or man-made outfall channel of sufficient hydraulic capacity, such that there is no overtopping or erosion downstream of the subject development for the release rate of the concentrated stormwater. This shall be required regardless of whether or not the peak discharge rate is changed by the development.~~
  - A. ~~Where an adequate channel or an adequate closed stormwater conveyance system is not available adjacent to the site, the developer shall provide an outfall drainage system satisfactory to the Director to preclude an adverse impact (e.g. soil erosion; sedimentation; yard flooding; duration of ponding water; inadequate overland relief) on downstream properties and receiving channels. In addition, an onsite Stormwater Management Facility shall be constructed and the release rates shall at a minimum, be required to restrict the flow to any inadequate outfall channel to predevelopment conditions.~~
  - B. ~~Concentrated surface waters shall not be discharged on adjacent or downstream property, unless an easement expressly authorizing such discharge has been granted by the owner of the affected land or unless the discharge is into a natural watercourse, or other appropriate discharge point as set forth above.~~
  
- 5. ~~The determination of flooding and channel erosion impacts to receiving streams shall be measured at each point of discharge and based upon:~~
  - A. ~~Runoff volumes that consider proposed land use and includes runoff from the balance of the upstream watershed contributing to each specific point of discharge.~~
  - B. ~~Complete calculations and analysis.~~
  - C. ~~On Site field shot cross sections.~~

**Comment [d14]:** This language has been moved to new Section 5-332.

~~D. Offsite field shot cross sections (where permission cannot be obtained to obtain these sections, the Town will consider alternate means of obtaining the required topography such as but not limited to aerial topography and field shot topography transposed from approved plans of record).~~

~~6. Proposed residential, commercial or industrial subdivisions, (subdivision plans and or Site Plans) shall apply stormwater management criteria to the land disturbance project plans as a whole and not as individual lots within a subdivision. Hydrologic parameters to be used in all engineering calculations shall reflect the ultimate land disturbance and land use.~~

~~7. Subdivision plans and site plans shall be designed such that properties and receiving waterways downstream of any land disturbing activity shall be protected from erosion and associated 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.~~

~~8. The design year event for stormwater management shall be as listed in Section 5-321 of this Article for the various watersheds.~~

**Comment [d15]:** This language has been moved to new Section 5-330 dealing with water quantity above state minimum standards.

~~**5-312 Hydrologic Design for Stormwater Management**~~

~~1. For a typical stormwater management facility, there are three variables to be considered in flood routing the structure. They are as follows:~~

~~A. Inflow to the pond which varies as a function of time;~~

~~B. Outflow from the pond which varies as a function of time; and~~

~~C. Storage which is the result of the difference between the inflow and outflow for a period of time or time interval.~~

~~2. For purposes of computing runoff, water quality requirements and water quantity storage requirements, existing predevelopment site use and land cover conditions (in place at time of plan preparation) shall be accurately represented in all models and computations. Each given land cover type (i.e. grass, forest, asphalt, concrete, gravel, etc) shall be assumed to be in good condition for modeling purposes.~~

**5-313312 Rational Method Design Storms and Hydrologic Methods**

1. The Rational ~~method-Method~~ or ~~modified-Modified~~ ~~rational-Rational~~ ~~method-Method~~ (as applicable) shall be used for determining the peak runoff for small drainage areas of twenty acres or less. ~~Refer to the Virginia Department of Transportation Drainage Manual and or the Virginia Stormwater Management Handbook for methodology.~~
2. ~~The required storage volume shall be developed using the rational method peak discharge and the methodology found in the VDOT Drainage Manual and the Virginia Stormwater Management Handbook. The NRCS method may also be used for these drainage sheds at the discretion of the design engineer or as may be required by the Director.~~

**5-314 USDA NRCS Methodology**

- ~~3.2.~~ The Natural Resources Conservation Service (NRCS) method ~~or old-Soil Conservation Service (SCS) method~~ shall be used for the determination of runoff for drainage areas larger than twenty acres. The use of the NRCS ~~or SCS~~ methodology shall be applied but not limited to large dams, major culverts, and all ponds and dams with a permanent pool. ~~The major methods and parameters of analysis with the NRCS method include:~~
  - A. ~~The NRCS WIN TR 55 (Windows Based Program) or old SCS TR 55 method (manual as well as computer based) entitled "Urban Hydrology for Small Watersheds (Technical Release 55)".~~
  - B. ~~The NRCS WIN TR 20 (Windows Based Program) or old SCS TR 20 (computer based) method entitled "TR 20 Computer Program for Project Formulation Hydrology (Technical Release 20)" or windows based WINTR 20 Computer Program.~~
  - C. ~~Shed parameters to be considered and analyzed when using the NRCS method are as follows:-~~
    - (1) ~~Drainage area.~~
    - (2) ~~Land use within the water shed, and associated imperviousness.~~

- ~~(3) — Soil types. Refer to Loudoun County Soils Map.~~
- ~~(4) — Water shed response time(s) (Time of Concentration).~~
- ~~(5) — Design storm (24 hour, Type II rainfall distribution)~~

~~D. — Use of the NRCS method requires understanding of a variety of numerical quantities used in the computations. For a detailed explanation of terms and methods, refer to latest edition of NRCS WIN-TR-55 (Windows Based Program) or old SCS "Soil Conservation Service Publications Technical Release 55" and NRCS WIN TR-20 (Windows Based Program) or old SCS "Technical Release 20".~~

- ~~4. — The required storage volume shall be determined by the "Storage Indication Method" as detailed in the Virginia Department of Transportation Drainage Manual, and/or the Virginia Stormwater Management Handbook. Other methods may be used only with prior approval of the Director.~~
- ~~5. — Other programs which utilize the methodology of NRCS WIN-TR-55 (Windows Based Program) or old SCS TR-55 or NRCS WIN-TR-20 (Windows Based Program) or old SCS TR-20 may be approved by the Director on a case-by-case basis.~~

~~A. — In order to use the storage indication method of flood routing, the following is required:~~

- ~~(1) — Develop an elevation discharge curve for the structure. For stormwater management structures, this curve will normally be developed for discharges in cubic feet per second.~~
- ~~(2) — Develop an elevation storage curve for the structure. The storage will normally be developed in acre-feet which will then be converted to cfs-hours in the working table.~~
- ~~(3) — Develop and plot the inflow hydrograph for stormwater management structures. Use the tabular discharge tables for different times of concentration to determine the inflow hydrograph. (From TR-55)~~

~~(4) — Select the routing interval. The shorter the interval selected, the more precise the results obtained will be.~~

~~B. — Use the NRCS or old SCS computer method or the storage indication with a time interval between three minutes and six minutes.~~

~~C. — It is necessary to use consistent units with any routing equation. Some commonly used sets of units are:~~

Time	Rates		Volumes		
	Inflow	Outflow	Inflow	Outflow	Storage
Hours	efs	efs	efs-hrs	efs-hrs	efs-hrs
Days	efs	efs	efs-days	efs-days	efs-days
Days	AF/day	AF/day	AF	AF	AF
Hours	in/hr	in/hr	inches	inches	inches
Days	in/day	in/day	inches	inches	inches

~~For most stormwater management ponds, the time will be in cubic feet per second (efs), and the volumes in efs-hours.~~

~~Some conversion factors are as follows:-~~

~~(1) — efs-hours = — 12.1 (acre-feet);~~

~~(2) — efs-days = — 0.504 (acre-feet); and~~

~~(3) — inches = — acre-feet/53.3 (drainage area in square miles)~~

**5-620320 Water Quality Design Criteria**

1. Indigenous vegetation should be preserved to the maximum extent practicable consistent with the proposed use, development, or redevelopment.

2. Impervious surface cover shall be minimized consistent with the proposed use, development, or redevelopment.

~~2-3.~~ All types of construction drawings, such as but not limited to residential construction plans, public improvement plans, and all types of site plans, except those exempt under Town Code Section 14-23(e)(6), shall provide water quality in accordance with the minimum requirements of the Virginia

**Comment [d16]:** This criteria was moved from old Section 5-620. It is language used in the Chesapeake Bay Preservation Act. The Town may wish to consider combining it with 5-321 below since they are similar in intent.

Stormwater Management Regulations as set forth in this DCSM regardless of lot size or amount of disturbed acres and regardless of whether a formal VSMP permit is required for the project.

**5-321 Use of Low Impact Development (LID) for Water Quality Environmental Site Design**

1. Each application for a regulated land-disturbing activity should include a written assessment for the potential for the use of Low Impact Development (LID) design techniques Environmental Site Design (ESD). ~~should include a written assessment of the potential for and give great consideration to the use of LID techniques to achieve, either in part or whole, the water quality criteria for all development, redevelopment or construction activity that requires a construction plan, site plan, minor site plan, site plan waiver or other land development application.~~

A. Each application for a development, redevelopment, or land disturbance that proposes to utilize LID shall include a written assessment of LID techniques proposed and how they will achieve, either in part or whole, the water quality criteria for that specific land development project.

B. Implementation of individual LID practices will be considered on a case by case basis at the discretion of the Director.

2. The Virginia Stormwater BMP Clearinghouse shall be the sole source of efficiencies and design of ESD practices being considered to meet the water quality requirements of this DCSM. However, ~~in~~ addition to other LID-ESD resources that may be available, the following ~~may~~ shall be considered in the development of the written assessment:

A. Low-Impact Design Strategies: An Integrated Design Approach, United States Environmental Protection Agency, Office of Water, EPA 841-B-00-003 dated June 1999 and subsequent modifications and updates thereof; and

B. Low-Impact Development Hydrologic Analysis, United States Environmental Protection Agency, Office of Water, EPA 841-B-00-002 dated June 1999 and subsequent modifications and updates thereof.

**5-640 322 HOT SPOT Hot Spots**

**Comment [d17]:** This criteria was moved from old Section 5-620.4. Per the Town's meeting with the engineering community on 3/3/2013, LID was changed to the more current term of Environmental Site Design.

**Comment [d18]:** Changed to "may" per meeting on 3/3/2013 since these are relatively old reference materials and there are many other materials available.

**Comment [d19]:** This criteria was moved from old Section 5-640.

1. The Director may determine that a proposed ~~development, redevelopment, or use~~ land use or activity associated with a regulated land-disturbing activity constitutes a pollution hotspot, and that a greater level of stormwater ~~treatment~~ quality management is necessary to prevent pollutant wash-off after construction.
2. A stormwater hot spot is defined as a land use or activity that generates higher concentrations of hydrocarbons, trace metals or toxicants than are found in typical stormwater runoff ~~or that generates a pollutant that is subject to a TMDL Waste Load Allocation (WLA) assigned to the Town. The maximum level~~ A greater level of stormwater ~~treatment~~ quality management, which assumes pre-development greenfield conditions regardless of actual existing site conditions, ~~may be needed~~ shall be required at hot spot sites to prevent pollutant wash off after construction.
3. ~~Developments~~ Land uses or activities that are deemed by the Director as a ~~Hot spot~~ Hot spot shall not be exempt from the ~~maximum BMP water quality design regulations~~ maximum requirements for water quality treatment in this DCSM even if the limits of disturbance is less than an acre and/or if the site is considered re-development.
4. ~~The following are examples of such hot spots~~ Hot spots may include, but are not limited to, the following:
  - A. Vehicle salvage yards and vehicle recycling facilities;
  - B. Vehicle service and vehicle maintenance facilities;
  - C. Vehicle equipment cleaning facilities;
  - D. Fleet storage areas;
  - E. Industrial sites;
  - F. Outdoor liquid container storage;
  - G. Outdoor loading and unloading facilities;
  - H. Commercial container nurseries;

I. Golf courses;

J. Storing or dispensing of petroleum products and ~~Hazardous~~ hazardous Substances; substances;

~~(1) — In order to adequately protect surface water and groundwater quality, land uses and activities that propose storing, handling and/or dispensing petroleum products and hazardous substances shall meet the following standards:~~

~~a. — Oil/water separators shall be required for all facilities that engage in activities (other than agricultural) that potentially generate oily wastewater, including but, not limited to, vehicle maintenance/washing/detailing, fuel storage/dispensing, and machine and paint shops. When available, the discharge shall be to the Town's sanitary sewer system. If this is not available and the discharge must be to the storm sewer, a Virginia Pollutant Discharge Elimination System (VPDES) permit will be required.~~

~~b. — Secondary containment shall be required for activities that propose storing, handling and/or dispensing of petroleum products (except for liquefied petroleum gas) and hazardous substances. The secondary containment shall be designed to provide a means of detecting material loss from the primary container; sufficient/compatible containment of the loss; retrieving the loss; and correcting the deficiency. For groups of tanks/containers, the secondary containment must be able to hold the contents of the largest container plus precipitation (if there is no roof). This precipitation shall not be re-directed to the storm sewer. Temporary secondary containment shall be provided for construction sites that use petroleum products or hazardous substances.~~

~~e. — The applicant shall provide evidence that an approved Emergency Response Plan has been filed with and~~

approved by the Town as well as the Loudoun County  
Department of Fire and Rescue Services.

- K. Dry cleaning operations;
- L. Public works storage areas;
- M. Facilities that generate or store hazardous materials;
- N. Chemical storage areas; and
- O. Areas known for the sale or transfer of contaminants

5. On making a written determination that a proposed development, redevelopment, or use and use or activity constitutes a pollution hotspot, the Director shall require the creation and implementation of a stormwater pollution prevention plan (SWPPP) in accordance with Sec. 5-660 of this Article to reduce the generation of pollutants at the source. The Stormwater Pollution Prevention Plan (SWPPP) shall be in addition to all other requirements in this Article other required BMPs. At the discretion of the Director, a SWPPP developed in conformance with 9VAC25-151-80 may be deemed sufficient to satisfy the requirements of this section.

6. In order to adequately protect surface water and groundwater quality, land uses and activities that propose storing, handling and/or dispensing petroleum products and hazardous substances shall meet the following standards:

A. Oil/water separators shall be required for all facilities that engage in activities (other than agricultural) that potentially generate oily wastewater, including but, not limited to, vehicle maintenance/washing/detailing, fuel storage/dispensing, and machine and paint shops. When available, the discharge shall be to the Town's sanitary sewer system. If this is not available and the discharge must be to the storm sewer, a Virginia Pollutant Discharge Elimination System (VPDES) permit will be required.

B. Secondary containment shall be required for activities that propose storing, handling and/or dispensing of petroleum products (except for liquefied petroleum gas) and hazardous substances. The secondary containment shall be designed to provide a means of detecting material

**Comment [d20]:** This language was taken from the SWPPP section since that section only applied to hot spots. 9VAC25-151-80 spells out the requirements for a SWPPP for industrial stormwater facilities.

**Comment [d21]:** This section was moved from under the list of examples above for flow and organizational purposes.

loss from the primary container; sufficient/compatible containment of the loss; retrieving the loss; and correcting the deficiency. For groups of tanks/containers, the secondary containment must be able to hold the contents of the largest container plus precipitation (if there is no roof). This precipitation shall not be re-directed to the storm sewer. Temporary secondary containment shall be provided for construction sites that use petroleum products or hazardous substances.

C. The applicant shall provide evidence that an approved Emergency Response Plan has been filed with and approved by the Town as well as the Loudoun County Department of Fire and Rescue Services.

#### **5-632350 Stream Delineation and Buffer Criteria**

**Comment [d22]:** This section was moved from 5-650 and also incorporates language from 5-620.3.H.

1. All development, redevelopment and uses regulated land-disturbing activities subject to this ~~article~~ Article shall clearly delineate perennial and intermittent streams on or directly adjacent to the site. Such determination shall be made using a reliable, site-specific, and scientifically valid system of in-field indicators acceptable to the Director such as but not limited to determinations from the Army Corps of Engineers or the Virginia Department of Environmental Quality or determinations based upon and in accordance with Identification Methods for the Origins of Intermittent and Perennial Streams (latest version) published by the North Carolina Division of Water Quality. The condition of the water features, including whether they are natural or engineered, shall also be noted. ~~and provide a minimum 50 foot buffer on each side of these features – as measured from the scar line (larger buffers may be required for a Creek Valley Buffer as defined by the Zoning Ordinance in specific situations).~~ The condition of the water features, including whether they are natural or engineered, shall also be noted.

~~2. All development, redevelopment, and uses subject to this article shall note whether or not perennial and intermittent streams exist on or directly adjacent to the site. A reliable, site specific determination shall be conducted to determine whether water bodies within or directly adjacent to the site have intermittent or perennial flow. Such determination shall be made using a scientifically valid system of in-field indicators acceptable to the Director such as but not limited to determinations from the Army Corps of Engineers or the Virginia Department of Conservation and Recreation or determinations based upon and in accordance with Identification Methods for the Origins of~~

~~Intermittent and Perennial Streams (most recent version) published by the North Carolina Division of Water Quality, as amended.~~

~~3. If, in the determination of the Director, adequate vegetation within the buffer area does not exist or is insufficient to meet the water quality performance criteria, the buffer area shall be enhanced.~~

~~4.2. Notwithstanding the above requirements, a~~Any site with a perennial ~~or~~ intermittent stream within a natural channel shall meet the following additional performance criteria:

A. Measures shall be taken to protect the perennial stream from non-concentrated stormwater runoff from adjacent impervious surfaces.

(1) A minimum 50 foot wide vegetated area preserved where present, or established where not present, shall be provided on both sides of the stream (measured from the ~~near line~~centerline of the stream). Larger buffers may be required for a Creek Valley Buffer as defined by the Zoning Ordinance in specific situations.

(2) If the required vegetated buffer area is in poor condition, as determined by the Director, the vegetated buffer area shall be enhanced to prevent erosion and ensure proper functioning of the area as a buffer to pollution.

(3) If the required vegetated buffer area does not exist or cannot be provided by a proposed development, an adequate buffer may (with prior approval of the Director) alternatively be met through the use of a smaller vegetated buffer area in combination with equivalent on-site stormwater treatment as long as such a reduction is not prohibited by other Town Ordinances and / or Regulations such as but not limited to the Creek Valley Buffer criteria as defined by the Zoning Ordinance.

~~(3)(4) See Section 5-700 for vegetated buffer easement requirements. The vegetated buffer area shall be placed in a stormwater easement dedicated to the Town and maintained as a vegetated buffer area, and shall be subject to a stormwater management~~

**Comment [d23]:** Moved from 5-620.3.H

**Comment [d24]:** Redundant language from above was deleted. This section clarifies that the requirement to have a 50-foot buffer applies to both perennial and intermittent streams.

~~agreement. The dedication of a stormwater easement is not to be construed as requiring the Town to maintain the vegetated buffer area.~~

**Comment [d25]:** Moved to new Section 5-700 on easements.

~~5.3. Establishment, enhancement, or replacement of the buffer area shall be in accordance with Chapter 5.1 “Buffer Area Establishment, Replacement, and Restoration” of the most recent version of Riparian Buffer Maintenance and Mitigation Guidance Manual published by the Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance Department of Environmental Quality, as amended or as modified by the Director.~~

~~6.4. Physical relocation, alteration, or undergrounding of a perennial or intermittent stream will be considered on a case-by-case basis.~~

~~7. Construction plans shall not be approved until proof is provided to the Director that all required federal, state, and local environmental permits have been obtained.~~

~~8. \_\_\_\_\_~~

~~9.5. If the required vegetated buffer area does not exist or cannot be provided by a proposed development, an adequate buffer may (with prior approval of the Director) alternatively be met through the use of a smaller vegetated buffer area in combination with equivalent on-site stormwater treatment as long as such a reduction is not prohibited by other Town Ordinances and / or Regulations such as but not limited to the Creek Valley Buffer criteria as defined by the Zoning Ordinance.~~

**Comment [d26]:** Redundant to (A)(3) above.

### 5-330 Water Quantity

1. The determination of flooding and channel erosion impacts to receiving streams shall be measured at each point of discharge and based upon:

**Comment [d27]:** This section was moved from old 5-311.4 since it is Leesburg specific.

- A. Runoff volumes that consider proposed land use and includes runoff from the balance of the upstream watershed contributing to each specific point of discharge.
- B. Complete calculations and analysis.
- C. On-Site field shot cross sections.

D. Offsite field shot cross sections (where permission cannot be obtained to obtain these sections, the Town will consider alternate means of obtaining the required topography such as but not limited to aerial topography and field shot topography transposed from approved plans of record).

~~2. Proposed residential, commercial or industrial subdivisions, (subdivision plans and or Site Plans) shall apply stormwater management criteria to the land disturbance project plans as a whole and not as individual lots within a subdivision. Hydrologic parameters to be used in all engineering calculations shall reflect the ultimate land disturbance and land use.~~

**Comment [d28]:** Language redundant to requirements in Town Code Section 14-23(g)(2) that the stormwater management plan include the entire common plan of development or sale where applicable.

~~3.2.~~ Subdivision plans and site plans shall be designed such that properties and receiving waterways downstream of any land-disturbing activity shall be protected from erosion and associated 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.

### 5-331 Detention Measures

1. On-site detention of stormwater is desirable in many cases to alleviate existing downstream drainage problems and to preclude the development of new ones. In some areas of the watershed, detention may cause increased peak flows to occur on the major streams and tributaries. Therefore, the downstream impact must be carefully investigated. The Director may prohibit detention of stormwater where and when it is identified in the Town's Stormwater Management Master Plan (in the Town Branch and Lower Tuscarora subwatersheds only) as not being in the best interest of the Town.

**Comment [d29]:** This language comes from Fairfax County's revised PFM.

2. Special stormwater management design is required within the Tuscarora drainage shed to address downstream flooding concerns in accordance with the Town's Stormwater Management Master Plan (see DCSM Section 5-341).  
~~Stormwater management within the channel of Town Branch shall be provided such that the channel will be protected for the 25-year event. In areas designated by the Director as having a high potential for flooding, the channel and adjacent properties shall be protected from the 100-year event.~~

**Comment [d30]:** Deleted language from this section originally came from 5-321.C(4)(a).

### 5-332 Adequate Outfall

**Comment [d31]:** Moved from old 5-311.1.D

1. Where an adequate channel or an adequate closed stormwater conveyance system is not available adjacent to the site, the developer shall provide a drainage system satisfactory to the Director to preclude an adverse impact (e.g. soil erosion; sedimentation; yard flooding; duration of ponding water; inadequate overland relief) on down-stream properties and receiving channels. In addition, the ~~Stormwater-stormwater Management-management Facility facility~~ shall be required at a minimum to restrict the flow to any outfall channel to predevelopment conditions. ~~If the developer chooses to install a storm drainage system, the system shall be designed in accordance with established, applicable criteria for such systems such that:~~
2. Concentrated stormwater runoff leaving a development site shall not aggravate or create a condition where an existing dwelling or a building constructed under an approved building permit floods from storms less than or equal to the 100-year storm event. If such a dwelling or building exists, detention for the 100-year storm event shall also be provided; and
3. Concentrated surface waters shall not be discharged on adjacent or downstream property, unless an easement expressly authorizing such discharge has been granted by the owner of the affected land or unless the discharge is into a natural watercourse, or other appropriate discharge point as set forth above.
4. ~~The selection of A, B, C or D above shall be as listed in the following paragraphs for the various watersheds:~~

~~5.4.~~ An adequate outfall within the Town shall be defined as:

- A. A well-defined (i.e., with bed and banks) natural or man-made channel which is capable of conveying the post development runoff for the design-year event, as defined herein for the particular shed in which the development is proposed, without eroding or overtopping its banks.
- B. A well-defined (i.e., with bed and banks) natural or man-made channel shall be considered adequate at any point where the total contributing drainage area is at least 100 times greater than the drainage area of the development site in question.
- C. An analysis shall be performed downstream of the site subject to proposed development to verify the adequacy of the receiving system. This analysis shall be performed for a minimum distance of 300 feet

**Comment [d32]:** These two sections were previously under 1. above. Now moved to be stand alone requirements.

downstream, and shall continue until the flow is discharged into a natural watercourse of sufficient capacity to convey the design-year event without overtopping or eroding its banks.

6.5. Concentrated stormwater leaving a development site shall only be discharged into a well-defined (i.e., with bed and banks) natural or man-made outfall channel of sufficient hydraulic capacity, such that there is no overtopping or erosion downstream of the subject development for the release rate of the concentrated stormwater. This shall be required regardless of whether or not the peak discharge rate is changed by the development.

A. Where an adequate channel or an adequate closed stormwater conveyance system is not available adjacent to the site, the developer shall provide an outfall drainage system satisfactory to the Director to preclude an adverse impact (e.g. soil erosion; sedimentation; yard flooding; duration of ponding water; inadequate overland relief) on downstream properties and receiving channels. ~~In addition, an onsite Stormwater Management Facility shall be constructed and the release rates shall at a minimum, be required to restrict the flow to any inadequate outfall channel to predevelopment conditions.~~

B. Concentrated surface waters shall not be discharged on adjacent or downstream property, unless an easement expressly authorizing such discharge has been granted by the owner of the affected land or unless the discharge is into a natural watercourse, or other appropriate discharge point as set forth above.

### 5-333 Pro-Rata Share Program

~~1. The developer may choose to:~~

~~2.1. Install on-site storm water detention to minimize the downstream impacts. However, (In lieu of or in addition to on-site stormwater quantity management required in this Article, the Town may require pro-rata share contributions in areas where downstream pro-rata share improvements have been installed and/or stormwater detention is not in the best interest of the overall drainage system as defined in the Stormwater Management Master Plan. The developer must demonstrate that there is no increase of downstream flooding for the post developed managed peak discharge. Concentrated flow from management facilities must be enclosed in a public easement as required by this article.~~

**Comment [d33]:** The Town asked on 11/7/2013 whether this conflicted with the new stormwater regulations or was less stringent. Based on review by Megan LeBoon, it is different and doesn't conflict – as a result we have kept it in the DCSM.

**Comment [d34]:** This section was moved from Section 5-210.14 since it deals with detention/water quantity requirements. Nutrient offsets are already dealt with directly in the Town Code.

A pro-rata share program is still allowed by the Code for water quality if it is in accordance with Code of Virginia 15.2-2243.

This section has been broken into two parts – those instances where the Town can require a developer to pay into the pro-rata fund and those instances where a developer has the option of using the pro-rata share program.

**2. Notwithstanding (1) above, in lieu of on-site stormwater quantity management required in this Article, a developer may:**

- A. Contribute his proportionate share toward the correction of off-site outfall deficiencies in those instances where pro-rata share policies have been adopted by the Town and construction of the downstream improvements is completed or where construction of the downstream improvements will occur concurrently with the subject development.
- B. Construct or to provide the funds for the construction of more than his proportionate share of the downstream off-site drainage improvements, so that he may proceed with the improvement of his land without damaging the properties of others.

In such cases, at the request of the Developer and based upon calculations prepared by the Developer's engineer and approved by the Director, the Town may establish a pro-rata share policy to collect, on a pro-rata basis, any excess funds expended beyond the Developer's proportionate share of the cost of such improvements from other properties within the watershed served by such drainage improvements when such properties are developed within a period of ten years from the date that the drainage improvements are financed or constructed, and to turn these funds without interest over to the initial developer or his assign(s).

3. Any requests for nutrient offsets shall be done in strict accordance with the Town Code.

~~Delay development until the necessary off site facilities or improvements are constructed by the Town or others. Other arrangements, specific to the site in question and subject to approval by the Director, may be proposed by the Developer.~~

**5-320340 General Design Criteria Stormwater Management Facilities**

**5-321341 Design of Stormwater Management Facilities within Tuscarora Creek Watershed**

**Comment [d35]:** Deleted this language since the Code of Virginia is specific about options being a pro-rata share program or a comprehensive watershed plan. Anything outside of these would be handled through exceptions.

Design of ~~Stormwater Management Facilities~~ within the Town of Leesburg's Tuscarora Creek watershed shall be based upon all of the following three criteria:

1. Flood Control Criteria

A. All designs for stormwater management and determination of adequate outfall for flood control shall at a minimum be in compliance with the Town of Leesburg Stormwater Management Master Plan adopted June 1990 as well as all criteria set forth below.

~~B. Within the Town of Leesburg there are four watersheds, Cattail Branch, Big Springs, Syeolin Creek, and Tuscarora Creek. The Tuscarora Creek watershed is further divided into four subbasins, Lower Tuscarora Creek downstream of the confluence with Town Branch, Upper Tuscarora Creek upstream of the confluence with Town Branch, Town Branch, and Dry Mill subbasins. Different design criteria applies to each of the watersheds and subbasins due to the uniqueness of each.~~

B. Design Criteria by Watershed for the Tuscarora Creek Watershed

~~(1) Cattail Branch. On site stormwater management (detention) shall be provided for all areas within the watershed exclusive of the Cattail Branch conveyance channel, such that the post-development peak runoff will not exceed the predevelopment peak runoff for the one and two year event.~~

~~(2) Big Springs. On site stormwater management (detention) shall be provided for all areas within the watershed exclusive of the Big Springs conveyance channel such that the post-development peak runoff will not exceed the predevelopment peak runoff for the one, two and ten year events.~~

~~(3) Syeolin Creek. On site stormwater management (detention) shall be provided for all areas within the watershed exclusive of the Syeolin Creek conveyance channel such that the post-development peak runoff will not exceed the predevelopment peak runoff for the one, two and ten year events.~~

~~(4) Tuscarora Creek~~

(1) Town Branch Subbasin

Town Branch, Channel. Stormwater management within the channel of Town Branch shall be provided such that the channel will be protected for the 25-year event. In areas designated by the Director as having a high potential for flooding, the channel and adjacent properties shall be protected from the 100-year event.

Town Branch, On-site. Stormwater management (detention) shall be provided for all areas within the watershed exclusive of the Town Branch conveyance channel such that the post development peak runoff will not exceed the predevelopment peak runoff for the one, two, ten and 25-year events.

~~(5)~~(2) Upper Tuscarora Creek Subbasin

Upper Tuscarora Creek, Channel. Stormwater management for the Upper Tuscarora Creek shall be by the use of regional facilities as delineated in the Master Plan.

Upper Tuscarora Creek, On-site. Stormwater management (detention) shall be provided by utilization of the regional facility for all areas within the watershed which drain to a regional facility. Design of regional facilities shall be such that the post development peak runoff will not exceed 0.1 cfs/acre, 0.3 cfs/acre, and 0.4 cfs/acre for the one, two, ten, and 25-year events, respectively.

- a. Where a proposed development is served by an existing regional stormwater management facility, Stormwater management (detention) shall be provided for all areas of the development within the watershed exclusive of the Tuscarora Creek conveyance channel such that the post development peak runoff will not exceed the predevelopment peak runoff for the one and two-year events.

- b. If a regional facility does not exist to serve a proposed development and if the Director concurs in writing that it is not feasible required to construct an on-site regional facility, ~~on-site Stormwater management (detention) shall be provided for all areas of the development within the watershed exclusive of the Tuscarora Creek conveyance channel such that the post development peak runoff will not exceed the predevelopment peak runoff for the one, two, ten and 25 year events~~ water quantity shall be addressed in accordance with the stormwater requirements set forth in this DCSM.

~~(6)(3)~~ Lower Tuscarora Creek Subbasin. On-site stormwater management (detention) shall be provided for all areas within the watershed exclusive of the Tuscarora Creek conveyance channel such that the post development peak runoff will not exceed the predevelopment peak runoff for the one and two year events.

- ~~a. Dry Mill Subbasin. On-site stormwater management (detention) shall be provided for all areas within the watershed exclusive of the Dry Mill Branch conveyance channel such that the post development peak runoff will not exceed the predevelopment peak runoff for the one and two year events.~~

2. Discharge Control Criteria

In addition to the flood control criteria above, all concentrated discharges of stormwater from road or site drainage systems, designed for the ten-year event, from all developing sites shall be discharged into an adequate channel (extending from the point of discharge to the main channel of the watershed listed above) for the ten-year storm event or greater at arterial road crossings, or stormwater management (detention) shall be provided. Refer to Section 5-250 concerning required channels for concentrated discharges.

3. Erosion Control Criteria

In addition to the flood control and discharge control criteria above, all concentrated discharges of stormwater from all developing sites shall be discharged into an adequate channel for the two-year storm event, or additional stormwater management (~~detention~~)measures shall be provided in accordance with this DCSM as well as other applicable state and federal regulations.

**5-322342**     **General Criteria**

1. ~~Detention facilities (wet and dry), except those which are underground, shall be designed utilizing both a primary spillway and a separate, independent emergency spillway. Combined spillways shall only be permitted when approved by the Director and shall conform to section 5-324.9.D, Combined Spillways.~~ The Director may preclude the onsite use of any stormwater management facilities, or require more stringent design, construction, and/or maintenance provisions if based on a review of the stormwater management plan the proposed facility cannot function as designed due to actual project site conditions.
2. Stormwater management facilities shall not be located on any single family attached or detached residential lot unless specifically approved, in writing, by the Director. However, lots may extend into a wet pond to the permanent pool elevation. All lots which are constructed in accordance with the above shall comply with the setbacks required for the 100-year flood plain.
3. If existing structural stormwater management facilities are employed to meet the water quality criteria in whole or part, an onsite inspection report certified by a person who is licensed as a professional engineer, architect, landscape architect, or land surveyor pursuant to Article 1 (54.1-400 et seq.) of Chapter 4 of Title 54.1 of the Code of Virginia shall be provided as evidence to prove that the existing stormwater management facility was ~~BMPs are structural evidence (certified by a professional engineer or licensed surveyor) shall be provided that prove the existing BMP had been~~ designed and constructed in accordance with proper design standards and specifications, and that facilities are currently in good working order, properly functioning and performing at their designed levels of service. A review of both the original structural design and maintenance plans may be required to verify this provision. A new maintenance agreement may also be required to ensure compliance with Town codes and ordinances.

**Comment [d36]:** This matches up with language from the Code of Virginia that defines the ability of the Town to prohibit or require more stringent standards than the Virginia Stormwater BMP Clearinghouse based on site specific issues.

**Comment [d37]:** New technical criteria may make it difficult for a single family property owner to avoid an on-site stormwater management facility. Added language gives the Director the authority to make exceptions to the existing policy if warranted.

**Comment [d38]:** Moved from old 5-620.1(A)(3)c. and also considering old 5-620-3(C).

4. Maintenance responsibility for stormwater management facilities that control only water quantity shall be as listed below:

**Comment [d39]:** Moved to other maintenance and inspection provisions under Section 5-370.

Type of Zoning Use	Maintenance		Guarantor of Drainage	Owner of Facility	Easement to Town
	Aesthetics	Drainage			
SFD	Lot Owners	Town	Town	Lot Owners or HOA	Yes
SFA	HOA	Town	Town	HOA	Yes
Multi Family	Lot Owner HOA	Lot Owner HOA	Town	Lot Owner HOA	Yes
Commercial Industrial Institutional	Lot Owner	Lot Owner	Town	Lot Owner	Yes

SFD: Single Family Detached

SFA: Single Family Attached

5. Maintenance responsibility for stormwater management facilities that control both water quantity and water quality or just water quality shall be as listed below:

Type of Zoning Use	Maintenance		Guarantor of Drainage	Owner of Facility	Easement to Town	Maint Agreement Required
	Aesthetics	Drainage				
SFD	Lot Owners HOA	Town	Lot Owners HOA	Lot Owners HOA	Yes*	Yes
SFA	Lot Owners HOA	Town	Lot Owners HOA	Lot Owners HOA	Yes*	Yes
Multi Family	Lot Owner HOA	Lot Owner HOA	Lot Owners HOA	Lot Owner HOA	Yes*	Yes
Commercial Industrial Institutional	Lot Owner	Lot Owner	Town	Lot Owner	Yes*	Yes

~~\*Private Stormwater Management easement with clause for Town to be maintainer of last resort.~~

~~SFD: Single Family Detached~~

~~SFA: Single Family Attached~~

~~4. Detention facilities (wet and dry), except those which are underground, shall be designed utilizing both a primary spillway and a separate, independent emergency spillway. Combined spillways shall only be permitted when approved by the Director and shall conform to section 5-324.9.D Section 521.9.D, Combined Spillways~~

~~4.5. Any embankment constructed for purposes of impounding stormwater shall be designed in accordance with the requirements in Section 5-500, Dams Design and Construction.~~

### ~~5-323 Detention Ponds~~

~~1. A detention pond is a water impoundment made by constructing a dam or an embankment or by excavating a pit.~~

~~A. Ponds which are constructed by the first method are referred to as embankment ponds, and those constructed by the second method are excavated ponds. Ponds constructed by both the excavation and the embankment methods are classified as embankment ponds, if the depth of water impounded against the embankment at the crest of the emergency spillway elevation is three feet or more.~~

~~B. This standard shall also be applied to stormwater management ponds which are normally dry, wet ponds which are constructed as a site amenity and ponds which provide dual function. Also see Section 5-327 of this Article.~~

~~2. General. The following practices apply where it is determined that stormwater management, water supply or temporary storage is justified and it is feasible and practical to build a pond to meet local and State Law requirements.~~

~~A. Site Conditions. Site conditions shall be such that runoff from the design year storms can be safely passed through.~~

**Comment [d40]:** Deleted since this practice is covered under the Clearinghouse.

~~(1) — A natural or constructed emergency spillway; or~~

~~(2) — A combination of a principal spillway and an emergency spillway.~~

~~B. — Drainage Area. The drainage area above the pond must be protected against erosion to the extent that expected sediment will not shorten the planned effective life of the structure. The drainage area for wet ponds should be a minimum of five acres for each acre foot of water. These requirements may be reduced if a dependable source of ground water or diverted surface water contributes to the pond. The water quality shall be suitable for its intended use.~~

~~C. — Depth. For a wet pond, the topography and soils of the site shall permit storage of water at a depth and volume which will ensure a dependable supply, considering beneficial use, sediment, season of use, and evaporation and seepage losses.~~

~~D. — Foundation. For either wet or dry ponds, the area on which the dam is to be placed shall consist of material that has sufficient bearing strength to support the dam without excessive consolidation. The foundation must consist of or be underlain by relatively impervious material, which will prevent excessive passage of water. Where such foundation conditions do not exist, the geotechnical engineer will determine if the site is feasible for the construction of a dam by fill displacement or other suitable methods to satisfy the intended purpose and shall provide a signed and sealed geotechnical report that details the construction method proposed.~~

~~E. — Reservoir Area. Where surface runoff is the primary source of water for a wet pond, the soils shall be impervious enough to prevent excessive seepage losses, or shall be of such nature that sealing is practical.~~

**5-324 Embankment Ponds**

~~1. — Embankment ponds shall conform to all of the following Town Standards as well as the “Virginia Impounding Structures Regulations (Dam Safety)”, Virginia’s updated “Dam Safety and Floodplain Management Programs and~~

**Comment [d41]:** Moved to new Section 5-521; more aligned with requirements for dams than water quantity criteria.

~~Regulations” and all related SCS or new NRCS “Technical Bulletins” or other written State requirements as applicable:~~

~~A. Failure of the dam will not result in loss of life, in damage to homes, commercial or industrial buildings, highways classified as through collectors or higher, railroads; or in interruption of the use or service of public utilities.~~

~~B. The product of the storage times the effective height of the dam is less than 2,000. Storage is the volume, in acre feet, in the reservoir below the elevation of the crest of the emergency spillway. The effective height of the dam is the difference in elevation in feet between the lowest open channel emergency spillway crest and the lowest point in the original cross section on the centerline of the dam. If there is no open channel emergency spillway, the top of the dam becomes the upper limit.~~

~~C. The Maximum Dam height allowed in the Town of Leesburg shall be less than 25 feet without prior approval from the Director.~~

~~D. The Geotechnical Engineer shall determine if a site has the characteristics to support a dam and shall certify to any methods required to remediate the site to a condition that would support a dam.~~

~~E. Approval is required by the Director for use of any impoundments regulated by the State of Virginia as set forth in the Virginia Soil and Water Conservation Board's Impounding Structures Regulations (Dam Safety) (VR 625-01-00), dated February 1, 1989, as revised under 4VAC 50-20-10, effective July 1, 2002 et.seq.~~

~~1. Permits for construction and operation of State regulated dams are issued by the Virginia Soil and Water Conservation Board.~~

~~2. A copy of any state approved design also must be submitted to the Director in order to receive Director approval for the construction plans.~~

~~F. Side Slopes: Side slopes shall be stable and shall not be steeper than three horizontal feet to one vertical foot without Director approval.~~

~~G. Pond bottoms (Dry Ponds) shall be graded to provide a minimum 1% slope to the lowest opening of the pond structure unless the Director approves a flatter slope.~~

~~2. Structure Classification. All structures (dams) will be reviewed and classed according to factors and procedures outlined in the National Engineering Manual and supplemented herein. The class of risk hazard as contained in this document is related to the damage that might result from a sudden major breach of the earth embankment. Structure classification and land use for runoff determination must take into consideration the anticipated changes in land use throughout the expected life of the structure. The valley downstream, and the relationship of the site to industrial and residential areas all have a bearing on the amount of potential damage in the event of a failure. The classification of a dam is determined only by the potential hazard from failure, not by the criteria selected for design.~~

~~A. Classification factors in the National Engineering Manual~~

~~(1) Class “Low Risk” Structures located in rural, agricultural, or urban areas dedicated to remain in flood tolerant usages where failure may damage non-resident buildings, agricultural land, flood plains, or Town and County roads.~~

~~(2) Class “Significant Risk” Structures located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, or minor railroads or cause interruption of use or service of relatively important public utilities.~~

~~(3) Class “High Risk” Structures located where failure may cause loss of life, serious damage to homes, industrial, and commercial buildings, important public utilities, main highways, or railroads.~~

~~B. When structures are spaced so that the failure of an upper structure could endanger the safety of a lower structure, the possibility of a multiple failure must be considered in assigning the structure classification of the upstream structure. Additional safety can be provided in either structure by:~~

~~(1) Increasing the retarding storage, and/or~~

~~(2) — Increasing the emergency spillway capacity.~~

~~C. — The following types of embankment structures are prohibited in the Town of Leesburg:~~

~~(1) — Class "a" structures with a storage height product of 2000 or greater, and/or an effective dam height of 35 feet and greater.~~

~~(2) — Class "b" Structures.~~

~~(3) — Class "c" Structures.~~

~~3. — Impoundment Laws~~

~~A. — Virginia Impounding Structures Regulations (Dam Safety) criteria requires that dams Regulated by the State of Virginia, must be certified by the State agency responsible for dam safety (Currently the Virginia Department of Conservation and Recreation (DCR) in Virginia).~~

~~B. — This requirement excludes impoundments having a dam height less than six feet and having less than 50 acre feet of storage. Refer to Detail DD-11 of this Article.~~

~~4. — Approximate method for determining Dam Breach Inundation Zone:~~

~~A. — This method is based on information contained in the Soil Conservation Service TSC Technical Note Engineering UD16, which was issued on July 3, 1969, and shall be performed for all embankment structures which have an embankment height exceeding 15 feet and or those which impound more than 25 acre feet of water. Refer to Section 5-520 for dam failure analysis requirements.~~

~~B. — This method is based on the following:~~

~~(1) — The dam is assumed to fail when the water depth is at the top of the dam.~~

~~(2) — The peak rate of the breached hydrograph is based on data supplied by the Bureau of Reclamation for actual dam failures.~~

~~(3) — The method is based upon a valley flood routing method taken from the Journal of the Proceedings of the ASCE, Hydraulics Division, May 1964, "Hydrology of Spillway Design", by Franklin F. Snyder.~~

~~C. — The graph, as shown in Detail DD-12 of this Article, has the width of the valley below the dam in feet versus the length of reach per acre foot of storage behind the dam for a depth (above bank full stage) at the lower end equal to one foot. Actual storage is to be calculated from the top of dam and the width of the valley would normally be the 100-year frequency storm flood plain.~~

~~D. — Two examples of how to use this graph are as follows:-~~

~~Example 1~~

~~A Developer wishes to build a lake for stormwater management and recreation. It has been determined that the height of the dam will be ten feet, and that there would be approximately eight acre feet of storage behind the dam. From visual observation, it is noted that there are some homes located on the flood plain 1,500 feet below the dam site. It has also been determined that the average width of the valley is 400 feet. An analysis must be made to determine if there would be a danger to these homes if the dam failed.~~

~~Using the above information, enter the left side of the graph with a valley width of 400 feet, move horizontally to the curve labeled H = ten feet, go down vertically and read 160 feet at the bottom of the graph. This value is for one acre foot of storage. It is determined that there are eight acre feet of storage, so multiply 160 feet by eight and obtain 1,280 feet. This is the distance below the dam where the depth of flow in the flood plain would be one foot if the dam would fail.~~

~~Since the homes were located 1,500 feet downstream from the dam, this would indicate that there would be little, if any, damage to these homes as a result of a sudden breach of the dam. This would indicate that the dam would be a low hazard, and that Class "a" design criteria could be used in the design of the dam if the flood plain is to remain in flood-tolerant usage.~~

Example 2

~~Same as Example 1, except that the height of the dam is 15 feet. Entering the graph again with a valley width of 400 feet and going across to the curve labeled H = 15 feet and then going vertically down, the length of reach would be equal to 210 feet for one acre foot of storage for depth (lower) = one foot. Eight acre feet of storage is necessary, therefore multiply 210 times eight and obtain 1,680 feet. This is the distance below the dam where the depth of flow in the flood plain would be one foot if the dam would fail.~~

~~Since the homes were located 1,500 feet downstream from the dam, this would indicate that the depth of flow at the homes would be greater than one foot and would probably cause serious damage to these homes. This would indicate that the dam would be a higher hazard structure than Class "a" and would therefore be prohibited within the Town of Leesburg.~~

~~This is an approximate method and more detailed valley routings will give more precise answers. This method should not be used if there is not a uniform valley width, or if there is any downstream obstruction, such as a road fill, an undersized pipe, etc.~~

~~5. Selecting the Stormwater Management Pond Site~~

- ~~A. The selection of a suitable stormwater management pond site should begin in the preliminary stage of the development, with a view of selecting the site that proves most practical and economical.~~
- ~~B. A pond with a normal pool planned as a site amenity, may incorporate the required stormwater management function; or a stormwater management pond may, with modification, be utilized as a site amenity.~~
- ~~C. A wet pond utilized as a site amenity should be located at a site where the valley is narrow, side slopes are relatively steep, and the slope of the valley floor will permit a large deep basin. Such sites tend to minimize the area of shallow water if a permanent pool is being considered; however, they should be examined carefully for adverse geologic conditions. In urban and suburban areas, large areas of shallow water should be avoided due to excessive evaporation losses and the growth of aquatic plants.~~

~~D. Consideration must also be given to any legal requirements. The landowner is responsible for obtaining all necessary and required easements of rights to discharge.~~

~~E. As previously noted the pond should not be located where sudden release of the water, due to failure of the dam, would result in loss of life, injury to persons, damage to residences or industrial buildings, railroads or highways, or cause interruption of use or service of public utilities. A site which presents one or more of these hazards is unsuitable and will not be approved.~~

~~F. A check should be made to ensure that no buried pipelines, cables, or other utilities exist in the construction area. Where such a site must be used, the utility owners shall be contacted prior to foundation investigation and utility relocation out of the embankment and impoundment area will be the responsibility of the developer.~~

~~G. No part of any pond shall be located within a 100 year Town and/or FEMA Floodplain without specific prior approval from the Director (and FEMA within FEMA floodplains).~~

~~H. The outfall from all BMP and/or SWM Facilities shall be at an elevation equal to or greater than the 100 year Floodplain elevation. With approval from the Director, the outfall pipe may extend into the 100 year floodplain as long as provisions are made for the pipe to have gaskets and the 100 year water surface elevation is lower than the bottom of the SWM facility.~~

~~6. Engineering Surveys. Once the location of the pond or reservoir has been determined, sufficient engineering surveys shall be performed so that the information required for stormwater management pond design can be obtained.~~

~~7. Geologic Investigations~~

~~A. All designs for wet ponds shall have a geologic investigation performed. Analysis shall be performed for dry ponds which have an embankment height greater than 15 feet and/or those which impound more than 25 acre-feet and/or those whose draw down time exceeds 24 hours.~~

- ~~B. The requirements of a foundation for an earthfill dam are that it provide stable support for the embankment under all conditions of saturation and loading, and that it provide sufficient resistance to seepage to prevent excessive loss of water. Adverse foundation conditions can lead to failure of a dam due to cracking, piping, sliding, settlement or uplift.~~
- ~~C. The foundation conditions under the proposed dam sites shall be investigated to ensure that the site is suitable and that a safe structure can be designed. The extent of the foundation examination will depend on the complexity of the conditions encountered and on the height of the dam. The "Unified System of Soil Classification" shall be used in foundation investigations and these logs shall be accurately located and shown on the final design plans.~~
- ~~D. Borings should be taken or test pits excavated at intervals along the centerline of the dam. The depth and spacing of the borings or pits should be sufficient to determine the suitability of the foundation.~~
- ~~E. Borings should also be taken along the centerline of the principal spillway to ensure an adequate foundation for the pipe and riser.~~
- ~~F. If a permanent pool is being considered, adequate soils investigations will be needed in the proposed pool area to be assured that excessive seepage will not be a problem.~~
- ~~G. In most cases, it is necessary to bypass excess storm runoff around the embankment of a pond through an excavated spillway. For economic reasons, suitable material excavated from the spillway should be used in the earthfill. Therefore, soil borings should be made along the approximate centerline of the proposed spillway to determine the type of material that will be encountered, its erodibility, and its suitability for use in the embankment. If additional borrow is needed, soil borings should be made in the selected borrow areas in order to estimate the kinds and amounts of suitable fill materials available.~~
- ~~H. Materials selected for construction of a dam must have sufficient strength for the dam to remain stable and provide sufficiently low~~

permeability, when compacted, to prevent harmful seepage through the dam.

I. ~~— A record or log of each boring or test pit should be made showing the location depth and classes of materials encountered. The location of each boring should be marked on the ground, so it can be referenced to other or more detailed surveys.~~

J. ~~— All information developed during the design process should be recorded in the form of an engineering plan for the pond.~~

8. ~~— Earth Embankment~~

A. ~~— Top Width. The minimum top width of the dam is shown below. When the embankment top is to be used as a maintenance access road, the minimum top width is to be the width of the proposed access road plus the top width as determined below.~~

<b>Total Height of Embankment (Feet)</b>	<b>Minimum Top Width (Feet)</b>
14 or less	12
15—19	12
20—24	12
25—34	*
35	*

\* or larger as may be required by the State approval agency

B. ~~— Side Slopes. The upstream and downstream side slopes of the settled embankment shall not be less than:~~

<b>Fill Material</b>	<b>Slope</b>	
	<b>Upstream</b>	<b>Downstream</b>
Clayey Sand, Clayey Gravel, Sandy Clay, Silty Sand, Silty Gravel...	3:1	3:1
Silty Clay, Clayey Silt>>>	3:1	3:1

~~C. — Wave Erosion Protection. Where needed to protect the face of the dam, special wave protection measures such as berms, riprap, sand gravel, soil cement or special vegetation shall be provided. Refer to the Virginia Department of Transportation Drainage Manual.~~

~~D. — Freeboard. The vertical interval between the elevation of the water surface in the reservoir with the emergency spillway flowing at design depth and the minimum elevation at the top of the settled embankment is the freeboard, and shall equal or exceed one foot; in addition, the minimum difference in elevation between the crest of the emergency spillway and the settled top of dam shall be two feet.~~

~~E. — Allowance for Settlement. The design height of the dam shall be increased by the amount needed to ensure that the design top elevation will be maintained after all settlement has taken place. If a minimum required density is specified, the increase shall be five percent.~~

~~F. — Foundation Cutoff. A cutoff trench of relatively impervious material shall be provided under the dam and into the abutments, as required, and be deep enough to extend into a relatively impervious layer except:~~

- ~~(1) — In those cases where a layer of relatively impervious material thick enough to provide stability exists at the surface of the foundation; or~~
- ~~(2) — In those cases where a layer of such material does not exist at a reasonable depth.~~
- ~~(3) — Where the Geotechnical Engineer certifies (to the satisfaction of the Director) that it is not necessary.~~

~~The cutoff shall be located at or upstream from the centerline of the dam. Where such a layer does not exist at a reasonable depth, the engineer responsible for the technical design shall provide a geotechnical analysis, demonstrating that the site is feasible for the construction of a dam.~~

~~The cutoff trench shall have a bottom width adequate to accommodate the equipment used for excavation, backfill and compaction operations,~~

~~with the minimum width being four feet, and shall have side slopes no steeper than one foot horizontal to one foot vertical.~~

~~G. Seepage Control:~~

~~(1) Seepage control is to be included:~~

- ~~a. If pervious layers are not intercepted by the cutoff;~~
- ~~b. If seepage may create swamping downstream;~~
- ~~c. If needed to ensure a stable embankment; or~~
- ~~d. If special problems, such as fractured rock, etc., require drainage for a stable dam~~
- ~~e. If recommended by the geotechnical engineer.~~

~~(2) Seepage control may be accomplished by~~

- ~~a. Foundation, abutment or embankment drains;~~
- ~~b. Reservoir blanketing; or~~
- ~~c. A combination of these measures.~~

~~Foundation drains are to be considered when the normal water depth in the pond is greater than 15 feet (measured from the low point at the centerline of the dam).~~

~~9. Spillways~~

~~A. Emergency spillways for all ponds will be designed to provide the required detention and to pass the full volume of that portion of the Probable Maximum Flood (PMF) shown in DD-11 based upon dam height and impoundment. (The PMF is defined in Article 11).~~

~~B. Principal Spillways. A conduit, with needed appurtenances, shall be placed under or through the dam except where a weir type structure is used.~~

- ~~(1) — The principal spillway shall be designed to provide the detention required and control the release rate for those design-year events stipulated for each major water shed.~~
- ~~(2) — The crest elevation of the inlet or riser shall be at least one foot below the crest elevation of the earth emergency spillway.~~
- ~~(3) — The inlet or riser size for pipe drops shall be such that the flow through the structure goes from weir flow control to pipe control flow without going into orifice flow control in the riser. The inlets and outlets shall be designed and analyzed to function satisfactorily for the full range of flow and hydraulic head anticipated. The riser shall be analyzed for flotation, using water at the principal spillway crest elevation, and assuming all orifices and pipes are plugged. The factor of safety against flotation shall be 1.2 or greater.~~
- ~~(4) — Size. The capacity of the pipe conduit shall be adequate to discharge long duration, continuous, or frequent flows without flow through the emergency spillways. The diameter of the pipe shall not be less than 12 inches.~~
- ~~(5) — Conduits under or through the dam shall be reinforced concrete. The conduits shall be capable of withstanding the external loading without yielding, buckling or cracking. Conduit strength shall not be less than Class III. The inlets and outlets shall be structurally sound and made from materials compatible with the pipe. All conduit joints are to be made watertight by the use of gaskets.~~
- ~~(6) — Excavation for Placement. Where excavation into existing or compacted ground is required in order to obtain the proper elevation for the conduit, this excavation shall be of sufficient width to accommodate the conduit, anti seep collars, earth hauling and hand operated compaction equipment. The side slopes of the excavation shall not be steeper than one to one.~~
- ~~(7) — Multiple Conduits. Where multiple conduits are used, there shall be sufficient space between the conduits and the installed~~

~~anti-seep collars to allow for backfill material to be placed between the conduits by the earth moving equipment and for easy access by hand operated compaction equipment. This distance between conduits shall be equal to or greater than the pipe diameter or width opening but not less than two feet.~~

- ~~(8) — Anti Seep Collars. Anti seep collars shall be installed around all conduits through earth fills of all wet ponds and for all dry ponds whose draw down time exceed 24 hours unless the Geotechnical Engineer certifies (to the satisfaction of the Director) that it is not necessary. Impoundment structures incorporating anti seep collars shall use the following criteria:~~
- ~~a. — Sufficient collars shall be placed to increase the seepage length along the conduit by a minimum of 15 percent of the pipe length located within the saturation zone.~~
  - ~~b. — The assumed normal saturation zone shall be determined by projecting a line with a slope of four horizontal to one vertical from the point where the normal water elevation touches the upstream slope of the fill to a point where this line intersects the invert of the conduit. All fill located below this line may be assumed to be saturated.~~
  - ~~c. — For ponds that are normally dry, the starting elevation shall be the maximum water surface elevation in the pond when the principal spillway storm is routed through the structure.~~
  - ~~d. — Maximum collar spacing shall be 14 times the minimum projection of the collar measured perpendicular to the pipe.~~
  - ~~e. — Minimum collar spacing shall be five times the minimum projection of the collar measured perpendicular to the pipe.~~
  - ~~f. — All anti seep collars and their connections to the conduit shall be water tight.~~

~~g. —Alternate designs (designed to the satisfaction of the Director and certified by the Geotechnical Engineer) will also be permitted.~~

~~(9) —Antivortex Devices. Drop inlet spillways are to have adequate antivortex devices in accordance with the latest edition of the Virginia Stormwater Management Handbook.~~

~~(10) —Safety Guardrails and Trash Racks. Trash racks shall have openings no larger than 3/4 of the conduit diameter or width opening, but in no case less than six inches in its smallest dimension. Racks and rails should be used when it is necessary to prevent clogging or when a safety hazard exists. Flat grates for trash racks are not acceptable, side openings must be provided.~~

~~(11) —All ponds in urban areas shall be analyzed for safety. Low stage inlets on ponds that are normally dry shall have adequate trash racks. Velocity of water through the trash rack opening at design flows shall not exceed three feet per second.~~

~~(12) —Drain Pipe. A pipe with a suitable valve should be provided to drain the pool area where needed for maintenance. The principal spillway conduit may be used as a pond drain when so located as to accomplish this function.~~

~~(13) —A narrative detailing how the pond is to be drained for maintenance and who is responsible shall be part of all plan sets submitted to the Town.~~

~~C. —Emergency Spillways~~

~~(1) —A separate, independent emergency spillway shall be provided for each dam, the purpose of which is to provide for safe passage of the appropriate portion of the Probable Maximum Flood (PMF) or the 100 year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design) without damage to the embankment.~~

- (2) ~~Capacity. The minimum capacity of emergency spillways shall be that required to pass the peak flow expected from the appropriate portion of the Probable Maximum Flood (PMF) or the 100-year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design). The routing shall start with the design water surface at the elevation of the crest of the principal spillway. Refer to Detail DD-11 at the end of this Article.~~
- (3) ~~Emergency spillways are to provide for passage of the design flow at a non-erosive velocity to a point downstream where the dam will not be endangered.~~
- (4) ~~Cross Section. Excavated earth spillways shall be trapezoidal and shall be located in undisturbed earth. The side slopes shall be stable for the material in which the spillway is to be constructed but not steeper than 3:1. For dams having effective heights exceeding 20 feet, the emergency spillway shall have a bottom width of not less than ten feet.~~
- (5) ~~When natural spillways are used, a dike shall be constructed from the end of the dam to prevent the flow from impinging on the toe of the dam. The dike shall have a freeboard of one foot above design flow.~~
- (6) ~~Permissible Velocities~~
  - a. ~~Earth spillways shall be designed for non-erosive velocities through the control section and for a reasonable distance below the spillway. The maximum permissible velocity for the grass or grass mixture to be used shall be selected from the following table:~~

<b>PERMISSIBLE VELOCITY FOR VEGETATED SPILLWAYS<sup>1</sup></b>			
<b>Vegetation</b>	<b>Permissible Velocity</b>		
	<b>Erosion-Resistant Soils<sup>2</sup></b>		<b>Easily Eroded<sup>3</sup></b>
	<b>Slope of Exit Channel</b>		<b>Slope of Exit Channel</b>
	pet 0-5	pet 5-10	pet 0-5
	ft/s	ft/s	ft/s
			pet 5-10
			ft/s

<del>Kentucky- Bluegrass Smooth Broome Tall Fescue Reed- Canarygrass</del>	<del>7</del>	<del>6</del>	<del>5</del>	<del>4</del>
<del>Sod-Forming- Grass-Legume- Mixtures</del>	<del>5</del>	<del>4</del>	<del>4</del>	<del>3</del>
<del>Lespedeza- Sericea Weeping- Lovegrass Yellow Bluestem Native Grass- Mixtures</del>	<del>3.5</del>	<del>3.5</del>	<del>2.5</del>	<del>2.5</del>

<sup>1</sup> SCS-TP-61

<sup>2</sup> Those with higher clay content and higher plasticity. Typical soil textures are silty clay, sandy clay, and clay.

<sup>3</sup> Those with a high content of fine sand or silt and lower plasticity, or non-plastic. Typical soil textures are fine sand, silt, sandy loam, and silty loam.

b. — The capacity of the spillway shall be determined using vegetal retardants representing an unmowed condition. The maximum velocity shall be determined with a vegetal retardants representing a closely mowed condition.

**GUIDE TO SELECTION OF VEGETAL RETARDANTS**

Stand	Average Height of Vegetation in Inches	Degree of Retardants	Stand	Average Height of Vegetation in Inches	Degree of Retardants
Good	Higher than 30	A	Fair	Higher than 30	B
	11 to 24	B		11 to 24	C
	6 to 10	C		6 to 10	D
	2 to 6	D		2 to 6	D
	Less than 2	E		Less than 2	E

(7) — Excavated earth spillways shall have an inlet channel, control section, and an exit channel. Upstream from the control section, the inlet channel shall be level for the minimum

~~distance of 25 feet and shall have side slopes equal to three to one or greater.~~

- ~~(8) — The flow shall enter the spillway through the inlet channel. — The maximum depth of flow (Hp) located upstream from the level part shall be controlled by the inlet channel, level part, and exit channel. Refer to Detail DD-13 of this Article.~~

~~Excavation of the inlet channel or the exit channel, or both, may be omitted where the natural slopes meet the minimum slope requirements. — The direction of slope of the exit channel must be such that discharge will not flow against any part of the dam. — Wing dikes, sometimes called kicker levees or training levees, can be used to direct the outflow to a safe point of release. — The spillway should be excavated into the earth for the full length and width of the spillway. Refer to Standard DS-4 in Appendix A.~~

~~If this is not practical, the end of the dam and any earthfill constructed to confine the flow, shall be protected by vegetation or riprap. The entrance to the inlet channel should be widened so it is at least 50 percent greater than the bottom width of the level part. The inlet channel should be reasonably short and shall be planned with smooth, easy curves for alignment. It shall have a slope toward the reservoir of not less than two percent to ensure drainage.~~

- ~~(9) — The inlet channel may be curved to fit existing topography, but exit channels shall be straight for a minimum distance well beyond the downstream toe of the dam at the lowest point in the valley.~~
- ~~(10) — The grade of the exit channel of a excavated earth spillway shall fall within the range established by discharge requirements and permissible velocities. The exit channel shall terminate only where the design flow may be discharged without damage to the earth embankment.~~
- ~~(4) — With the required discharge capacity, the degree of retardance, permissible velocity, and the natural slope of the exit channel~~

~~known, the bottom width of the level and exit sections and the depth of the flow ( $H_p$ ) can be computed from figure in Detail DD-13 of this Article which show discharge per foot of width. The natural slope of the exit channel should be altered as little as possible.~~

~~D. Combined Spillways~~

- ~~(1) Combined spillways (a single structure that combines the primary and emergency spillways) shall require approval of the Director and shall only be permitted when adequate provisions for the release of flows based upon the appropriate portion of the Probable Maximum Flood (PMF) or the 100-year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design) can be accommodated downstream of the structure's outfall and when protection of the embankment is employed. Refer to Detail DD-11 of this article for spillway design requirements.~~
- ~~(2) The combined spillway (when approved by the Director) shall be designed to provide the detention required and control the release rate for those design year events stipulated for each major water shed and adequately control the outflow of the less frequent events of the appropriate portion of the Probable Maximum Flood (PMF) or the 100-year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design).~~
- ~~(3) The combined spillway (when approved by the Director) shall provide for a minimum of 24 inches of freeboard from the elevation of the appropriate portion of the Probable Maximum Flood (PMF) or the 100-year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design) to the Top of the Dam.~~
- ~~(4) Any design which utilizes a combined spillway shall incorporate a secondary all weather access route for the facility.~~

~~E. Structural Emergency Spillways~~

~~(1) Pipes, culverts, chutes or drops, when used for principal spillways or principal emergency or emergency spillways, shall be designed in accordance with the principles set forth in the National Engineering Handbook, "Drop Spillways"; and "Chute Spillways." The minimum capacity of a structural spillway shall be that required to pass the peak flow expected. The routing shall start with the water surface at the elevation of the design storm.~~

~~(2) Structural emergency spillways may only be approved after an independent structural review of the design is completed by a structural engineer familiar with hydraulic structures, selected by the Director. All costs of this review shall be borne by the Developer.~~

**5-325343**

**Excavated Ponds**

1. General. Excavated ponds, with contributing watershed areas of more than ten acres which create a failure hazard, shall be designed as embankment ponds. Excavated ponds, that are normally dry (SWM ponds) and include a pipe outlet control system, shall be designed using the principal and emergency spillways design criteria as that for embankment ponds.
2. Side Slopes. Side slopes of excavated ponds shall be such that they will be stable and shall not be steeper than three horizontal to one vertical.
3. Pond bottom (Dry Ponds) shall be graded to provide a minimum 1% slope to the lowest opening of the pond structure unless a lesser slope is approved by the Director.
4. Inlet Protection. Where surface water enters the pond in a natural or excavated channel, the side slope of the pond shall be protected against erosion.
5. Placement of Excavated Material. The material excavated from the pond shall be placed in one of the following ways so that its weight will not endanger the stability of the pond side slopes and where it will not be washed back into the pond by rainfall: Refer to Standard DS-5 in Appendix A.

- A. Uniformly spread to a height not exceeding three feet with the top graded to a continuous slope away from the pond.
- B. Uniformly placed or shaped reasonably well with side slopes no steeper than three horizontal feet to one vertical foot for the excavated material behind a berm width equal to the depth of the pond but not less than 12 feet.
- C. Shaped to a designed form that blends visually with the landscape. D. Used for low embankment and leveling.
- D. Hauled away.

~~5-326~~ Wet Ponds

~~1. Wet ponds shall conform to the following:~~

~~A. Excavation and shaping required to permit the reservoir area to suitably serve the planned purpose shall be included in the construction plans. Reservoirs constructed or created shall incorporate the following requirements:~~

- ~~(1) All wet ponds should have a drain pipe. A device to take overflow from the bottom, rather than the top, is advisable but not required.~~
- ~~(2) The minimum surface area should be one half acre. A minimum of 80 percent of the shoreline shall be sloped such that the water depth is three feet deep extending six feet from the water's edge and shall have a minimum six foot depth over at least one third of the surface area with a portion at least eight feet deep. The eight foot requirement may be waived when a spring having a flow exceeding 225 gallons per minute per acre-foot of water, serves as a water supply. Refer to Standard DS-6 in Appendix A.~~
- ~~(3) All wet ponds shall be designed with a suitable liner designed and certified to by a qualified professional engineer to ensure the wet pond will hold the permanent volume of water it has been designed for.~~

**Comment [d42]:** Criteria for wet ponds are contained in the Virginia Stormwater BMP Clearinghouse.

**5-327344 Visual Resource Design—Wet and Dry Ponds**

1. ~~Ponds~~ Stormwater management facilities in areas of high public visibility and those associated with recreation are to receive careful visual design. The underlying criterion for all visual design is appropriateness. The shape and form of ponds, excavated material and plantings are to relate visually to their surroundings and to their function.
  
2. The embankment can be shaped to blend with the natural topography. The edge of the ~~pond~~ facility can be shaped so it is generally curvilinear, rather than rectangular. Excavated material can be shaped so the final form is smooth, flowing and fitting to the adjacent landscape, rather than angular geometric mounds. Where feasible, islands can be added for visual interest and wildlife value. Shrubs along one quarter of the shoreline to benefit other wildlife are permissible. Shoreline trees on ponds over three acres are required.
  - A. Landscape Planning. A pond's apparent size is not always the same as its actual size. For example, the more sky reflected on the water surface, the larger a pond appears. A pond completely surrounded by trees will appear smaller than a pond the same size without trees or with some shoreline trees. The shape of a pond should complement its surroundings. Irregular shapes with smooth, flowing shorelines generally are more compatible with the lines of countryside landscape. Peninsulas, inlets, or islands can be formed to create interest in the configuration of the water's edge. Refer to Standard DS-7 in Appendix A.
  - B. The pond should be located and designed to use the existing landform, vegetation, water, and structures with minimum disturbance. Landforms can often form the impoundment with minimum excavation. Openings in the vegetation can be used to avoid costly clearing and grubbing. Existing structures such as stone walls and tails can be retained to control pedestrian and vehicular traffic and minimize disruption of existing use. In the area where land and water meet, vegetation and landform can provide interesting reflections on the water's surface, guide attention to or from the water, frame the water to emphasize it, and direct passage around the pond.

- C. In some situations a curved dam alignment is more desirable than a straight alignment. Curvature may be used to retain existing landscape elements, reduce the apparent size of the dam, blend the dam into surrounding natural landforms, and provide a natural-appearing shoreline/
  - D. Finish-grading techniques used to achieve a smooth landform transition include slope rounding at the top and bottom of cuts or fills and on side slope intersections, and slope warping to create variety in the horizontal and vertical pitch of finished slopes. Additional fill can be placed on the backslope and abutments of the dam, if needed, to achieve this landform transition. Refer to Standard DS-8 in Appendix A.
  - E. Density and height of vegetation can be increased progressively from the water's edge to the undisturbed vegetation. In this way the cleared area will look more natural. Feathering can be accomplished by selective clearing, installation of new plants, or both.
  - F. Ponds of rectangular shape shall not be used where the resulting straight lines would be in sharp contrast to surrounding landscape patterns. A pond can be excavated in a rectangular form and the edge shaped later with a blade scraper to create an irregular configuration.
3. Planning the placement or disposal of the material excavated from the pond.
- A. If waste material is not removed from the site, it must be placed so that its weight does not endanger the stability of the side slopes and rainfall does not wash the material back into the pond. If material is stacked, it shall be placed with side slopes no steeper than the natural angle of repose of the soil. Waste material shall not be stacked in a geometric mound but shaped and spread to blend with natural landforms in the area. Because most excavated ponds are in flat terrain, the waste material may be the most conspicuous feature in the landscape. Interrupting the existing horizon with the top of the waste mound should be avoided. Refer to Standard DS-5 in Appendix A.
  - B. Waste material can also be located and designed to be functional. It can screen undesirable views, buffer noise and wind, or improve the site's suitability for recreation. In shaping the material, there should be no less than 12 feet between the toe of the fill and the edge of the pond.

**5-328345 Stormwater Management Pond Plans**

The following information shall be shown on the design drawings for all stormwater management ponds:

1. Watershed Map. Watershed maps shall be shown on plans submitted for approval. Bar scales shall be used. The map shall show the watershed boundary; the drainage pattern; location of bridges and culverts and other structures that affect the flow of water; location of roads, buildings, property lines and fences and north arrow.
2. Plan View. The plan view should indicate the, center line of dam and cross section of the dam as well as a profile of the outlet structure and outfall pipe with corresponding station numbers. The plan will contain an accurate contour map of the structure site and adjacent area. When this map is shown on a plan-profile sheet, the plan scale should be the same as the profile. The contour interval should be one or two feet. The plan view should show in detail the following:
  - A. The spillways and fill locations.
  - B. All benchmarks, soil borings, borrow pits, fences, buildings, roads, bridges, springs, wells or other improvements that influence the design or construction of the proposed work.
  - C. Property lines.
  - D. Name of property owners.
  - E. Contour at normal pool and design stormwater surface elevations.
  - F. Contour map of flooded area. The scale of this map may be one inch = 20 feet where it can incorporate the details of the local plan, to one inch = 100 feet where a separate map would be required. The size, as determined by the scale and required details, vary from a one sheet combination of all maps and the profile, to an individual sheet for this map alone. The object of this map is to indicate with reasonable accuracy:

**Comment [d43]:** The Town asked about whether the BMP Clearinghouse had any of these requirements and whether any of this section could be deleted. The regulations and Clearinghouse don't specify this, so this section can be left as is.

- (1) Contours of the normal pool elevation at a maximum contour interval of two feet when needed for design.
  - (2) Contour of the spillway design flood water surface elevation. These contours shall be on a one foot vertical interval.
- G. The applicant shall on the construction plan set, provide a reference to the geotechnical report and include all applicable geotechnical notes regarding liner, embankment, seepage controls, etc.
3. Profile of Principal and Emergency Spillway. The profile shall be plotted at a scale of one inch equals ten feet horizontally and one inch equals five feet vertically on profile paper. The following shall be shown:
- A. Principal Spillway. The spillway must be shown on the profile at the correct station and elevation. The following elevations shall be clearly labeled:
    - (1) The crest of the spillway.
    - (2) The top of outlet apron or invert of pipe spillway at the outlet.
    - (3) The water surface at maximum stage of design storm.
    - (4) The top of the earthfill (settled height).
  - B. Emergency spillway. The spillway must be shown on the profile at the correct station and elevation. The following shall be clearly shown:
    - (1) Crest of the spillway.
    - (2) Length of the control section.
    - (3) Slope of the approach channel.
    - (4) Slope of the exit channel.
    - (5) The existing ground elevation along the centerline.

- C. For both spillway profiles, the location and elevation of rock, gravel or soil strata that affects the design or location of the structure shall be shown.
4. Cross Sections. Cross sections should be plotted as viewed looking downstream. The profile station for each cross section plotted should be centered directly below the cross section on the data sheet. When possible, the cross section should be plotted to the same horizontal and vertical scale, thereby giving an undistorted cross section.
- A. The cross section along the centerline of the proposed earthfill shall show the following information:
    - (1) Elevations and important dimensions of the principal spillway in proper relation to the cross section showing the elevations of crest, apron, and top of weir or headwall.
    - (2) The top of the earthfill as constructed and its final settled height.
    - (3) The elevation of earthfill berms, if applicable.
    - (4) The elevation and dimensions of the emergency spillway.
    - (5) The location and descriptions of soil borings taken along or near the centerline of the proposed structure.
    - (6) The dimensions of and the depth of the cutoff trench.
  - B. Cross sections through the fill or embankment area shall show the following information:
    - (1) The side slopes of the fill.
    - (2) The top width of the embankment.
    - (3) The elevation of top of fill as constructed and its settled height.
    - (4) The existing and proposed ground lines.
    - (5) Property line, if applicable.

- (6) Core trench dimensions and location.
- (7) Foundation drain.
- (8) The elevation of earthfill berms, if applicable.
- (9) The location of any fences,
- (10) Stations and centerline or baseline.

It may be possible to show this information on the profile of the principal spillway.

5. Other Details as Needed.
  - A. Seeding and mulching specifications for the fill, spillway, and borrow areas.
  - B. Pipe and riser construction details supplemented with details of appurtenant structures including but not limited to trash racks, anti-seep collars, propped outlet, concrete reinforcing, fencing.
  - C. Construction notes required to assist in layout, construction, and checking of the completed practice.
  - D. Notes and details from qualified soils engineer.

**5-330346**     **Rooftop Detention**

~~5-331~~     ~~Design Criteria~~

1. Design Criteria

- A. Roof top storage shall be an appropriate design to detain up to the ten-year, two-hour event, and emergency overflow provisions shall be adequate to discharge the 100- year, 30-minute event.
  - (1) A roof design in the Town of Leesburg is currently based on a snow load of 30 pounds per square foot or 5.8 inches of water.

Assuming a reasonable factor of safety, properly designed roofs are structurally capable of holding three inches of detained stormwater.

- (2) Roofs calculated to store depths greater than three inches shall be required to show structural adequacy of the roof design and to be approved by the Loudoun County Building Official prior to approval by the Director.
- B. No less than two roof drains shall be installed in roof areas of 10,000 square feet or less, and at least four drains in roof areas over 10,000 square feet in area. Roof areas exceeding 40,000 square feet shall have one drain for each 10,000 square foot area. Refer to Detail DD-14 of this Article.
- C. Emergency overflow measures adequate to discharge the 100-year, 30-minute event without unnecessary risk to life or property must be provided.
- (1) If parapet walls exceed three inches in height, the designer shall provide openings (scuppers) in the parapet wall sufficient to discharge the 100-year, 30-minute storm flow at a water level not exceeding five inches.
  - (2) A scupper shall be provided for every 20,000 square feet of roof area, and the invert of the scupper shall not be more than 3.5 inches above the roof level. (If such openings are not practical, then detention rings shall be sized accordingly).
- D. Detention rings shall be placed around all roof drains that do not have controlled flow. Refer to Standard DS-9 in Appendix A.
- (1) The number of holes or size of openings in the rings shall be computed based on the area of roof drained and runoff criteria.
  - (2) The minimum spacing of sets of holes is two inches center-to-center.
  - (3) The height of the ring is determined by the roof slope and in no case shall the height of the ring exceed three inches.

- (4) The diameter of the rings shall be sized to allow the 100-year design storm to overtop the ring (overflow design is based on weir computations with the weir length equal to the circumference of the detention ring).
- (5) Conductors and leaders shall also be sized to pass the expected flow from the 100-year design storm.
- E. The maximum draw down time of the roof shall not exceed 17 hours.
- F. The Town of Leesburg will accept Josam Manufacturing Company and Zurn Industries, Inc. market "controlled-flow" roof drains, or other approved equivalents.
- G. Access for inspection shall be provided for all roof drains.

~~5-332~~ Plan Preparation

2. Plan Preparation

H.A. Computations required on all development plans:

- (1) The roof area in square feet.
- (2) The storage volume provided at three-inch depth.
- (3) The maximum allowable and calculated discharge rate.
- (4) Inflow-outflow hydrograph analysis or acceptable charts (For Josam Manufacturing Company and Zurn Industries, Inc. standard drains, the peak discharge rates as given in their charts are acceptable for drainage calculation purposes without requiring full inflow-outflow hydrograph analysis).
- (5) The number of drains required.
- (6) The size of openings required in detention rings.

- (7) The size of rings to accept openings and to pass the 100-year design storm.

**5-340347      Underground Detention**

**5-341      General**

**1.      General**

- A. All underground detention facilities that are to be publicly maintained or associated with a residential subdivision shall have prior approval of the Director.
- B. Private underground stormwater management facilities utilizing corrugated metal pipe (CMP) will be approved, if the conditions listed below are satisfied:
  - (1) Pipe must be aluminum CMP or aluminized steel CMP. Other materials may be considered on a case by case basis with prior approval from the Director.
  - (2) All access structures, manholes, inlets, and control structures must be reinforced concrete meeting Virginia Department of Transportation standards and conform with OSHA Confined Space Regulations.
  - (3) Calculations must be submitted to demonstrate that the structure will withstand the expected traffic loading in a paved area.
  - (4) All construction details must be provided.
  - (5) Structures must not be placed under the main site accessways or adjacent to the public right-of-way.
- C. Underground systems conveyed to the Town must be constructed entirely of reinforced concrete.

**5-342      Design Criteria**

**2.      Design Criteria**

~~D.A.~~ Underground detention shall be a closed tank or pipe system.

~~E.B.~~ Sediment traps and trash racks shall be provided. These should be placed near maintenance access points.

~~F.C.~~ All underground facilities shall have at least two points of access to facilitate maintenance. The Director, on the recommendation of the Director of Public Works, may require additional access points if it is necessary for the required maintenance.

~~G.D.~~ All underground detention facilities shall have spillways designed to accommodate the design-year event, while providing detention for the one-year, two-year and ten-year event(s) as required.

~~H.E.~~ All facilities shall provide for adequate overland relief for runoff in excess of the ten-year event. Routing of the 100-year event through the underground detention facility is not required.

F. Peak runoff rates from the facility shall be less than or equal to both of the design- years' pre-development runoff rates.

I.G. See Section 5-700 for easement requirements.

~~J.~~ ~~All underground detention facilities shall be within storm drainage easements conveyed to the Town and include a separate maintenance agreement, both in a form approved by the Town Attorney. Easement widths as determined below shall be in one foot increments.~~

~~(1) Pipes~~

~~a. For single pipes 24 inches and less in diameter the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on both sides of the pipe.~~

~~b. For single pipes greater than 24 inches in diameter the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the~~

~~elevation of the proposed finished grade on both sides of the pipe plus the outside diameter of the pipe.~~

~~e. For multiple pipes at the same or different elevations the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on the most outside pipe, plus the combined outside pipe diameters, plus the width of space between each pipe.~~

~~d. The minimum easement width for any storm sewer shall be 15 feet. The maximum easement width shall be 30 feet for single pipes or 15 feet each side for multiple pipes.~~

~~e. Refer to Standard WS 16 in Appendix A.~~

**Comment [d44]:** Moved to Section 5-700 on easements.

~~5-343~~ **Plan Preparation**

3. Plan Preparation

~~K.A.~~ Plans shall accurately show the alignment of the structure and all appropriate easements.

~~L.B.~~ All corners and junctions of conduits shall be shown on all plans. These shall include the invert elevations of the tank if applicable.

~~M.C.~~ A profile of the tank or conduit, including sufficient sections, shall be shown.

~~N.D.~~ Details of gravel bed, tank, or conduit construction and entrance and outfall structures shall be shown.

~~O.E.~~ Plan views of structures consisting of multiple sections shall include flow arrows.

~~5-350~~~~348~~ **Porous Pavement**

~~5-351~~ **General**

1. General

- A. The use of the following porous pavement surfaces shall be allowed on private property with all required design elements as appropriate for individual site conditions and a privately maintained maintenance agreement acceptable to the Town:
- (1) Pervious Pavers
  - (2) Pervious Concrete
  - (3) Other materials may be considered on a case by case basis and shall require prior approval of the Director.
- B. The use of porous pavement shall not be allowed for any public facility without prior approval of the Director of Public Works.

~~5-352~~ Design Criteria

2. Design Criteria

- ~~C.A.~~ Soil tests shall be conducted in accordance with Section 9-300.
- (1) In addition to these tests, a percolation test shall be performed.
  - (2) An outflow "hydrograph" shall be developed based on the absorption and percolation rate of both subgrade and pavement and supplemental subdrainage.
- ~~D.B.~~ Projected traffic counts and live loading calculations are required.
- ~~E.C.~~ The mix (gradation) including density of both the subgrade and the porous pavement, shall be designed and sealed by a professional registered engineer certified by the State of Virginia with background in pavement design.
- ~~F.D.~~ Preparation of the site and the placement of the pavement shall be done under the direct supervision of a professional engineer registered in the State of Virginia.

G.E. Pavement density tests shall be made within three hours of placement and shall be compared with engineer's calculations.

H.F. Prior to final inspection, a second density test shall be made and results compared with the previous test.

I.G. The construction plans shall contain:

- (1) Engineering calculations, including design mix criteria and specifications.
- (2) Calculation of the ten-year peak inflow rate.
- (3) Storm routing calculations shall be provided as required by the Director.
- (4) Calculations for nominal percolation rates based on the closure of voids due to sediment deposition.
- (5) Provisions for freeze/thaw action and approved deicing chemicals shall be noted.

J.H. All future repairs (sealing, overlays) shall be done only with the prior approval of the Director of Plan Review and shall be in accordance with guidelines outlined above.

**5-360350**      **Regional Facilities**

1. Regional facilities shall be determined based on the area of the drainage shed associated with the specific structure as follows:
  - A. The drainage area to the structure shall be no less than 100 acres to be considered for a regional facility.
  - B. The facility shall serve more than two sites.
2. The Director of Plan Review shall ultimately decide, based on the above criteria and the future benefit to the public, whether the facility is to be accepted as a regional facility.

3. These facilities shall be located such that they conform to those areas outlined within the Stormwater Management Master Plan for possible regional facilities. Other sites may be approved at the discretion of the Director of Plan Review.
4. Sites which are conveying their stormwater to a regional facility shall convey their stormwater through closed conduit, or adequate open channels. These systems shall have duly recorded easements.
5. Regional facilities shall be designed such that they retain a permanent pool of water with continuous release, and be of adequate volume and depth to become an amenity to the community.
6. For guidelines for dam design, refer to Section 5-520 of this Article.
7. If buildings are to be constructed downstream from the facility where failure may result in loss of life, the appropriate portion of the Probable Maximum Flood (PMF) or the 100 year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design) elevation shall be determined and a building restriction zone set, similar to the restrictions for flood plains. Refer to Section 5-420 of this Article.

**5-370360**

**Waivers and Exemptions**

1. Stormwater management waivers and exemptions shall be considered in accordance with the process established in Section 14-23 of the Town Code.  
~~All development proposed in the Town of Leesburg must demonstrate compliance with the required stormwater management criteria for the watershed in which the development is located.~~
- ~~2. Provided the applicant can prove down stream adequate outfall (as defined by this manual) exists and there are no known existing downstream drainage issues and the effect of the proposed development will not cause an adverse impact to downstream properties as noted in the section below, the Director, with proper justification, may consider granting a waiver of the requirements for an on site stormwater management facility for the following types of development only (when not prohibited by this or any other applicable ordinance):~~

**Comment [d45]:** Waivers and exemptions are now limited to those provided for by the Virginia Stormwater Management Regulations, which are reflected in the Town Code.

~~A. Subdivisions of detached single family residential developments where:~~

<del>Minimum Lot Size</del>	<del>Maximum Lot Size</del>
<del>1 acre</del>	<del>5 acres</del>
<del>1/2 acre</del>	<del>2 acres</del>
<del>1/3 acre</del>	<del>1 acre</del>
<del>1/4 acre</del>	<del>1 acre</del>
<del>1/8 acre</del>	<del>1 acre</del>

~~B. Subdivisions of multi family residential developments which total one acre or less.~~

~~C. Institutional developments in which there is one acre or less of disturbed area and, included therein, 1/2 acre or less of impervious area.~~

~~D. Industrial and commercial developments in which the total disturbed area is 2/3 acre or less and included therein, 1/3 acre or less of impervious area.~~

~~3. For purposes of clarity, the following statements shall apply to these guidelines:~~

~~A. Institutional developments shall be defined as: churches, cemeteries, libraries, schools, day care centers, fire departments, hospitals, nursing convalescence homes, and recreational facilities and their related buildings and parking lots.~~

~~B. All parking lots shall be considered impervious and therefore included in the impervious area calculations.~~

~~C. Building on or resurfacing a previously approved or legally "nonconforming" impervious area shall not require stormwater management nor shall it be included as an addition of impervious area.~~

~~D. Impervious area calculations for buildings shall include all overhanging projections such as eaves, canopies and covered walks.~~

~~4.2. Unless otherwise prohibited, with adequate justification, the Director may grant a waiver of on-site stormwater management for the above types of development and, in extreme circumstances, for development not listed above.~~

only if one of the following conditions is satisfiedThe following are examples  
of when a waiver may be considered by the Director:

- A. The hydraulic characteristics of the receiving stream or the environmental characteristics of the existing stream and the site are such that on-site management or detention of flows are contrary to sound engineering practices or detrimental to the environment.
- B. Existing off-site stormwater management facilities provide the required control. In such cases, on-site stormwater management may be waived provided that the delivery system from the developing site to the off-site stormwater management facility is designed based on Articles 5 and 6 of this ~~Manual~~DCSM.
- C. An off-site stormwater management facility has been identified for construction in the Capital Improvements Program, and the applicant will agree to a financial contribution or dedicated an easement or land for the construction thereof.
- D. Two or more developments, including that of the applicant, have provided jointly, through reciprocal easements, or other means, for the management of the stormwater facility.

~~5.3.~~ Any new projects which are additions, extensions and modifications to those developments listed in the above categories which have been granted a prior waiver under this policy shall be required to provide stormwater management for the entire site where the acreage limitations listed for each are exceeded by the subsequent addition, extension and modification thereto.

~~6.4.~~ Owners and ~~Developers~~developers who have projects falling within these categories or the following conditions and who desire not to provide stormwater management for the site, must request in writing to the Director, that the requirements be waived.

~~7.5.~~ Each request will be considered individually by the Director. All applications for a waiver will receive a written response outlining the reasons for approval or denial of the application within 45 days of receipt of a complete application.

~~8.6.~~ It should be noted that in reviewing the waiver application, all storm drainage out-falls, receiving channels and channel capacities, velocities and other

related storm drainage discharge considerations will be closely examined to determine the need for additional outfall treatment and/or channel protection needs. Further, the developer's engineer shall furnish the Director a signed and sealed document prior to granting a stormwater management waiver, stating that the receiving storm drain system in question is adequate.

**5-380370**     **Inspection and Maintenance Provisions**

~~1.~~ ~~The inspection and maintenance impact of stormwater management facilities is considered to be a primary concern to the Town of Leesburg and to the future operation of these facilities.~~

~~2.1.~~ Engineers in the preparation of plans for construction shall include ~~Inspections~~inspections, maintenance and operation of these facilities as one of the primary design considerations. All construction and site plans shall ~~contain~~be accompanied by a separate an Inspection Schedule and ~~maintenance~~Maintenance plan-Plan that identifies the owner, the responsible parties for inspections and maintenance as well as the inspection requirements and maintenance plan schedule that must be approved and recorded prior to plan approval. A separate Maintenance Agreement shall also be required to have been approved in a format approved by the Town Attorney and recorded prior to plan approval.

~~3.2.~~ The following shall be included in the design of detention facilities:

- A. Access-ways shall be designated on plans and cleared, graded, and constructed along with the facility. These access-ways shall be a minimum of 12 feet in width with a maximum cross slope of 2% and a maximum longitude slope of 12%.
- B. Proximity of facilities to public right-of-way shall be determined in order to minimize the length of required access-way.
- C. Access shall be provided such that all portions of a facility are accessible.
- D. Standard drainage easement agreements are not acceptable for access; therefore, special access easement agreements are to be executed which shall preclude planting of shrubs, construction of fences and other structures within the easement.

**Comment [d46]:** Also reiterated in new Section 5-700

- E. Grading of access ways to facilities and grading around facilities shall leave slopes which do not exceed eight percent to allow for access by maintenance vehicles.
- F. Major facilities including wet ponds, underground chambers, etc., shall be accessible with at least one all-weather access roadway to include a minimum of a 12-foot wide surface to the satisfaction of the Director.
- G. As these facilities are generally in close proximity to dwellings and may be subject to vandalism, principal spillways and other devices shall be designed to minimize unauthorized entry or tampering.
- H. Underground chambers shall provide for two or more access points for ventilation and cleaning and be large enough to accommodate cleaning equipment. Generally, the access, where possible, shall be a minimum of 24 inches in diameter to facilitate maintenance and conform to Town standards for access.

**3. Maintenance responsibility for stormwater management facilities that control only water quantity shall be as listed below:**

**Comment [d47]:** Moved from old 5-322 to consolidate maintenance standards.

Type of Zoning Use	Maintenance		Guarantor of Drainage	Owner of Facility	Easement to Town
	Aesthetics	Drainage			
SFD	Lot Owners	Town	Town	Lot Owners or HOA	Yes
SFA	HOA	Town	Town	HOA	Yes
Multi-Family	Lot Owner HOA	Lot Owner HOA	Town	Lot Owner HOA	Yes
Commercial Industrial Institutional	Lot Owner	Lot Owner	Town	Lot Owner	Yes

SFD: Single Family Detached

SFA: Single Family Attached

4. Maintenance responsibility for stormwater management facilities that control both water quantity and water quality or just water quality shall be as listed below:

Type of Zoning Use	Maintenance		Guarantor of Drainage	Owner of Facility	Easement to Town	Maint Agreement Required
	Aesthetics	Drainage				
SFD	Lot Owners HOA	Town	Lot Owners HOA	Lot Owners HOA	Yes*	Yes
SFA	Lot Owners HOA	Town	Lot Owners HOA	Lot Owners HOA	Yes*	Yes
Multi-Family	Lot Owner HOA	Lot Owner HOA	Lot Owners HOA	Lot Owner HOA	Yes*	Yes
Commercial Industrial Institutional	Lot Owner	Lot Owner	Town	Lot Owner	Yes*	Yes

\*Private Stormwater Management easement with clause for Town to be maintainer of last resort.

SFD: Single Family Detached

SFA: Single Family Attached

(End of Section)

**SECTION 5-400 FLOOD PLAIN POLICY AND GUIDELINES**

**5-410 Applicability**

Without prior approval of the Director and all other required approvals under Town ordinance, there shall be no construction permitted within flood plains. This shall include all stormwater management facilities. Floodplain, for the purpose of this ~~manual~~DCSM, shall mean a drainage area of 50 acres or more that is inundated by the 100-year water surface elevation along any natural watercourse permanent or intermittent. Wet ponds with a permanent pool whose embankments cross the flowline of a watercourse will be permitted with Director approval. However, adequate calculations must be provided indicating that the embankment construction will create no adverse impact to downstream property from flows based on a 100-year event. These calculations shall include adequate hydraulic and flood plain limit computations (HEC RAS or other method approved by the Director run for both existing and proposed conditions). These computations will assume that the entire drainage area upstream of the structure is in its ultimate developed condition (based upon the current Town and County, where applicable, (Comprehensive) Plans, the current Town and County, where applicable Zoning Map and the existing development of properties within the watershed, whichever depicts the highest use that generates the highest potential for stormwater runoff).

**5-420 Policy on Use of Floodplain Areas**

1. Flood plain areas are primarily intended to remain as open or common areas. These areas may be utilized to provide space for recreational activities.
2. Under no circumstances shall any residence be located adjacent to a 100-year water surface such that its lowest point's nearest edge is within two vertical feet and 15 horizontal feet of the defined flood plain. Commercial and industrial buildings may be located closer than 15 feet horizontal and 2 feet vertical with appropriate floodproofing and prior approval of the Director.
3. The Developer must provide factual information that any proposed development will not adversely affect the existing 100-year water surface elevation. The Developer also must provide emergency access to the development during the 100-year flood.
4. In any case, where a road, public or private, which provides access to a development, subdivision, or residence is inundated by the 100-year floodplain

as identified by, the Federal Emergency Management Agency (FEMA); or is inundated by more than twelve inches for the 100-year overland relief for the storm drainage system, the Developer shall provide an emergency vehicle access study. This study shall demonstrate that an alternate emergency vehicular access route is available to bring emergency services to the area beyond the flooding of the road during the 100-year storm event and include the following:

- A. The alternate emergency vehicle access route must be along public streets or private streets only.
- B. The alternate emergency vehicle route must be less than one mile long.
- C. The alternate emergency vehicle route must be above the 100-year flood elevation at all points.

**5-421 Warning and Disclaimer of Liability**

- 1. The degree of flood protection to be required by the Town of Leesburg Design and Construction Standards Manual is considered reasonable for regulatory purposes. Lower frequency floods may occur or flood heights may be increased by man-made or natural causes, such as bridge openings restricted by debris.
- 2. Therefore, this Article does not imply that areas outside the flood plain areas, or land uses permitted within such areas, will be free from flooding or flood damages under all conditions.
- 3. Additionally, the grant of a permit or approval of a subdivision or land development plan in an identified flood plain area or flood hazard area shall not constitute a representation, guarantee, or warranty of any kind by any official or employee of the Town of Leesburg of the practicability or safety of the proposed use, and shall create no liability upon the Town of Leesburg, its officials or employees.

**5-422 Processing of Subdivisions and Site Plans Within or Immediately Adjacent to Floodplains**

- 1. If a Subdivision Plan, or any type of Site Plan or Capital Improvement Plan or land disturbing activity proposes to modify the ground surface, the channel

alignment, or proposes construction within or contiguous to the Town defined 100 year floodplain (a point at which the drainage area is equal to or greater than 50 acres) of any natural water course, permanent or intermittent. The following processing procedure shall apply:

- A. A floodplain study shall be submitted for Town review in accordance with Section 5-430 of this article.
- (1) A floodplain study shall be submitted for Town review and comments for all land development activities associated with parcels that contain 100 year floodplain as well as for parcels that are directly adjacent to parcels containing 100 year floodplain; Studies submitted in conjunction with Site Plans or Construction Plans may be included on Plan Review Schedule. Except for Town Capital Improvements Plans, the Department of Plan Review (DPR) reviews and approves all drainage related Town floodplains not regulated by FEMA. For all Capital Improvement Plans, the Department of Capital Projects Management reviews and approves all drainage related Town floodplains not regulated by FEMA.
  - (2) A floodplain alteration study shall be submitted for Town review and comments for all land development activities associated with parcels that propose construction activities that are performed within the limits of the 100 year floodplain as noted above. Studies submitted in conjunction with Site Plans or Construction Plans may be included on Plan Review Schedule. Except for Town Capital Improvements Plans, DPR reviews and approves all drainage alterations related Town floodplains not regulated by FEMA. For all Capital Improvement Plans, the Department of Capital Projects Management reviews and approves all drainage related Town floodplains not regulated by FEMA.
  - (3) After Town review and resubmission by the Applicant, if necessary, the floodplain study and/or floodplain alteration study may be approved by the Town if all outstanding comments have been properly addressed and resolved with DPR or CPM depending upon the type of plan submission as noted above.

- (4) Prior to Final Town Approval of the Floodplain and or Floodplain Alteration Study, the Applicant shall provide the Town with an electronic version of the study in a format to be determined by the Town.
2. If the floodplain study or alteration is determined to lie within a designated FEMA floodplain, the applicant shall first obtain an approval of the studies through DPR (for all projects not associated with a Town Capital Improvement Project) and then be responsible to prepare and package the study in a format acceptable to FEMA for the Town to submit to FEMA for their final review and approval.

For all Town managed Capital Improvement Projects, the Department of Capital Projects Management shall be responsible to prepare and package the study in a format acceptable to FEMA and to submit to FEMA for their final review and approval.

Specifically:

- A. A floodplain study shall be submitted for Town review in accordance section 5-430 of this article.
  - (1) After the Town has approved the study(ies) the Applicant shall prepare the FEMA floodplain study package for submission to the Town. For all Town Capital Improvement Projects, the Department of Capital Projects Management shall be responsible to prepare the appropriate FEMA Floodplain study packages;
  - (2) The Appropriate Town Staff then prepares and sends a transmittal to FEMA requesting their review of the study; including the applicant's package and a Town endorsement.
  - (3) Where the applicant's or Town's study proposes to change the flood elevation that FEMA has on record, FEMA will notify the Town of their approval by letter authorizing a FEMA "Conditional Letter of Map Revision (CLOMR)".

- (4) Upon the Town's receipt of the CLOMR, a copy of FEMA notification will be transmitted to the applicant and / or the appropriate Town Staff.
- (5) The Applicant's or Town's Engineer shall furnish the appropriate Town Staff with any revisions and correspondence related to the Study that they send directly to FEMA during the FEMA approval process. In addition the applicant's or Town's engineer shall furnish the appropriate Town Staff with a copy of the final version of the study that was approved by FEMA and a letter certifying that no other changes were made to the study other than those required by FEMA.
- (6) The associated construction plans shall not be approved nor shall the Applicant be permitted to begin any construction on their site until such time as the CLOMR has been issued for the project and copies have been made available to the appropriate Town and County Staff.
- (7) Upon completion of all construction activities involving the 100 year floodplain, the Applicant's or Town's engineer shall submit as-built construction drawings of the final floodplain study with field shot topography of the new land contours as well as any proposed infrastructure within or directly adjacent to the floodplain.
- (8) Once the appropriate Town Staff confirms the floodplain study as- built is consistent with the approved plans and the originally approved floodplain and floodplain alteration study, the as-built floodplain study is routed to FEMA for review and approval along with the Town's approval endorsement.
- (9) FEMA will notify the Town of their approval by letter authorizing a FEMA "Letter of Map Revision (LOMR)".
- (10) Occupancy of proposed buildings associated with a related subdivision plan or site plan will not be issued until such time as the Town has been provided a copy of the approved LOMR from FEMA.

3. Construction drawings or site plans submitted for Town review shall conform to any floodplain and or floodplain alteration studies that have been approved or prepared for floodplains that exist on or are directly adjacent to the proposed development or land disturbing activities.
  - A. All types of Site Plans, Construction Plans and/or Capital Improvement Plans containing floodplain, shall not be deemed acceptable for review until such time as the floodplain study (and if applicable the floodplain alteration study) have been submitted to the Town for review. Concurrent processing of floodplain studies and Site Plans or Construction Plans is permitted.
  - B. The associated Site Plans (all types), Construction Plans and/or Capital Improvement Plans shall not be approved nor shall the Applicant be permitted to begin any construction on their site until such time as all Town comments have been resolved and the CLOMR has been issued for the project and copies have been made available to the appropriate Town and County Staff.

**5-430 Preparation of Floodplain Studies**

**5-431 General**

1. Floodplain studies shall be required for subdivisions or any type of Site Plan or developments or areas subject to a Capital Improvement Plan which contain or are contiguous to natural watercourses, whether permanent or intermittent, with drainage areas greater than 50 acres upstream of the subject site. Floodplain studies may be deemed necessary for smaller drainage areas as required by the Director.
2. Flows shall be determined by the SCS or new NRCS methodology or rational method up through twenty acres (see Section 5-231 of this ~~Manual~~DCSM) unless otherwise approved by the Director.
3. Water surface elevations shall be determined using the standard step or HEC-RAS or other approved method. Computations shall be based on physical properties of the drainage shed and sound engineering judgment. The Manning "n" values for each cross section and method used shall be approved by the Director prior to submission of computed water surface elevations. Refer to

the HEC-RAS Hydraulic Reference Manual, \*Latest Edition) for an acceptable methodology of determining the Manning's "n" values for natural channels.

4. Spacing of cross sections shall not exceed 300 feet and shall be cut at all changes in:
  - A. Horizontal alignment,
  - B. Channel gradient,
  - C. Channel width, and
  - D. At any obstruction in the channel which significantly affects the flow.
5. Cross sections shall be field run for final flood plain studies or the engineer may provide certified topography with a two-foot interval contour.
6. Cross sections shall extend both upstream and downstream of the subject site to the point where the post development water surface elevations are identical to the existing predevelopment water surface elevations and shall continue 300 feet beyond said point.

**5-432 Plans**

1. Floodplain study plan views shall be drawn at a horizontal scale of one inch equals no more than 50 feet and no less than 25 feet. The accompanying profiles shall utilize the same horizontal scale with a vertical scale of one inch equals no more than ten feet and no less than five feet.
2. The floodplain limits (100-year) as calculated by the study shall be shown accurately on the plans.
3. Limits of potential construction shall also be designated on the plans. These limits shall preclude residences within two vertical feet and 15 horizontal feet of the computed 100-year water surface elevations except as previously noted.
4. The baseline and section lines shall be shown on the plans. Mathematical ties between the baseline, flood plain easement lines and property lines shall also be shown.

5. Profiles for all cross sections shall be shown to a scale of one inch equals no more than five feet vertically and one inch equals no more than 50 feet horizontally. These profiles shall include the following information:
  - A. Cross section identification consistent with plan review.
  - B. Manning's "n" values used and where applied.
  - C. Computed 100-year water surface elevation with station callout.
  - D. Stationing shall be consistent with HEC-2 or HEC-RAS input data (if applicable).
6. Profiles shall show the 100-year water surface elevation and invert elevation of the stream at every cross section for the entire length of the study.

**5-440 Existing Construction in Flood Plain**

Federal Flood Insurance criteria dictates that the effects of the 100-year storm on buildings insured under the Flood Insurance Program must be investigated. Such cases would only be encountered when a structure encroaches upon an existing flood plain, thus creating a backwater condition.

(End of Section)

**SECTION 5-500 DAMS DESIGN AND CONSTRUCTION**

**5-510 Regulations**

**5-511 Virginia Department of Historic Resources, Division of Soil and Water Conservation (VDHR SWC)**

1. Construction of impoundments requires compliance with this ~~manual~~-DCSM as well as the State of Virginia standards under 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 Regulations established by the Virginia Soil and Water Conservation Board (VS&WCB). Permits for construction and operation of dams regulated by DCR shall be issued by the Virginia Department of Conservation and Recreation.
2. All dam designs regulated by DCR can be submitted directly to DCR by the applicant as long as the applicant simultaneously copies all correspondence submitted to DCR to the Town of Leesburg. The Applicant shall provide proof to the Town of Leesburg that all required dam permits have been issued before scheduling a preconstruction meeting. All dam designs not regulated by DCR shall be made part of the site plan or construction plans submitted to the Town of Leesburg.

**5-512 Town of Leesburg Regulations**

1. It is the policy of the Town of Leesburg, that compliance with the criteria set forth within this Article shall be required for the design and construction of dams within Town limits that are not under the jurisdiction of the Virginia Department of Conservation and Recreation.
2. The design procedures and criteria in this Article have been compiled for the use of persons involved in the design and construction of impoundment structures of sufficient size to represent a potential hazard to downstream properties.
3. The Town of Leesburg will review all dam designs and regulate those intended to impound water except as exempted below:
  - A. Any existing or proposed dam regulated by the Federal Government or the Virginia Department of Conservation and Recreation.

- B. All dams formed by highway embankments
  - (1) The Virginia Department of Transportation has special design criteria for permanently impounding water upstream of highway embankments.
  - (2) The Director shall approve such impoundments only upon favorable recommendation from the Virginia Department of Transportation.
- 4. Refer to Detail DD-11 of this Article for a graphical representation of impoundments which are regulated by the Town of Leesburg or regulated by the Virginia Department of Conservation and Recreation.
- 5. Except as exempted above, highway embankments shall not be used as dam embankments within the Town. This does not restrict the use of culverts with a headwater condition during rainfall events without a permanent surface elevation.
- 6. An inspection and maintenance agreement shall be executed with the Town by the owner and recorded among the land records of the Town of Leesburg prior to plan approval.
- 7. A permit from the Town shall also be required for dam construction.
- 8. Dams regulated by the Town of Leesburg shall be designed by a Professional Engineer licensed in the State of Virginia with expertise in the fields of geotechnical engineering, hydraulics, and dam design.
- 9. During construction, the owner shall employ an engineer licensed in the State of Virginia to inspect the construction of the dam, to file weekly reports with the Director covering construction progress including soil and compaction test data.
- 10. Record drawings with as-built information shall be submitted to the Director at the completion of construction and shall include soil classification, compaction and density test results, and concrete test results, to document the physical and structural soil characteristics of the facility.

11. After completion of construction, the owner's construction engineer shall certify, in writing, that the dam was constructed in accordance with the approved plans and specifications.

**5-520 Design Criteria**

1. All dam and embankment designs shall conform to the practices accepted by the Virginia Department of Conservation and Recreation (DCR), the Army Corps of Engineers, or others as approved by the Director. All dam and embankment designs shall conform to the requirements of Sections: 5-323, 5-324, 5-325, 5-326, 5-327, and 5-328 of this ~~Manual~~DCSM.
2. Storage volume. An evaluation of the topography of the drainage area to the proposed wet pond is necessary to ensure that an adequate base flow exists to maintain a permanent pool of water in accordance with DCR guidelines.
3. Dams shall be designed based on hydrology methods developed in the old SCS TR-55, NRCS WIN TR-55 (Windows Based Program), the old SCS TR-20, NRCS WIN TR-20 (Windows Based Program), or HEC-HMS as well as other programs which utilize the general methodology of TR-55 or TR-20 which may be approved by the Director on a case by case basis.
  - A. All designs shall incorporate emergency spillways, the design of which shall provide the required stormwater management detention and shall pass the full volume of that portion of the Probable Maximum Flood (PMF) shown in DD-11 based upon dam height and impoundment. (The PMF is defined in Article 11). In no case shall the emergency spillway elevation be lower than the computed ten-year water surface elevation. An examination and determination of the flood plain created by the passing of the DD-11 PMF shall also be conducted and the limits of the area so flooded shall be delineated on submitted plans.
  - B. All embankments shall be designed with a top width and side slopes appropriate for the material used to construct them.
  - C. Compaction standards to be employed are to be stated on the plans.
  - D. The embankment design shall take into account settlement based on compaction and type of material used.

- E. Side slopes above the permanent pool elevation shall be no steeper than three to one.
  - F. The top of the embankment shall be a minimum of one foot and a maximum of two feet above the computed water surface elevation when passing through the emergency spillway the full volume of that portion of the Probable Maximum Flood (PMF) shown in DD-11 based upon dam height and impoundment. (The PMF is defined in Article 11).
  - G. Core trench, anti-seep collars or alternate measures, erosion protection on upstream face and outlet protection shall be considered in the design and a detail per the recommendations within the approved geotechnical report shall be included on the plans.
  - H. Any riser employed shall be designed to overcome buoyant forces. Risers shall also incorporate trash racks with anti-vortex devices.
4. Dam Failure.
- A. As determined by the Director, a dam failure analysis is required for facilities with embankments between six and 25 feet with a capacity greater than 15 acre feet.
  - B. As part of the overall dam design, the engineer shall determine the segment of stream valley downstream from the dam that would experience an increased flood depth resulting from a potential dam failure.
  - C. Two types of danger reach analyses are to be investigated.
    - (1) For the first analysis, the engineer shall route the next highest design storm through the proposed spillway system. Refer to Detail DD-11 of this Article.
      - a. If the dam may fail as a result of overtopping, a danger reach analysis shall be performed.
      - b. If overtopping does not occur, a downstream analysis is not required.

- (2) The second analysis shall consider a dam failure as a result of internal erosion with the pond or lake level at normal pool elevation. Analysis of this type will not be required for dams without a permanent pool.
  
- D. Where required, the analysis shall be conducted to a point downstream where the dam break flood depth, danger reach length, has attenuated to within one foot or less of the flood depth that would be experienced without the dam.
  
- E. If the dam break analysis shows a potential for flooding of habitable structures, the engineer and owner shall increase the spillway capacity and downstream channel capacity where applicable.
  
- F. References used in dam design, construction, and maintenance include the latest versions of:
  - (1) Virginia Stormwater Management Handbook, (Latest edition).
  - (2) Virginia Erosion & Sediment Control Handbook, (Latest edition).
  - (3) Army Corps of Engineers Technical Manuals.
  - (4) Virginia Department of Conservation and Recreation Technical Manuals
  - (5) Nonstructural Urban BMP Handbook, Northern Virginia Regional Commission Technical Manuals, (Latest edition).
  - (6) Northern Virginia BMP Handbook; Northern Virginia Regional Commission Technical Manuals, (Latest edition).
  
- G. Easements

Easements shall be provided for vehicular access for maintenance of the facility and its appurtenances.

**5-324521 Embankment Ponds**

**Comment [d48]:** Moved from old Section 5-324.

~~10-1.~~ Embankment ponds shall conform to all of the following Town Standards as well as the “Virginia Impounding Structures Regulations (Dam Safety)”, Virginia’s updated “Dam Safety and Floodplain Management Programs and Regulations” and all related SCS or new NRCS “Technical Bulletins” or other written State requirements as applicable:

- A. Failure of the dam will not result in loss of life, in damage to homes, commercial or industrial buildings, highways classified as through collectors or higher, railroads; or in interruption of the use or service of public utilities.
- B. The product of the storage times the effective height of the dam is less than 2,000. Storage is the volume, in acre-feet, in the reservoir below the elevation of the crest of the emergency spillway. The effective height of the dam is the difference in elevation in feet between the lowest open channel emergency spillway crest and the lowest point in the original cross section on the centerline of the dam. If there is no open channel emergency spillway, the top of the dam becomes the upper limit.
- C. The Maximum Dam height allowed in the Town of Leesburg shall be less than 25 feet without prior approval from the Director.
- D. The Geotechnical Engineer shall determine if a site has the characteristics to support a dam and shall certify to any methods required to remediate the site to a condition that would support a dam.
- E. Approval is required by the Director for use of any impoundments regulated ~~by the State of Virginia as set forth in~~ under the Virginia Virginia Soil and Water Conservation Board's Impounding Structures Regulations (Dam Safety) (VR 625-01-00), dated February 1, 1989, as revised under 4VAC 50-20-10 et seq.), effective July 1, 2002 et seq.
  - 1. Permits for construction and operation of State regulated dams are issued by the Virginia Soil and Water Conservation Board.
  - 2. A copy of any state-approved design also must be submitted to the Director in order to receive Director approval for the construction plans.

F. Side Slopes: Side slopes shall be stable and shall not be steeper than three horizontal feet to one vertical foot without Director approval.

G. Pond bottoms (Dry Ponds) shall be graded to provide a minimum 1% slope to the lowest opening of the pond structure unless the Director approves a flatter slope.

~~44-2.~~ Structure Classification. All structures (dams) will be reviewed and classed according to factors and procedures outlined in the National Engineering Manual and supplemented herein. The class of risk hazard as contained in this document is related to the damage that might result from a sudden major breach of the earth embankment. Structure classification and land use for runoff determination must take into consideration the anticipated changes in land use throughout the expected life of the structure. The valley downstream and the relationship of the site to industrial and residential areas all have a bearing on the amount of potential damage in the event of a failure. The classification of a dam is determined only by the potential hazard from failure, not by the criteria selected for design.

A. Classification factors in the National Engineering Manual

- (1) Class “Low Risk” Structures located in rural, agricultural, or urban areas dedicated to remain in flood tolerant usages where failure may damage non-resident buildings, agricultural land, flood plains, or Town and County roads.
- (2) Class “Significant Risk” Structures located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, or minor railroads or cause interruption of use or service of relatively important public utilities.
- (3) Class “High Risk” Structures located where failure may cause loss of life, serious damage to homes, industrial, and commercial buildings, important public utilities, main highways, or railroads.

B. When structures are spaced so that the failure of an upper structure could endanger the safety of a lower structure, the possibility of a multiple failure must be considered in assigning the structure

classification of the upstream structure. Additional safety can be provided in either structure by:

- (1) Increasing the retarding storage, and/or
- (2) Increasing the emergency spillway capacity.

C. The following types of embankment structures are prohibited in the Town of Leesburg:

- (1) Class "a" structures with a storage height product of 2000 or greater, and/or an effective dam height of 35 feet and greater.
- (2) Class "b" Structures.
- (3) Class "c" Structures.

#### 12.3. Impoundment Laws

- A. Virginia Impounding Structures Regulations (Dam Safety) -criteria requires that dams ~~regulated~~ by the State of Virginia, ~~must be certified by the State-state agency responsible for dam safety (Currently currently the Virginia Department of Conservation and Recreation (DCR) in Virginia).~~
- B. This requirement excludes impoundments having a dam height less than six feet and having less than 50 acre-feet of storage. Refer to Detail DD-11 of this Article.

#### 13.4. Approximate method for determining Dam Breach Inundation Zone:

- A. This method is based on information contained in the Soil Conservation Service TSC - Technical Note - Engineering UD16, which was issued on July 3, 1969, and shall be performed for all embankment structures which have an embankment height exceeding 15 feet and or those which impound more than 25 acre-feet of water. Refer to Section 5-520 for dam failure analysis requirements.
- B. This method is based on the following:

- (1) The dam is assumed to fail when the water depth is at the top of the dam.
- (2) The peak rate of the breached hydrograph is based on data supplied by the Bureau of Reclamation for actual dam failures.
- (3) The method is based upon a valley flood routing method taken from the Journal of the Proceedings of the ASCE, Hydraulics Division, May 1964, "Hydrology of Spillway Design", by Franklin F. Snyder.

C. The graph, as shown in Detail DD-12 of this Article, has the width of the valley below the dam in feet versus the length of reach per acre-foot of storage behind the dam for a depth (above bank full stage) at the lower end equal to one foot. Actual storage is to be calculated from the top of dam and the width of the valley would normally be the 100-year frequency storm flood plain.

D. Two examples of how to use this graph are as follows:

**Example 1**

A Developer wishes to build a lake for stormwater management and recreation. It has been determined that the height of the dam will be ten feet, and that there would be approximately eight acre-feet of storage behind the dam. From visual observation, it is noted that there are some homes located on the flood plain 1,500 feet below the dam site. It has also been determined that the average width of the valley is 400 feet. An analysis must be made to determine if there would be a danger to these homes if the dam failed.

Using the above information, enter the left side of the graph with a valley width of 400 feet, move horizontally to the curve labeled H = ten feet, go down vertically and read 160 feet at the bottom of the graph. This value is for one acre-foot of storage. It is determined that there are eight acre-feet of storage, so multiply 160 feet by eight and obtain 1,280 feet. This is the distance below the dam where the depth of flow in the flood plain would be one foot if the dam would fail.

Since the homes were located 1,500 feet downstream from the dam, this would indicate that there would be little, if any, damage to these

homes as a result of a sudden breach of the dam. This would indicate that the dam would be a low hazard, and that Class "a" design criteria could be used in the design of the dam if the flood plain is to remain in flood tolerant usage.

#### Example 2

Same as Example 1, except that the height of the dam is 15 feet. Entering the graph again with a valley width of 400 feet and going across to the curve labeled H = 15 feet and then going vertically down, the length of reach would be equal to 210 feet for one acre-foot of storage for depth (lower) = one foot. Eight acre-feet of storage is necessary, therefore multiply 210 times eight and obtain 1,680 feet. This is the distance below the dam where the depth of flow in the flood plain would be one foot if the dam would fail.

Since the homes were located 1,500 feet downstream from the dam, this would indicate that the depth of flow at the homes would be greater than one foot and would probably cause serious damage to these homes. This would indicate that the dam would be a higher hazard structure than Class "a" and would therefore be prohibited within the Town of Leesburg.

This is an approximate method and more detailed valley routings will give more precise answers. This method should not be used if there is not a uniform valley width, or if there is any downstream obstruction, such as a road fill, an undersized pipe, etc.

#### 4.5. Selecting the Stormwater Management Pond Site

- A. The selection of a suitable stormwater management pond site should begin in the preliminary stage of the development, with a view of selecting the site that proves most practical and economical.
- B. A pond with a normal pool planned as a site amenity, may incorporate the required stormwater management function; or a stormwater management pond may, with modification, be utilized as a site amenity.
- C. A wet pond utilized as a site amenity should be located at a site where the valley is narrow, side slopes are relatively steep, and the slope of the valley floor will permit a large deep basin. Such sites tend to

minimize the area of shallow water if a permanent pool is being considered; however, they should be examined carefully for adverse geologic conditions. In urban and suburban areas, large areas of shallow water should be avoided due to excessive evaporation losses and the growth of aquatic plants.

- D. Consideration must also be given to any legal requirements. The landowner is responsible for obtaining all necessary and required easements of rights to discharge.
- E. As previously noted the pond should not be located where sudden release of the water, due to failure of the dam, would result in loss of life, injury to persons, damage to residences or industrial buildings, railroads or highways, or cause interruption of use or service of public utilities. A site which presents one or more of these hazards is unsuitable and will not be approved.
- F. A check should be made to ensure that no buried pipelines, cables, or other utilities exist in the construction area. Where such a site must be used, the utility owners shall be contacted prior to foundation investigation and utility relocation out of the embankment and impoundment area will be the responsibility of the developer.
- G. No part of any pond shall be located within a 100-year Town and/or FEMA Floodplain without specific prior approval from the Director (and FEMA within FEMA floodplains).
- H. The outfall from all BMP and/or SWM Facilities shall be at an elevation equal to or greater than the 100-year Floodplain elevation. With approval from the Director, the outfall pipe may extend into the 100 year floodplain as long as provisions are made for the pipe to have gaskets and the 100 year water surface elevation is lower than the bottom of the SWM facility.

15-6. Engineering Surveys. Once the location of the pond or reservoir has been determined, sufficient engineering surveys shall be performed so that the information required for stormwater management pond design can be obtained.

16-7. Geologic Investigations

- A. All designs for wet ponds shall have a geologic investigation performed. Analysis shall be performed for dry ponds which have an embankment height greater than 15 feet and/or those which impound more than 25 acre-feet and/or those whose draw down time exceeds 24 hours.
- B. The requirements of a foundation for an earthfill dam are that it provide stable support for the embankment under all conditions of saturation and loading, and that it provide sufficient resistance to seepage to prevent excessive loss of water. Adverse foundation conditions can lead to failure of a dam due to cracking, piping, sliding, settlement or uplift.
- C. The foundation conditions under the proposed dam sites shall be investigated to ensure that the site is suitable and that a safe structure can be designed. The extent of the foundation examination will depend on the complexity of the conditions encountered and on the height of the dam. The "Unified System of Soil Classification" shall be used in foundation investigations and these logs shall be accurately located and shown on the final design plans.
- D. Borings should be taken or test pits excavated at intervals along the centerline of the dam. The depth and spacing of the borings or pits should be sufficient to determine the suitability of the foundation.
- E. Borings should also be taken along the centerline of the principal spillway to ensure an adequate foundation for the pipe and riser.
- F. If a permanent pool is being considered, adequate soils investigations will be needed in the proposed pool area to be assured that excessive seepage will not be a problem.
- G. In most cases, it is necessary to bypass excess storm runoff around the embankment of a pond through an excavated spillway. For economic reasons, suitable material excavated from the spillway should be used in the earthfill. Therefore, soil borings should be made along the approximate centerline of the proposed spillway to determine the type of material that will be encountered, its erodibility, and its suitability for use in the embankment. If additional borrow is needed, soil

borings should be made in the selected borrow areas in order to estimate the kinds and amounts of suitable fill materials available.

- H. Materials selected for construction of a dam must have sufficient strength for the dam to remain stable and provide sufficiently low permeability, when compacted, to prevent harmful seepage through the dam.
- I. A record or log of each boring or test pit should be made showing the location depth and classes of materials encountered. The location of each boring should be marked on the ground, so it can be referenced to other or more detailed surveys.
- J. All information developed during the design process should be recorded in the form of an engineering plan for the pond.

17-8. Earth Embankment

- A. Top Width. The minimum top width of the dam is shown below. When the embankment top is to be used as a maintenance access road, the minimum top width is to be the width of the proposed access road plus the top width as determined below.

<b>Total Height of Embankment (Feet)</b>	<b>Minimum Top Width (Feet)</b>
14 or less	12
15 - 19	12
20 - 24	12
25 – 34	*
35	*

\* or larger as may be required by the State approval agency

- B. Side Slopes. The upstream and downstream side slopes of the settled embankment shall not be less than:

<b>Fill Material</b>	<b>Slope</b>	
	<b>Upstream</b>	<b>Downstream</b>
Clayey Sand, Clayey Gravel,	3:1	3:1

Sandy Clay, Silty Sand, Silty Gravel...		
Silty Clay, Clayey Silt>>>	3:1	3:1

C. Wave Erosion Protection. Where needed to protect the face of the dam, special wave protection measures such as berms, riprap, sand-gravel, soil cement or special vegetation shall be provided. Refer to the Virginia Department of Transportation Drainage Manual.

D. Freeboard. The vertical interval between the elevation of the water surface in the reservoir with the emergency spillway flowing at design depth and the minimum elevation at the top of the settled embankment is the freeboard, and shall equal or exceed one foot; -in addition, the minimum difference in elevation between the crest of the emergency spillway and the settled top of dam shall be two feet.

E. Allowance for Settlement. The design height of the dam shall be increased by the amount needed to ensure that the design top elevation will be maintained after all settlement has taken place. If a minimum required density is specified, the increase shall be five percent.

F. Foundation Cutoff. A cutoff trench of relatively impervious material shall be provided under the dam and into the abutments, as required, and be deep enough to extend into a relatively impervious layer except:

- (1) In those cases where a layer of relatively impervious material thick enough to provide stability exists at the surface of the foundation; or
- (2) In those cases where a layer of such material does not exist at a reasonable depth.
- (3) Where the Geotechnical Engineer certifies (to the satisfaction of the Director) that it is not necessary.

The cutoff shall be located at or upstream from the centerline of the dam. Where such a layer does not exist at a reasonable depth, the engineer responsible for the technical design shall provide a geotechnical analysis, demonstrating that the site is feasible for the construction of a dam.

The cutoff trench shall have a bottom width adequate to accommodate the equipment used for excavation, backfill and compaction operations, with the minimum width being four feet, and shall have side slopes no steeper than one foot horizontal to one foot vertical.

G. Seepage Control.

(1) Seepage control is to be included:

- a. If pervious layers are not intercepted by the cutoff;
- b. If seepage may create swamping downstream;
- c. If needed to ensure a stable embankment; or
- d. If special problems, -such -as -fractured -rock, -etc., - require drainage for a stable dam
- e. If recommended by the geotechnical engineer.

(2) Seepage control may be accomplished by

- a. Foundation, abutment or embankment drains;
- b. Reservoir blanketing; or
- c. A combination of these measures.

Foundation drains are to be considered when the normal water depth in the pond is greater than 15 feet (measured from the low point at the centerline of the dam).

18.9. Spillways

- A. Emergency spillways for all ponds will be designed to provide the required detention and to pass the full volume of that portion of the Probable Maximum Flood (PMF) shown in DD-11 based upon dam height and impoundment. (The PMF is defined in Article 11).

- B. Principal Spillways. A conduit, with needed appurtenances, shall be placed under or through the dam except where a weir type structure is used.
- (1) The principal spillway shall be designed to provide the detention required and control the release rate for those design-year events stipulated for each major water-shed.
  - (2) The crest elevation of the inlet or riser shall be at least one foot below the crest elevation of the earth emergency spillway.
  - (3) The inlet or riser size for pipe drops shall be such that the flow through the structure goes from weir-flow control to pipe control flow without going into orifice flow control in the riser. The inlets and outlets shall be designed and analyzed to function satisfactorily for the full range of flow and hydraulic head anticipated. The riser shall be analyzed for flotation, using water at the principal spillway crest elevation, and assuming all orifices and pipes are plugged. The factor of safety against flotation shall be 1.2 or greater.
  - (4) Size. The capacity of the pipe conduit shall be adequate to discharge long duration, continuous, or frequent flows without flow through the emergency spillways. The diameter of the pipe shall not be less than 12 inches.
  - (5) Conduits under or through the dam shall be reinforced concrete. The conduits shall be capable of withstanding the external loading without yielding, buckling or cracking. Conduit strength shall not be less than Class III. The inlets and outlets shall be structurally sound and made from materials compatible with the pipe. All conduit joints are to be made watertight by the use of gaskets.
  - (6) Excavation for Placement. Where excavation into existing or compacted ground is required in order to obtain the proper elevation for the conduit, this excavation shall be of sufficient width to accommodate the conduit, anti-seep collars, earth hauling and hand operated compaction equipment. The side slopes of the excavation shall not be steeper than one to one.

- (7) Multiple Conduits. Where multiple conduits are used, there shall be sufficient space between the conduits and the installed anti-seep collars to allow for backfill material to be placed between the conduits by the earth moving equipment and for easy access by hand operated compaction equipment. This distance between conduits shall be equal to or greater than the pipe diameter or width opening but not less than two feet.
- (8) Anti-Seep Collars. Anti-seep collars shall be installed around all conduits through earth fills of all wet ponds and for all dry ponds whose draw down time exceed 24 hours unless the Geotechnical Engineer certifies (to the satisfaction of the Director) that it is not necessary. Impoundment structures incorporating anti-seep collars shall use the following criteria:
- a. Sufficient collars shall be placed to increase the seepage length along the conduit by a minimum of 15 percent of the pipe length located within the saturation zone.
  - b. The assumed normal saturation zone shall be determined by projecting a line with a slope of four horizontal to one vertical from the point where the normal water elevation touches the upstream slope of the fill to a point where this line intersects the invert of the conduit. All fill located below this line may be assumed to be saturated.
  - c. For ponds that are normally dry, the starting elevation shall be the maximum water surface elevation in the pond when the principal spillway storm is routed through the structure.
  - d. Maximum collar spacing shall be 14 times the minimum projection of the collar measured perpendicular to the pipe.
  - e. Minimum collar spacing shall be five times the minimum projection of the collar measured perpendicular to the pipe.

- f. All anti-seep collars and their connections to the conduit shall be water tight.
  - g. Alternate designs (designed to the satisfaction of the Director and certified by the Geotechnical Engineer) will also be permitted.
- (9) Antivortex Devices. Drop inlet spillways are to have adequate antivortex devices in accordance with the latest edition of the Virginia Stormwater Management Handbook.
- (10) Safety Guardrails and Trash Racks. Trash racks shall have openings no larger than 3/4 of the conduit diameter or width opening, but in no case less than six inches in its smallest dimension. Racks and rails should be used when it is necessary to prevent clogging or when a safety hazard exists. Flat grates for trash racks are not acceptable, side openings must be provided.
- (11) All ponds in urban areas shall be analyzed for safety. Low stage inlets on ponds that are normally dry shall have adequate trash racks. Velocity of water through the trash rack opening at design flows shall not exceed three feet per second.
- (12) Drain Pipe. A pipe with a suitable valve should be provided to drain the pool area where needed for maintenance. The principal spillway conduit may be used as a pond drain when so located as to accomplish this function.
- (13) A narrative detailing how the pond is to be drained for maintenance and who is responsible shall be part of all plan sets submitted to the Town.

#### C. Emergency Spillways

- (1) A separate, independent emergency spillway shall be provided for each dam, the purpose of which is to provide for safe passage of the appropriate portion of the Probable Maximum Flood (PMF) or the 100 year storm event or the spillway design

flood (whichever is applicable to the specific stormwater management facility design) without damage to the embankment.

- (2) Capacity. The minimum capacity of emergency spillways shall be that required to pass the peak flow expected from the appropriate portion of the Probable Maximum Flood (PMF) or the 100 year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design). The routing shall start with the design water surface at the elevation of the crest of the principal spillway. Refer to Detail DD-11 at the end of this Article.
- (3) Emergency spillways are to provide for passage of the design flow at a non-erosive velocity to a point downstream where the dam will not be endangered.
- (4) Cross Section. Excavated earth spillways shall be trapezoidal and shall be located in undisturbed earth. The side slopes shall be stable for the material in which the spillway is to be constructed but not steeper than 3:1. For dams having effective heights exceeding 20 feet, the emergency spillway shall have a bottom width of not less than ten feet.
- (5) When natural spillways are used, a dike shall be constructed from the end of the dam to prevent the flow from impinging on the toe of the dam. The dike shall have a freeboard of one foot above design flow.
- (6) Permissible Velocities
  - a. Earth spillways shall be designed for non-erosive velocities through the control section and for a reasonable distance below the spillway. The maximum permissible velocity for the grass or grass mixture to be used shall be selected from the following table:

<b>PERMISSIBLE VELOCITY FOR VEGETATED SPILLWAYS<sup>1</sup></b>		
<b>Vegetation</b>	<b>Permissible Velocity</b>	
	<b>Erosion-Resistant Soils<sup>2</sup></b>	<b>Easily Eroded<sup>3</sup></b>

	Slope of Exit Channel		Slope of Exit Channel	
	pct 0-5	pct 5-10	pct 0-5	pct 5-10
	ft/s	ft/s	ft/s	ft/s
Kentucky Bluegrass Smooth Broome Tall Fescue Reed Canarygrass	7	6	5	4
Sod-Forming Grass-Legume Mixtures	5	4	4	3
Lespedeza Sericea Weeping Lovegrass Yellow Bluestem Native Grass Mixtures	3.5	3.5	2.5	2.5

<sup>1</sup> SCS-TP-61

<sup>2</sup> Those with higher clay content and higher plasticity. Typical soil textures are silty clay, sandy clay, and clay.

<sup>3</sup> Those with a high content of fine sand or silt and lower plasticity, or non-plastic. Typical soil textures are fine sand, silt, sandy loam, and silty loam.

- b. The capacity of the spillway shall be determined using vegetal retardants representing an unmowed condition. The maximum velocity shall be determined with ~~a~~ vegetal retardants representing a closely mowed condition.

GUIDE TO SELECTION OF VEGETAL RETARDANTS					
Stand	Average Height of Vegetation in Inches	Degree of Retardants	Stand	Average Height of Vegetation in Inches	Degree of Retardants
Good	Higher than 30	A	Fair	Higher than 30	B
	11 to 24	B		11 to 24	C
	6 to 10	C		6 to 10	D
	2 to 6	D		2 to 6	D
	Less than 2	E		Less than 2	E

- (7) Excavated earth spillways shall have an inlet channel, control section, and an exit channel. Upstream from the control section, the inlet channel shall be level for the minimum distance of 25 feet and shall have side slopes equal to three to one or greater.
- (8) The flow shall enter the spillway through the inlet channel. The maximum depth of flow ( $H_p$ ) located upstream from the level part shall be controlled by the inlet channel, level part, and exit channel. Refer to Detail DD-13 of this Article.

Excavation of the inlet channel or the exit channel, or both, may be omitted where the natural slopes meet the minimum slope requirements. The direction of slope of the exit channel must be such that discharge will not flow against any part of the dam. Wing dikes, sometimes called kicker levees or training levees, can be used to direct the outflow to a safe point of release. The spillway should be excavated into the earth for the full length and width of the spillway. Refer to Standard DS-4 in Appendix A.

If this is not practical, the end of the dam and any earthfill constructed to confine the flow, shall be protected by vegetation or riprap. The entrance to the inlet channel should be widened so it is at least 50 percent greater than the bottom width of the level part. The inlet channel should be reasonably short and shall be planned with smooth, easy curves for alignment. It shall have a slope toward the reservoir of not less than two percent to ensure drainage.

- (9) The inlet channel may be curved to fit existing topography, but exit channels shall be straight for a minimum distance well beyond the downstream toe of the dam at the lowest point in the valley.
- (10) The grade of the exit channel of an excavated earth spillway shall fall within the range established by discharge requirements and permissible velocities. The exit channel shall terminate only where the design flow may be discharged without damage to the earth embankment.

~~3~~(1) With the required discharge capacity, the degree of retardance, permissible velocity, and the natural slope of the exit channel known, the bottom width of the level and exit sections and the depth of the flow (Hp) can be computed from figure in Detail DD-13 of this Article which show discharge per foot of width. The natural slope of the exit channel should be altered as little as possible.

F-B. Combined Spillways

- (1) Combined spillways (a single structure that combines the primary and emergency spillways) shall require approval of the Director and shall only be permitted when adequate provisions for the release of flows based upon the appropriate portion of the Probable Maximum Flood (PMF) or the 100 year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design) can be accommodated downstream of the structure's outfall and when protection of the embankment is employed. Refer to Detail DD-11 of this article for spillway design requirements.
- (2) The combined spillway (when approved by the Director) shall be designed to provide the detention required and control the release rate for those design-year events stipulated for each major water shed and adequately control the outflow of the less frequent events of the appropriate portion of the Probable Maximum Flood (PMF) or the 100 year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design).
- (3) The combined spillway (when approved by the Director) shall provide for a minimum of 24 inches of freeboard from the elevation of the appropriate portion of the Probable Maximum Flood (PMF) or the 100 year storm event or the spillway design flood (whichever is applicable to the specific stormwater management facility design) to the Top of the Dam.

- (4) Any design which utilizes a combined spillway shall incorporate a secondary all weather access route for the facility.

G.C. Structural Emergency Spillways

- (1) Pipes, culverts, chutes or drops, when used for principal spillways or principal-emergency or emergency spillways, shall be designed in accordance with the principles set forth in the National Engineering Handbook, "Drop Spillways"; and "Chute Spillways." The minimum capacity of a structural spillway shall be that required to pass the peak flow expected. The routing shall start with the water surface at the elevation of the design storm.
- (2) Structural emergency spillways may only be approved after an independent structural review of the design is completed by a structural engineer familiar with hydraulic structures, selected by the Director. All costs of this review shall be borne by the Developer.

(End of Section)

~~SECTION 5-600 — STORMWATER RUNOFF QUALITY CONTROL CRITERIA~~

~~5-610 — General~~

- ~~1. For any development, redevelopment, public improvement or construction activity that requires a construction plan, site plan, minor site plan, site plan waiver or other land development application, stormwater runoff shall be controlled and water quality Best Management Practices (BMPs) shall be employed to provide effective post construction pollutant removal in accordance with the following:
  - ~~A. Compliance with the water quality criteria may be achieved by applying the performance based criteria or the technology based criteria as found in the Virginia Stormwater Management Handbook and additional requirements as stated below:
    - ~~(1) Additional requirements as stated within this article,~~
    - ~~(2) Chapter 14 of the Town Code, and~~
    - ~~(3) Applicable state and federal laws, regulations, and permits such as but not limited to the Virginia Stormwater Management Act (Code of Virginia 10.1-603 et seq) and the Virginia Stormwater Management Program (VSMP) Permit Regulations (4VAC50-60 et seq)~~~~
  - ~~B. To promote and preserve water quality such that the land disturbance activities are limited to the building footprint area and that area necessary to provide for the proposed use or development.~~
  - ~~C. For the Town to be provided proof that all associated permits required by federal, state, and local laws and regulations have been obtained prior to initiating grading or other on-site activities on any portion of a lot or parcel.~~
  - ~~D. To encourage designs that minimize discharge of stormwater pollutants to wetlands, except where constructed wetlands are used as a BMP and are designed in accordance with Federal and State standards.~~~~

**Comment [d49]:** This section has been incorporated under 5-300 since both quality and quantity requirements are meant to be addressed with integrated facilities.

**Comment [d50]:** Section 5-610 and 5-620 are now replaced by general references and standards cited in 5-310.

~~E. To encourage designs that maximize the use of sheet flow through vegetated areas and maximizes the flow length through vegetated areas.~~

~~F. To encourage designs that plan areas of concentrated development to be located in upland areas and away, to the maximum extent practicable, from surface waters and major drainageways in Town.~~

~~G. To encourage infiltration practices such as bio-retention, infiltration trenches, and rain gardens but only permit them where it can be demonstrated that soil conditions are favorable, or if adequate under-drain systems are included in the design.~~

~~H. Low Impact Development (LID) design techniques should be considered for all development, redevelopment or construction activity that requires a construction plan, site plan, minor site plan, site plan-waiver or other land development application.~~

~~2. Where a conflict may arise between water quality design criteria listed above, the more stringent provisions shall prevail. Definitions, unless the context clearly indicates to the contrary, shall be those found in Chapter 14 of the Town Code.~~

#### ~~5-620~~ **Water Quality Design Criteria**

~~1. Best Management Practices (BMP) measures shall be incorporated into the design and plan set of all Construction Plans, Public Improvement Plans, Site Plans, Minor Site Plans, Mini Site Plans, Site Plan Waivers and other applicable land development applications (except as noted in this article) as follows:~~

~~A. In average land cover condition is defined as the measure of the average amount~~

~~(1) For a proposed development project, the post development nonpoint source pollutant load shall not exceed the pre-development load. For the purpose of calculating the pre-development pollutant load, an average land cover condition of 16 percent impervious cover as noted above shall be used.~~

- ~~(2) For redevelopment sites, the nonpoint source pollutant load shall not exceed the greater of:~~
- ~~a. The pollutant load, based on existing conditions, minus 10 percent or~~
  - ~~b. the pollutant load based on an average land cover condition of 16 percent impervious cover.~~
- ~~(3) The Director of Plan Review may waive or modify this requirement for redevelopment sites that originally incorporated BMPs for stormwater runoff quality control, provided the following provisions are satisfied:~~
- ~~a. In no case shall the post development non point source pollution runoff load exceed the pre development load; and~~
  - ~~b. Runoff pollution loads for the proposed development shall be calculated and water quality calculations verified utilizing appropriate methods related to the existing BMP measures located on the site to prove that the existing facility will continue to adequately control nonpoint source pollution associated with the proposed development; and~~
  - ~~c. If BMPs are structural, evidence (certified by a professional engineer or licensed surveyor) shall be provided that prove the existing BMP had been designed and constructed in accordance with proper design standards and specifications, and that facilities are currently in good working order, properly functioning and performing at their designed levels of service. A review of both the original structural design and maintenance plans may be required to verify this provision. A new maintenance agreement may also be required to ensure compliance with Town codes and ordinances;~~

**Comment [d51]:** Similar language has been moved to new 5-341.3.

~~2. Unless otherwise provided for here within, the Virginia Stormwater Management Handbook shall be utilized for the purposes of determining the applicability and design guidelines for various BMP measures such as but not limited to:~~

~~A. The purpose of determining the applicability, pollutant removal efficiency and design guidelines, not specifically contained within this manual, for various BMP measures. (Alternative design methods shall require approval by the Director of Plan Review.)~~

~~B. The purpose of determining the design parameters for Technology-Based and Performance Based Water Quality Criteria. The Director reserves the right to require that the Performance Based Water Quality Criteria be utilized.~~

~~C. The purpose of determining the Water Quality Volume (WQV), based on the proposed land uses contributing runoff to the BMP facility~~

~~D. Acceptable BMP measures that incorporate extended detention (designed to release the WQV over a minimum time of 30 hours).~~

~~E. Determining the stormwater pollutant removal credit for sheet flow directed to a vegetated area, the area must meet the requirements for a “vegetated filter strip” as defined in the Virginia Stormwater Management Handbook. In such an application, the entire vegetated filter strip shall be located within an easement that ensures the protection of the water quality BMP.~~

~~F. Pollutant removal efficiencies for BMP measures not included in the chart at the end of this article. The Director of Plan Review shall reserve the right to modify the Pollutant Removal Efficiencies at any time.~~

~~3. Design Considerations~~

~~A. The site may include multiple projects or properties that are adjacent to each other or lie within the same drainage area where a single BMP is used to satisfy water quality protection requirements.~~

- ~~B. — Credit for treating off-site developed sites is not permitted by right. However, it may be considered on a case-by-case basis if determined to be appropriate by the Director.~~
- ~~C. — If treatment for a site or portion of a site is proposed to be accomplished using an existing off-site BMP:
  - ~~(1) — The BMP must be certified as providing full water quality treatment for the existing off-site impervious surface area as well as the on-site area draining to the facility.~~
  - ~~(2) — A maintenance agreement, approved by the Director and the Town Attorney, shall be executed between the facility owner and the owner of the property that drains to the facility.~~~~
- ~~D. — The Applicant should consider BMP strategy options as outlined in the Virginia Stormwater Management Handbook. However, the Director shall have the authority to accept or reject the use of a specific structural or nonstructural BMP included herein as may be appropriate for a specific site or project. Considerations should include:
  - ~~(1) — Drainage area served;~~
  - ~~(2) — Impervious surface cover and density of the proposed development;~~
  - ~~(3) — Soil type and permeability;~~
  - ~~(4) — Topography, including slope and depth to bedrock;~~
  - ~~(5) — Maintenance requirements and whether the maintenance will be public or private;~~
  - ~~(6) — Whether the measure is located in a public Right of Way or Public Easement (Manufactured BMPs shall not be permitted within public rights of way or public easements without prior approval of the Director.)~~
  - ~~(7) — Whether the system is on-line or off-line;~~~~

- ~~(8) — The land use being served and types of pollutants typically generated by the land use;~~
- ~~(9) — Type of access required for routine and non-routine maintenance; and,~~
- ~~(10) — Type of control required and whether quality and quantity controls can be combined in a single system.~~

~~E. — Additional BMP (Water Quality) Design Options~~

- ~~(1) — Infiltration practices shall be allowed only where it can be demonstrated that soil conditions are favorable or if an adequate underdrain system is incorporated into the design.~~
- ~~(2) — The Town encourages the use of nonstructural BMP measures alone or in combination with structural BMPs in order to meet water quality goals. Acceptable BMP credits to reduce the effects of impervious cover and the need for structural BMPs are identified in the Virginia Stormwater Management Handbook.~~
- ~~(3) — On a case by case basis and with the prior approval of the Director, compliance with a site specific VSMP / VPDES permit issued by the Virginia Department of Environmental Quality may be considered to meet the stormwater quality performance criteria requirements if equivalency in pollutant removal can be established by the applicant.~~
- ~~(4) — On a case by case basis and with the prior approval of the Director of Plan Review, participation in a Town sanctioned regional facility may be considered to meet the stormwater quality performance criteria requirements.~~
- ~~(5) — Techniques to meet the stormwater quantity and quality performance criteria are often employed within the same structure or facility. Standards that apply to one set of performance criteria shall not reduce the performance criteria for the other. If both quality and quantity measures are provided~~

~~within the same facility, the final design shall ensure that the performance criteria and maintenance are compatible.~~

~~(6) Innovative and alternative stormwater quality and quantity controls may be allowed at the sole discretion of the Director of Plan Review. The Director of Plan Review may require whatever conditions are necessary, including post construction monitoring, to ensure that the proposed control meets the minimum performance criteria.~~

~~A. Indigenous vegetation should be preserved to the maximum extent practicable consistent with the proposed use, development, or redevelopment.~~

~~B. Impervious surface cover shall be minimized consistent with the proposed use, development, or redevelopment.~~

~~C. Notwithstanding the above requirements, any site with a perennial stream within a natural channel shall meet the following additional performance criteria:~~

~~(1) Measures shall be taken to protect the perennial stream from non-concentrated stormwater runoff from adjacent impervious surfaces.~~

~~a. A minimum 50 foot wide vegetated area preserved where present, or established where not present, shall be provided on both sides of the stream (measured from the sear line). Larger buffers may be required for a Creek Valley Buffer as defined by the Zoning Ordinance in specific situations.~~

~~b. If the required vegetated buffer area is in poor condition, as determined by the Director, the vegetated buffer area shall be enhanced to prevent erosion and ensure proper functioning of the area as a buffer to pollution.~~

~~c. If the required vegetated buffer area does not exist or cannot be provided by a proposed development, an adequate buffer may (with prior approval of the~~

**Comment [d52]:** Moved to 5-320.

**Comment [d53]:** Moved to 5-323 and merged with similar language from old 5-650.

~~Director) alternatively be met through the use of a smaller vegetated buffer area in combination with equivalent on-site stormwater treatment as long as such a reduction is not prohibited by other Town Ordinances and / or Regulations such as but not limited to the Creek Valley Buffer criteria as defined by the Zoning Ordinance.~~

~~d. The vegetated buffer area shall be placed in a stormwater easement dedicated to the Town and maintained as a vegetated buffer area, and shall be subject to a stormwater management agreement. The dedication of a stormwater easement is not to be construed as requiring the Town to maintain the vegetated buffer area.~~

~~2. Use of Low Impact Development (LID) for Water Quality~~

**Comment [d54]:** Moved to 5-321.

~~A. Low Impact Development (LID) design techniques should include a written assessment of the potential for and give great consideration to the use LID techniques to achieve, either in part or whole, the water quality criteria for all development, redevelopment or construction activity that requires a construction plan, site plan, minor site plan, site plan waiver or other land development application.~~

~~B. Each application for a development, redevelopment, or land disturbance that proposes to utilize LID shall include a written assessment of LID techniques proposed and how they will achieve, either in part or whole, the water quality criteria for that specific land development project.~~

~~C. Implementation of individual LID practices will be considered on a case-by-case basis at the discretion of the Director.~~

~~D. In addition to other LID resources that may be available, the following shall be considered in the development of the written assessment:~~

~~(1) Low Impact Design Strategies: An Integrated Design Approach, United States Environmental Protection Agency, Office of Water, EPA 841-B-00-003 dated June 1999 and subsequent modifications and updates thereof; and~~

- (2) ~~Low Impact Development Hydrologic Analysis, United States Environmental Protection Agency, Office of Water, EPA 841-B-00-002 dated June 1999 and subsequent modifications and updates thereof.~~

~~5-630~~ ~~**Exemptions to Water Quality Requirements**~~

- 1. ~~The Town may allow exemptions to water quality requirements under the following conditions:~~
  - A. ~~With Director approval, the following situations may be exempt from water quality design requirements:~~
    - (1) ~~Individual land development projects that disturb less than one acre of land except for:~~
      - a. ~~Developments that are part of a larger existing or planned/phased development (Director's discretion).~~
      - b. ~~Developments that are deemed "Hot Spots" as defined in 5-640 of this article.~~
    - (2) ~~Linear development projects (such as but not limited to construction of power, communication, or other utility lines, storm sewer improvement projects and highway construction projects), provided that:~~
      - a. ~~Less than one acre of land will be disturbed per outfall or watershed, and~~
      - b. ~~There will be only insignificant increases in peak flow rates, and~~
      - c. ~~There are no existing or anticipated flooding or erosion problems downstream of the discharge point.~~
  - B. ~~Other exemptions listed in the latest version of the Virginia Stormwater Management Handbook will be considered by the Director of a case by case basis.~~

**Comment [d55]:** Exemptions and exceptions are now covered under the Town Code as cited in Section 5-311.

~~5-640~~ ~~**HOT SPOTS**~~

- 5. ~~The Director may determine that a proposed development, redevelopment, or use constitutes a pollution hotspot, and that a greater level of stormwater treatment is necessary to prevent pollutant wash-off after construction.~~
- 6. ~~A stormwater hot spot is defined as a land use or activity that generates higher concentrations of hydrocarbons, trace metals or toxicants than are found in~~

**Comment [d56]:** Moved to 5-322.

~~typical stormwater runoff. A greater level of stormwater treatment may be needed at hot spot sites to prevent pollutant wash off after construction.~~

~~7. Developments that are deemed by the Director as a Hot Spot shall not be exempt from the maximum BMP water quality design regulations even if the limits of disturbance is less than an acre and/or if the site is considered re-development.~~

~~8. The following are examples of such hot spots:~~

~~A. Vehicle salvage yards and vehicle recycling facilities;~~

~~B. Vehicle service and vehicle maintenance facilities;~~

~~C. Vehicle equipment cleaning facilities;~~

~~D. Fleet storage areas;~~

~~E. Industrial sites;~~

~~F. Outdoor liquid container storage;~~

~~G. Outdoor loading and unloading facilities;~~

~~H. Commercial container nurseries;~~

~~I. Golf courses;~~

~~J. Storing or dispensing of petroleum products and Hazardous Substances;~~

~~(1) In order to adequately protect surface water and groundwater quality, land uses and activities that propose storing, handling and/or dispensing petroleum products and hazardous substances shall meet the following standards:~~

~~a. Oil/water separators shall be required for all facilities that engage in activities (other than agricultural) that potentially generate oily wastewater, including but, not limited to, vehicle maintenance/washing/detailing, fuel storage/dispensing, and machine and paint shops. When~~

~~available, the discharge shall be to the Town's sanitary sewer system. If this is not available and the discharge must be to the storm sewer, a Virginia Pollutant Discharge Elimination System (VPDES) permit will be required.~~

~~b. Secondary containment shall be required for activities that propose storing, handling and/or dispensing of petroleum products (except for liquefied petroleum gas) and hazardous substances. The secondary containment shall be designed to provide a means of detecting material loss from the primary container; sufficient/compatible containment of the loss; retrieving the loss; and correcting the deficiency. For groups of tanks/containers, the secondary containment must be able to hold the contents of the largest container plus precipitation (if there is no roof). This precipitation shall not be re-directed to the storm sewer. Temporary secondary containment shall be provided for construction sites that use petroleum products or hazardous substances.~~

~~e. The applicant shall provide evidence that an approved Emergency Response Plan has been filed with and approved by the Town as well as the Loudoun County Department of Fire and Rescue Services.~~

~~K. Dry cleaning operations.~~

~~L. Public works storage areas~~

~~M. Facilities that generate or store hazardous materials~~

~~N. Chemical storage areas~~

~~O. Areas known for the sale or transfer of contaminants~~

~~9. On making a written determination that a proposed development, redevelopment, or use constitutes a pollution hotspot, the Director shall require the creation and implementation of a stormwater pollution prevention plan in-~~

~~accordance with Sec. 5-660 of this Article to reduce the generation of pollutants at the source. The Stormwater Pollution Prevention Plan (SWPPP) shall be in addition to other required BMPs.~~

**5-650 Stream Delineation and Buffer Criteria**

**Comment [d57]:** Moved to 5-323.

- ~~10. All development, redevelopment and uses subject to this article shall clearly delineate perennial and intermittent streams on the site and provide a minimum 50-foot buffer on each side of these features—as measured from the scar line (larger buffers may be required for a Creek Valley Buffer as defined by the Zoning Ordinance in specific situations). The condition of the water features, including whether they are natural or engineered, shall also be noted.~~
- ~~11. All development, redevelopment, and uses subject to this article shall note whether or not perennial and intermittent streams exist on or directly adjacent to the site. A reliable, site specific determination shall be conducted to determine whether water bodies within or directly adjacent to the site have intermittent or perennial flow. Such determination shall be made using a scientifically valid system of in-field indicators acceptable to the Director such as but not limited to determinations from the Army Corps of Engineers or the Virginia Department of Conservation and Recreation or determinations based upon and in accordance with Identification Methods for the Origins of Intermittent and Perennial Streams (most recent version) published by the North Carolina Division of Water Quality, as amended.~~
- ~~12. If, in the determination of the Director, adequate vegetation within the buffer area does not exist or is insufficient to meet the water quality performance criteria, the buffer area shall be enhanced.~~
- ~~13. Establishment, enhancement, or replacement of the buffer area shall be in accordance with Chapter 5.1 “Buffer Area Establishment, Replacement, and Restoration” of the most recent version of Riparian Buffer Maintenance and Mitigation Guidance Manual published by the Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance, as amended or as modified by the Director.~~
- ~~14. Physical relocation, alteration, or undergrounding of a perennial or intermittent stream will be considered on a case-by-case basis.~~

15. ~~Construction plans shall not be approved until proof is provided to the Director that all required federal, state, and local environmental permits have been obtained.~~
16. ~~If the required vegetated buffer area does not exist or cannot be provided by a proposed development, an adequate buffer may (with prior approval of the Director) alternatively be met through the use of a smaller vegetated buffer area in combination with equivalent on-site stormwater treatment as long as such a reduction is not prohibited by other Town Ordinances and/or Regulations such as but not limited to the Creek Valley Buffer criteria as defined by the Zoning Ordinance.~~

**5-660 Stormwater Pollution Prevention Plans**

**Comment [d58]:** Now covered in Section 5-322.

1. ~~All development, redevelopment, or land-disturbing activity must, if applicable, comply with the Virginia Pollutant Discharge Elimination System Permit Regulation set forth in 9VAC 25-31 et seq and the Virginia Stormwater Management Program Permit Regulations set forth in 4VAC50-60-10 et seq.~~
2. ~~This includes individual and general permits for stormwater discharges associated with industrial activity.~~
3. ~~At the discretion of the Director, a stormwater pollution prevention plan developed in compliance with 9VAC 25-31 may be deemed sufficient to satisfy the requirements for a plan to address hot spots as outlined in Section 5-640.~~
4. ~~If the Director determines that either the stormwater pollution prevention plan developed in compliance with 9VAC 25-31 et seq is insufficient to address pollutants of concern, or that the development, redevelopment, or use is not subject to the provisions of 9VAC 25-31 et seq but is still likely to generate pollutants of concern, the Director may require the development of a site-specific stormwater pollution prevention plan. Such a stormwater pollution prevention plan shall consist of the following elements:~~
  - A. ~~A description of the site, including location, drainage systems, and past, existing, and proposed land uses.~~
  - B. ~~A description of those responsible for implementation of the plan.~~

- ~~C. An assessment of potential pollutant sources.~~
- ~~D. A description of BMPs to be used to prevent the entry of potential pollutant sources into the Town’s stormwater management system.~~
- ~~E. A schedule for BMP implementation.~~
- ~~F. A plan for assessing and evaluating the effectiveness of the BMPs and a process for implementing new BMPs if necessary.~~
- ~~G. Any stormwater management plan developed to meet the water quality requirements of this Article shall be considered a part of the overall BMP plan approved by the Director and subject to the same long term maintenance and reporting requirements.~~

**Table 5-630-1 BMP Efficiencies and Considerations**

BMP	% Removal Efficiency	Range of Impervious-	Positive Considerations	Negative Considerations
<del>Vegetated-Filter Strip*</del>	<del>10%</del>	<del>16-21%</del>	<del>1. Increases vegetative cover. 2. Can serve small,</del>	<del>1. Low removal efficiency. 2. Small drainage area 3. Water quality only.</del>
<del>Grassed-Swale</del>	<del>15%</del>	<del>16-21%</del>	<del>1. Easy to incorporate. 2. May be considered for use</del>	<del>1. Low removal efficiency. 2. Water quality only. 3. Requires</del>
<del>Constructed Wetland*</del>	<del>20%</del>	<del>22-37%</del>	<del>1. May be used for wetland mitigation. 2. May be used</del>	<del>1. Space intensive. 2. Water quality only. 3. May be visually</del>
<del>Extended Detention</del>	<del>35% (2*WQV)</del>	<del>22-37%</del>	<del>1. Well established design principles.</del>	<del>1. Space intensive. 2. Sometimes perceived as not</del>

**Comment [d59]:** Superseded by Virginia Stormwater BMP Clearinghouse referenced in new Section 5-310.

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Retention-Basin	40% (3*WQV)  50% (4*WQV)  65% (5*WQV)	22-37%  38-66%  67-100%	1.— Well established design principles. 2.— Can incorporate quantity controls. 3.— Can serve a large area.	1.— Increased maintenance costs. 2.— Increased liability due to standing water.
Infiltration (Basins or Trenches)*	50% (1*WQV)  65% (2*WQV)	38-66%  67-100%	1.— High removal efficiency. 2.— Effective groundwater recharge.	1.— Requires permeable soils. 2.— Quantity control limited.
Bioretention Basin/Filter*	50%	38-66%	1.— Can be aesthetically pleasing as a landscaping feature. 2.— Appropriate for very dense urban areas.	1.— Small drainage area. 2.— Not to be used near marine clays or wetlands.
Sand Filter*	65%	67-100%	1.— Most appropriate in very dense urban areas. 2.— May be placed underground to save space.	1.— Primarily water quality control. 2.— Maintenance is more expensive.

BMP	% Removal Efficiency	Range of Impervious-	Positive Considerations	Negative Considerations
<b>BMP Measures</b>				5. More expensive to
<b>Manufactured BMPs (Stormceptor, Baysaver, etc.)</b>	Variable 15-20%	Variable, depending upon Manufacturer-recommendations	1. Easy to install and design. 2. Manufacturer may perform maintenance. 3. Can be	1. Proprietary device. 2. Water quality only. 3. Design and removal efficiencies not standardized.
<b>Green Roof*</b>	Variable	Variable	1. Secondary benefits (improve air quality, reduce thermal pollution). 2. Aesthetically pleasing.	1. Best for new-construction. 2. Design and removal efficiencies not standardized.
<b>Permeable Pavers / pervious-concrete*</b>	Variable	Variable	1. Does not take up additional land space. 2. Reduces overall site imperviousness. 3. Most	1. Are easily clogged or compacted. 2. Not for high traffic-areas. 3. Requires permeable-
<b>Tree Box-Filter (Filtera or similar)*</b>	Variable 74%	Variable, depending upon Manufacturer-recommendations	1. May be used for retrofit situations. 2. Small	1. Treats only small-area. 2. Water quality only. 3. High maintenance-
<b>Street Sweeping*</b>	Variable	Variable	1. Aesthetically pleasing. 2. Reduces trash on roads and	1. Equipment is expensive and labor-intensive. 2. Water quality only.

\*Due to design and long-term maintenance uncertainties, these specific BMP facilities (if Publicly Maintained) as well as any other non-standard BMP facilities not specifically listed herein (if Publicly Maintained), will only be approved on a case-by-case basis and only after prior approval has been granted by the Director.

WQV = Water Quality Value

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**SECTION 5-~~700~~—600 INSPECTION AND ACCEPTANCE**

**5-~~710~~610 Inspection**

1. All storm sewers shall be inspected by the Town of Leesburg Inspectors (or their designee) and/or the Virginia Department of Transportation at periodic intervals during construction.
2. These inspections shall include a visual check of all storm sewer and appurtenances for damage related to construction.

**5-~~720~~620 Acceptance**

1. All damage as determined by the above inspection shall be corrected, (replaced or repaired) to the satisfaction of the Director before acceptance.
2. Testing as required by the Director prior to acceptance shall be done in the same manner as that in Article 4, Section 150 of this ~~Manual~~DCSM.
3. Storm sewers shall be clean and free of debris and sediment prior to acceptance by the Town.
4. The Director shall approve and recommend for acceptance ~~accept~~ all storm sewer, appurtenances, and ~~detention-stormwater management~~ facilities when it has been determined that the field engineering and construction has been completed as stated in the approved plans, the structures are in place, the ground around them stabilized in accordance with the final plans, a stormwater facility maintenance agreement has been executed, the performance bond for maintenance is provided, and a site as-built drawing has been submitted by the applicant and approved by the Town. Once the paper copies of the Final Site As-Built has been approved by the Town, the applicant shall, prior to acceptance and bond release, provide the Town with additional paper copies as well as an electronic version (in a format determined acceptable by the Town) of the As-Built drawings.

(End of Section)

**SECTION 5-700 EASEMENTS**

**5-701 General**

1. The easement requirements of this section are in addition to other easement requirements contained in this Article.
2. Storm drainage, stormwater management facility, natural channel, and vegetated buffer area easements shall be required in accordance with the table in Section 5-702.
3. Flood plain easements shall be required in accordance with Section 5-400.
4. All easements shall be conveyed to the Town and shall be in a form approved by the Town Attorney. Easement widths shall be in one foot increments.
5. All stormwater management facility easements and vegetated buffer area easements must include a separate maintenance agreement in accordance with this Article and the Town Code.
- ~~6.~~ The dedication of a vegetated buffer area easement is not to be construed as requiring the Town to maintain the vegetated buffer area.
- ~~7.~~ Only publicly maintained structures shall be located in the Town’s right-of-way, Town-owned property, or public easements unless granted written permission from the Director.
- ~~8.~~ All privately maintained structures shall be located within private easements that guarantee the Town maintenance rights and access as the maintainer of last resort.
- ~~9.~~ Standard easements are not acceptable for access to detention facilities; therefore, special access easement agreements are to be executed that preclude planting of shrubs and the construction of fences and other structures within the easement.

**Comment [d60]:** New easement section consolidating requirements from various sections. Specific requirements have been placed in a new table in Section 5-702.

**Comment [d61]:** Moved from Section 5-370.2.D.

**5-220702 Easement Applicability and Width Easements**

**Comment [d62]:** Easement applicability language is taken from Section 5-220, Section 5-347, and Section 5-323 and organized into the following table.

<u>Easement Type</u>	<u>Applicability</u>	<u>Width</u>
<u>Storm Drainage – Pipes</u>	<u>Minimum</u>	<u>15 feet</u>
	<u>Maximum</u>	<u>Single Pipes – 30 feet</u>

<u>Easement Type</u>	<u>Applicability</u>	<u>Width</u>
		<u>Multiple Pipes – 15 feet each side</u>
	<u>Single pipes less than or equal to 24 inches in diameter</u>	<u>1:1 side slope from the pipe invert to the elevation of the finished grade on both sides of the pipe</u>
	<u>Single pipes greater than 24 inches in diameter</u>	<u>1:1 side slope from the pipe invert to the elevation of the finished grade on both sides of the pipe plus the outside diameter of the pipe</u>
	<u>Multiple pipes</u>	<u>1:1 side slope from the lowest pipe invert to the elevation of the finished grade on the most outside pipe, plus the combined outside pipe diameters, plus the width of space between each pipe.</u>
<u>Storm Drainage – Channels</u>	<u>Top width of the channel bank less than or equal to 5 feet</u>	<u>Minimum 15 feet</u>
	<u>Top width of the channel bank between 5 and 10 feet</u>	<u>Top width plus a ten foot access strip immediately adjacent to one side of the channel</u>
	<u>Top width of the channel bank greater than 10 feet; side slopes exceeding 3:1</u>	<u>Top width plus a ten foot access strip immediately adjacent to both sides of the channel</u>
	<u>Top width of the channel bank greater than 10 feet; side slopes not exceeding 3:1</u>	<u>Top width plus a ten foot access strip immediately adjacent to one side of the channel</u>
<u>Storm Drainage – Yard Inlets and End Sections</u>	<u>Yard inlets and end sections (or headwalls)</u>	<u>Minimum width set at the limits of the 10-year water surface elevation</u>
<u>Storm Drainage – 100-year Overland Relief</u>	<u>100-year overland relief flow path, not including ponded areas contiguous to the flow path</u>	<u>Minimum width set at the limits of the 100-year overland relief flow path</u>
<u>Stormwater Management Facility</u>	<u>Above ground structures</u>	<u>10 feet beyond engineered structural components and the 100-year water surface elevation</u>
	<u>Underground structures</u>	<u>10 feet beyond periphery of the structure</u>

**Comment [d63]:** Stormwater management facility easement language is the only new requirement in the easement table. All other requirements are pre-existing and taken from other parts of the DCSM.

<u>Easement Type</u>	<u>Applicability</u>	<u>Width</u>
	<u>Access roadways</u>	<u>1 foot on each side of the entire length of the roadway</u>
<u>Natural Channel</u>	<u>Minimum</u>	<u>Limits of the 100-year water surface</u>
<u>Vegetated Buffer Area</u>	<u>Minimum</u>	<u>Width of vegetated buffer area required in Section 5-323</u>

~~All storm sewer pipes or channels to be maintained by the Town of Leesburg shall be within storm drainage easements conveyed to the Town in a form approved by the Town Attorney. Easement widths as determined below shall be in one-foot increments.~~

**Comment [d64]:** All subsequent easement language is reflected in 5-701 and 5-702.

~~A. Pipes~~

~~(1) For single pipes 24 inches and less in diameter the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on both sides of the pipe.~~

~~(2) For single pipes greater than 24 inches in diameter the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on both sides of the pipe plus the outside diameter of the pipe.~~

~~(3) For multiple pipes at the same or different elevations the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on the most outside pipe, plus the combined outside pipe diameters, plus the width of space between each pipe.~~

~~(4) The minimum easement width for any storm sewer shall be 15 feet. The maximum easement width shall be 30 feet for single pipes or 15 feet each side for multiple pipes.~~

~~(5) Refer to Standard WS-16 in Appendix A.~~

~~B. Channels~~

(1) The minimum easement width shall be 15 feet for channels with a designed top width of the channel bank of five feet or less.

(2) The easement width shall be equal to the top width plus a ten-foot access strip immediately adjacent to the channel for channels with a designed top width of the channel bank between five and ten feet.

(3) The easement width shall be equal to the top width plus a ten-foot access strip immediately adjacent to each side of the channel for channels with a designed top width greater than ten feet. Where the channel is designed with side slopes not exceeding 3:1 and a bottom width no greater than ten feet, or for paved channels, one ten-foot access strip immediately adjacent to either side of the channel is required.

#### C. Yards Inlets and End Sections

(1) The minimum easement width at all yard inlets and end sections (or head walls) shall be the limits of the ten-year water surface elevation.

D. One hundred-year overland relief.—The minimum easement width shall be the limits of the 100-year overland relief flow path.—This does not include the ponded areas contiguous to the flow path.

F. All underground detention facilities shall be within storm drainage easements conveyed to the Town and include a separate maintenance agreement, both in a form approved by the Town Attorney.—Easement widths as determined below shall be in one-foot increments.

#### A. Pipes

(1) For single pipes 24 inches and less in diameter the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on both sides of the pipe.

(2) For single pipes greater than 24 inches in diameter the easement width shall be determined by a 1:1 side slope extending from the

elevation of the pipe invert to the elevation of the proposed finished grade on both sides of the pipe plus the outside diameter of the pipe.

(3) For multiple pipes at the same or different elevations the easement width shall be determined by a 1:1 side slope extending from the elevation of the pipe invert to the elevation of the proposed finished grade on the most outside pipe, plus the combined outside pipe diameters, plus the width of space between each pipe.

(4) The minimum easement width for any storm sewer shall be 15 feet. The maximum easement width shall be 30 feet for single pipes or 15 feet each side for multiple pipes.

(5) Refer to Standard WS-16 in Appendix A.

1. Natural water courses and drainageways. The minimum easement width shall be the limits of the 100-year water surface.

2. The vegetated buffer area shall be placed in a stormwater easement dedicated to the Town and maintained as a vegetated buffer area, and shall be subject to a stormwater management agreement. The dedication of a stormwater easement is not to be construed as requiring the Town to maintain the vegetated buffer area.

**Comment [d65]:** Moved from 5-323; and reflected in 5-701.

**CONSTRUCTION DETAILS**  
**ASSOCIATED WITH CHAPTER 5**

## **Summary of Significant Proposed Amendments to the Leesburg Town Code and the Design and Construction Standards Manual to Comply with the Virginia Stormwater Management Program Regulations**

Prepared by AMEC Environment & Infrastructure, Inc. for the Town of Leesburg  
December 19, 2013

The Town of Leesburg must make changes to the Town Code and Design and Construction Standards Manual (DCSM) to comply with the new requirements of the Virginia Stormwater Management Program (VSMP) regulations. Specifically, this includes amending Chapter 14 - Environment, Article II - Stormwater Management of the Town Code and Article 5 - Storm Drainage of the Design and Construction Standards Manual (DCSM).

A preliminary draft was submitted to the Virginia Department of Environmental Quality (DEQ) on April 1, 2013. The purpose of the preliminary draft was to demonstrate adequate progress toward making necessary changes. The Town was informed by DEQ that the preliminary draft met the standard for adequate progress. Town staff has since met with the Environmental Advisory Council (September 3<sup>rd</sup>) and the engineering and development community (December 3<sup>rd</sup>) to review proposed changes and solicit feedback and input.

The following is the current schedule for finalizing changes to the Town Code and DCSM:

- By January 15, 2014 – Submit a second draft of the amended Town Code and DCSM to DEQ. DEQ will perform a detailed review to ensure that the documents meet with the requirements of the VSMP regulations.
- By March 15<sup>th</sup> – Receive comments back from DEQ, the Town will make changes if necessary.
- March 20<sup>th</sup> – Planning Commission work session.
- April 22<sup>nd</sup> – Town Council work session.
- By May 15<sup>th</sup> – Adopt and submit final Town Code and DCSM for approval by the State Water Control Board.
- July 1<sup>st</sup> – Go-live date for new requirements.

The following is a summary of significant proposed changes to the Town Code and the DCSM.

**Town Code - Chapter 14 Environment, Article II Stormwater Management**

<b>Article Section</b>	<b>Amended or New</b>	<b>Change/Requirement</b>
State Law references	Amended	Updates references to account for the transfer of the Virginia Stormwater Management Program (VSMP) from the Virginia Soil and Water Conservation Board (Section 10.1-602.3 et seq of the Code of Virginia) to the State Water Control Board (Section 62.1-44.15:27 et seq of the Code of Virginia).
Sec. 14-19 Definitions	Amended	Adds several new definitions necessary to implement amendments to the article. Changes the term “Low impact development” to the more updated term “Environmental site design.” This change is also reflected in the DCSM.
Sec. 14-21 Authority	Amended	Simplifies and updates state enabling authority language.
Sec. 14-23 Program components (a) Elements	Amended	Adds a new stormwater program element entitled “VSMP compliance.” This is further discussed in subsection (e).
(c) Illicit discharges	Amended	Makes minor changes to the list of acceptable stormwater discharges based on changes to the Town’s MS4 permit. Eliminates from the list of allowable discharges “lawn fertilizer provided it is applied in accordance with the manufacturer’s recommendations.” This language is not found in the MS4 permit.
(e)(1) VSMP compliance elements	New	Establishes that no land-disturbing activity may take place until all requirements of the article are approved by the Town. The most significant change is that the Town is now responsible for administration of the state general construction permit process. This includes accepting the developer’s registration statement and authorizing the state to issue the general permit. These activities were previously performed by DEQ.
(e)(2) Stormwater pollution prevention plan	New	Establishes the requirement for a stormwater pollution prevention plan (SWPPP). The SWPPP is made up of two plans that are already required by the Town (erosion and sediment control plan and stormwater management plan) and a new plan – the pollution prevention plan (discussed in (f)(3)). The SWPPP does not need to be reviewed by the Town prior to issuing a general permit; however, the Town is responsible for making sure the SWPPP is being implemented during the development process.
(e)(3) Fees and bonds	New	Establishes fee and bonding requirements. The fee schedule is set by the State Water Control Board and is included in the amended Land Development Review and Inspection Fee Schedule. Bonding details are included in the Subdivision and Land Development Regulations.

Article Section	Amended or New	Change/Requirement
(e)(4) Grandfathering	New	References state grandfathering requirements. In general, these are projects that have already begun the planning process and will be subject to the existing stormwater technical criteria.
(e)(5) Monitoring and inspections	New	Establishes specific standards for the Town to inspect land-disturbing activities for all components of the SWPPP.
(e)(6) Exemptions	New	<p>Exempts several activities from the article. The Town must provide an exemption for single family residences that disturb less than one acre and are not part of a common plan of development from the requirement to obtain a state general permit and to comply with the water quality and quantity technical criteria. Any other land-disturbing activity less than one acre and not part of a common plan of development may be exempted or exempted with conditions.</p> <p>It should be noted that even if exempt, these smaller activities contribute to new pollutant loads that will need to be addressed under the Chesapeake Bay TMDL. The proposed exemptions seek to balance protecting water resources with ensuring that the new requirements do not impose an unreasonable burden on these smaller activities and Town staff.</p> <p>The draft ordinance proposes the following exemptions in accordance with state law:</p> <p><b>Site Plan Waiver or Standard Zoning Permit</b> – These are very small projects and are proposed to be exempt from the new water quality and quantity requirements provided that they meet existing requirements for erosion and sediment control.</p> <p><b>Single Family Residences</b> – Single family residences disturbing less than an acre and not part of a common plan of development are exempt from the new water quality and quantity requirements provided that they meet existing requirements for erosion and sediment control.</p> <p><b>Other Activities Less Than One Acre</b> – All other activities under one acre and not part of a common plan of development must meet the new water quality requirements (so as not to add to the Town’s Chesapeake Bay TMDL pollutant load) and the existing erosion and sediment control requirements. However, they are exempt from having to meet the new water quantity requirements. Note that the erosion and sediment control requirements contain provisions to protect neighboring properties from adverse impacts from water quantity.</p>
(f)(3) Pollution prevention plan	New	Establishes the requirement for a pollution prevention plan (PPP). This will be included as part of the SWPPP. Generally, the PPP is intended to minimize the exposure of materials to precipitation and ensure that practices are in place to prevent pollution from wastewater, handling of fuels and lubricants, etc.

Article Section	Amended or New	Change/Requirement
(g)(1) Minimum requirements for stormwater	Amended	<p>Establishes new state-mandated technical criteria for water quality and water quantity control. This section references the state regulations rather than try to include all of the requirements in the Town Code. Given the changing nature of the regulations, this will ensure consistency and reduce the need for changes to the Town Code.</p> <p>New development will need to meet pollutant reduction standards that are equivalent to a site with 10% impervious cover, 30% turf-grass, and 60% forest cover (0.41 lbs/phosphorus/year).</p> <p>Redevelopment will need to reduce pollution from existing conditions by 10% for land disturbances under one acre and 20% for greater than one acre.</p>
(g)(2) Stormwater management plan	Amended	<p>Establishes a more detailed description of what must be included in the stormwater management plan and makes clear that the plan and technical criteria must apply to an entire common plan of development, even if the individual activity is less than one acre.</p>
(g)(3) Nutrient credit offsets	New	<p>Permits a developer to use off-site compliance options for achieving pollutant reductions for smaller projects. These situations are expressly spelled out in the Code of Virginia. Off-site options are not allowed for water quantity requirements.</p> <p>The Town has the authority to allow larger activities to utilize offsite compliance options where an onsite stormwater facility may conflict with other Town goals. This section authorizes the Director of Plan Review to establish such guidelines.</p>
(g)(4) Stormwater management plan review	New	<p>Establishes specific procedures and timeframes for Town review of the stormwater management plan. The timeframes are set by the Code of Virginia.</p>
(g)(5) Exceptions	New	<p>Establishes exceptions to the technical criteria in (g)(1). Exceptions to the water quality criteria cannot be made unless off-site options in (g)(3) have been considered and found not available. The draft also allows exceptions if implementing the regulations conflicts with the Town's flood control program.</p>
(h)(1) Stormwater management system maintenance	Amendments	<p>Makes technical adjustments to the requirement that all stormwater management facility owners must have a maintenance agreement.</p>
Sec. 14-24 Violations	Amendments	<p>Replaces existing language on penalties with enhanced language allowed by the state regulations. Fines up to \$32,500 per day per violation are possible.</p>

Summary of Town Code and DCSM Amendments to Comply with VSMP Permit Regulations  
 December 19, 2013

<b>Article Section</b>	<b>Amended or New</b>	<b>Change/Requirement</b>
Sec. 14-25 Hearings	New	Establishes a process for requesting a formal hearing when a property owner is aggrieved by a decision made without a formal hearing. This process is set by the Code of Virginia.
Sec. 14-26 Appeals	New	Establishes an appeals process. Appeals of any decision made by the Director of Plan Review must be made to the Town Manager within 30 days. Decisions by the Town Manager may be appealed to the Town Council and then the circuit court. The Town has discretion under the Code of Virginia for establishing the appeals process.

**Design and Construction Standards Manual - Article 5, Storm Drainage**

Article Section	Amended or New	Change/Requirement
In General		<p>The primary change to the DCSM has been to remove specific stormwater requirements and calculations that are otherwise found in the Town Code, the Virginia Stormwater Management Handbook, the Virginia Stormwater BMP Clearinghouse, and other standard state and federal reference manuals. This has been done for two primary reasons. First, standards and specifications now change with greater frequency and can quickly cause the DCSM to become out-of-date. The most recent standards and specifications are easily found on-line. Second, the Town is precluded from having standards different from the Virginia Stormwater BMP Clearinghouse without review by the Virginia DEQ (different standards adopted prior to January 1, 2013 are exempt from this review process). As a result, the Town has less discretion over design standards.</p> <p>Based on the above, the amended DCSM references acceptable standards and specifications and focuses on those areas where Town specifications are different.</p>
Sec. 5-100 and Sec. 5-110	Amended	Technical changes and removal of redundant language.
Sec. 5-120	Amended	Renames from “Remarks” to “References.” Updates and expands the list of referenced materials.
Sec. 5-210	Amended	Technical changes to meet the VSMP permit regulations.
Sec. 5-210 14. Pro-Rata Share	Moved	Moves pro-rata share language to Section 5-300.
Sec. 5-220	Moved	Moves section dealing with easements to new Section 5-700. Additional easement language throughout the text has been consolidated into the new Section 5-700 as appropriate.
Sec. 5-221	Amended	Removes reference to rainfall precipitation frequency data charts included in the DCSM. NOAA peak rainfall intensity charts are updated frequently based on local rain gage data and composite charts for the Town will be updated as necessary and will now be found on the Town’s website.
Sec. 5-239 2.B.	Amended	Clarifies requirements for how hydraulic gradient will be calculated and shown.
Sec. 5-242 2.	Amended	Deletes requirement for accounting for overland relief of the 100 year storm event in open channel design.

Article Section	Amended or New	Change/Requirement
Sec. 5-300	Amended	Consolidates water quantity requirements with the water quality requirements that had been located in Section 5-600 in recognition that the VSMP permit regulations address both in a more integrated manner.
Sec. 5-310	Amended	Sets the stage for replacing stormwater criteria detail contained in Section 5-300 with references to the appropriate sections of the VSMP permit regulations.
Sec. 5-311	Replaced	Removed old Section 5-311 entitled Stormwater Management Requirements and replaces with a new section entitled Applicability. The requirements previously outlined in this section are now included by reference in the updated Section 5-310. This section now references the Town Code sections dealing with when the requirements are applicable and also the grandfathering provisions of the VSMP permit regulations.
Sec. 5-312	Amended and Merged	Merged sections entitled Rational Method and USDA-NRCS Methodology into new Design Storms and Hydrologic Methods. New section references appropriate methodology and deletes extraneous detail.
Sec. 5-320	Moved	<p>Moves general water quality performance criteria contained in old Section 5-620 into this section. As noted previously, water quality and quantity technical criteria are merged in Section 5-310. These are items adopted by the Town through the authority of the Chesapeake Bay Preservation Act. Since the Town is not subject to the Act, the Town is permitted, but not required, to adopt these requirements.</p> <p>Language is also included reiterating that unless exempt under the Town Code, all activities regardless of lot size and whether a formal VSMP permit is required must meet the water quality technical criteria.</p>
Sec. 5-321	Amended and Moved	<p>Moves language regarding the use of Low Impact Development contained in old Section 5-620 into this section. The term is also changed to the more modern Environmental Site Design. This section requires developers to demonstrate how ESD was considered in the site design and was amended to require use of the BMP Clearinghouse in designing such facilities. Additional resources are also provided for guidance in developing the written assessment. This is language above and beyond the VSMP permit regulations that was adopted as part of the Town's MS4 Program Plan.</p>
Sec. 5-322	Amended and Moved	<p>Moves language regarding the ability of the Town to impose additional requirements on hot spots contained in old Section 5-620 into this section. Makes technical and clarifying changes.</p>

<b>Article Section</b>	<b>Amended or New</b>	<b>Change/Requirement</b>
Sec. 5-323	Amended and Moved	Merges redundant language from old Section 5-650 and 5-620.3.H. Clarifies existing policy to require a buffer along intermittent streams in addition to perennial streams.
Sec. 5-330	Amended and Moved	Moves existing Leesburg-specific language concerning water quantity from old Section 5-311.4. Subsection 2 is deleted since it is redundant to the requirements of Town Code Section 14-23(g)(2) requiring a stormwater management plan to include the entire common plan of development.
Sec. 5-331	Amended	Specifies that on-site detention, while desirable in many cases, may cause or contribute to downstream flooding and therefore the Director may prohibit detention when identified in Town plans or by the Director as not being in the best interests of the Town.
Sec. 5-332	Amended and Moved	Technical changes and removal of redundant language to existing DCSM criteria dealing with adequate outfall.
Sec. 5-333	Amended and Moved	Moves language regarding pro-rata share program from old Section 5-210. Technical changes to ensure that the pro-rata share program complies with requirements of the VSMP program and to make it clear that nutrient offsets must be done in accordance with the Town Code.
Sec. 5-341	Amended	Removes special design criteria for Cattail Branch, Big Springs, and Sycolin Creek watersheds. Criteria for these watersheds will now be those from technical criteria from the VSMP regulations. Keeps and makes technical amendments to special design criteria for Tuscarora Creek watershed.
Sec. 5-442	Amended and Moved	Adds new language in agreement with the Code of Virginia (§62.1-44.15:33(C)) stating when the Director may preclude the onsite use of a type of stormwater management facility or require more stringent design based on a review of the stormwater plan and site-specific conditions.
Old Sec. 5-323	Deleted	Deletes old Section 5-323 dealing with design standards for detention ponds. These are now contained in the Virginia Stormwater BMP Clearinghouse.
Old Sec. 5-324	Moved	Moves old Section 5-325 Embankment Ponds to Section 5-521 since it is more aligned with dam requirements than water quantity criteria or design standards.
Old Sec. 5-326	Deleted	Deletes old Section 5-326 dealing with design standards for wet ponds. These are now contained in the Virginia Stormwater BMP Clearinghouse.
Sec. 5-342	Amended	Makes organizational amendments to this section and moves language regarding maintenance and inspection provisions to a consolidated section on maintenance and inspections (Section 5-370).

<b>Article Section</b>	<b>Amended or New</b>	<b>Change/Requirement</b>
Sec. 5-347	Amended	Moves easement language to new consolidated Section 5-700
Sec. 5-348	Amended	Specifies that porous pavement is allowed only if appropriate for individual site conditions. Makes organizational amendments to this section.
Sec. 5-360	Amended	Deletes most of the existing language regarding when waivers and exemptions may be granted and replaces them with reference to Section 14-23 of the Town Code. This section of the Town Code mirrors the specific requirements in the VSMP regulations as to when a waiver or exemption may be allowed.
Sec. 5-370	Amended	Provides that the maintenance and inspection plan must be approved by the Town prior to plan approval. Consolidates inspection and maintenance provisions by merging language from old Section 5-322.
Sec. 5-521	Moved	Moves old Section 5-324 Embankment Ponds to Section 5-521 since the language is more aligned with dam requirements than water quantity criteria or design standards.
Old Sec. 5-600	Deleted	Deletes old Section 5-600. This section dealt with stormwater quality control criteria and has been merged into a consolidated Section 5-300.
Sec. 5-600	Moved	Moves old Section 5-700 Inspections and Acceptance to Section 5-600. Clarifies that a maintenance agreement must be executed and a performance bond provided prior to acceptance of infrastructure by the Director.
Sec. 5-700	New	Consolidates easement requirements from throughout Article 5 into one section. Includes storm drain system language from old Section 5-220, underground detention language from Section 5-347, and vegetated buffer area language from Section 5-323. New Section 5-701 contains general easement requirements while new Section 5-702 places specific requirements in table format.



## VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP)

### REQUIRED ELEMENTS OF LOCAL VSMP & APPLICATION PACKAGE

**Locality:** Town of Leesburg

Reviewer: \_\_\_\_\_

Date: Draft – January 2, 2014

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To facilitate review of the local Virginia Stormwater Management Program (VSMP) application package, the following information is necessary. This checklist is intended to be used to provide a locality with a list of items, documents and procedures that must be submitted to Department of Environmental Quality (DEQ) staff in order for the Virginia Water Control Board (Board) to approve the local VSMP. All items listed are requirements in the Virginia Stormwater Management Program (VSMP) Permit Regulations and the Virginia Stormwater Management Act.

#### **VSMP Application Package Components – 9VAC25-870-150 - Authorization procedures for Virginia stormwater management programs.**

The following are the items that must be submitted by localities required to adopt a VSMP in accordance with § [62.1-44.15:27](#) of the Code of Virginia or towns electing to adopt their own VSMPs as part of the application package:

1. The draft VSMP ordinance(s) as required in 9VAC25-870-148;
2. A funding and staffing plan;
3. The policies and procedures including, but not limited to, agreements with Soil and Water Conservation Districts, adjacent localities, or other public or private entities for the administration, plan review, inspection, and enforcement components of the program; and
4. Such ordinances, plans, policies, and procedures must account for any town lying within the county as part of the locality's VSMP program unless such towns choose to adopt their own program.

The information referenced under “information needed for review” is to be provided by local staff. Local staff should replace the description of information requested in the “Local Staff to Provide” column with the location, local ordinance citation, or brief summary of requested information.

<b>Item #</b>	<b>Code/Regulatory citation</b>	<b>Information needed for review</b>	<b>Local Staff to Provide</b>	<b>DEQ Staff Review of Information from Locality</b>
1.	<a href="#">62.1-44.15:27 E</a> <a href="#">9VAC25-870-150.A.1</a>	Copy of the final draft of the local Stormwater Management Ordinance (s).	A copy of the most recent draft of the updated Stormwater Management Ordinance is included in <b>Attachment A</b> along with the VSMP Local Ordinance Checklist. The draft ordinance has been posted on the Town's webpage and was presented for informational purposes to Town Council on January 13, 2014.	<i>Ordinance provided?</i> Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
2.	<a href="#">9VAC25-870-150.A.2</a>	Funding and staffing plan.	A copy of the most recent Funding and Staffing Plan dated December 17, 2013 is included in <b>Attachment B</b> .	<i>Information provided?</i> Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
3.	<a href="#">62.1-44.15:27 A</a> <a href="#">9VAC25-870-150.A.3</a>	Is the locality partnering with adjacent localities or other entities for the administration, plan review, inspection and enforcement components of a stormwater management program?	The Memoranda Of Understanding (MOUs) between the Town of Leesburg and Loudoun County dated February 3, 2010 is included in <b>Attachment C</b> . This MOU relates to the Town's erosion and sediment control program.	<i>Information provided?</i> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Comments:
4.	<a href="#">9VAC25-870-150.A.4</a>	Ordinance language, policies and procedures that account for any town lying within the county as part of the locality's VSMP program unless such towns choose to adopt their own program.	Not applicable.	<i>Information provided?</i> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Comments:
5.	<a href="#">62.1-44.15:33</a>	Identification of any provisions of a local stormwater management program in existence before January 1, 2013 that contains more stringent provisions	The Town's ordinance does not contain more stringent criteria utilizing the provisions of 62.1-44.15:33. The Town is proposing to regulate certain activities under one acre of land-	<i>Information provided?</i> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Comments:

		than the current VSMP regulations.	<p>disturbance using the authority of 62.1-44.15:34; however, that does not apply here.</p> <p>The Town’s Design and Construction Standards Manual (DCSM) contains criteria and requirements that are more stringent than the VSMP regulations. A summary of these criteria and requirements is provided in <b>Attachment D</b>.</p>	
6.	<a href="#">9VAC25-870-148.A.1</a>	Identification of the authority accepting complete registration statements, and of authorities completing plan review, plan approval, inspection and enforcement.	<p>A copy of the most recent Funding and Staffing Plan dated December 17, 2013 is included in <b>Attachment B</b>.</p>	<p><i>Information provided?</i>                  Yes <input type="checkbox"/> No <input type="checkbox"/>                  Comments:</p>
7.	<a href="#">9VAC25-870-148.A.2</a>	Identification of ordinance language and processes for the review and approval of erosion and sediment control and stormwater management plans.	<p>Ordinance language for stormwater management plan review and approval is contained in Town Code Sections 14-23(g)(2) and (4) (<b>Attachment A</b>).</p> <p>Requirements for the erosion and sediment control plan are contained in Article 10 of the DCSM (<b>Attachment E</b>).</p> <p>The draft Submittal and Review of Stormwater Management and Erosion and Sediment Control Plans SOP is included in <b>Attachment F</b>.</p>	<p><i>Information provided?</i>                  Yes <input type="checkbox"/> No <input type="checkbox"/>                  Comments:</p>
8.	<a href="#">9VAC25-870-148.A.4</a> <a href="#">9VAC25-870-114</a>	Identification of inspection program for land disturbing activities.	<p>Ordinance language for the inspection program for land disturbing activities is found in Town Code Section 14-23(e)(5) (<b>Attachment A</b>).</p> <p>The draft Construction Site Inspection Process SOP is included in <b>Attachment G</b>.</p>	<p><i>Information provided?</i>                  Yes <input type="checkbox"/> No <input type="checkbox"/>                  N/A <input type="checkbox"/>                  Comments:</p>

9.	<a href="#">9VAC25-870-112</a> <a href="#">9VAC25-870-148.A.5</a>	<p>Identification of requirements for the long term inspection and maintenance of BMPs.</p>	<p>Ordinance language for BMP maintenance is found in Town Code Section 14-23(h) (<b>Attachment A</b>).</p> <p>Language is also included in deeds granting the Town a stormwater management easement for privately maintained facilities. The language is included in <b>Attachment H</b>.</p> <p>The draft BMP Maintenance and Inspection SOP is included in <b>Attachment I</b>.</p>	<p><i>Information provided?</i>                  Yes <input type="checkbox"/> No <input type="checkbox"/>                  Comments:</p>
10.	<a href="#">9VAC25-870-148.A.6</a> <a href="#">9VAC25-870-700</a> <a href="#">9VAC25-870-800</a>	<p>Identification of location of fee structure and if the fee structure differs from the statewide fee schedule.</p>	<p>The Stormwater Management fee schedule, Attachment “A” to the Town of Leesburg Land Development Review and Inspection Fee Schedule, per Town Code 14-23(e)(3) (<b>Attachment A</b>) and Section 1.04 of the Subdivision and Land Development Regulations (SLDR) is included in <b>Attachment J</b>. The fee schedule will be made available on the Town’s webpage as well as at the Department of Plan Review’s customer service counter.</p>	<p><i>Information provided?</i>                  Yes <input type="checkbox"/> No <input type="checkbox"/>                  Comments:</p>
11.	<a href="#">9VAC25-870-148.A.7</a> <a href="#">9VAC25-870-116</a>	<p>Explanation of local enforcement for stormwater management program.</p>	<p>The Town’s enforcement protocol is contained in the draft Construction Site Inspection Process SOP (<b>Attachment G</b>).</p> <p>A copy of Division 6, Administration and Enforcement, of the SLDR is included in <b>Attachment K</b>.</p>	<p><i>Information provided?</i>                  Yes <input type="checkbox"/> No <input type="checkbox"/>                  Comments:</p>
12.	<a href="#">9VAC25-870-148.A.8</a>	<p>Identification of policies/procedures for obtaining and releasing bonds as applicable.</p>	<p>The draft Bond Release SOP is included in <b>Attachment L</b>.</p>	<p><i>Information provided?</i>                  Yes <input type="checkbox"/> No <input type="checkbox"/>                  N/A <input type="checkbox"/></p>

Locality: Town of Leesburg

			Procedures for establishing a Bond Agreement with the Town of Leesburg through bond release are defined in Sections 6.04 through 6.09 of the Town’s Subdivision and Land Development Regulations ( <b>Attachment K</b> ).	Comments:
13.	<a href="#">9VAC25-870-148.A.9</a> <a href="#">9VAC25-870-126</a>	Identification of procedures for reporting and recordkeeping.	The draft Record Keeping SOP is included in <b>Attachment M</b> .	<i>Information provided?</i> Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

**Other supporting documentation**

14.	<a href="#">9VAC25-870-65</a>	Copy of BMP design criteria.	A copy of the most recent draft of the updated DCSM is included in <b>Attachment N</b> along with a summary of the significant amendments that have been made to the DCSM and the Town Code for compliance with the VSMP regulations.	<i>Information provided?</i> Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
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**The following is to be completed by DEQ staff.**

15.	Is the local Erosion and Sediment Control program consistent as defined in 62.1-44.15:54.D?	<i>DEQ staff should verify status in advance and note here prior to sending to local contact.</i>	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
16.	a. Is the locality within Tidewater Virginia as defined in the Chesapeake Bay Preservation Act? b. If so, is the local Bay Act program consistent and compliant?	<i>DEQ staff should verify status in advance and note here prior to sending to local contact.</i>	a. Yes <input type="checkbox"/> No <input type="checkbox"/> Comments: b. Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
17.	Is the locality an MS4 locality?	<i>DEQ staff should verify status in advance and note here prior to sending to local contact.</i>	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:



## VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) LOCAL ORDINANCE CHECKLIST

December 20, 2013

Locality      Town of Leesburg

Reviewer:      \_\_\_\_\_

Date:            January 2, 2014

Virginia local governments that adopt a Virginia State Water Control Board (Board) approved Virginia Stormwater Management Program (VSMP) must develop local ordinances that incorporate specific components of the Virginia Stormwater Management Act and Virginia Stormwater Management Program (VSMP) Regulations. The Department has developed this VSMP Local Ordinance Checklist as a tool to assist Regional Office staff and local governments in the development and review of local SWMP ordinances. It was developed using the DCR Stormwater Management Model Ordinance as a template for organization and minimum requirements. We recommend that the Virginia Stormwater Management Act and the VSMP Permit Regulations be used when reviewing local stormwater ordinances. The relevant code and/or regulatory citations are included to provide the reviewer with the actual regulatory requirement and language.

### 1-1. PURPOSE AND AUTHORITY

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
1	<a href="#">9VAC25-870-20</a>	Purpose: Describes purpose of local VSMP ordinance.	Verify that purpose of the ordinance is described: provides the framework for the administration, implementation and enforcement of the provisions of the Virginia Stormwater Management Act and delineates the procedures and requirements to be followed in connection with permits issued by the local VSMP authority.	Provided in Town Code Section 14-20 – “Purpose and Findings” and Section 14-21 – “Authority.”	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
2	<a href="#">62.1-44.15:27</a>	Establishes requirement for localities to establish a stormwater management program.	Ensure reference to 62.1-44.15.27 is given.	Referenced in Town Code Section 14-21.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

### 1-2. DEFINITIONS

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
3	<a href="#">9VAC25-870-10</a>	Definitions: The Model	The reviewer should ensure that these	All definitions are presented in Town Code Section 14-19;	Provision met?

		Ordinance includes 33 definitions necessary for inclusion in a local storm water ordinance.	33 definitions are included in the local ordinance. Additional definitions may be included but should be reviewed against the Regulations. All definitions should be consistent with the Regulations. Ensure that any references to DCR are changed to DEQ.	<p>exceptions include the following:</p> <ul style="list-style-type: none"> <li>• Administrator is not included in the definitions because the Director of Plan Review is clearly defined as the administrator on Section 14-22 – “Administration.”</li> <li>• Chesapeake Bay Preservation Area Land-disturbing Activity is not included since the Town is not subject to the Chesapeake Bay Preservation Act.</li> <li>• VSMP Permit is not included since the Town is not proposing to create a new stand-alone stormwater permit. Rather, the issuance of any other permit that would allow a land-disturbing activity is now contingent on meeting the stormwater management requirements. This was discussed with DCR in January 2013 (Ginny Snead and Joan Salvati) and the Town was told its approach was acceptable to avoid duplication of efforts and streamline the review and approval process.</li> <li>• State Board is not included since only its proper name is used in the ordinance.</li> <li>• VSMP Authority is not used since it is redundant – the Town is the authority. The term VSMP Authority is not used in the ordinance.</li> </ul>	Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
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### 1-3. STORMWATER PERMIT REQUIREMENT; EXEMPTIONS

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
4	<a href="#">62.1-44.15:34 A</a>	Requires a VSMP authority permit to be issued prior to the commencement of land disturbance.	Verify requirement exists in the local ordinance.	Town Code Section 14-23(e) – “VSMP Compliance” provides that no person may engage in any land-disturbing activity and not grading, building, or other permit shall be issued for the property, until all requirements of the ordinance are met. As noted above, the Town is making commencement of land disturbing activities contingent on approval of required program elements without creating a special new VSMP local authority permit.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
5	<a href="#">9VAC25-870-51</a>	Outlines specific technical criteria and administrative requirements land disturbing activities	Ensure ordinance states that Chesapeake Bay Act land disturbing activities do not require completion of a registration statement or require coverage under the General Permit but	Not required. The Town is not subject to the Chesapeake Bay Preservation Act.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/>  Technical criteria/administr

		subject to the Chesapeake Bay Preservation Act must meet.	shall be subject to the technical criteria and program and administrative requirements in 9VAC25-870-51. Determine if all 9 technical criteria/administrative requirements are specified in the local ordinance: 1. Erosion and sediment control plan 2. Stormwater management plan 3. Exceptions may be requested 4. Long-term maintenance of stormwater management facilities 5. Water quality design criteria 6. Water quality compliance 7. Channel protection and flood protection 8. Offsite compliance options available 9. Subject to design storm and hydrologic methods, linear development controls, and criteria associated with stormwater impoundment structures or facilities		ative requirements specified? 1. Yes <input type="checkbox"/> No <input type="checkbox"/> 2. Yes <input type="checkbox"/> No <input type="checkbox"/> 3. Yes <input type="checkbox"/> No <input type="checkbox"/> 4. Yes <input type="checkbox"/> No <input type="checkbox"/> 5. Yes <input type="checkbox"/> No <input type="checkbox"/> 6. Yes <input type="checkbox"/> No <input type="checkbox"/> 7. Yes <input type="checkbox"/> No <input type="checkbox"/> 8. Yes <input type="checkbox"/> No <input type="checkbox"/> 9. Yes <input type="checkbox"/> No <input type="checkbox"/>  Comments:
6	<a href="#">62.1-44.15:34 C</a>	Lists 8 activities that are exempt under the Regulations.	Must be phrased exactly like the Code to ensure proper interpretation. Determine if all 8 activities are specified in the local ordinance: 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,	Town Code Section 14-23(e)(6) – “Exemptions” covers relevant exemptions. Note the following: <ul style="list-style-type: none"> <li>References to the Chesapeake Bay Preservation Area Designation and Management Regulations are not included.</li> <li>The ordinance cites the appropriate Code reference for land clearing associated with agricultural or silvicultural purposes rather than including the verbiage in the ordinance. This was deemed acceptable by DCR during a meeting with the Town in January 2013.</li> <li>The Town has exercised its discretion to regulate activities under one acre of land-disturbance in accordance with 62.1-44.15:34.C.4 of the Code of Virginia. The Town is proposing to exempt activities that require only a site plan waiver or a standard zoning permit (very small projects) and single-family residential projects under an acre and not part of a common plan of development. These activities will still be required to comply with the Town’s E&amp;SC requirements. Other activities under an acre will need to</li> </ul>	Exempt activities specified? 1. Yes <input type="checkbox"/> No <input type="checkbox"/> 2. Yes <input type="checkbox"/> No <input type="checkbox"/> 3. Yes <input type="checkbox"/> No <input type="checkbox"/> 4. Yes <input type="checkbox"/> No <input type="checkbox"/> 5. Yes <input type="checkbox"/> No <input type="checkbox"/> 6. Yes <input type="checkbox"/> No <input type="checkbox"/> 7. Yes <input type="checkbox"/> No <input type="checkbox"/> 8. Yes <input type="checkbox"/> No <input type="checkbox"/>  Comments:

			<p>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 Chapter 11 (§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;</p> <p>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 Chesapeake Bay Preservation Act (§62.1-44.15:67 et seq.) may regulate these single family residences where land disturbance exceeds 2,500 square feet;</p> <p>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 Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC 25-830) adopted pursuant to the Chesapeake Bay Preservation Act (§62.1-44.15:67 et seq.) 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</p>	<p>comply with E&amp;SC requirements and minimum water quality technical standards. However, they will not be required to comply with the water quantity technical standards, obtain a general permit, or develop a SWPPP.</p>	
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			<p>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;</p> <ol style="list-style-type: none"> <li>5. Discharges to a sanitary sewer or combined sewer system;</li> <li>6. Activities under a state or federal reclamation program to return an abandoned property to an agricultural or open land use;</li> <li>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;</li> <li>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.</li> </ol>		
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**1-4. STORMWATER MANAGEMENT PROGRAM ESTABLISHED; SUBMISSION AND APPROVAL OF PLANS**

	<b>State Code/Regulation</b>	<b>Description</b>	<b>Review Strategy</b>	<b>Local Code Citation</b>	<b>Review Results</b>
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	<b>Citation</b>				
7	<a href="#">62.1-44.15:34</a> <a href="#">9VAC25-870-54.A-C</a> <a href="#">9VAC25-870-59</a>	Requires an approved erosion & sediment control plan, stormwater management plan, and general permit registration statement prior to issuance of a VSMP authority permit.	Verify these 3 requirements are specified in the local ordinance, where required.	Town Code Section 14-23(e)(1) – “VSMP Compliance Elements” requires all three elements prior to any land-disturbing permit. Since the Town has a pre-existing stormwater program, the additional language proposed by the SWCB shouldn’t affect the Town’s ordinance.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
8	<a href="#">62.1-44.15:34</a>	Allows for issuance of VSMP authority permit only after evidence of general permit coverage is obtained.	Verify requirement exists in the local ordinance, where required.	Town Code Section 14-23(e)(1)b states that evidence of general permit coverage must be provided.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
9	<a href="#">9VAC25-870-750.A</a>	Requires fees to be paid before issuance of VSMP authority permit.	Verify requirement exists in the local ordinance.	Town Code Section 14-23(e)(3) states that all fees must be paid in accordance with the fee schedule provided for by Section 1.04 of the Town’s Subdivision and Land Development Regulations. The fee schedule is attached.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
10	<a href="#">62.1-44.15:34 A</a>	Requires approval of a VSMP authority permit prior to issuance of grading, building or other local permit.	Verify requirement exists in the local ordinance.	As noted previously, per discussions with DCR in January 2013, the Town has opted not to issue a physically-separate VSMP permit. Rather, issuance of grading, building, or other local permits is contingent on meeting the requirements of this ordinance. Language is provided in Town Code Section 14-23(e).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

**1-5. STORMWATER POLLUTION PREVENTION PLAN (SWPPP); CONTENTS OF PLAN**

	<b>State Code/Regulation Citation</b>	<b>Description</b>	<b>Review Strategy</b>	<b>Local Code Citation</b>	<b>Review Results</b>
11	<a href="#">9VAC25-870-54.A</a> <a href="#">9VAC25-880-70, Section II</a>	Requires SWPPP to be in compliance with state regulations and general permit requirements.	Ensure references to 9VAC25-870-54 and 9VAC25-880-70 are included. SWPPPs must include: 1. Approved erosion and sediment control plan 2. Approved stormwater management plan 3. Pollution Prevention Plan for regulated land disturbing activities	Referenced in Town Code Section 14-23(e)(2) – “Stormwater Pollution Prevention Plans.” 9VAC25-870-54 is specifically cited. 9VAC25-880-70 is cited by reference to the general permit.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

			4. Description of any additional control measures necessary to address a TMDL (Not required to be listed in local ordinance as long as regulatory reference is given.)		
12	<a href="#">9VAC25-870-54.G</a>	Describes conditions under which a SWPPP must be amended by the operator.	Verify local ordinance states that SWPPP must be amended when there is a change in design, construction, operation or maintenance that has significant effect on discharge of pollutants not addressed by existing SWPPP.	Referenced in Town Code Section 14-23(e)(2)c.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
13	<a href="#">9VAC25-870-54.G</a>	Describes conditions under which SWPPP must be maintained by operator.	Verify local ordinance states that 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 at the construction site.	Referenced in Town Code Section 14-23(e)(2)d.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

#### 1-6. STORMWATER MANAGEMENT (SWM) PLAN; CONTENTS OF PLAN

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
14	<a href="#">9VAC25-870-55.A</a>	Requires SWM plan to apply technical criteria and consider all sources of surface runoff and subsurface and groundwater flows converted to surface runoff.	Verify requirement exists in the local ordinance: A. A stormwater management plan shall be developed and submitted to the VSMP authority. The stormwater management plan shall be implemented as approved or modified by the VSMP authority and shall be developed in accordance with the following: 1. A stormwater management plan for a land disturbing activity shall apply the stormwater management technical criteria set forth in this part to the entire land disturbing activity. Individual lots in new residential, commercial, or industrial developments shall not be	Minimum technical criteria is referenced in Town Code Section 14-23(g)(1) and the requirement for the criteria to apply to the entire common plan of development and to consider all sources is referenced in Town Code Section 14-23(g)(2).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

			<p>considered separate land-disturbing activities.</p> <p>2. A stormwater management plan shall consider all sources of surface runoff and all sources of subsurface and groundwater flows converted to surface runoff.</p> <p>Note: Highlighted language reflects 12-17-13 regulatory amendment. Other language within the section remains unchanged and is provided for context.</p>		
15	<a href="#">9VAC25-870-55.B 1-8</a>	Lists 8 required SWM plan elements.	<p>Determine if all 8 elements are specified in the local ordinance:</p> <ol style="list-style-type: none"> <li>1. 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;</li> <li>2. Contact information including name, address, telephone number and parcel number of the property or properties affected;</li> <li>3. Narrative that includes a description of current site conditions and final site conditions or if allowed by the VSMP authority, the information provided and documented during the review process that addresses the current and final site conditions;</li> <li>4. General description of the proposed stormwater management facilities and mechanism through which the facilities will be operated/ maintained after construction is complete;</li> <li>5. Information on proposed stormwater management facilities, including (i) type of facilities; (ii) location, including geographic coordinates;</li> </ol>	Referenced in Town Code Section 14-23(g)(2)a-h.	<p>All elements specified?</p> <ol style="list-style-type: none"> <li>1. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>2. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>3. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>4. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>5. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>6. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>7. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>8. Yes <input type="checkbox"/> No <input type="checkbox"/></li> </ol> <p>Comments:</p>

			<p>(iii) acres treated; and (iv) surface waters or karst features into which facility will discharge;</p> <p>6. Hydrologic/hydraulic computations, including runoff characteristics;</p> <p>7. Documentation/calculations verifying compliance with water quality and quantity requirements of the regulations;</p> <p>8. Map or maps of site that depicts topography of the site and includes:</p> <p>a. Contributing drainage areas;</p> <p>b. Existing streams, ponds, culverts, ditches, wetlands, other water bodies, floodplains;</p> <p>c. Soil types, geologic formations if karst features are present in the area, forest cover, other vegetative areas;</p> <p>d. Current land use including existing structures, roads, locations of known utilities and easements;</p> <p>e. Sufficient information on adjoining parcels to assess impacts of stormwater from the site on these parcels;</p> <p>f. Limits of clearing and grading, proposed drainage patterns on the site;</p> <p>g. Proposed buildings, roads, parking areas, utilities, stormwater management facilities;</p> <p>h. Proposed land use with tabulation of percentage of surface area to be adapted to various uses, including but not limited to planned locations of utilities, roads and easements.</p>		
16	<a href="#">9VAC25-870-55.B 9</a>	Letter of availability required for use of off-site compliance options.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-23(g)(2)i.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
17	<a href="#">9VAC25-870-</a>	Requires elements of	Verify requirement exists in the local	Referenced in Town Code Section 14-23(g)(2)j.	Provision met?

	<a href="#">55.C</a>	SWM plans that include activities regulated under Chapter 4 of Title 54.1 of the Code of Virginia be appropriately sealed and signed by professional registered in the Commonwealth of Virginia.	ordinance.		Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
18	<a href="#">9VAC25-870-55.D</a>	Requires construction record drawing be submitted to VSMP authority. Must be appropriately sealed and signed by a professional registered in the Commonwealth of Virginia certifying that the SWM facilities have been constructed in accordance with approved plan.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-23(g)(2)k.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

**1-7. POLLUTION PREVENTION PLAN (PPP); CONTENTS OF PLAN**

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
19	<a href="#">9VAC25-870-56</a>	Requires PPP which details design, installation, implementation and maintenance of pollution prevention measures in accordance with Regulations.	Verify requirement exists in the local ordinance or is included by reference.	Referenced in Town Code Section 14-23(f)(3).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
20	<a href="#">9VAC25-870-56.A 1-3, B 1-4 and C</a>	Lists PPP requirements as outlined in the Regulations.	Determine if all 8 requirements are specified in the local ordinance or are included by reference: 1. Minimize discharge of pollutants	Referenced in Town Code Section 14-23(f)(3)a-c.	All requirements specified? 1. Yes <input type="checkbox"/> No <input type="checkbox"/> 2. Yes <input type="checkbox"/> No <input type="checkbox"/>

			<p>from equipment and vehicle washing, wheel wash water and other wash waters. Wash waters must be treated prior to discharge;</p> <p>2. Minimize exposure of all materials on site to precipitation and stormwater;</p> <p>3. Minimize discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures;</p> <p>4. BMPs to prohibit wastewater from washout of concrete, unless managed by appropriate control;</p> <p>5. BMPs to prohibit wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;</p> <p>6. BMPs to prohibit discharges of fuels, oils or other pollutants used in vehicle/equipment operation/maintenance;</p> <p>7. BMPs to prohibit discharges of soaps or solvents used in vehicle/equipment washing;</p> <p>8. Discharges from dewatering activities are prohibited unless managed by appropriate controls.</p>		<p>3. Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>4. Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>5. Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>6. Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>7. Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>8. Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Comments:</p>
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**1-8. REVIEW OF STORMWATER MANAGEMENT (SWM) PLAN**

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
21	<a href="#">9VAC25-870-108.A</a>	Requires the VSMP authority to review and approve SWM plans.	Verify requirement exists in the local ordinance. May include “or any duly authorized agent of the Administrator”.	Requirement for review is referenced in Town Code Section 14-23(e)(1)(d). Specific review requirements and procedures and contained in Town Code Section 14-23(g)(4).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
22	<a href="#">9VAC25-870-108.B</a>	Establishes time frame for review of SWM	Ensure all review period benchmarks are included:	Referenced in Town Code Section 14-23(g)(4).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/>

		plans and requirement for communication of decision to applicant.	<ol style="list-style-type: none"> <li>1. Completeness of plan must be determined and applicant notified of determination within 15 days of receipt. <ol style="list-style-type: none"> <li>a. If incomplete, applicant must be notified in writing.</li> <li>b. If determination of completeness is made, 60 days from date of communication is allowed for review.</li> <li>c. If determination of completeness is not made and communicated within 15 days, plan shall be deemed complete as of date of submission and 60 days from date of submission will be allowed for review.</li> <li>d. Any plan previously disapproved must be reviewed within 45 days of resubmission.</li> </ol> </li> <li>2. Decision to approve or disapprove plan must be provided in writing; if not approved reasons must be provided in writing.</li> <li>3. If a plan meeting all requirements is submitted and no action is taken within appropriate time frame, the plan will be deemed approved. (Note: Shorter time frames are acceptable.)</li> </ol>		Comments:
23	<a href="#">9VAC25-870-108.C</a>	Describes the conditions under which modifications to approved SWM plans may be allowed or required.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-23(g)(4)b.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
24	<a href="#">9VAC25-870-108.E</a>	Requires construction record drawing for permanent BMPs. May elect not to require for SWM facilities for which maintenance	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-23(g)(4)c.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

		agreements are not required pursuant to 9VAC25-870-112.			
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**1-9. TECHNICAL CRITERIA FOR REGULATED LAND DISTURBING ACTIVITIES**

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
25	<a href="#">9VAC25-870-62</a> <a href="#">9VAC25-870-63</a> <a href="#">9VAC25-870-65</a> <a href="#">9VAC25-870-66</a> <a href="#">9VAC25-870-69</a> <a href="#">9VAC25-870-72</a> <a href="#">9VAC25-870-74</a> <a href="#">9VAC25-870-76</a> <a href="#">9VAC25-870-85</a> <a href="#">9VAC25-870-92</a> <a href="#">9VAC25-870-93</a> <a href="#">9VAC25-870-94</a> <a href="#">9VAC25-870-95</a> <a href="#">9VAC25-870-96</a> <a href="#">9VAC25-870-97</a> <a href="#">9VAC25-870-98</a> <a href="#">9VAC25-870-99</a>	Technical criteria for land disturbing activities.	Technical criteria must be part of the VSMP, but do not have to be included within the ordinance. They may be contained within a local document that is referenced within the ordinance or the ordinance may reference 9VAC25-870-62 thru 99 of the Regulations. State technical criteria or more stringent local standards must be enforceable through the ordinance. 9VAC25-870-93 thru 99 must also be contained or referenced in local ordinances.	Appropriate sections of 9VAC25-870-62 thru 92 are referenced in Town Code Section 14-23(g)(1). Town Code Section 14-23(e)(4) references 9VAC25-870-48 for the grandfathering requirements.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
26	<a href="#">9VAC25-870-48</a>	Describes conditions under which grandfathering of projects may occur.	Verify requirements exist in the local ordinance: A. Any land disturbing activity shall be considered grandfathered by the VSMP authority and shall be subject to the Part II C technical criteria of the VSMP Regulation provided: 1. A proffered or conditional zoning plan, zoning with a plan of development, preliminary or final subdivision plat, preliminary or final site plan, or any document determined by the locality to be equivalent thereto (i) was approved by the locality prior to July 1, 2012,	Town Code Section 14-23(e)(4) references 9VAC25-870-48 for when grandfathering applies and 9VAC25-870-93 through 9VAC25-870-99 for the grandfathering technical criteria.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

			<p>(ii) provided a layout as defined in 9VAC25-870-10, (iii) will comply with the Part II C technical criteria of the VSMP Regulation, and (iv) has not been subsequently modified or amended in a manner resulting in an increase in the amount of phosphorus leaving each point of discharge, and such that there is no increase in the volume or rate of runoff;</p> <p>2. A state permit has not been issued prior to July 1, 2014; and</p> <p>3. Land disturbance did not commence prior to July 1, 2014.</p> <p>B. Locality, state and federal projects shall be considered grandfathered by the VSMP authority and shall be subject to the Part II C technical criteria of the VSMP Regulation provided:</p> <p>1. There has been an obligation of locality, state or federal funding, in whole or in part, prior to July 1, 2012, or the department has approved a stormwater management plan prior to July 1, 2012;</p> <p>2. A state permit has not been issued prior to July 1, 2014; and</p> <p>3. Land disturbance did not commence prior to July 1, 2014.</p> <p>C. Land disturbing activities grandfathered under subsections A and B of this section shall remain subject to the Part II C technical criteria of the VSMP Regulation for one additional state permit cycle. After such time, portions of the project not under construction shall become subject to any new technical criteria adopted by the board.</p> <p>D. In cases where governmental</p>		
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			bonding or public debt financing has been issued for a project prior to July 1, 2012, such project shall be subject to the technical criteria of Part II C. E. Nothing in this section shall preclude an operator from constructing to a more stringent standard at his discretion.		
27	<a href="#">9VAC25-870-122</a>	Describes conditions under which exceptions to the technical criteria may be granted.	Verify requirements exist in the local ordinance.	Referenced in Town Code Section 14-23(g)(5). In addition to the language from the Model Ordinance, the Town has included an exception for when the water quantity requirements conflict with the Town's flood management program and adopted stormwater management plan.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

### 1-10. LONG-TERM MAINTENANCE OF PERMANENT STORMWATER FACILITIES

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
28	<a href="#">9VAC25-870-58</a>	Requires recorded instrument for long term maintenance of permanent BMPs.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-23(h).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
29	<a href="#">9VAC25-870-112.A</a>	Sets out specific requirements for long term maintenance of permanent BMPs.	Determine if all 5 requirements are specified in the local ordinance: 1. Submitted prior to approval of stormwater management plan 2. Stated to run with land 3. Provide necessary access to property for maintenance and inspection 4. Provide for inspections and maintenance and submission of reports 5. Be enforceable	<ul style="list-style-type: none"> <li>Town Code Section 14-23(e)(1)d requires compliance with stormwater management system maintenance requirements prior to issuance of a land-disturbing permit.</li> <li>Town Code Section 14-23(h)(1)a provides that the maintenance agreement will run with the land.</li> <li>Town Code Section 14-23(h)(2) provides for necessary access for maintenance and inspections.</li> <li>Town Code Section 14-23(h)(1)c provides for inspections and maintenance, and for the submission of reports.</li> <li>Town Code Section 14-23(h)(3) provides that the Director of Plan Review has the authority to enforce maintenance provisions.</li> </ul>	All requirements specified? 1. Yes <input type="checkbox"/> No <input type="checkbox"/> 2. Yes <input type="checkbox"/> No <input type="checkbox"/> 3. Yes <input type="checkbox"/> No <input type="checkbox"/> 4. Yes <input type="checkbox"/> No <input type="checkbox"/> 5. Yes <input type="checkbox"/> No <input type="checkbox"/>  Comments:
30	<a href="#">9VAC25-870-112.B</a>	Allows option for localities to not require a recorded BMP	If locality desires to allow this option, verify requirement exists in the local ordinance.	The Town of Leesburg does not desire to allow this option at the present time.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

		maintenance agreement on individual residential instrument.			
31	<a href="#">9VAC25-870-114.D</a>	If individual residential BMPs are not required to have recorded instrument, localities must develop strategy to address maintenance.	Applicable only if individual BMPs are not required to have recorded instrument.	Not applicable.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

### 1-11. MONITORING AND INSPECTIONS

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
32	<a href="#">9VAC25-870-114.A</a>	Requires VSMP authority to inspect for 4 compliance items during construction.	Determine if all 4 required inspection items are specified in the local ordinance: 1. Compliance with erosion and sediment control plan 2. Compliance with stormwater management plan 3. Development, updating, implementation of pollution prevention plan 4. Development and implementation of additional control measures to address a TMDL	Referenced in Town Code Section 14-23(e)(5)a.	Inspection items specified? 1. Yes <input type="checkbox"/> No <input type="checkbox"/> 2. Yes <input type="checkbox"/> No <input type="checkbox"/> 3. Yes <input type="checkbox"/> No <input type="checkbox"/> 4. Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
33	<a href="#">62.1-44.15:39</a>	Allows entry onto property in order to obtain information to assist in the enforcement of ordinance.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-23(e)(5)b.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
34	<a href="#">62.1-44.15:40</a>	Requires permittee to provide information to VSMP authority when requested.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-23(e)(5)d.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
35	<a href="#">9VAC25-870-114.B.2</a>	Requires post-construction inspections	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-23(e)(5)e.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/>

		to be conducted by VSMP authority at least once every 5 years.			Comments:
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### 1-12. HEARINGS

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
36	<a href="#">62.1-44.15:44</a> <a href="#">9VAC25-870-118</a>	Establishes right to hearing by any permit applicant, permittee, or person subject to state permit requirements aggrieved by a VSMP authority.	Verify requirement exists in the local ordinance. (Note: Local Board of Zoning Appeals and locality Program Administrators or his/her designee cannot constitute the Appeals Board. A separate Board or Commission must be appointed to hear appeals.)	The hearings process is referenced in Town Code Section 14-25. Hearing will be conducted by the Leesburg Town Council.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
37	<a href="#">62.1-44.15:45</a> <a href="#">62.1-44.26</a>	Establishes procedures for hearings.	Verify that hearings held by local government comply with the requirements of §62.1-44.26 A – C: 1. Must be conducted by local governing or appeals body at a regular or special meeting or by at least one member designated to conduct such hearings or at any other authorized time and place. 2. Verbatim record of proceedings must be taken and filed with local governing or appeals body.	Referenced in Town Code Section 14-25(b)-(d).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

### 1-13. APPEALS

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
38	<a href="#">62.1-44.15:46</a>	Establishes right to appeals process.	Pursuant to §62.1-44.15:46, each locality must adopt an appeals procedure, which should be appropriate for the stormwater ordinance provisions, and shall be conducted in accordance with the locality's existing	Referenced in Town Code Section 14-26. Appeals are to be filed with the Town Manager, which may then be further appealed to the Town Council.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

			appeals procedures.		
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### 1-14. ENFORCEMENT

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
39	<a href="#">62.1-44.15:37 A</a> <a href="#">9VAC25-870-116.A</a>	Requires notice to be served if Administrator determines there is a failure to comply.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-24(b)(1).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
40	<a href="#">62.1-44.15:37 A</a>	Requires compliance measures to address permit conditions and timeframe for completion.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-24(b)(1).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
41	<a href="#">62.1-44.15:37 A</a>	Describes failure to comply actions.	Ensure that the local ordinance states that an order may be issued that ceases all land-disturbing activities until corrected.	Referenced in Town Code Section 14-24(b)(1)b.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
42	<a href="#">62.1-44.15:37</a> <a href="#">9VAC25-870-116.A 1</a>	Allows for informal and formal proceedings if Administrator determines that there is a failure to comply.	Verify requirement exists in the local ordinance.	Referenced in Town Code Section 14-24(b)(2)	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
43	<a href="#">62.1-44.15:49</a> <a href="#">9VAC25-870-116</a>	Provides enforcement authority and schedule of civil penalties for enforcement actions. Criminal misdemeanor charges are an option also.	Components from 9VAC25-870-116 A 1 & A 2 must be incorporated into the VSMP ordinance. Ensure that the maximum penalty of \$32,500 per violation per day is not exceeded and that violations for which a penalty may be imposed are given.	Referenced in Town Code Section 14-24(b)(4).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

### 1-15. FEES

(The inclusion of fees within the ordinance is optional. If they are not included within the ordinance, they should be documented elsewhere and must be submitted to DEQ as part of the Local VSMP Application package.)

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
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44	<a href="#">62.1-44.15:28</a>	Establishes fees to cover costs associated with implementation of a VSMP.	Verify that the locality has either incorporated the fee schedule into their ordinance or local procedures. See Table 1 in SWM Model Ordinance or regulatory citation. (Note: Localities have ability to raise or lower fees. May also utilize other sources of funding.)	Referenced in Town Code Section 14-23(e)(3) and Town Code Section 1.04 (Subdivision and Land Development Regulations). Actual fee schedule is adopted separately as the Town of Leesburg Land Development Review and Inspection Fee Schedule. See Stormwater Management Fees attached.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
45	<a href="#">9VAC25-870-820</a>	Fees associated with coverage under the General Permit for Discharges of Stormwater from Construction Activities (CGP).	See Table 1 in SWM Model Ordinance or regulatory citation.	See Stormwater Management Fees attached.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
46	<a href="#">9VAC25-870-825</a>	Fees associated with modification or transfer of CGP.	See Table 2 in SWM Model Ordinance or regulatory citation.	See Stormwater Management Fees attached.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
47	<a href="#">9VAC25-870-830</a>	Maintenance fees.	See Table 3 in SWM Model Ordinance or regulatory citation.	See Stormwater Management Fees attached.	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:
48	<a href="#">9VAC25-870-770</a>	Specifies how incomplete and late payments are handled.	Verify local ordinance states that incomplete payments deemed as nonpayments, interest may be charged on late payments, and a 10% late payment fee applied to delinquent accounts.	See Stormwater Management Fees attached (endnotes).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

### 1-16. PERFORMANCE BOND

(This section is optional and is not required to be included in local ordinances.)

	State Code/Regulation Citation	Description	Review Strategy	Local Code Citation	Review Results
49	<a href="#">62.1-44.15:34 A</a> <a href="#">9VAC25-870-104.D</a>	Allows for bonds and sets out criteria.	Not required in local ordinances.	Referenced in Town Code Section 14-23(e)(3).	Provision met? Yes <input type="checkbox"/> No <input type="checkbox"/> Comments:

**DEQ Attachment “B”**

***Town of Leesburg, Virginia***  
**Funding and Staffing Plan for Compliance with the  
Virginia Stormwater Management Regulations**

**Final Draft - December 17, 2013**

**Background**

Since 2002, the Town of Leesburg (Town) has operated a municipal separate storm sewer system (MS4) under authorization of the General Virginia Stormwater Management Program (VSMP) Permit for Discharges of Stormwater from Small MS4s (9VAC25-870). To fulfill the requirements of the permit, the Town has established policies and procedures to implement the six minimum control measures outlined in the permit. Among those measures outlined in the permit are requirements to implement and enforce provisions for construction site stormwater runoff control and post-construction stormwater management. Construction site stormwater runoff control is largely achieved through application of the Loudoun County erosion and sediment control program through a memorandum of understanding (MOU) between the Town and the County. Post-construction stormwater management is achieved through application of the Town of Leesburg Stormwater Management Ordinance (Town Code, Chapter 14), which was adopted in 2007. The Town has established staffing and funding levels necessary to maintain compliance with the MS4 permit requirements.

Amendments to the Virginia Stormwater Management Program in 2011 impose additional responsibilities on the Town that must be implemented starting July 1, 2014. This includes enhanced requirements for stormwater quality and quantity control that must be addressed in the stormwater management plan. In addition, the Town must ensure that the applicant has applied for and received coverage under the VSMP general construction permit. Finally, during the construction inspection process, the Town must check that the land disturber is actively implementing a Stormwater Pollution Prevention Plan (SWPPP), which consists of the stormwater management plan, erosion and sediment control plan, and pollution prevention plan. These changes necessitate amendments to the Town Code, a review of roles and responsibilities (including the MOU with Loudoun County), and the development of a Funding and Staffing Plan.

This document represents the Funding and Staffing Plan that must be submitted to the Virginia Department of Environmental Quality under 9VAC25-870-150.A.2. It is based on an assessment of the Town’s existing stormwater program and the Town’s plans for ensuring that adequate funding and staffing are in place to implement the new VSMP provisions.

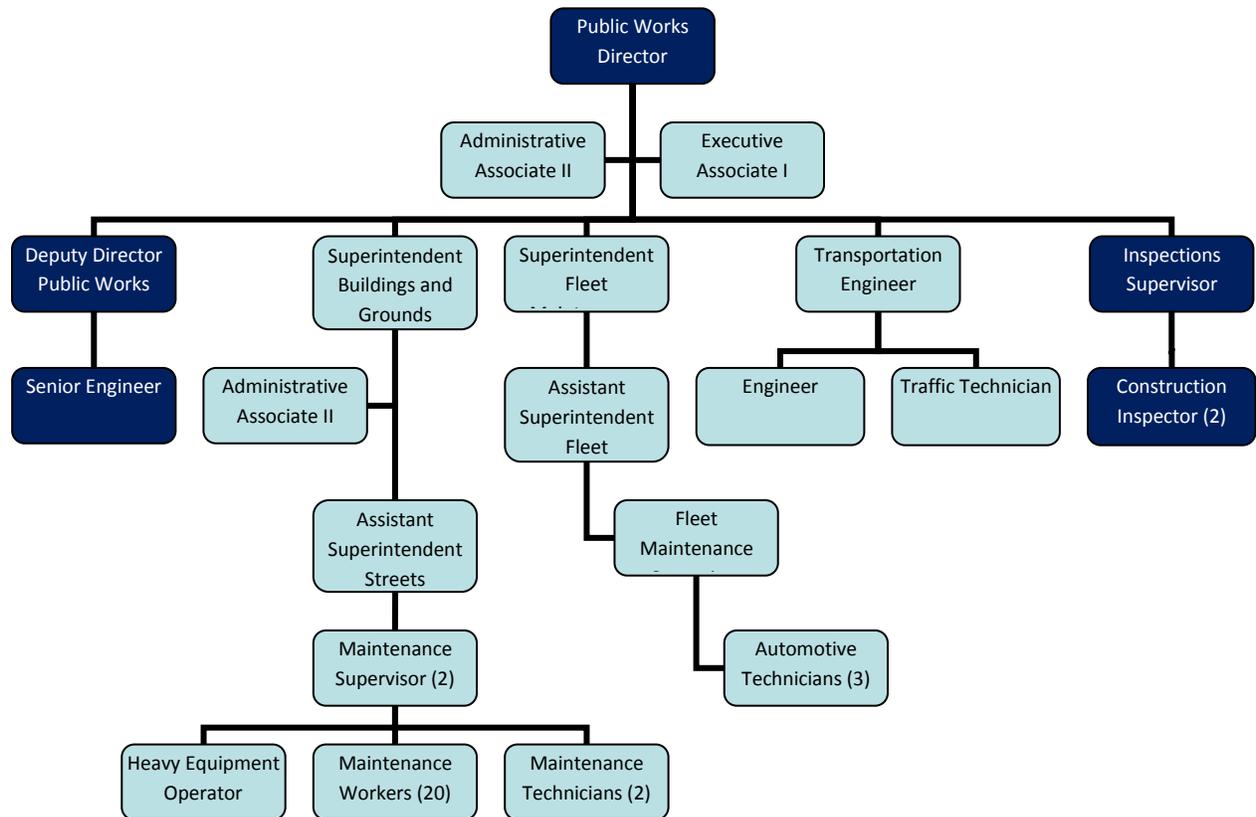
**Key Organizational Structure**

Implementation of the Town’s stormwater program is primarily handled by the Town’s Department of Public Works (DPW) and Department of Plan Review (DPR). Figures 1 and 2 provide the organizational structure of both, respectively. Individuals highlighted in dark blue are those that play a primary role in implementing the MS4 permitting obligations. While others, including the Town Attorney, play roles in stormwater program, the amount of time directly spent on program activities is minimal and therefore not included in this analysis.

Administration of the Town’s stormwater management program is based in the DPW Engineering and Inspections Division, with the Director and Deputy Director providing overall management. A division Senior Engineer leads the effort to review all engineering construction drawings for structural stormwater best management practices (BMPs), erosion and sediment control measures, and other stormwater related engineering details and specifications. Inspections of municipal and construction sites are conducted by DPW’s inspection group, which is currently comprised of an Inspection Supervisor and two Construction Inspectors. Inspectors verify the structural integrity of stormwater management ponds, storm sewer outfalls, and other BMPs that are maintained as part of the Towns compliance with stormwater management regulations. As part of compliance with the existing VSMP regulations, the inspection group oversees the implementation of permanent stormwater structures installed as part of development to manage long term stormwater quality and quantity.

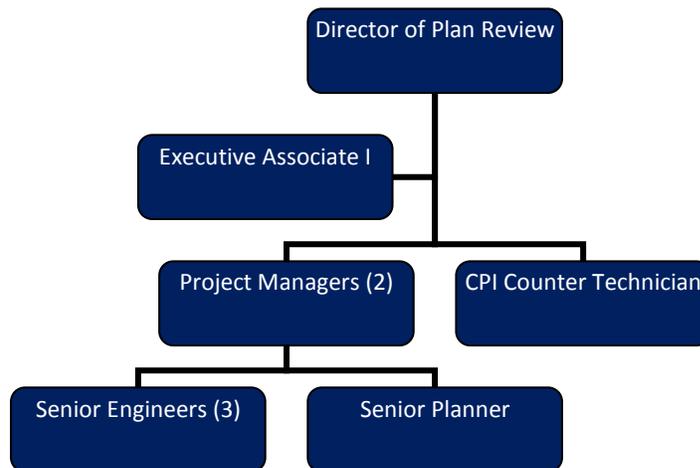
Program enforcement is primarily the responsibility of the inspection group. In the event of a violation, the Inspection Supervisor will initiate appropriate enforcement action to ensure that the operator and/or activity return to compliance. Existing enforcement actions are outlined in Section 14-24 of the Town Code. Enforcement specifically related to erosion and sediment control requirements are handled by Loudoun County in accordance with the MOU. In addition, the Town has the authority to bring enforcement action against a person for any violation of the Town Code, including erosion and sediment control provisions.

**Figure 1 – Department of Public Works Organizational Flow Chart**



The DPR provides overall review of construction plans and related documents for planned development/redevelopment within the Town. The engineering team oversees and approves all planned development in the Town, with plans and specifications for short term and permanent stormwater management being a part of the overall plan review process. DPR conducts review and approval of developers' stormwater management plans to control long term stormwater quality and quantity. Currently, the Town is operating under a MOU with Loudoun County regarding the review and approval of state required erosion and sediment control plans. The MOU stipulates that the County will provide plan review and construction site inspections of development within the Town in order to verify compliance with erosion and sediment control requirements.

**Figure 2 – Department of Plan Review Organizational Flow Chart**



### Existing Program Funding

Funding support for existing DPW and DPR staff is provided through a combination of resources from the general fund, capital projects fund, the utility fund, and zoning and development fees. Budgeting for DPW is set at \$11,488,747 for FY2014. This funding is provided through a combination of the Town's general fund, the capital projects fund, and the utilities fund.

Table 1 provides a detailed summary of the budget and funding allocation for DPW.

**Table 1: Department of Public Works FY2014 Budget Summary<sup>1</sup>**

Expense Summary	FY 2014 Budget	Funding Source	FY 2014 Budget
Administration	\$608,621	General Fund	\$7,836,096
Engineering and Inspections	\$586,067	Capital Projects Fund	\$112,136
Streets and Grounds	\$3,966,624	Utilities Fund	\$453,515
Building Maintenance	\$988,695	State Highway Maintenance	\$3,087,000
Fleet Maintenance	\$1,566,631		
Refuse and Recycling	\$2,778,983		
Traffic Management	\$993,126		
<b>Total</b>	<b>\$11,488,747</b>	<b>Total</b>	<b>\$11,488,747</b>

Source: Town of Leesburg, Virginia. FY2014 Adopted Budget & FY 2014-2019 Capital Improvements Program.

Funding for DPR is provided through a combination of Town allocated funds (general, capital projects, and utilities funds) and zoning and development fees paid by developers. Total budget allocations for FY2014 equal \$1,344,674. Table 2 below provides a detailed summary of the budgeting and funding allocation for DPR.

**Table 2: Department of Plan Review FY2014 Budget Summary<sup>2</sup>**

Expense Summary	FY 2014 Budget	Funding Source	FY 2014 Budget
Plan Review	\$1,344,674	General Fund	\$774,555
		Capital Projects Fund	\$56,152
		Utilities Fund	\$75,867
		Zoning and Development Fees	\$438,100
<b>Total</b>	<b>\$1,344,674</b>	<b>Total</b>	<b>\$1,344,674</b>

Source: Town of Leesburg, Virginia. FY2014 Adopted Budget & FY 2014-2019 Capital Improvements Program.

The Engineering and Inspection Division is comprised of a total of four full time employees (FTE) that are tasked to perform construction technical review and inspections within the Town. The FY2014 personnel budget allocation for the Engineering and Inspection Division is \$539,342 (Table 3). This is equivalent to \$134,836 per FTE. The Department of Plan Review is comprised of nine FTEs. With a FY2014 personnel budget of \$1,274,022, DPR's cost per FTE is \$141,558.

<sup>1</sup> Budget value includes expense allocations for personnel and other services and supplies related to the Public Works Department.

<sup>2</sup> Budget value includes expense allocations for personnel, contractual services, materials and supplies, continuous charges and capital outlay.

**Table 3 – Budget Summary for Personnel Costs**

Organization	FY 2014 Budget <sup>3</sup>	FTE	Budget/FTE
Public Works Engineering and Inspection Division	539,342	4.0	\$134,836
Department of Plan Review	\$1,274,022	9.0	\$141,558

Source: Town of Leesburg, Virginia. FY2014 Adopted Budget & FY 2014-2019 Capital Improvements Program.

**Existing Program Staffing**

The estimated annual effort that Town staff dedicate to stormwater related issues is provided in Table 4. The estimate was based on an assessment by Town staff, as well as an estimate of construction activity in the near future. The estimate of future construction is discussed in more detail in later sections of this plan. The estimated effort and cost provided below will continue to be refined in the future through evaluation of Town personnel time sheet logs.

**Table 4 – Estimated Personnel Effort for Existing Stormwater Program**

Department	Personnel Title	Total FTE	Stormwater Management Effort	
			Equivalent FTE	Total Cost <sup>4</sup>
Public Works	Director	1	0.07	
	Deputy Director	1	0.24	
	Senior Engineer	1	0.50	
	Inspection Supervisor	1	0.40	
	Inspectors	2	0.80	
<b>Public Works Total Annual Estimated Effort</b>			<b>2.01</b>	<b>\$271,020</b>
Plan Review	Director	1	0.10	
	Executive Associate I	1	0.02	
	CPI Counter Technician	1	0.02	
	Project Manager	2	0.30	
	Senior Engineers	3	0.75	
	Senior Planner	1	0.08	

<sup>3</sup> Budget shown represents allocation for “Personnel Services” only.

<sup>4</sup> Total cost equals equivalent FTE times Budget/FTE values from Table 3.

<b>Plan Review Department Total Annual Estimated Effort</b>	<b>1.27</b>	<b>\$179,779</b>
<b>Town of Leesburg Total Annual Estimated Effort</b>	<b>3.28</b>	<b>\$450,799</b>

**New Stormwater Program Requirements**

New VSMP permit regulations will require the Town to modify the current program to handle additional responsibilities involved in facilitating permit regulations. Specifically, the Town will have to implement procedures and policies to provide for the following actions:

- **Stormwater Management Plan Approval** – The Town currently reviews and approves the stormwater management plan as part of any regulated land-disturbing activity. The new regulations impose more stringent water quality and water quantity control requirements, which are likely to increase review and approval time.
- **Registration Statement Processing** – Prior to the new permit regulation, registration statements filed for coverage under the state construction stormwater permit were submitted to DEQ for processing. Under the new permit, registration statements will be submitted to the local authority. As a result, the Town will be responsible for accepting and processing registration statements for construction stormwater general permit coverage.
- **Registration Statement Fee Collection** – To fund the additional effort involved in meeting the new regulatory requirements, the Town will begin to collect fees associated with the submittal of registration statements by developers for coverage under the construction stormwater general permit. The Town will be required to establish a means for collecting and tracking permit fees.
- **Stormwater Pollution Prevention Plan (SWPPP) Review** – The Virginia construction general permit requires the development of a SWPPP that consists of a stormwater management plan, erosion and sediment control plan, and pollution prevention plan. Currently, the Town reviews and approves the stormwater management plan, while the County provides approval of the erosion and sediment control plan. While the SWPPP and pollution prevention plan do not have to be approved as part of the development process, the Town must check for the adequacy and completeness of the SWPPP during the construction inspection process. This will take additional time by the Town’s construction inspection group.
- **Stormwater Management Facility Inspections** – The new permit regulations increase minimum requirements for post-construction stormwater management facility inspections and maintenance. The Town already meets these new minimum requirements including a process for requiring owners to submit facility maintenance certifications on an annual basis. As a result, no additional effort will be required on the part of Town staff.

**Changes to the Plan Review and Oversight Process**

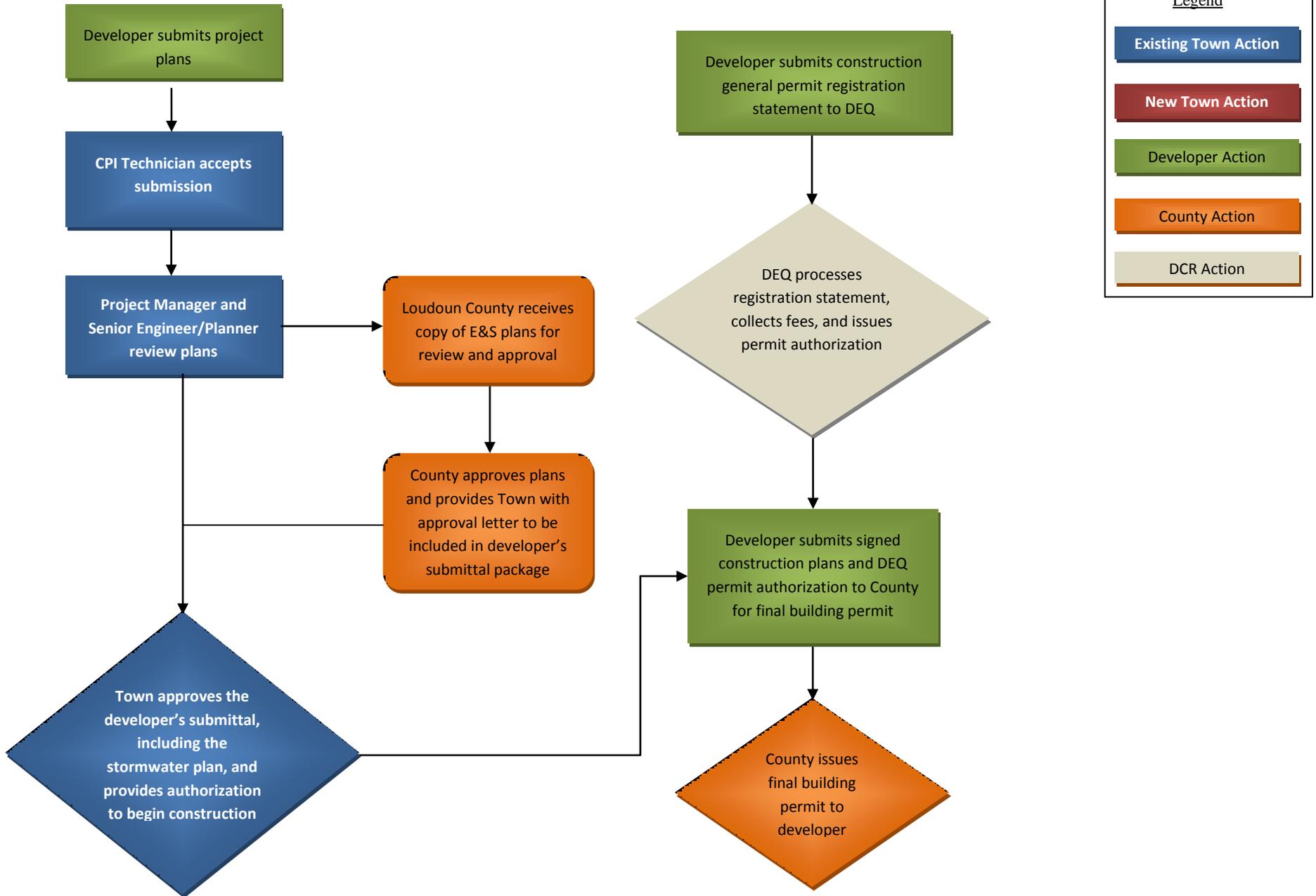
The Town will modify its plan review and oversight process to account for the changes noted above. The existing review process is included in Figure 3. The additional review and approval required under the new VSMP regulations will add several new elements to the Town’s process. Figure 4 provides an example of how the new elements will be added into the initial plan review process and subsequent plan

oversight during site inspections. This process maintains Loudoun County's continued involvement in implementing the erosion and sediment control requirements. Town personnel will assume responsibility of all other functions required by the regulations.

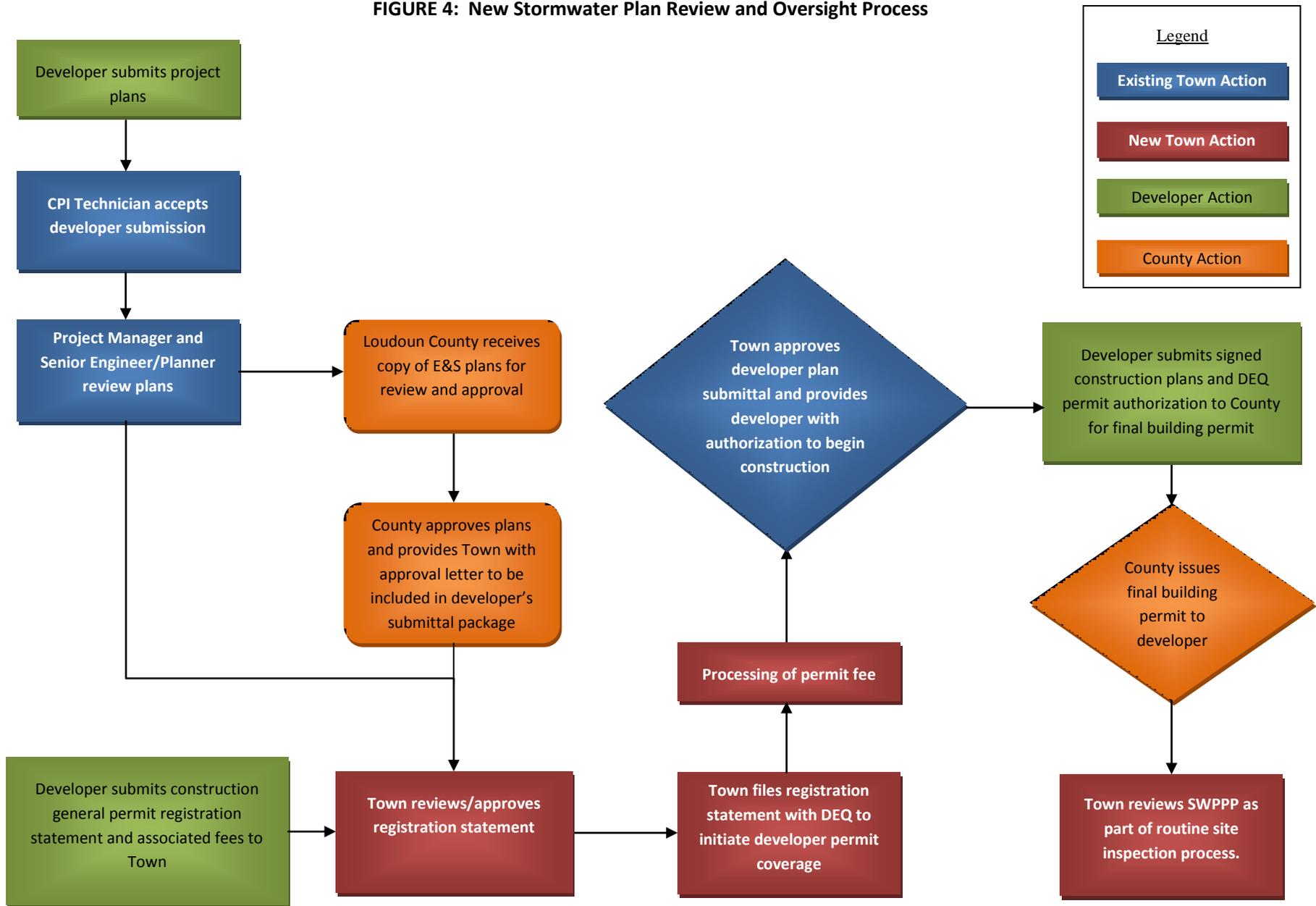
As noted in Figure 4, the new plan review and oversight process will add the following new steps:

- **Review and Approval of the Registration Statement** – Under the new regulations, the Town will be required to review and accept the developer registration statement. This new step will be included in the plan review process, following the County's approval of the developer's erosion and sediment control plan. This review will be completed by DPR and/or DPW.
- **Filing of the Registration Statement** – Following the review and approval of the registration statement, the Town must file the registration statement with DEQ. This task will be administrative in nature and be completed by the DPR CPI Technician.
- **Processing of Permit Fee** – Upon submittal of the registration statement, the developer will be required to pay a permit fee to the Town. In the past, this fee has been collected directly by DEQ. Based on the Town's current understanding, the developer will pay the fee directly to the Town, and then the Town will provide 28% to DEQ through a cooperative agreement. The framework for this process is anticipated to be administrative in nature, and will be conducted by DPR.
- **Review of SWPPP** – Currently, the developer is required to develop a SWPPP in compliance with the state stormwater construction general permit. The developer is not required to provide the SWPPP to the Town for review. Under the new regulations, the Town will be required to review the developer SWPPP as part of the construction inspection process. The Town will be required to ensure that the SWPPP is fully compliant with permit regulations, properly implemented on site, and kept up to date at all times. This review will include both a field evaluation and a desktop review, and will be conducted as a part of each inspection by the Town, throughout the course of the project. This effort will be completed by the DPW Engineering and Inspections Division.

FIGURE 3: Existing Stormwater Plan Review Process



**FIGURE 4: New Stormwater Plan Review and Oversight Process**



**Estimation of Future Construction Activity**

The amount of effort involved in fulfilling the requirements of the new VSMP regulations is based largely on the amount of anticipated construction projects during a given fiscal year. While many factors play a part in new development and redevelopment, examining historic construction trends within the Town can provide a base line for estimating future development. Historic trends in construction within the Town’s jurisdiction have steadily decreased since 2008. Table 5 provides the number of projects initiated per fiscal year beginning 2009. In addition, the table shows the fees that would be collected under the new fee structure authorized by the VSMP regulations.

Fees approved under the VSMP are authorized to be assessed to the developer for obtaining permit coverage. Projects that disturb an area less than one acre are not required to obtain permit coverage. Therefore, no fee is included for projects less than one acre.

**Table 5 – Historic Overview and Future Projection of Construction Activity**

Fiscal Year	Project Size (acres) and Permit Fee					Total Projects	Gross Fees <sup>5</sup>	Net Fees <sup>6</sup>
	< 1 \$0	1 – 5 \$2,700	5 – 10 \$3,400	10 – 50 \$4,500	50 – 100 \$6,100			
2009	11	8	7	2	1	29	\$60,500	\$43,560
2010	3	8	3	1	0	16	\$36,300	\$26,136
2011	5	4	2	2	0	13	\$26,600	\$19,152
2012	4	2	1	2	0	9	\$17,800	\$12,816
<b>Future Annual Projections</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>12</b>	<b>\$23,200</b>	<b>\$16,704</b>

One factor that has influenced the decrease in construction is the current economy. However, the primary factor in the future will be the availability of undeveloped land within the Town’s jurisdiction. Currently, approximately 85 percent of total land area is developed. The remaining 15 percent of land available for development would presumably be developed at a decreasing pace, as seen in historical trends. It may be reasonable to assume that property redevelopment would increase overtime to accommodate the evolving needs of the Town and local economy. In forecasting future construction projects, it is reasonable to assume a slight increase in development and redevelopment from FY 2012 levels, but the lack of developable land within the Town limits the potential for increased development. As indicated in the Future Projections row in the table, an annual estimate of 12 construction projects is being assumed for purposes of this plan. The total gross permit fee would equate to \$23,200 annually. Of this amount, the Town would retain \$16,704 follow the allocation of 28 percent to DEQ.

<sup>5</sup> Potential fees based on maximum permit fee established for each identified project size category under the new VSMP regulations, as outlined in 9VAC25-870-820.

<sup>6</sup> Fees retained by the Town following the appropriation of 28 percent of fees collected to DEQ, per 9VAC25-870-820.

For projects operating under the stormwater construction general permit for a timeframe that extends past the one year anniversary of the project’s initial permit coverage date, the regulations allow the Town to assess developers an annual permit maintenance fee. Similar to the permit fees, the annual permit maintenance fee is dependent on the total amount of acreage disturbed. A break-down of the anticipated annual maintenance fees that may be collected by the Town on an annual basis are included in Table 6. The break-down is based on the total number of construction projects initiated during future years. Considering projects less than one acre will not be required to obtain general permit coverage, no maintenance fee is anticipated. It is assumed that half of all projects between one and five acres will continue past their permits one year anniversary and incur an annual maintenance fee. All projects greater than 5 acres are anticipated to continue past the permit dates one year anniversary, and will subsequently incur the annual permit maintenance fee.

**Table 6 – Estimation of Future Annual Maintenance Fee Revenue**

	Project Size (acres) and Permit Fee					Total Projects	Net Fees <sup>7</sup>
	< 1	1 – 5	5 – 10	10 – 50	50 – 100		
	-	\$400	\$500	\$650	\$900		
Annual Construction Projects	5	4	1	2	0	12	
Projects Incurring Annual Maintenance Fees	0	2	1	2	0	5	
<b>Total Fee collected</b>	-	<b>\$800</b>	<b>\$500</b>	<b>\$1,300</b>	-		<b>\$2,600</b>

**Estimation of Future Funding and Staffing**

Due to the current level of funding and staffing maintained by the Town and the efficiency provided through shared responsibilities in the plan review and oversight process, the impact of the new regulations on staffing is expected to be modest. Table 7 provides an overview of the effort required to administer the existing program and an estimated level of effort to fully implement a program in compliance with the provisions of the new VSMP regulations. Incorporating the new permit requirements will entail an estimated increase of effort from 3.28 FTE to 4.18 FTE, for a difference of 0.90 FTE. The SWPPP and registration statement review are likely to require the most effort, while processing of the registration statement and the associated fee is anticipated to be a lesser effort. The estimated level of effort is based on Town staff’s past knowledge and experience to conduct like work, and the anticipated number of construction projects presented in Table 5. The additional effort will result in a necessary increase in the program budget from \$450,799 to \$575,714. That is an estimated increase of \$124,915.

<sup>7</sup> Fees retained by the Town following the appropriation of 28 percent of fees collected to DEQ, per 9VAC28-870-820.

**Table 7 – Estimated Change in Personnel Effort**

Department	Personnel Title	Total FTE	Existing Stormwater Management Effort		Additional Stormwater Management Effort		Future Stormwater Management Effort	
			Equivalent FTE	Total Cost <sup>8</sup>	Equivalent FTE	Total Cost <sup>8</sup>	Equivalent FTE	Total Cost <sup>8</sup>
Public Works	Director	1	0.07		0.01		0.08	
	Deputy Director	1	0.24		0.06		0.30	
	Senior Engineer	1	0.50		0.00		0.50	
	Inspection Supervisor	1	0.40		0.10		0.50	
	Inspectors	2	0.80		0.20		1.00	
<b>Public Works Total Annual Estimated Effort</b>			<b>2.01</b>	<b>\$271,020</b>	<b>0.37</b>	<b>\$49,889</b>	<b>2.38</b>	<b>\$320,909</b>
Plan Review	Director	1	0.10		0.10		0.20	
	Executive Associate I	1	0.02		0.00		0.02	
	CPI Counter Technician	1	0.02		0.18		0.20	
	Project Manager	2	0.30		0.10		0.40	
	Senior Engineers	3	0.75		0.15		0.90	
	Senior Planner	1	0.08		0.08		0.08	
<b>Department of Plan Review Total Annual Estimated Effort</b>			<b>1.27</b>	<b>\$179,779</b>	<b>0.53</b>	<b>\$75,026</b>	<b>1.80</b>	<b>\$254,805</b>
<b>Town of Leesburg Total Annual Estimated Effort</b>			<b>3.28</b>	<b>\$450,799</b>	<b>0.90</b>	<b>\$124,915</b>	<b>4.18</b>	<b>\$575,714</b>

<sup>8</sup> Total cost equals equivalent FTE times Budget/FTE values from Table 3.

The Town’s existing stormwater program is primarily funded through the general fund. As shown in Table 8 below, while the new VSMP permit fees serve to offset part of the additional cost associated with the expanded program, it does not fully cover these costs. As a result, additional general fund appropriations will be used to fund the expanded program. However, the Town may consider petitioning the State Water Control Board in the future for an increase in the base permit fee to provide a level of funding that equals the effort required for total program implementation.

**Table 8 – Estimation of Future Budget Needs and Funding Source**

Task		FTE Effort	Estimated Budget
<b>Implementation of Existing VSMP Regulations</b>	DPW Program Implementation	2.01	\$271,020
	DPR Program Implementation	1.27	\$179,779
	<b>Existing Program Total</b>	<b>3.28</b>	<b>\$450,799</b>
<b>Implementation of Changes to VSMP Regulations</b>	DPW Program Implementation	0.37	\$49,889
	DPR Program Implementation	0.53	\$75,026
	<b>Additional Program Cost</b>	<b>0.90</b>	<b>\$124,915</b>
<b>Implement Full Program</b>	<b>Total Future Program Cost</b>	<b>4.18</b>	<b>\$575,714</b>
Funding Source		Estimated Budget	
	Existing Allocation	\$450,799	
	Registration Statement Permit Fees	\$16,704	
	Annual Permit Maintenance Fees	\$2,600	
	Expansion of General Fund Allocation	\$105,611	
	<b>Total</b>	<b>\$575,714</b>	

# Attachment “A” to the Town of Leesburg Land Development Review and Inspection Fee Schedule

Stormwater Management Fees – Draft January 2, 2014

## Stormwater Management Fees<sup>1</sup>

**INITIAL LAND-DISTURBING ACTIVITY:**

The following fees must be paid by the applicant to the Town prior to the issuance of the general permit defined in Town Code Section 14-19 and prior to the issuance of any grading, building, land-disturbing, or similar permit regulated in accordance with Town Code Section 14-23. *Specifically, one half of the following fees shall be paid with the first submission construction plan package that shall include the first draft of all VSMP compliance elements. The second half of the required fees shall be paid with the signature set submission of the construction plans which shall include the final versions of all VSMP compliance elements.*

When a site or sites have been purchased for development within a previously permitted common plan of development or sale, the applicant shall be subject to fees in accordance with the disturbed acreage of their site or sites.

Persons whose coverage under the general permit has been revoked shall apply to the Virginia Department of Environmental Quality (DEQ) for an Individual Permit for Discharges of Stormwater from Construction Activities.

	Total Fee	Portion Paid to DEQ <sup>2</sup>
General/Stormwater Management – Small Activity (areas within common plans of development or sale with land disturbance acreage less than 1 acre)	\$290	\$81
General/Stormwater Management – Small Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 1 acre and less than 5 acres)	\$2,700	\$756
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 5 acres and less than 10 acres)	\$3,400	\$952
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 10 acres and less than 50 acres)	\$4,500	\$1,260
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 50 acres and less than 100 acres)	\$6,100	\$1,708
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 100 acres)	\$9,600	\$2,688

**MODIFICATIONS OR TRANSFERS:**

The following fees must be paid to the Town prior to the modification or transfer of general permit registration statements issued by the State Water Control Board. If the general permit modification results in changes to stormwater management plans that require additional review by the Town, such reviews shall be subject to the fee in this table. The fee assessed shall be based on the total disturbed acreage of the site. In addition to the modification fee, modifications resulting in an increase in total disturbed acreage shall pay the difference in the actual initial permit fee paid and the permit fee that would have been applied for the total disturbed acreage in accordance with initial land-disturbing activity table above.

Fees shall not be assessed to the following:

1. Permittees who request minor modifications to general permits as defined in Town Code Section 14-19. Permit modifications at the request of the permittee resulting in changes to the stormwater management plan that require additional review by the director shall not be exempt.
2. Permittees whose general permits are modified or amended at the initiative of DEQ, excluding errors in the registration statement identified by the Town or errors related to the acreage of the site.

General/Stormwater Management – Small Activity (areas within common plans of development or sale with land disturbance acreage less than 1 acre)	\$20
General/Stormwater Management – Small Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 1 acre and less than 5 acres)	\$200
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 5 acres and less than 10 acres)	\$250
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 10 acres and less than 50 acres)	\$300
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 50 acres and less than 100 acres)	\$450
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 100 acres)	\$700

**PERMIT MAINTENANCE:**

General permit coverage maintenance fees shall be paid annually to the Town, by the anniversary date of general permit coverage. No permit will be reissued or automatically continued without payment of the required fee. General permit coverage maintenance fees shall be applied until the permit coverage is terminated. Permit maintenance fees shall apply to expired permits that have been administratively continued.

General/Stormwater Management – Small Activity (areas within common plans of development or sale with land disturbance acreage less than 1 acre)	\$50
General/Stormwater Management – Small Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or	\$400

greater than 1 acre and less than 5 acres)	
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 5 acres and less than 10 acres)	\$500
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 10 acres and less than 50 acres)	\$650
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 50 acres and less than 100 acres)	\$900
General/Stormwater Management – Large Activity (sites or areas within common plans of development or sale with land disturbance acreage equal or greater than 100 acres)	\$1,400

<sup>1</sup>All incomplete payments will be deemed as nonpayments, and the applicant shall be notified of any incomplete payments. Interest shall be charged for late payments at the underpayment rate set forth in Code of Virginia § 58.1-15 and is calculated on a monthly basis at the applicable periodic rate. A 10% late payment fee shall be charged to any delinquent account, defined as over 90 days past due. The Town is entitled to all remedies under the Code of Virginia in collecting any past due amount.

<sup>2</sup>This is the portion of the total fee that is paid to the Virginia Department of Environmental Quality (DEQ). If the project is completely administered by DEQ such as may be the case for a state or federal project or projects covered by individual state permits, the entire applicant fee shall be paid to DEQ.

**DEQ Attachment “F”**

**Town of Leesburg, Virginia  
Submittal and Review of Stormwater Management and  
Erosion and Sediment Control Plans**

**STANDARD OPERATING PROCEDURE**

- All Virginia Stormwater Management Program (VSMP) compliance elements, including one half of the required stormwater management fees, are submitted to the Town of Leesburg as part of the first submission of the Site Plan or Subdivision Construction Drawing. The SWPPP can be in draft format with the first submission.
- All VSMP compliance elements are distributed to the Town of Leesburg Plan Review Engineer and sent out to the Loudoun County Building and Development Erosion and Sediment Control Division as a referral.
- The Town of Leesburg has a Memorandum of Understanding (MOU) in place with Loudoun County that states that they will review the Erosion and Sediment Control Plans, issue the Grading Permit, and inspect Erosion and Sediment Control facilities during construction.
- The Town’s plan review engineer utilizes the checklists in Appendix 3 of the Virginia Stormwater Management Handbook to review the stormwater management plan to verify that the minimum standards are met and required elements of the plan have been provided and the submission requirements listed in Article 10 of the DCSM.
- Both the Town’s plan review engineer and the Loudoun County Erosion and Sediment Control Engineer utilize Chapter 6 & 7 of the Erosion and Sediment Control Handbook to verify that minimum standards are met and required elements of the plan have been provided.
- Comments on the VSMP compliance elements are prepared and sent out to the applicant/engineer to be addressed. All elements are revised and resubmitted until satisfactorily addressed.
- Final versions of all VSMP compliance elements are submitted with the signature set submission of the Site Plan or Subdivision Construction Drawing. The second half of the Stormwater management fees are collected with this submission.
- Once the Town has reviewed all the VSMP information and found the documentation to be in conformance with Town and State requirements, Town staff will populate the DEQ charts and recommend that DEQ issue a compliance letter under the criteria of Virginia’s General Permit.
- Once DEQ issues their letter, the plans are signed by the Town, which approves the VSMP compliance elements.
- The Town of Leesburg issues a Permit Processing Clearance Letter and the applicant submits a grading permit application to Loudoun County.
- In accordance with the MOU with Loudoun County, they review and approve the required Grading Permit, which permits construction to begin.
- The Town will process the payment to the Commonwealth of Virginia for their share of all collected VSMP compliance fees at the end of each quarter.

**DEQ Attachment “G”**

**Town of Leesburg, Virginia  
Construction Site Inspection Process**

**STANDARD OPERATING PROCEDURE**

- All Virginia Stormwater Management Program (VSMP) compliance elements, including the approved Site or Subdivision Construction Drawings, are provided to the Town of Leesburg Public Works Inspector as well as the Loudoun County Erosion and Sediment Control Inspector.
- The Town of Leesburg Public Works Inspector utilizes Appendix 3 of the Virginia Stormwater Management Handbook and the VSMP compliance elements to verify that the stormwater management facilities are constructed properly. The Town of Leesburg Public Works Inspector visits the site several times per week.
- In accordance with the Memorandum of Understanding (MOU) in place with Loudoun County, the Loudoun County Erosion and Sediment Control Inspector inspects the erosion and sediment control measures to verify that they are performing as designed.
- The Loudoun County Erosion and Sediment Control Inspector visits the site at various times, including after rainfall events. Inspection reports are generated with each site visit, which are provided to the Town of Leesburg, Department of Public Works.
- Upon stabilization of the site, the Loudoun County Erosion and Sediment Control Inspector allows all erosion and sediment controls to be removed.
- If any violations are noted, the contractor and applicant shall be notified in writing of such violations within five working days. Failure to comply with the terms of the notice of violation shall be referred to the Town Attorney’s office for enforcement actions as outlined in the Town Code.
- Upon completion of the site improvements and stormwater management facilities, the developer submits as-builts and a certificate of completion of the Town of Leesburg, Department of Public Works.
- Periodic review of the site SWPPP may be requested by the Town of Leesburg Department of Public Works Inspector for compliance to Town Code 14-23.

**DEQ Attachment “I”**

**Town of Leesburg, Virginia  
Best Management Practice (BMP) Maintenance and Inspection**

**STANDARD OPERATING PROCEDURE**

- The required Certificate of Completion stating that the BMP facilities have been activated and are operating as designed is provided to the Town of Leesburg after all construction is completed.
- Town Public Works staff manually enters each individual BMP facility into an inventory database in Microsoft Excel format. The database is utilized to track all facilities in the Town of Leesburg and that proper maintenance is kept up to date.
- The Town of Leesburg Public Works sends out annual notices to each property owner in the fall reminding them to provide the required inspection reports for each BMP facility by the end of the calendar year. This annual report is required in Town Code Section 14-23h.
- After receipt of the annual reports, Town the Leesburg Public Works inspectors visit the site to visually verify that the reports appear accurate.
- If no report is submitted by April 1<sup>st</sup>, the Town Attorney is notified and Public Works staff follows the procedure as outlined in the Town Code for enforcement actions.
- In addition to the annual reports required by the property owner, the Town of Leesburg Public Works staff inspects each facility in accordance with the MS4 permit.
- The database is updated by Public Works staff to reflect each inspection of the facility.

**DEQ Attachment “L”**

**Town of Leesburg, Virginia  
Bond Release**

**STANDARD OPERATING PROCEDURE**

- The Town of Leesburg Public Improvements Bond is released in accordance with the procedures outlined in Article 10 of the Town of Leesburg Design and Construction Standards Manual and Division 6 of the Town of Leesburg Subdivision and Land Development Regulations.
- The Loudoun County Erosion and Sediment Control Bond is released by Loudoun County when the site has been adequately stabilized in accordance with the MOU.

## Town of Leesburg, Virginia Stormwater Management Record Keeping

### STANDARD OPERATING PROCEDURE

- The Town of Leesburg Department of Public Works (DPW) creates and maintains the BMP facility Microsoft Excel database. The following information will be collected for each newly installed facility in the Town: geographic coordinates, acres treated, and the surface waters into which the stormwater management facility will discharge.
- DPW will document and track in Excel format the number and type of enforcement actions taken on existing stormwater management facilities in the Town.
- DPR will document and track the number of exemptions granted to the Town's stormwater management provisions in accordance with Town Code Chapter 14 Article 2 – Stormwater Management.
- The Town will submit the above information on a fiscal year basis (July 1 to June 30) to the Virginia Department of Environmental Quality no later than October 1 of each year with the Town's MS4 permit annual report.
- Project records, including approved stormwater pollution prevention plans (SWPPP's), shall be kept for three years after permit termination or project completion.
- Stormwater management facility inspection records shall be documented and retained for at least five years from the date of inspection.
- The annual inspection reports required by the property owner and the semi-annual inspection reports completed by the Town of Leesburg are kept in accordance with the Records Retention and Disposition Schedule General Schedule No. GS-06 for County and Municipal Governments issued by the Library of Virginia.
- Construction record drawings for the BMP facilities shall be maintained in perpetuity or until a stormwater management facility is removed.
- All registration statements submitted in accordance with Town Code Chapter 14 Article 2 – Stormwater Management shall be documented and retained for at least three years from the date of project completion or permit termination.

**Stormwater Management Easement (Privately Maintained).**

Owner hereby grants and conveys unto the Town, its successors and assigns, a **Stormwater Management Easement (Privately Maintained)** for the purpose of installing, constructing, operating, maintaining, adding to, repairing, replacing, altering present or future stormwater management facilities and structures including but not limited to stormwater storage areas, drainage ditches, drainage lines, or other drainage structures and facilities, plus necessary inlet structures, manholes, and appurtenances collectively for the collection, storage and/or treatment of storm waters and its transmission through, upon, and across a portion of the Owner’s Property said easement areas being more particularly bounded and described on the Plat as the “**Stormwater Management Easement (Privately Maintained)**”.

The above-described “**Stormwater Management Easement (Privately Maintained)**” is subject to the following conditions:

1. Owner shall construct the Stormwater Management (SWM) Facilities according to the construction plans approved by the Town (the “**Plans**”) and in compliance with all applicable laws and regulations promulgated pursuant to the Code of Virginia § 62.1-44.15:24, et. seq and 62.1-44.15:27, et. seq., **9VAC25-870 (Virginia Stormwater Management Program Regulations)**. All drainage lines and appurtenant facilities installed in the

**“Stormwater Management Easement (Privately Maintained)”**

Area shall be and remain the property of the Grantor, its successors and assigns.

2. The Owner, its successors and assigns, shall be responsible for any specific maintenance requirements included in the Plans, all applicable SWM Regulations, and for providing adequate maintenance of all drainage lines and appurtenant facilities located within the **“Stormwater Management Easement (Privately Maintained)”** Area; adequate maintenance means good working condition so that these facilities are performing their design functions as described and shown on the Plans and as described in all applicable SWM Regulations (currently, found in the Virginia State Code, the BMP Clearinghouse, the Virginia Stormwater Management Handbook and the Town’s Design and Construction Standards Manual (DCSM), latest editions).
  
3. Owner, its successors and assigns, shall annually file an inspection report, which shall be signed and sealed by a qualified professional engineer or surveyor, with the Town of Leesburg Department of Public Works that shows compliance with the Plans and applicable SWM Regulations (currently, found in the

DEQ Attachment “H”

Virginia State Code, the BMP Clearinghouse, the Virginia Stormwater Management Handbook and the Town’s DCSM, latest editions).

4. The Town, its authorized agents and employees, shall have the right, but not the obligation, to enter upon the “**Stormwater Management Easement (Privately Maintained)**” Area to inspect the “**Stormwater Management Easement (Privately Maintained)**” area whenever the Town deems it reasonably necessary. Except in cases of emergency, the Town shall make reasonable attempts to notify the Owner, its successors and assigns, prior to entering the Property.
  
5. If the Owner, its successors and assigns, fails to adequately maintain the “**Stormwater Management Easement (Privately Maintained)**” Area, inspect and file annual reports, or comply with applicable SWM regulations, the Town and its agents shall have the right, but not the obligation, to perform any reasonable inspection, replacement, repair and maintenance as the Town deems necessary. The Owner, its successors and assigns, shall, reimburse the Town the costs of the inspection, replacement, repair, and maintenance of the SWM Facilities performed by the Town within 30 days of receipt thereof. This

DEQ Attachment “H”

provision shall not be construed to allow the Town to erect any building or structure in the “**Stormwater Management Easement (Privately Maintained)**” Area without obtaining written approval of the Owner.

6. The Town and its agent or assigns shall have full and free use of said “**Stormwater Management Easement (Privately Maintained)**” Area for the purposes named herein and shall have all rights and privileges necessary to exercise the rights granted in this easement including, but not limited to, the right of access to and from the “**Stormwater Management Easement (Privately Maintained)**” Area and the right to use adjoining land where necessary; provided, however, that this right to use adjoining land shall be exercised only during periods of actual inspection, replacement, repair and maintenance of the SWM Facilities, and then only to the extent necessary to perform inspections, replacement, repair and maintenance of the SWM Facilities, and further, this right shall not be construed to allow the Town to erect any building or structure on such adjoining lands.
7. If the Owner, its successors and assigns, fails to adequately maintain the “**Stormwater Management Easement (Privately**

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**Maintained)**” Area, inspect and file annual reports, or comply with applicable SWM Regulations, the Town and its agent or assigns shall have the right, but not the obligation, to trim, cut and remove trees, shrubbery, fences, structures, or other obstructions in and near the “**Stormwater Management Easement (Privately Maintained)**” Area, deemed by the Town to interfere with the proper and efficient operation and maintenance of the SWM Facilities, provided that the Town, at the expense of the Owner, its successors and assigns, shall restore as the Town deems necessary, all land or premises disturbed by the inspection, construction, operations and maintenance of said SWM facilities.

8. The Owner, its successors and assigns, shall not alter the SWM Facilities without prior written approval of the Town. The Owner, its successor and assigns, shall submit a written request to the Town of Leesburg Department of Public Works for approval of any alteration to the “**Stormwater Management Easement (Privately Maintained)**” Area.
9. The Owner reserves the right to make use of the easement areas herein granted which may not be inconsistent with the rights herein conveyed, or interfere with the use of said easement

DEQ Attachment “H”

areas by the Town for the purposes named; provided, however, that the Owner, its successors and assigns, shall comply with all applicable Federal, State, Local and Town ordinances and regulations prior to placing any building, roadway, or other structure, or fence, in the easement areas.

10. The Owner, its successors or assigns, including but not limited to homeowner and business associations, shall indemnify and hold harmless the Town, and its agents, for any liability or claims of any kind resulting from the construction, presence, maintenance, inspection, repair or failure of the facilities within or adjacent to the “**Stormwater Management Easement (Privately Maintained)**” Area.

**Memorandum of Understanding**  
**For Erosion & Sediment Controls and**  
**Stormwater Management / Best Management Practice**  
**Between Loudoun County, Virginia**  
**And The Town of Leesburg**

THIS MEMORANDUM OF UNDERSTANDING is made and entered into this 3<sup>rd</sup> day of February, 2009<sup>2010</sup> by and between Loudoun County (hereinafter the "County"), and the Town of Leesburg (hereinafter the "Town").

**Purpose of the Memorandum**

**WHEREAS**, clean water is crucial to the quality of life of both County and Town residents as well as the economic vitality of the region and the Commonwealth; and,

**WHEREAS**, the Commonwealth of Virginia requires the County and the Town to implement measures to protect water quality under the *Virginia Pollutant Discharge Elimination System (VPDES) Phase II* program, the *Virginia Stormwater Management Program (VSMP)*, *National Pollutant Discharge Elimination System Program (NPDES)*, the *County and Town's Municipal Separate Storm Sewer System Permit (MS-4)*, the *Virginia Erosion and Sediment Control Law, Regulations, and Certification Regulations*, and the *Virginia Stormwater Management Regulations*; and,

**WHEREAS**, the County enforces *Chapter 1220: Erosion Control* of the *Codified Ordinances of Loudoun County within the County and the Town* to ensure 100% of construction site run off is adequately controlled; and,

**WHEREAS**, the Town enforces Design Standards, Hydrologic Design, Stormwater Management, Watershed Protection, and Best Management Practices (BMP) of the Town of Leesburg's Design and Construction Standards Manual; and

**WHEREAS**, the County and the Town have determined that it is mutually beneficial to establish a cooperative and coordinated approach to implementation of the Town's stormwater and erosion and sediment control requirements; and,

**WHEREAS**, the County issues grading permits for the Town upon the Town's approval of site plans;

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**NOW THEREFORE** the County and Town agree that their respective responsibilities are as follows:

**A. County Responsibilities**

1. Review all Site and Construction Plans provided to the County as a referral by the Town and provide technical comments with respect to erosion and sediment control matters.
  2. Review and provide technical comments to applicants on all Grading Permit Applications submitted to the County.
  3. Require proof that all other associated State and Federal permits have been obtained prior to issuing any grading permit.
  4. Require that an Erosion and Sediment control bond be posted to the County on all projects prior to approving the grading permit.
  5. If a Grading Permit Application is inconsistent with the State laws and the Loudoun County Erosion and Sediment control ordinances, the County shall reject the Grading Permit Application and notify the Applicant.
  6. Issuance of grading permits upon applicant's compliance with all applicable requirements and the Town's approval of site plans (expressed via zoning clearance letter or zoning permit).
  7. Provide inspections for issued grading permits consistent with the Loudoun County Erosion and Sediment Control inspection schedule.
  8. Pursue administrative enforcement of grading permits in violation of the County erosion and sediment control ordinances as identified by County Field Managers during routine inspections.
  9. Investigate violations of the Loudoun County erosion and sediment control ordinances as identified by Town Staff.
  10. If during routine inspections, the County's field manager witness violations of the Town's VSMP, VDPES and NPDES permits, the County will notify the Town.
  11. Administer Erosion and Sediment control bond inspections and subsequent Erosion and Sediment control bond releases.
-

12. Upon request, provide general technical assistance to the Town with respect to erosion and sediment control matters.
13. If requested by the Town, the County's Field Manager shall make available to the Town all grading permit correspondence, erosion and sediment control field inspection reports as well as any written violations issued for all projects being inspected by the County within the Town's corporate limits.

#### **B. Town Responsibilities**

1. Review and approve construction/site plans within the Town's Corporate Limits in accordance with all Town Ordinances and State Laws (including but not limited to floodplain studies & alterations, as well as adequate outfall, stormwater management and BMP measures).
  2. Require that all projects within the Town's Corporate Limits comply with Town and State's stormwater management regulations, including the use of Best Management Practices (BMP) to protect water quality. For projects within the Town's Corporate Limits, the Town will review all stormwater management and BMP plans and routinely inspect construction sites to verify compliance with all applicable Town, State and Federal stormwater management regulations.
  3. Submit construction/site plans within the Town's Corporate Limits to the County as a referral for erosion and sediment control review.
  4. The Town shall forward to the Loudoun County Erosion and Sediment Control Program all construction/site plan re-submissions which may require grading permit approval.
  5. During the review process, ensure that all Erosion and Sediment Control plans are in general conformance with all State Laws regarding Erosion & Sediment Control MS-19 Minimum Standards as noted within the County's referral comments.
  6. Upon Town approval of the plan, issue Zoning Clearance Letter to the applicant and forward a copy to the Loudoun County Erosion and Sediment Control Program.
  7. When observed, report any site violations that may cause imminent damage to waterways within the Town's Corporate Limits to the Loudoun County Erosion and Sediment Control Program.
-

8. Prepare annual updates to the Town's Municipal Separate Storm Sewer System MS-4, NPDES, VPDES & VSMP permits as required by the State within the Town of Leesburg Corporate limits and provide copies to the County for their files.
9. Pursue legal enforcement of violations of the County Erosion and Sediment Control Ordinances within the Town's corporate limits.

**C. Amendments and Modifications**

This Memorandum of Understanding may be amended at any time by mutual consent of the parties, in writing.

**D. Termination**

Any termination or request for modification of this Memorandum of Understanding by either party shall be submitted in writing and require mutual written agreement by both the County and the Town.

However, this Memorandum of Understanding shall automatically terminate upon written notice of termination by one of the parties on the basis of one of the following events:

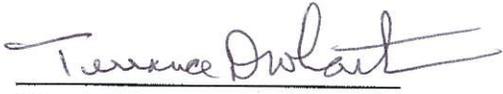
1. The Town implementing a local erosion and sediment control program within its corporate limits as approved by the Commonwealth of Virginia, Department of Conservation and Recreation; or
  2. The Commonwealth of Virginia, Department of Conservation and Recreation approval to exclude the administration of the Loudoun County Erosion and Sediment Control Program within the Town limits; or
  3. Upon statutory authority releasing the County from mandatory administration of an Erosion and Sediment Control program within the Town.
-

This Memorandum of Understanding shall become effective upon the endorsement of the parties as well as adoption of applicable ordinances and shall remain in effect unless terminated by one of the parties as noted above.

In Witness Whereof, the parties herein have caused this document to be executed as of the date of the last signature shown below:

**LOUDOUN COUNTY, VIRGINIA**  
A Political Subdivision

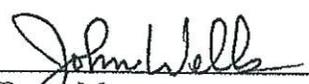
Approved as to Form

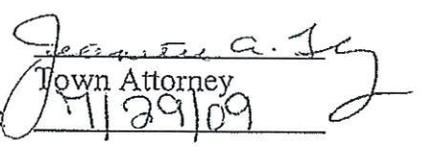
By:   
Director  
Department of Building and Development  
Date: 2/3/10

By:   
County Attorney  
Date: 2-3-10

**TOWN OF LEESBURG, VIRGINIA**  
A Municipal Corporation of Virginia

Approved as to Form

By:   
Town Manager  
Date: 7/29/09

By:   
Town Attorney  
Date: 7/29/09

**DEQ Attachment “K”**

**Division 6 | Administration and Enforcement**

**Sec. 6.01 Director**

For all Subdivision Plats, Subdivision Construction Plans, Site Plans, Minor Site Plans, Mini Site Plans, Site Plan Waivers and related documents (with the exception of Capital Improvement Construction Plans managed by the Department of Capital Plans Managements), “Director” shall mean: the Director of Plan Review unless otherwise noted within these Subdivision and Land Development Regulations.

For all Capital Improvement Construction Plans managed by the Department of Capital Plans Management, “Director” shall mean: the Director of Capital Plans Management unless otherwise noted herein.

- (a) The Director shall make and enforce reasonable rules and regulations necessary and appropriate for the administration of this Article and file such rules and regulations with the Clerk of Council.
- (b) The Director shall have the responsibility of acting on behalf of the Commission in making determinations that a particular applicant has or has not complied with the requirements of this Article and shall perform the following functions:
  - (1) Establish that all the requirements of this Article have been fully met by the applicant.
  - (2) Make certain inspection of improvements with proposed subdivisions and developments maintaining a vigil on the quality of the improvements and the adherence of the applicant’s work to the timetables specified in this Article.
  - (3) Distribute copies of all plans and plats to appropriate officials and agencies for their study and review comments.
  - (4) Determine instances of non-compliance with this Article on the basis of an interpretation of this Article and review comments of officials and agencies to whom review copies of the plan and plat were sent.
  - (5) Review final subdivision plats, site plans, Minor Site Plans, Mini Site Plans, Site Plan Waivers, Capital Improvement Construction Plans and all project related plats. Verify that the final subdivision plat is in accordance with the preliminary plat and associated construction drawings. Verify that the final site plan is in accordance with this Article and such standards for design and construction as Council may adopt, determine that the requirements of this Article have been met, and either approve or disapprove the final plat or plan.
  - (6) Issue orders for compliance to applicants including orders to discontinue work in instances of non-compliance with this Article.

The Director of Plan Review and Zoning Administrator shall:

- (a) Review the preliminary plat submitted by an applicant and either approve or disapprove the preliminary plat.
- (b) Evaluate the recommendation of all Town Departments and other applicable review agencies relative to subdivision applications.
- (c) Make recommendations to the Planning Commission and Town Council concerning the need for, and type of, amendments to this Article.

### **Sec. 6.02 Commission**

The Commission shall:

- (a) Make recommendations to the Council concerning the need for, and type of, amendments to this Article.

### **Sec. 6.03 Variation**

- (a) Upon application by an applicant, the Commission may authorize a variation in the substantive regulations contained in Division 4 and 5 of this Article when it finds that a variation is warranted due to an unusual situation or when strict adherence to the general regulations would result in substantial injustice or hardship.
- (b) In making application for a variation, the applicant must demonstrate in writing that:
  - (1) The requested variation is in keeping with the purpose and intent of the Subdivision and Land Development Regulations;
  - (2) The granting of said variation would not be of substantial detriment to adjacent property;
  - (3) The granting of said variation would not be contrary to the public health, safety and general welfare;
  - (4) The situation is not of a general or recurring nature for similarly situated properties within the Town.
- (c) In deciding an application for variation, the Planning Commission shall be guided by its findings with regard to the preceding test, together with the following items and any other such pertinent information as is necessary for the Commission to make its findings:
  - (1) The construction drawing reflecting the requested variation is approved by the Director;
  - (2) Any variation in street requirements is reasonable in relation to ultimate projected traffic generation and will not result in street sections that do not satisfy minimum Virginia Department of Transportation standards;

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- (3) Any variation in sidewalk standards is compensated through an adequate alternative provision for pedestrian traffic.
- (d) No variation granted pursuant to this section shall relieve the obligation of the applicant to comply with any other applicable local or state regulations.
- (e) In authorizing a variation the Commission may impose such conditions regarding location, character and other features of the proposed subdivision or development as it may deem necessary in the public interest, and may require a guarantee or bond to insure compliance with the conditions imposed.
- (f) Applications for variation may be made by any applicant. Once the application has been determined to be complete by the Director, the application and accompanying maps, plans or other information shall be transmitted promptly to the Commission for consideration and action. The Director shall also transmit a copy of the application to the Town Council.
- (g) Upon the initial public meeting to consider a variation application, the Planning Commission shall determine whether the potential public impacts of the request warrant a public hearing. If it is determined that a public hearing is warranted, such hearing shall be scheduled within thirty (30) days of said determination. Notice of public hearing shall satisfy all Code of Virginia requirements for such hearings. The Planning Commission shall take action to approve, or deny the application within thirty (30) days of the initial public meeting if no public hearing is held or within sixty (60) days of the initial public meeting if a public hearing is held.

**Sec. 6.04 Bonding of Required Improvements**

- (a) The purpose of the bonding process is to obtain guarantees acceptable to the Town insuring the timely and proper installation of required development and subdivision improvements. Bonds shall be posted to guarantee the installation of improvements for all developments described below:
  - (1) All improvements described in Section 15.2-2241 of the Code of Virginia, as amended, that will be accepted for public use and public maintenance by the Town of Leesburg.
  - (2) All other improvements required by the Zoning Ordinance and Subdivision and Land Development Regulations and also as specified in Section 15.2-2241.5 of the Code of Virginia, as amended and as determined by the Director.
  - (3) For improvements proffered as part of any zoning map amendment application and required by the Zoning Administrator in accordance with Section 15.2-2299 of the Code of Virginia, as amended.
  - (4) Improvements offered as part of any variance or special exception application or required by the Board of Zoning Appeals in accordance with Section 15.2-2309.2.c and 15.2-2309.6 of the Code of Virginia, as amended.
- (b) All improvements proffered during the rezoning process shall be bonded at the time the first site plan or subdivision plat is approved.
- (c) These bonding procedures shall not apply to the following developments:

- (1) Developments that only require the installation of entrances to public streets. All such improvements shall be guaranteed through the issuance of a right-of-way permit.
- (d) For any development or subdivision with \$200,000 or more in public improvements, the Town Council shall have the authority to:
  - (1) Review and approve, disapprove and modify performance agreements.
  - (2) Grant or deny an applicant’s request for more time than the initial two (2) year period to complete the construction of public improvements associated with a site plan or subdivision application.
  - (3) Accept public improvements which have been installed in accordance with final plans, subject to the requirements of Section 6.09 of these Subdivision and Land Development Regulations.
  - (4) Release applicants from obligations of performance agreements for installation of public improvements and release performance bonds posted to guarantee such contracts as described in 6.09 of these Subdivision and Land Development Regulations.
- (e) For any development or subdivision with less than \$200,000 in public improvements, the Town Manager shall have the authority to:
  - (1) Review and approve, disapprove and modify performance agreements.
  - (2) Grant or deny an applicant’s request for more time than the initial two (2) year period to complete the construction of public improvements associated with a site plan or subdivision application.
  - (3) Accept public improvements which have been installed in accordance with final plans, subject to the requirements of 6.09 of these Subdivision and Land Development Regulations.
  - (4) Release applicants from obligations of performance agreements for installation of public improvements and release performance bonds posted to guarantee such contracts as described in 6.09 of these Subdivision and Land Development Regulations.

**Sec. 6.05 Procedure for Establishing a Bond Agreement**

- (a) To establish a bond agreement with the Town of Leesburg the following forms shall be executed:
  - (1) Performance Agreement
  - (2) Estimate of improvements
  - (3) Bond guarantee, as described in Section 6.06 of these Subdivision and Land Development Regulations.
  - (4) Water Extension Permit, if applicable
  - (5) Sanitary Sewer Extension Permit, if applicable

**DEQ Attachment “K”**

The bond agreement forms must be filed with the Director of Public Works. The Town Attorney shall review all proposed amendments to the standard bond agreement forms and provide the Director of Public Works with a recommendation.

- (b) Any improvement in a proposed subdivision or development may be bonded in sections provided that these sections are indicated on the approved subdivision or development plans and the Director of Public Works has found that provisions have been made to insure that these improvements can be enjoyed without undue risk to public safety. Improvements such as temporary cul-de-sacs and traffic barricades will be included in the estimate of improvements. Where possible, sections shall begin and terminate at street intersections or other logical points.

**Sec. 6.06 Bond Guarantee**

- (a) The purpose of the bond guarantee is to provide the Town with a source of funds to complete the required improvement if the applicant is in default of the performance agreement as described in Section 6.09 of these Subdivision and Land Development Regulations.
- (b) The following bond guarantees are acceptable provided they are consistent with the regulations below:
  - (1) Cash may be posted to guarantee any performance agreement. The funds on deposit shall generate market-rate interest as earned by the Town. Interest will be available to the Town in the case of default or breach of the performance agreement. If the improvements are successfully completed this interest shall be refunded to the applicant.
  - (2) Irrevocable letters of credit from financial institutions are acceptable provided they are approved by the Town Attorney and the following conditions are met:
    - ((a)) All letters of credit shall conform to the letter of credit form provided by the Town or shall be approved by the Town Attorney.
    - ((b)) Letters of credit shall extend at least three (3) months beyond the expiration date of the performance agreement.
    - ((c)) The financial institution must notify the Director of Public Works in writing at least 60 days in advance of any cancellation including normal expiration of term. Failure to do so will automatically extend the letter of credit for an additional three (3) months. (Amended 08/12/08)
    - ((d)) The financial institution issuing the letter of credit must have a rating of 20 or higher as evaluated by Highline Financial.
    - ((e)) The financial institution issuing the letter of credit shall be insured by the Federal Depository Insurance Corporation or the Federal Savings and Loan Insurance Corporation and be chartered in the State of Virginia or shall have a designated agent (i.e., Branch Bank) in Virginia.
  - (3) Corporate surety bonds are an acceptable method of guaranteeing performance agreements provided the following conditions are met:

- ((a)) All corporate surety bonds shall conform to the form provided by the Town or shall be approved by the Town Attorney.
- ((b)) Bonds shall be furnished by an insurance company licensed to transact fidelity and surety insurance in Virginia.
- ((c)) The surety shall have a rating of XV or better as evaluated by A.M. Best's Rating or must be on the Federal Government, Treasury Department's List of Certified Companies. These lists will be maintained by the Director of Public Works.

### **Sec. 6.07 Extensions and Reduction of Performance Bonds**

- (a) Performance agreements may be extended for one year periods or less. Any request for extension shall be accompanied by an estimate of the remaining work and a timetable for the completion of the improvements. Upon recommendation of the Director of Public Works, the Town Council or the Town Manager shall act within thirty (30) days of any written request to extend a performance agreement. In considering an extension of a performance agreement, the Town Council or the Town Manager should consider the following factors:
  - (1) Current rating of corporate surety and status of the financial institution.
  - (2) Progress in completing the development plan or subdivision.
  - (3) Complaints received about nuisances resulting from development of the property.
  - (4) Cost estimate of completing the site plan or subdivision.
- (b) The amount of bonded improvements may be reduced by action of the Town Council. Upon recommendation of the Director of Public Works, the Town Council or the Town Manager shall act within thirty (30) days of the receipt of any written request for a bond reduction. If any deficiencies in completed improvements remain, the Director of Public Works shall transmit a list of the deficiencies to the applicant within thirty (30) days of the reduction request. The Town Council or the Town Manager shall act or respond within thirty (30) days of any request for an extension or reduction of a performance bond.

### **Sec. 6.08 Establishment of a Maintenance Agreement**

A maintenance agreement shall be executed for the repair or replacement of defective materials and workmanship within the required public improvements for a period of time extending for one year from the actual date of Town Council or Town Manager acceptance of such improvements. The maintenance bond shall equal five percent of the original total cost of the bonded improvements in the subdivision or development.

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**Sec. 6.09 Acceptance of Improvements and Release of Performance Agreement**

- (a) Within their authority as described in Section 6.04 of these Subdivision and Land Development Regulations, the Town Council or Town Manager shall accept public improvements installed by an applicant which meet the following conditions:
  - (1) The completed improvements comply with the design standards of Division 4.
  - (2) Public improvements have been completed in accordance with the requirements of Division 5.
  - (3) Installation of public improvements has been completed in accordance with approved plans.
  - (4) All final inspections required by this Article have been completed by the Town and the bonded improvements were found to be acceptable by the Director of Public Works. (Amended 08/12/08)
  - (5) The applicant shall have prepared and submitted one reproducible set and two sets of prints of plans that accurately depict the bonded improvements for which the Town is to be responsible for operation and maintenance.
  - (6) The applicant, by appropriate instrument in a form approved by the Town Attorney, has conveyed to the Town good title free of all liens to all public improvements for which the Town is to be responsible for operation and maintenance.
- (b) Within their authority as described in Section 6.04 of these Subdivision and Land Development Regulations, the Town Council or Town Manager shall release applicants from performance agreements when the subdivisions are vacated pursuant to Section 2.14 of these Subdivision and Land Development Regulations.

**Sec. 6.10 Required Approvals of Final Site Plan, Minor Site Plan, Mini Site Plan, Site Plan Waiver, Town Capital Improvement Plan and Final Plat(s)**

The following approvals shall accompany or be shown on a final site plan, minor site plan, or final plat and shall be necessary for its approval:

- (a) Certification by a registered surveyor that the final plat is correct.
- (b) Certification by a registered engineer, or a licensed 3(b) land surveyor that the final or minor site plan has been prepared in accordance with requirements of this Article.

- (c) Director of Plan Review and Zoning Administrator approval is required for all Site Plans, Minor Site Plans, Mini Site Plans, Site Plan Waivers, Final Plats and related documents (with the exception of Capital Improvement Construction Plans managed by the Department of Capital Plans Managements, unless otherwise noted within these Subdivision and Land Development Regulations.
- (d) Director of Capital Plans Management and Zoning Administrator approval is required for all Capital Improvement Construction Plans managed by the Department of Capital Plans Management unless otherwise noted herein.
- (e) Director of Utilities approval of the construction drawings for public water and sanitary sewer service associated with the final site plan, minor site plan, and final plat.
- (f) Agreement of public improvements authorized by Council and one of the requirements of Section 13-60(b)(4), Section 13-66(d), and 13-68(d) completed.

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ARTICLE 10

CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
DEVELOPMENT PLANS AND CAPITAL IMPROVEMENT PLANS  
INFORMATION AND PREPARATION

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SECTION 10-100 CONSTRUCTION DRAWING PREPARATION

10-110 Required Contents of Construction Drawings for Subdivisions

1. General. Construction drawings shall be prepared for all required public improvements.
  - A. The construction drawings shall be prepared in substantial conformance with the approved preliminary plat.
  - B. The drawings shall be clearly legible and submitted at a scale no more than one inch equals 30 feet and individual sheets shall be 24 x 36 inches in size, with an approved cover sheet attached.
  - C. All construction drawings shall bear the professional seal with date and signature of a design professional licensed to practice in the Commonwealth of Virginia. Professional seals with date and signature shall be affixed in accordance with the Rules and Regulations promulgated by the Commonwealth of Virginia, Board of Architects, Professional Engineers, Land Surveyors, Certified Interior Design, and Landscape Architects, latest edition. Drawings without seal, date and signature will be deemed incomplete and returned without review.
  - D. A detailed cost estimate of all public improvements and a separate detailed cost estimate of all erosion control measures as shown on the construction drawings shall be prepared by the developer and provided on the Town cover sheet.
    - (1) Public Improvements
      - (a) Unit prices will be provided by the Director for general construction items. For other items, the developer shall provide a cost estimate.

## 10-110 TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS

- (b) Quantity takeoffs, price extensions, and estimate totals shall be prepared by the developer.
    - (c) All cost estimates shall be certified by the design professional of record.
    - (d) All cost estimates are subject to approval of the Director.
  - (2) Erosion and Sediment Control
    - (a) The developer shall prepare cost estimates in accordance with the requirements of Loudoun County.
  - E. In addition to the specific requirements cited below, construction drawings shall also include other calculations, drawings, details and notes that may be deemed necessary by the Director to ensure the design, operation and maintenance of public systems.
2. Specific Information Required. The construction drawings shall include the following details and information appropriate to the project. Refer to Articles 1 through 9 for more detailed requirements. Additional engineering information, calculations, drawings, details, and notes not in conflict with the town's required specifications may be deemed necessary by the Director in unusual circumstances to ensure the safe and efficient operation and maintenance of the public facilities within the subdivision and may be required as a condition for approval.

Supporting calculations, reports, and analyses may be submitted in a "design book" format or may be affixed to the plan set.

- A. Water System. Construction Drawings for public water systems shall include:
  - (1) Water system calculations, prepared by the developer's engineer, which demonstrate adequate domestic supply pressure and fire flow. Water system calculations shall be based upon the hydraulic conditions as predicted by the Town's water system computer model. Computer modeling for hydraulic conditions at the points of connection is performed by the town Utilities Department on a fee basis. Coordinate existing water system computer modeling with the Director of Utilities.

**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
DEVELOPMENT PLANS AND CAPITAL IMPROVEMENT PLANS  
INFORMATION AND PREPARATION**

- (2) State Health Department approval for all water system extensions serving 15 or more equivalent residential connections. Such approval shall be in accordance with the Town's approved Local Review Program.
- (3) Location and sizes of existing and proposed water mains, lines, meters, valves, connections and easements.
- (4) Profile of existing and proposed waterlines within the limits of work showing existing and proposed grades.
- (5) Profiles drawn to a scale of no greater than one inch equals 30 feet horizontal, and one inch equals five feet vertical of water lines, indicating amount of cover and clearance at other utility crossings, length of pipe, pipe material, joints, thrust restraints, pipe fittings and deflections, trenching and bedding requirements.
- (6) Location of existing and proposed fire hydrants, siamese and sprinkler connections, post indicator valves and other fittings, blow-offs and air release valves.
- (7) Coverage plan for fire hydrants, indicating coverage of all areas with 300-foot hose reach to the most remote edge of any proposed structure or parking facility, whichever is farthest from the hydrant.
- (8) Pipe strength calculations for all water lines with depth of cover less than 3 feet (if subject to vehicle live load) and for all water lines with depth of cover exceeding 20 feet.
- (9) Notes, references to construction standard details of this Manual, and construction details for non-standard structures and installation, necessary for the construction, maintenance and inspection of the public water system.

## B. Sanitary Sewer System.

- (1) Calculations supporting the basis of the sanitary sewer system design. Terminal lines 8 inches in diameter serving less than 8,000 gpd and having the required 1 percent slope or greater do not require calculations but sewer design flow shall be shown in the design table.
- (2) State Health Department approval for all systems which will serve more than 400 persons. Such approval shall be in accordance with the Town's approved Local Review Program.
- (3) Plans drawn to a scale no greater than one inch equals 30 feet indicating the location and sizes of existing and proposed sanitary sewer lines, manholes, cleanouts, laterals and easements. Profile of existing sewer lines within the limits of work, showing existing and proposed grades.
- (4) Profiles drawn to a scale no greater than one inch equals 30 feet horizontal and one inch equals five feet vertical of public sanitary sewer lines, indicating amount of cover, clearance from other utilities, invert elevations, elevation of any 100-year flood plain within 100 feet of the project, length of pipe, pipe material, joints, pipe fittings and deflections, trenching and bedding requirements.
- (5) Capacity, complete engineering calculations, and full specifications for any proposed lift stations.
- (6) Pipe strength calculations for all sanitary sewer lines with depth of cover less than 3 feet (if subject to vehicle live load) and for all sanitary sewer lines with depth of cover exceeding 20 feet.
- (7) Notes, references to construction standard details of this manual, and construction details for non-standard structures and installation necessary for the construction, maintenance and inspection of the sanitary sewer system.

**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
DEVELOPMENT PLANS AND CAPITAL IMPROVEMENT PLANS  
INFORMATION AND PREPARATION**

C. Road System.

- (1) Typical section of improvements to public roads and approved private road systems including common driveways and parking courts, and pavement design calculations if other than a local road. The typical road section shall specify the typical pavement section (referencing Virginia Department of Transportation materials), standard cross-slope point of finish grade for profile, design CBR requirements, width of pavement, and width of right-of-way or easement. This cross section shall also indicate proposed sidewalks, utility strips and tree planting areas within the right-of-way.
- (2) Road cross section at 50-foot intervals in all areas of transition, superelevation, addition of lanes, and crossovers. Cross sections shall extend to existing grade on each side of road, shall be dimensioned from the road centerline to indicate width of lanes, pavement, slope, and right-of-way. Cross sections shall include elevations at centerline, top of curb, top of bank, toe of bank, and point of grade line; this requirement may be met by reference to profile sheets if cross sections are cut at stations with computed elevations shown on the profile sheets.
- (3) Plans and profiles of roads, drawn to a scale no greater than one inch equals 30 feet horizontally and one inch to five feet vertically, showing stations, percent of grades, elevations at 50-foot stations on vertical tangent sections and on 25-foot stations in vertical curves, spot elevations for all non-typical sections, locations of entrances, taper design and any necessary structures and roadway appurtenances.
- (4) Sight distance shall be shown in plan and profile at all street intersections and road entrances, other than single-family driveways, unless warranted by unique topographical conditions. Distances shall be specifically delineated by dimensions or station and shall be determined in accordance with the requirements of this Manual.
- (5) All public streets shall be classified by function and indicate the projected average daily traffic.

## 10-110 TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS

- (6) Location of existing and proposed traffic signals, stop and yield signs, and posted speed limits.
- (7) Existing and proposed streets, names, and widths of pavement, rights-of-way and entrances.
- (8) Existing and projected traffic information necessary for the design of the road in compliance with Town or Virginia Department of Transportation requirements.
- (9) Horizontal and vertical curve data, definition of curve control points (PI, PC, PT, PVI, PVR, etc.)
- (10) Information regarding the maintenance of any private streets, parking courts, or common driveways.
- (11) Notes, references to construction standard details of this manual, and construction details for non-standard structures and installation necessary for the construction, maintenance and inspection of the public and private road system.

### D. Parking Areas.

- (1) Tabulations indicating the number of required and provided off-street parking spaces.
- (2) Indication of the size and dimensions of off-street parking spaces, including the specific delineation of any parking spaces utilizing an overhang to reduce the length of parking spaces.

### E. Sidewalks and Trails.

- (1) The location and dimension of all proposed public and private sidewalks and trails and their relationship to existing sidewalks or trails.
- (2) A cross section of all public sidewalks or trails.

**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
DEVELOPMENT PLANS AND CAPITAL IMPROVEMENT PLANS  
INFORMATION AND PREPARATION**

- F. Plantings and Landscaping. Landscaping plan drawn to a scale no greater than one inch equals 50 feet, indicating the size, type and location of all proposed street trees, landscape materials, and buffer yards. The location of existing and proposed easements shall also be shown on the plan to avoid conflicts between proposed landscape areas and utility improvements.
- G. Storm Drainage System.
- (1) Existing major sub-basin drainage divides and all proposed drainage divides for proposed drainage facilities, shown at a scale no greater than one inch equals 50 feet for on-site areas and no greater than one inch equals 200 feet for off-site areas not exceeding 100 acres, and no greater than one inch equals 500 feet for offsite areas exceeding 100 acres. Drainage divide maps for floodplain studies only may be at a scale no greater than one inch equals 2,000 feet. Drainage divide maps shall clearly delineate the boundaries for the existing major drainage areas and all proposed drainage areas, and indicating the amount of land within individual drainage areas and runoff coefficients. The plan sheet for proposed drainage divides must show the final grading of the site and all physical improvements and drainage elements thereon. Drainage areas must "close" and account for all on-site areas.
  - (2) Storm drainage calculations to include runoff and pipe sizing, hydraulic grade line for pipes surcharged above the pipe crown for any portion of that pipe run, inlet sizing and channel and swale capacity, and system demonstrating adequacy of design for each element of the required public drainage system. Calculations for the drainage system shall be in the format of the Virginia Department of Transportation Drainage Manual. Open channels shall be designed in compliance with the Virginia Erosion and Sedimentation Control Handbook, Chapter 5.
  - (3) Plan and profile of the designed drainage system drawn to a scale no greater than one inch equals thirty 30 feet horizontal and one inch equals five feet vertical. Plan and profile are required for underground conduits, at-grade conduits and open channel reaches in

**10-110 TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

the system. Data required includes: location, type, top elevation, inverts of structures, material, class, slope, length of pipe, cover over the top of the pipe and clearance at all utility crossings.

- (4) Location of 100-year flood plain for any water course (constant or intermittent, natural or manmade) within 25 feet of the subject property. Limits of the 100-year flood plain may be taken from existing records if the water course or the 100-year water surface elevation is not modified by development on the subject property.
- (5) Location, description, and certification that an "adequate" downstream channel, complying with the flood control stormwater management criteria and the discharge control stormwater management criteria of this manual, exists or will be provided with the project. Description shall include channel cross section at control points and profile to the point of adequacy. Plan and profile for the off-site channel shall be at a scale not greater than one inch equals 200 feet.
- (6) Overland relief for 100-year storm, showing that residential buildings or other structures will not be flooded or damaged. Overland relief shall be provided for all natural or manmade sumps where water may pond if the underground drainage system becomes inoperative. Overland relief easement must be provided to maintain the overland relief path and prevent flooding; the easement need not encompass the upstream ponded area.
- (7) Location and size of existing and proposed public drainage systems, connections, inlets and gutters, and natural and man-made channels.
- (8) A stormwater management plan sheet and narrative with supporting calculations detailing the techniques proposed.
- (9) Details and narrative defining special maintenance provisions (if any), which are over and above the requirements listed in the standard "stormwater detention facility" easement, for any proposed stormwater detention ponds.

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- (10) Notes, references to construction standard details of this manual, and construction details for non-standard structures and installation necessary for the construction, maintenance, and inspection of the storm drainage system.

H. Lot Grading and Soils.

- (1) Existing and proposed topography, vegetation and drainage areas to include specific location and disposition of specimen trees, and limits of clearing dimensioned from the perimeter boundary.
- (2) Topography shall extend a minimum of 25 feet beyond the site boundary and/or limits of work.
- (3) Contour interval shall be two feet and, in areas of less than four percent slope, spot elevations 50 feet on center shall be provided.
- (4) Grading plans shall be at a scale no less than one inch equals 30 feet and shall indicate physical improvements, drainage systems, finish floor and basement elevations, spot elevations at lot corners and all breaks in grade. Survey control point locations for grading operations shall be indicated.
- (5) The applicant shall submit a complete detailed geotechnical investigation in accordance with the requirements of this manual. The detailed geotechnical investigation is to be prepared under the direction of, and sealed by, a registered professional engineer licensed in the Commonwealth of Virginia with experience in geotechnical engineering. The detailed investigation shall contain specific recommendations for problems anticipated during the proposed construction of required public improvements, overlot cuts or fills in excess of 6 feet, and slopes exceeding 1 vertical foot in 3 horizontal feet.

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The design professional shall provide the Director with a written statement from the geotechnical engineer stating that he has reviewed the plans, as submitted, and that the plans were prepared in accordance with the recommendations of the geotechnical investigation.

**I. Erosion and Sediment Control.**

- (1) General description of project, type and nature of land disturbing activity, and amount of grading involved.
- (2) Description of existing topography, vegetation and drainage.
- (3) Description of neighboring and downstream properties which may be affected by the land disturbance.
- (4) Specific erosion and sediment control plan sheet and narrative providing the details and calculations required to select and size the measures to be used, in compliance with this Manual and the Loudoun County Erosion and Sediment Control Ordinance and Plan.
- (5) Existing and proposed topography, vegetation and drainage area to erosion and sediment control devices, as required for design in accordance with the Virginia Erosion and Sediment Control Handbook, and limits of clearing dimensioned from the perimeter boundary.
- (6) Topography shall extend a minimum of 25 feet beyond the site boundary or limits of work.
- (7) Contour intervals shall be two feet, except in areas of less than four percent slope, where spot elevations 50 feet on center shall be provided.
- (8) Location, description, and certification of an "adequate" downstream channel complying with the erosion control stormwater management criteria of this manual and complying with the Virginia Erosion and Sediment Control Standards, exists or will be provided with the project. Description shall include channel cross section at control points and profile to the point of adequacy. Plan and profile for the off-site channel shall be at a scale not greater than one inch equals 200 feet.

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- (9) Information and specifications on how the site will be stabilized after construction is completed.

J. Other Information.

- (1) Public street security lighting plan coordinated with the Director and in accordance with the street security lighting policy of this manual.
- (2) A lighting plan indicating that all outdoor lighting fixtures (if any) proposed with the subdivision construction drawings, exclusive of public street lights and walkway, accent lights or yard lighting located on individual residential lots, will not have a source of illumination that is visible beyond the site or cause illumination of adjacent properties in excess of 0.5 foot-candles as measured at the site boundary.
- (3) Location of proposed electrical, telephone, cable television, and gas lines and associated easements.
- (4) Boundary survey of the property with bearings and distances.
- (5) Off-site right-of-way dedications, temporary construction easements, off-site easement documents, maintenance agreements, and letters of permission (letters of permission only acceptable for private, non-bonded improvements on lands of others).
- (6) Off-site right-of-way dedication, temporary construction easements, off-site easement documents, maintenance agreements and letters of permission (letters of permission only acceptable for private, non-bonded improvements on lands of others).
- (6) Other information required by the Director of Engineering as necessary to review and approve the construction drawings, not in conflict with the Town's required specifications.
- (7) All survey monuments, lot corners, block markers and construction benchmarks, together with their description shall be provided.

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**10-120 Required Contents of Construction Drawings for all types of Site Plans, Development Plans, Capital Improvements Plans and Similar Type Plans**

1. Construction drawings shall be prepared for all required public improvements to be constructed, such that the site will be developed in accordance with the final site development or capital improvement plan, Town Code and State law.
  - A. The drawings shall be clearly legible and submitted at a scale no more than one inch equals 30 feet and individual sheets shall be 24 x 36 inches in size, with an approved cover sheet attached and shall be an integral part of the final site plan or construction drawing submission.
  - B. All construction drawings shall bear the professional seal with date and signature of a design professional licensed to practice in the Commonwealth of Virginia. Professional seals with date and signature shall be affixed in accordance with the Rules and Regulations promulgated by the Commonwealth of Virginia Board of Architects, Professional Engineers, Land Surveyors, Certified Interior Design and Landscape Architects, latest edition. Drawings without seal, date and signature will be deemed incomplete and returned without review.
  - C. A detailed cost estimate of all public improvements and a separate detailed cost estimate of all erosion control measures as shown on the construction drawings, shall be prepared by the developer in a format approved by the Director of Plan Review. (Excludes Town Capital Improvement Projects).
    - (1) Public Improvements
      - (a) Unit prices will be provided by the Director for general construction items. For other items, the developer shall provide a cost estimate.
      - (b) Quantity takeoffs, price extensions, and estimate totals shall be prepared by the developer.
      - (c) All cost estimates shall be certified by the design professional of record.
      - (d) All cost estimates are subject to approval of the Director.

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(2) Erosion and Sediment Control

- (a) The developer shall prepare cost estimates in accordance with the requirements of Loudoun County.

D. In addition to the specific requirements cited below, construction drawings shall also include other calculations, drawings, details and notes that may be deemed necessary by the Director to ensure the design, operation and maintenance of public systems.

2. Specific Information Required. The construction drawings shall include the following details and information appropriate to the project. Refer to Articles 1 through 9 for more detailed requirements. Additional engineering information, calculations, drawings, details, and notes not in conflict with the Town's required specifications may be deemed necessary by the Director in unusual circumstances to ensure the safe and efficient operation and maintenance of the public facilities within the development and may be required as a condition for approval.

Supporting calculations, reports, and analyses may be submitted in a "design book" format or may be affixed to the plan set.

A. Water System. Construction Drawings for public water systems shall include:

- (1) Water system calculations, prepared by the developer's engineer, which demonstrate adequate domestic supply pressure and fire flow. Water system calculations shall be based upon the hydraulic conditions as predicted by the Town's water system computer model. Computer modeling for hydraulic conditions at the points of connection is performed by the Town Utilities Department on a fee basis. Coordinate existing water system modeling with the Director of Utilities.

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- (2) State Health Department approval for all water system extensions serving 15 or more equivalent residential connections. Such approval shall be in accordance with the Town's approved Local Review Program.
- (3) Location and sizes of existing and proposed water mains, lines, meters, valves, connections and easements. Profile of existing water lines within the limits of work showing existing and proposed grades.
- (4) Profiles drawn to a scale of no greater than one inch equals 30 feet horizontal, and one inch equals five feet vertical, of waterlines, indicating amount of cover and clearance at crossings with other utilities, length of pipe, pipe material, joints, thrust restraint, pipe fittings and deflections, trenching and bedding requirements.
- (5) Location of existing and proposed fire hydrants, siamese and sprinkler connections, post indicator valves and other fittings, blow-offs and air release valves.
- (6) Coverage plan for fire hydrants, indicating coverage of all areas with 300-foot hose reach to the most remote edge of any proposed structure or parking facility, whichever is farthest from the hydrant.
- (7) Pipe strength calculations for all water lines with depth of cover less than 3 feet (if subject to vehicle live load) and for all waterlines with depth of cover exceeding 20 feet.
- (8) Notes, references to construction standard details of this manual, and construction details for non-standard structures and installations necessary for the construction, maintenance and inspection of the public water system.

**B. Sanitary Sewer System.**

- (1) Calculations supporting the basis of the sanitary sewer system design. Terminal lines 8 inches in diameter serving less than 8,000 gpd and having the required 1 percent slope or greater do not require calculations but sewer design flow shall be shown in the design table.

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- (2) State Health Department approval for all systems which will serve more than 400 persons. Such approval shall be in accordance with the Town's approved Local Review Program.
- (3) Plans drawn to a scale no greater than one inch equals 30 feet indicating the location and sizes of existing and proposed sanitary sewer lines, manholes, cleanouts, laterals and easements. Profile of existing sewer lines within the limits of work, showing existing and proposed grades.
- (4) Profiles drawn to a scale no greater than one inch equals 30 feet horizontal and one inch equals five feet vertical of public sanitary sewer lines, indicating amount of cover, clearance, invert elevations, elevation of any 100-year flood plain within 100 feet of the project, length of pipe, pipe material, joints, thrust restraints, pipe fittings and deflections, trenching and bedding requirements.
- (5) Capacity, complete engineering calculations, and full specifications of any proposed lift stations.
- (6) Pipe strength calculations for all sanitary sewer lines with depth of cover less than 3 feet (if subject to vehicle live load) and for all sanitary sewer lines with depth of cover exceeding 20 feet.
- (7) Notes, references to construction standard details of this manual, and construction details for non-standard structures and installations necessary for the construction, maintenance and inspection of the sanitary sewer system.

C. Road System.

- (1) Typical section of improvements to public roads and approved private road systems including common driveways and parking courts, and pavement design calculations if other than a local road. The typical road section shall specify the typical pavement section (referencing Virginia Department of Transportation materials), standard cross-slope, point of finish grade for profile, design CBR compaction requirements, width of pavement, and width of right-of-way or easement. This cross section shall also indicate proposed

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sidewalks, utility strips and tree planting areas within the right-of-way.

- (2) Road cross section at 50-foot intervals in all areas of transition, superelevation, addition of lanes and crossovers. Cross sections shall extend to existing grade on each side of road, shall be dimensioned from the road centerline to indicate width of lanes, pavement, slope, and right-of-way. Cross sections shall include elevations at centerline, top of curb, top of bank, toe of bank, and point of grade line; this requirement may be met by reference to profile sheets if cross sections are cut at stations with computed elevations shown on the profile sheets.
- (3) Plan and profiles of roads, drawn to a scale no greater than one inch to 30 feet horizontally and one inch to five feet vertically, showing stations, percent of grades, elevations at 50-foot stations in vertical tangent sections and on 25-foot stations in vertical curves, spot elevations for all non-typical sections, locations of entrances, taper design and any necessary structures and roadway appurtenances.
- (4) Sight distance shall be shown in plan and profile at all street intersections and road entrances, other than single-family driveways, unless warranted by unique topographical conditions. Distances shall be specifically delineated by dimensions or station and shall be determined in accordance with the requirements of this Manual.
- (5) All public streets shall be classified by function and indicate the projected average daily traffic.
- (6) Location of existing and proposed traffic signals, stop and yield signs, posted speed limits.
- (7) Existing and proposed streets, names, and widths of pavement, rights-of-way and entrances.
- (8) Existing and projected traffic information necessary for the design of the road in compliance with Town or Virginia Department of Transportation requirements.

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- (9) Horizontal and vertical curve data, definition of curve control points (PI, PC, PT, PVI, PVR, etc.)
- (10) Information regarding the maintenance of any private streets, parking courts, or common driveways.
- (11) Notes, references to construction standard details, and construction details for non-standard structures and installations necessary for the construction, maintenance and inspection of the public and private road system.

**D. Parking Areas.**

- (1) Tabulations indicating the number of required and provided off-street parking spaces.
- (2) Indication of the size and dimensions of off-street parking spaces, including the specific delineation of any parking spaces utilizing an overhang to reduce the length of parking spaces.

**E. Sidewalks and Trails.**

- (1) The location and dimension of all proposed public and private sidewalks and trails and their relationship to existing sidewalks or trails.
- (2) A cross section of all public sidewalks or trails.

**F. Plantings and Landscaping.** Landscaping plan drawn to a scale no greater than one inch equals 50 feet, indicating the size, type and location of all proposed street trees, landscape materials, and buffer yards. The location of existing and proposed easements shall also be shown on the plan to avoid conflicts between proposed landscape areas and utility improvements.

**G. Storm Drainage System.**

- (1) Existing major subbasin drainage divides and all proposed drainage divides for proposed drainage facilities, shown at a scale no greater than one inch equals 50 feet for on-site areas

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and no greater than one inch equals 200 feet for off-site areas not exceeding 100 acres, and no greater than one inch equals 500 feet for off-site areas exceeding 100 acres. Drainage divide maps for flood plain studies only may be at a scale no greater than one inch equals 2,000 feet. Drainage divide maps shall clearly delineate the boundaries for the existing major drainage areas and all proposed drainage areas, and indicating the amount of land within individual drainage areas and runoff coefficients. The plan sheet for proposed drainage divides must show the final grading of the site and all physical improvements and drainage elements thereon. Drainage areas must "close" and account for all on-site areas.

- (2) Storm drainage calculations to include runoff and pipe sizing, hydraulic grade line for pipes surcharged above the pipe crown for any portion of that pipe run, inlet sizing and channel and swale capacity, and system demonstrating adequacy of design for each element of the required public drainage system. Calculations for the drainage system shall be in the format of the Virginia Department of Transportation Drainage Manual.

Open channels shall be designed in compliance with the Virginia Erosion and Sedimentation Control Handbook, Chapter 5.

- (3) Plan and profile of the designed drainage system drawn to a scale no greater than one inch equals 30 feet horizontal and one inch equals five feet vertical. Plan and profile are required for underground conduits, at-grade conduits and open channel reaches in the system. Data required include: location, type, top elevation, inverts of structures, material, class, slope, length of pipe, cover over the top of the pipe, and clearance at all utility crossings.
- (4) Location of 100-year flood plain for any water course (constant or intermittent, natural or manmade) within 25 feet of the subject property. Limits of the 100-year flood plain may be taken from existing records if the water course or 100-year water surface elevation is not modified by development on the subject property.

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- (5) Location, description, and certification that an "adequate" downstream channel, complying with the flood control stormwater management criteria and the discharge control stormwater management criteria of this Manual, exists or will be provided with the project. Description shall include channel cross section at control points and profile to the point of adequacy. Plan and profile for the off-site channel shall be at a scale not greater than one inch equals 200 feet.
- (6) Overland relief for 100-year storm, showing that residential buildings or other structures will not be flooded or damaged. Overland relief shall be provided for all natural or manmade sumps where water may pond if the underground drainage system becomes inoperative. Overland relief easements must be provided to maintain the overland relief path and prevent flooding; the easement need not encompass the upstream ponded area.
- (7) Location and size of existing and proposed public drainage systems, connections, inlets and gutters, and natural and man-made channels.
- (8) A stormwater management plan sheet and narrative with supporting calculations detailing the techniques proposed.
- (9) Details and narrative defining special maintenance provisions (if any), which are over and above the requirements listed in the standard "stormwater detention facility" easement, for any proposed stormwater detention ponds.
- (10) Notes, references to construction standard details of this Manual, and construction details for non-standard structures and installations necessary for the construction, maintenance, and inspection of the storm drainage system.

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H. Lot Grading and Soils.

- (1) Existing and proposed topography, vegetation and drainage areas to include specific location and disposition of specimen trees, and limits of clearing dimensioned from the perimeter boundary.
- (2) Topography shall extend a minimum of 25 feet beyond the site boundary and/or limits of work.
- (3) Contour interval shall be two feet and, in areas of less than four percent slope, spot elevations 50 feet on center shall be provided.
- (4) Grading plans shall be at a scale no greater than one inch equals 30 feet and shall indicate physical improvements, drainage systems, finished floor and basement elevations, spot elevations at lot corners and all breaks in grade. Survey control point locations for grading operations shall be indicated.
- (5) The applicant shall submit a complete detailed geotechnical investigation in accordance with the requirements of this Manual. The detailed geotechnical investigation is to be prepared under the direction of, and sealed by, a registered professional engineer licensed in the Commonwealth of Virginia with experience in geotechnical engineering. The detailed investigation shall contain specific recommendations for problems anticipated during the proposed construction of required public improvements, overlot cuts or fills in excess of 6 feet, and slopes exceeding 1 vertical foot in 3 horizontal feet.

The design professional shall provide the Director with a written statement from the geotechnical engineer stating that he has reviewed the plans, as submitted, and that the plans were prepared in accordance with the recommendations of the geotechnical investigation.

I. Erosion and Sediment Control.

- (1) General description of project, type and nature of land disturbing activity, and amount of grading involved.

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- (2) Description of existing topography, vegetation and drainage.
- (3) Description of neighboring and downstream properties which may be affected by the land disturbance.
- (4) Specific erosion and sediment control plan sheet and narrative providing the details and calculations required to select and size the measures to be used, in compliance with the Virginia Erosion and Sediment Control Handbook and to the satisfaction of the Director and the Loudoun County Department of Building and Development.
- (5) Existing and proposed topography, vegetation and drainage area to erosion and sediment control devices, as required for design in accordance with the Virginia Erosion and Sediment Control Handbook, and limits of clearing dimensioned from the perimeter boundary.
- (6) Topography shall extend a minimum of 25 feet beyond the site boundary and or limits of work.
- (7) Contour intervals shall be two feet, except in areas of less than four percent slope, where spot elevations 50 feet on center shall be provided.
- (8) Location, description, and certification that an "adequate" downstream channel complying with the erosion control stormwater management criteria of this Manual and complying with the Virginia Erosion and Sediment Control Standards, exists or will be provided with the project. Description shall include channel cross section at control points and profile to the point of adequacy. Plan and profile for the off-site channel shall be at a scale not greater than one inch equals 200 feet.
- (9) Information and specifications on how the site will be stabilized after construction is completed.

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J. Other Information.

- (1) Public street security lighting plan coordinated with the Director and in accordance with the street security lighting policy of this manual.
- (2) An onsite lighting plan indicating that all outdoor lighting fixtures exclusive of public street lights will not have a source of illumination that is visible beyond the site or cause illumination of adjacent properties in excess of 0.5 foot-candles as measured at the site boundary. Levels of illumination at entrances may be higher but in no case shall cause glare on public roadways.
- (3) Location of proposed electrical, telephone, cable television, and gas lines and associated easements.
- (4) Boundary survey of the property with bearings and distances.
- (5) Off-site right-of-way dedication, temporary construction easements, off-site easement documents, maintenance agreements and letters of permission (letters of permission only acceptable for private, non-bonded improvements on lands of others).
- (6) Other information required by the Director, as necessary to review and approve the construction drawings, not in conflict with the Town's required specifications.
- (7) All survey lot corners and construction benchmarks, together with their description, shall be provided.

**10-130 Requirements for Rough Grading Plans**

Upon acceptance of the construction drawings for detailed review by the Director, the applicant may request Zoning clearance for rough grading operations. An application of approval for rough grading plan approval shall include a plan which :

- A. Is drawn at a scale not greater than one inch equals 50 feet.

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- B. Indicates existing topography and the topography proposed at the conclusion of rough grading operations.
- C. Has a maximum contour interval of two feet.
- D. Demonstrates that the site shall be adequately drained and will not pond stormwater after rough grading.
- E. Does not rely upon or indicate any future drainage systems which may be proposed as part of the construction drawing application.
- F. Identifies the proposed erosion and sediment controls, with supporting calculations and details.
- G. Includes stormwater management strategies and calculations for the two-year frequency storm for the site as rough graded.
- H. Includes information and specifications pertaining to the stabilization of the site after the rough grading is completed.
- I. Indicate areas of tree removal on the site.

The Director shall review the above information and make a recommendation to the Zoning Administrator regarding zoning clearance for the issuance of a Rough Grading Permit. For the purposes of these regulations, "rough grading" shall be limited to: clearing of trees, grubbing of roots, overlot grading, cut but not fill for roadways and town maintained utilities; alternatively, the developer may submit the above information in the form of a rough grading development plan (subject to administrative review and approval by the Planning Commission), bond the earthwork to be performed to establish subgrade for public roads and Town maintained utilities, and enter into a "PC-2" Public Utilities Contract with the Town. Upon all appropriate Town approvals, the rough grading development plan may be approved by the Director and, for the purposes of these regulations, "rough grading" shall be limited to: clearing of trees, grubbing of roots, overlot grading, cut and fill for roadways and town maintained utilities.

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**10-135 Requirements for Grading and Drainage Plans on Lots of Record**

1. Prior to issuance of a zoning permit for construction on an existing lot of record, which is not included in an approved set of construction drawings and currently bonded with the Town, the Developer shall provide a grading, drainage, and utilities connection plan prepared by design professional licensed to practice in the Commonwealth of Virginia. Such a plan shall contain the following information and shall demonstrate no adverse physical impact on existing public improvements or adjacent private property.
  
2. Specific Information and Details Required. The grading, drainage, and utilities connection plan shall include the following details and information appropriate to the project. Other engineering information, calculations, drawings, details, and notes not in conflict with the Town's required specifications may be deemed necessary by the Director as a condition for approval.
  - A. Water System.
    - (1) Water system calculations which demonstrate adequate domestic supply pressure and fire flow.
    - (2) Location and sizes of existing and proposed water mains, lines, meters, valves, connections and easements.
    - (3) Location of existing and proposed fire hydrants and other fittings, blow-offs and air release valves.
    - (4) Coverage plan for fire hydrants, indicating coverage of all areas with 300-foot hose reach to the most remote edge of any proposed structure.
  
  - B. Sanitary Sewer System.
    - (1) Calculations supporting the basis of the sanitary sewer system design. (Not required for single family development.)

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- (2) Plans drawn to a scale no greater than one inch equals 30 feet indicating the location and sizes of existing and proposed sanitary sewer lines, manholes, cleanouts, laterals and easements. Profile of existing sewer lines and laterals within the limits of work, showing existing and proposed grades.
- (3) Profiles drawn to a scale no greater than one inch equals 30 feet horizontal and one inch equals five feet vertical of proposed lateral connection to public sanitary sewer lines and laterals, indicating amount of cover, clearance from other utilities, invert elevations, length of pipe, pipe material, trenching and bedding requirements.

C. Road System.

- (1) Typical section of improvements (if any) to public roads and approved private road systems including common driveways and parking courts, and pavement design calculations if other than a local road.
- (2) Plans and profiles of proposed roads or driveways if over 8% grade, drawn to a scale no greater than one inch equals 30 feet horizontally and one inch to five feet vertically, showing stations, percent of grades, elevations at 50-foot stations on vertical tangent sections and on 25-foot stations in vertical curves, spot elevations for all non-typical sections, locations of entrances, taper design and any necessary structures and roadway appurtenances.
- (3) Sight distance shall be shown in plan and profile at single-family driveways, if warranted by unique geometric or topographical conditions.
- (4) Existing and proposed streets, names, and widths of pavement, rights-of-way and entrances.
- (5) Information regarding the maintenance of any private streets, parking courts, or common driveways.

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D. Parking Areas.

- (1) Tabulations indicating the number of required and provided off-street parking spaces.
- (2) Indication of the size and dimensions of off-street parking spaces.

E. Sidewalks and Trails.

- (1) The location and dimension of all proposed public and private sidewalks and trails and their relationship to existing sidewalks or trails.
- (2) A cross section of all public sidewalks or trails.

F. Plantings and Landscaping. Landscaping shall be shown on the plan drawn to a scale no greater than one inch equals 30 feet, indicating the size, type and location of all proposed street trees, landscape materials, and buffer yards.

G. Storm Drainage System.

- (1) Existing and proposed drainage divides, shown at a scale no greater than one inch equals 30 feet for on-site areas and no greater than one inch equals 200 feet for off-site areas, clearly delineating the boundaries for the existing and proposed drainage areas, and indicating the amount of land within individual drainage areas and runoff coefficients. The plan for proposed drainage divides must show the final grading of the site and all physical improvements and drainage elements thereon. Drainage areas must "close" and account for all on-site areas.
- (2) Storm drainage calculations for any culverts or storm drainage to include runoff and pipe sizing, swale capacity, demonstrating adequacy of design. Calculations for the drainage system shall be in the format of the Virginia Department of Transportation Drainage Manual. Open channels shall be designed in compliance with the Virginia Erosion and Sedimentation Control Handbook, Chapter 5.

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- (3) Plan and profile of the designed drainage system drawn to a scale no greater than one inch equals thirty (30) feet horizontal and one inch equals five feet vertical. Plan and profile are required for underground conduits. Data required includes: location, type, top elevation, inverts of structures, material, class, slope, length of pipe, cover over the top of the pipe and clearance at all utility crossings.
- (4) Location of 100-year flood plain on-site.
- (5) Location, description and certification that an "adequate" downstream channel to receive discharge from the designed storm drainage outfall exists or will be included in the project.
- (6) Overland relief of 100-year storm, showing that houses, buildings or other structures will not be flooded or damaged.
- (7) Location and size of existing and proposed public drainage systems, connections, inlets and gutters, and natural and man-made channels and all associated easements.

**H. Lot Grading.**

- (1) Existing and proposed topography, vegetation and drainage areas to include specific location and disposition of specimen trees, and limits of clearing dimensioned from the perimeter boundary.
- (2) Grading plans shall be at a scale no less than one inch equals 30 feet and shall indicate physical improvements, drainage systems, finish floor and basement elevations, spot elevations at lot corners and all breaks in grade. Survey control point locations for grading operations shall be indicated.

**I. Erosion and Sediment Control.**

- (1) General description of project, type and nature of land disturbing activity, and amount of grading involved.
- (2) Description of existing topography, vegetation and drainage.

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- (3) Description of neighboring and downstream properties which may be affected by the land disturbance.
- (4) Existing and proposed topography, vegetation and drainage area to erosion and sediment control devices, as required for design in accordance with the Virginia Erosion and Sediment Control Handbook, and limits of clearing dimensioned from the perimeter boundary.
- (5) Topography shall extend a minimum of 25 feet beyond the site boundary or limits of work.
- (6) Contour intervals shall be two feet, except in areas of less than four percent slope, where spot elevations 50 feet on center shall be provided.
- (7) Information and specifications on how the site will be stabilized after construction is completed.

J. Other Information.

- (1) A lighting plan indicating that all outdoor lighting fixtures (if any) proposed with the subdivision construction drawings, exclusive of public street lights and walkway, accent lights or yard lighting located on individual residential lots, will not have a source of illumination that is visible beyond the site or cause illumination of adjacent properties in excess of 0.5 foot-candles as measured at the site boundary.
- (2) Location of existing electrical, telephone, cable television, and gas lines. Individual house services need not be shown.
- (3) Recorded boundary line information of the property with bearings and distances.
- (4) Letters of permission, temporary construction easements, off-site easement documents and maintenance agreements.
- (5) Other information required by the Director as necessary to review and approve the construction drawings, not in conflict with the Town's required specifications.

## 10-140 TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS

### 10-140 Construction

1. Cutsheets.
  - A. Cutsheets prepared by a surveyor or engineer, duly authorized by the State of Virginia to prepare same, shall be submitted in triplicate to the Director of Capital Projects Management for all capital improvement projects and to the Director of Public Works for all subdivision or private development projects for approval, not less than 24 hours prior to actual construction.
  - B. Cutsheets shall be prepared on forms approved by the appropriate Director as stated above. *Refer to Cutsheet Detail of this Article.*
  - C. Cutsheets shall provide sufficient information including, but not limited to, stations, depth, and widths to accurately excavate utility trenches.
  - D. Special requirements for utility trench excavations such as shoring and dewatering pumps based on Geotechnical information shall be clearly stated.
  - E. Approval of construction sheets (cut sheets) by the appropriate Director as stated above shall be construed as certification to construct under the Town of Leesburg's Plan Review Process.
2. Construction Stakeout Plan Requirements
  - A. The limits of clearing shall be identified by stakes or flagging.
  - B. Construction stakeout shall be performed sufficiently in advance of the construction activities to ensure compliance with the approved construction drawings.
  - C. Stakes shall be placed at not more than 100-foot intervals along the approximate centerline of public and private roads and along all pipelines on the specified offsets.
  - D. All utility structures and proposed entrances, including single family detached driveways, shall also be staked.
  - E. Field stakes must be clearly visible and description of purpose stated.

**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
DEVELOPMENT PLANS AND CAPITAL IMPROVEMENT PLANS  
INFORMATION AND PREPARATION**

- F. The construction plans, cut sheets and field stakes shall have a corresponding reference system.

**10-150      As-Built Drawings Requirements**

- 1. Record As-Built drawings for all capital improvement projects shall be submitted to the Director of Capital Projects Management for review and approval. All other Record As-Built Drawings shall be submitted to the Director of Public Works as a condition precedent to the Town's acceptance of any facility or improvement for maintenance.
- 2. Record drawings shall be:
  - A. Prepared utilizing copies of the approved construction drawings as a base, in permanent ink, with the plan and the corresponding profile (if applicable) on the same sheet. Once the as-built has been approved by the appropriate Town Staff, the licensed professional who prepared the record as-built drawings shall provide the Town with a copy of the "Record As-built Drawings" in a digital format compatible with the Town's digital archiving systems.
  - B. Prepared showing the public facilities as actually located in the field. Certification of facilities location shall be limited to appurtenances of the public facilities which are normally visible at or above ground level. This limitation shall be clearly noted on all sheets.
  - C. Prepared showing any information concerning public facilities provided to the developer and/or contractor by the Director of Public Works or the Director of Capital Projects Management through the assigned Town of Leesburg Public Facilities inspector. All such information shall be clearly annotated to indicate the source.
  - D. Prepared and sealed by a surveyor or engineer duly authorized by the State of Virginia to prepare same.
  - E. Prepared showing, in addition to the information required on the construction drawings, the information listed below for each town maintained public facility. When the as-built information differs from the approved construction plans, a design analysis for the existing conditions may be required by the Director.

## 10-150 TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS

3. Record drawings shall note the location of any sanitary sewer repairs or replacement during the construction period. Location of each repair will be measured from the manholes on each side of the repair.
4. Minimum requirements of an acceptable record drawing for stormwater detention facilities utilizing an embankment shall contain:
  - A. A profile of the top of dam.
  - B. A cross section of the emergency spillway at the control section.
  - C. A profile along the centerline of the emergency spillway.
  - D. A profile along the centerline of the principal spillway extending at least 100 feet downstream of the fill.
  - E. The elevation of the principal spillway crest.
  - F. The elevation of the principal spillway conduit invert (inlet and outlet).
  - G. The diameter, length, and type of material for the riser.
  - H. The diameter, length, and type of material for the conduit.
  - I. The size and type of anti-vortex and trash rack devices and their elevations in relation to the principal spillway crest.
  - J. The number, size, and location of the anti-seep collars.
  - K. The diameter and size of any low stage orifices or drain pipes.
  - L. The length, width, and depth or contours of the pool area so that design volume can be verified.
  - M. A certification statement and seal by Licensed Professional stating that the record drawing is accurate and complete and that the pond as constructed meets the requirements of the approved construction drawings; and listing specific deviations, if any.

**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
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5. Minimum requirements of an acceptable record drawing for Town maintained public facilities shall contain any significant deviation from the approved construction drawings and also the following information:
  - A. Water Lines
    - (1) Location of valve boxes, air release valves, and blowoffs, with 2 ties to permanent above ground physical features.
    - (2) Incorporate significant changes to the approved waterline profile by contacting the Town's construction inspector.
  - B. Sanitary Sewers
    - (1) Location of manholes and cleanouts with 2 ties to permanent above ground physical features.
    - (2) Significant changes to the approved sewer line profile.
    - (3) Inverts and diameters for all pipes in all manholes.
    - (4) Computed pipe slope between as-built inverts.
  - C. Storm Drainage
    - (1) Location of manholes (but not drainage interception structures) with 2 ties to permanent above ground physical features.
    - (2) Significant changes to the approved pipe/stormwater conveyance channel profile.
    - (3) Inverts and diameters of pipes in all manholes and inlets.
    - (4) Computed pipe slope between as-built inverts.
    - (5) Control section verification for the defined overland relief path shown on the approved construction drawings, typically taken at design cross section locations.
    - (6) Cross section verification for storm water conveyance channels typically taken at design cross section locations.

**TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

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**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
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**SECTION 10-200                      MONUMENTS**

1. Two permanent monuments shall be placed in the ground within each block of a subdivision.
  - A. Permanent monuments shall be composed of concrete not less than four inches square or four inches in diameter and at least 30 inches long.
  - B. The top of permanent monuments shall be set not less than one inch nor more than four inches above the finished grade at their respective locations.
  - C. All required monuments shall be clearly visible.
  - D. Such monuments shall be inspected and approved by the Director of Public Works before any improvements are accepted by the Town.
2. Final plans and final plats shall show the location of required permanent monuments.
3. Lot corner pins shall be placed at all lot corners in subdivisions and at all corners of a development.
  - A. Lot corner pins shall be iron or steel pipe or bar not less than one-half inch nor more than one inch in diameter and at least 24 inches long.
  - B. The top of all corner pins shall be set flush to one inch above the finished grade at their respective locations.
4. All points of angles and curves in street rights-of-way shall be identified as required for lot corners.

(End of Section)

**TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

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**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
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**SECTION 10-300                      CONSTRUCTION SCHEDULE**

1.     The developer's contractor shall prepare two copies of a construction schedule on a form acceptable to the Town. The construction schedule shall be submitted to the Town at the pre-construction meeting prior to the commencement of construction.
  
2.     The developer's contractor and the developer shall schedule a pre-construction meeting with the Director prior to the commencement of construction to review the construction schedule, inspection procedures, and safety policies.
  
3.     The schedule shall be designed to be completed as a bar chart with each bar annotated to identify the portion of the plan under construction, for example:
  - A.     Construction of buildings,
  
  - B.     Utilities; water, storm, sanitary, gas
  
  - C.     Streets,
  
  - D.     Final acceptance.

(End of Section)

**TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

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**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
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**SECTION 10-400                      RETAINING WALLS**

1. Any retaining walls utilized in connection with a Subdivision Plan, any type of Site Plan, Development Plan or Capital Improvement Plan associated with a subdivision or development project shall require construction drawings sealed by a licensed Virginia professional engineer which include retaining walls greater than 36 inches high shall include the following information to insure adequate clearances onsite for retaining wall installation.
  - A. Finish grades - top and bottom
  - B. Limits of foundation system
  - C. Limits of tie back system
  - D. Limits of drainage system
  - E. Wall materials
  - F. Wall dimensions
2. It shall be the responsibility of the developer to install retaining walls within the clearances shown on the approved construction drawings and in conformance with the retaining wall construction permit issued by Loudoun County.
3. Approval of construction drawings by the Town of Leesburg does not express or imply construction approval of the retaining walls shown therein. Retaining walls are subject to the Loudoun County Building Code at the time of building permit issuance, and must be submitted to Loudoun County for review and approval prior to the commencement of construction of the retaining wall.

(End of Section)

**TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

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**SECTION 10-500**

**PRO-RATA SHARE POLICY**

**SECTION DELETED.**

**TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

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**SECTION 10-600**

**COST ESTIMATE SCHEDULE**

**10-610**            **General Criteria**

1.     The estimate schedule is designed to expedite the processing of the completion bond.
  - A.     The engineer shall determine the quantities and current costs and enter them in the estimate schedule based on the most current bonding unit price list from the Town of Leesburg.
  - B.     The Director shall review the estimate schedule for accuracy.
2.     Subdividers shall be responsible for all improvements within dedicated rights-of-way until streets are accepted by the Virginia Department of Transportation, including appurtenances beyond the right-of-way lines that serve the improvements within the right-of-way.

**10-620**            **Bonding of Improvements**

1.     Procedures for establishing a Bond Agreement with the Town of Leesburg through bond release are defined in Sections 6.04 through 6.09 of the Town's Subdivision and Land Development Regulations.

**CONSTRUCTION DRAWINGS FOR SUBDIVISION PLANS, ALL TYPES OF SITE PLANS,  
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**SECTION 10-700**

**VIRGINIA DEPARTMENT OF TRANSPORTATION  
SPECIFICATIONS**

1. The current specifications of the Virginia Department of Transportation shall govern for all materials, workmanship, reasonable limitations and construction procedures in conjunction with the specific standards and specifications adopted by Town of Leesburg.
2. In cases where there are no existing standards for a particular structure, detailed scale drawings and specifications, both engineering and construction, shall be submitted with the plans.
3. In cases where the existing VDOT standard for a particular structure is to be modified, detailed drawings and specifications, both engineering and construction, shall be submitted with the plans.

(End of Section)

**TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

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**SECTION 10-800**

**THIRD PARTY EASEMENTS**

All third party easements (i.e., those off-site easements conveyed to the Town of Leesburg on the behalf of the applicant by a third party) required to support the construction drawings for subdivisions and development plans must be recorded in the Land Evidence Records of Loudoun County, Virginia, prior to approval and signature of the construction drawings.

1. Third party easement deeds must be reviewed by the Town of Leesburg Town Attorney for legal format prior to recordation.
2. Third party easement plats must be reviewed by the Director for conformance with the construction drawings prior to recordation.
3. Third party easements must be executed by all parties including the Town officials prior to recordation.
4. Third party easements may be submitted for review at the time of second submission of the construction drawings.

(End of Section)

**TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

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**SECTION 10-900                      REVISIONS**

1. Any proposed revision to approved plans and profiles shall be submitted to and approved by the Director.
2. It shall be understood that the revision, if approved, is submitted with the knowledge and consent of the developer.
3. The following procedures shall be required for the submission and approval of a revision:
  - A. A letter of transmittal shall accompany each revision submitted for review and approval describing the revision in detail and its general location.
  - B. The submitting engineer shall certify that no other changes have been made on the plan or profile except those previously approved.
  - C. All revisions shall be clearly marked using a highlighter or circled with a wide red marker.

(End of Section)

**TOWN OF LEESBURG DESIGN & CONSTRUCTION STANDARDS**

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PRESENTED January 14, 2014

RESOLUTION NO. \_\_\_\_\_

ADOPTED \_\_\_\_\_

A RESOLUTION: AUTHORIZING STAFF TO SEND THE TOWN’S LATEST DRAFT STORMWATER REGULATIONS TO THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY FOR COMPLIANCE REVIEW WITH THE NEW VIRGINIA STORMWATER MANAGEMENT PROGRAM REGULATIONS.

WHEREAS, the Town Code and the Leesburg Design and Construction Standards Manual (DCSM), set forth Town ordinances and regulations for the Town’s stormwater management regulations for water quality and water quantity; and

WHEREAS, the Commonwealth of Virginia adopted new minimum standards and requirements for the regulation of stormwater through amendments to the Virginia Stormwater Management Program (VSMP) Regulations on September 13, 2011; and

WHEREAS, the Virginia Department of Environmental Quality (DEQ) drafted a “model” stormwater management ordinance which has been approved with modifications by the State Water Control Board through late December 2013; and

WHEREAS: the DEQ now oversees all stormwater regulations for all local jurisdictions to ensure they comply with the States minimum requirements for stormwater management (including water quantity, water quality and adequate outfall); and

WHEREAS, Staff has developed the required amendments to the Leesburg Town Code and the DCSM to conform to the new minimum Virginia stormwater regulations; and

A RESOLUTION: AUTHORIZING STAFF TO SEND THE TOWN'S LATEST DRAFT STORMWATER REGULATIONS TO THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY FOR COMPLIANCE REVIEW WITH THE NEW VIRGINIA STORMWATER MANAGEMENT PROGRAM REGULATIONS.

WHEREAS, Staff has met with the EAC and members of the private sector to provide an overview of the new Town regulations and incorporated their comments to the extent possible while still meeting the minimum requirements of the State.

THEREFORE, RESOLVED, by the Council of the Town of Leesburg that Staff is hereby authorized to send the most recent draft revisions of the Leesburg Town Code and the DCSM stormwater ordinances and regulations along with a summary of all changes, applicable DEQ charts & checklists, the Town's proposed funding and staffing plan, a proposed Stormwater Management Fee Schedule, applicable staff standard operating procedures, deed language for privately maintained stormwater facilities, and other supporting data to DEQ for their compliance review of these documents with the new VSMP Regulations.

PASSED this \_\_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
Kristen C. Umstattd, Mayor  
Town of Leesburg

ATTEST:

\_\_\_\_\_  
Clerk of Council