



Subject: Downstream Drainage Easement

Category: Land Development Engineering

Number: 7-4.1

Date: June 1, 2009 (effective)

PURPOSE:

The purpose of this policy is to promote the health and safety of County residents by ensuring that no deleterious impacts are created to existing down stream properties or public road infrastructure from stormwater runoff associated with new land development activity.

POLICY:

1. Definitions:

- a. **Adequate outfall:** The natural or man-made open conveyance system or watercourse which has the capacity to convey the stormwater runoff from a site, without a change in flow characteristics, onto private property. An adequate outfall might be a drainage channel in a public right of way, a public storm drain pipe conveyance, or a recorded flood plain.
- b. **Site outfall:** the point of discharge of stormwater from the development at the property line.
- c. **Study point:** the point selected at the approval of the Deputy Director, Land Development Engineering, for which all hydrologic, hydraulic and photographic studies are to be performed.

2. Minimum Stormwater Design Criteria:

2.1. The stormwater runoff from a site cannot change from pre-development conditions in flow rate and location of discharge for the design storm. In addition, stormwater runoff from a site shall maintain the capacity and stability of the down stream conveyance system to an adequate outfall. Any change in these characteristics from pre-development conditions will require a down stream offsite drainage easement. In addition, the following criteria must be met:

- 2.1.1. The location of the site outfall shall not change from pre-development conditions, unless approved by the Deputy Directory, Land Development Engineering; and,

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DIVISION OF PUBLIC WORKS
POLICY MANUAL**

- 2.1.2. The design storm shall be site specific and shall be determined by the Deputy Director, Land Development Engineering. The design storm will be at a minimum the 2 and 10-year 24-hour frequency storm event. A site located in a known flooding problem area may need to include the 100-year 24-hour frequency storm event as an additional site design storm, as determined by the Deputy Director, Land Development Engineering.
- 2.2. A determination shall be made of conditions in the watershed downstream of each development site. It is important to identify any existing structures that are subject to an unacceptable flooding hazard. In the event that a known downstream flooding condition or erosion condition exists under the pre-development condition, the Deputy Director, Land Development Engineering may require that an off-site drainage easement be provided or improvements be made per the requirements of Section 4 through Section 6 of this Policy.

3. Requirements for Offsite Drainage Easement:

- 3.1. The developer must employ the best available stormwater management technology to meet the conditions identified in Section 3. If one or more of the conditions identified in Section 3 cannot be achieved, the developer shall obtain a recorded off-site drainage easement from all abutting property owners to convey managed stormwater runoff to an adequate outfall.
- 3.2. All necessary offsite drainage easements are to be obtained prior to final plat or site development approval.
- 3.3. An adequate outfall shall be a minimum of one of the following:
 - 3.3.1. The point at which the site outfall discharges into the first adequately sized public storm drain structure down stream of the site;
 - 3.3.2. The first point of confluence where the drainage area to the site outfall is joined by another drainage area equal to or greater than the drainage area of the site outfall;
 - 3.3.3. A FEMA floodplain or a recorded floodplain easement; or,
 - 3.3.4. An existing recorded drainage easement, SWM easement, or public right-of-way as deemed adequate by the Deputy Director, Land Development Engineering.
- 3.4. The off-site drainage easement must contain the 10-year water surface elevation (WSE) with 1-foot of freeboard.
- 3.5. All down stream conveyance systems, whether man-made or natural, located between the site outfall and the adequate outfall must safely pass the 10-year 24-hour frequency storm event without impacting any existing structures. In addition, the 100-year WSE

must pass between the site outfall and the adequate outfall without entering any existing residential dwelling units or business structures.

- 3.6. In the event that an off-site drainage easement is needed, it must be prepared in a format that can be recorded in the land records office by either Plat or Deed of Easement.

4. Discharge Study Criteria:

- 4.1. For all site plan or preliminary plan development submittals, an upstream and down stream impact study is required to characterize existing conditions and determine potential impacts of site stormwater runoff on adjacent properties, streams and existing conveyance systems between the site outfall and the adequate outfall. The study shall include: a. Characterization of Existing Site Conditions; b. Design Storm Selection; c. Pre and Post Development Hydrology and Hydraulics; d. Design of Proposed Conveyance
- 4.2. A Characterization of Existing Site Conditions shall be provided with the first submission of the preliminary plat or site plan. The characterization study shall include:
 - 4.2.1. A photographic study, scaled with a site map identifying the location of each picture is to be submitted with the first submission of the preliminary plat or site plan. At a minimum, photos are to be taken at all critical areas showing buildings, streams, road crossings, and existing conveyance systems.
 - 4.2.2. Off-site topography is required in the vicinity of the site outfall and within 500 feet of the site. For potentially critical structural flooding conditions, field run topography at a minimum of 2-foot contours may be required where stormwater runoff must flow offsite across private property between or near an existing structure prior to reaching an adequate outfall. Spot elevations along all foundations are required for any existing offsite permanent structure within 15 feet of an existing or proposed conveyance system, or 100-year WSE, which ever is greater. The determination of a potentially critical structural flooding condition shall be made by the Deputy Director, Land Development Engineering.
 - 4.2.3. A pre-development drainage area map at a scale no less than 1" = 200', must be provided showing existing topography, the existing drainage area(s), on-site subdrainage area(s), site outfalls, site tributaries, proposed study points, adjacent property boundaries, property owners, zoning, existing structures, existing storm drains, existing outfalls, existing driveways and vegetation.
 - 4.2.4. In the event that the down stream conveyance passes under an existing public or private road or driveway, an additional analysis is required to ensure that the existing water surface elevation for the road design storm at the road crossing does not exceed design requirements per Washington County road crossing design standards.

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DIVISION OF PUBLIC WORKS
POLICY MANUAL**

4.3. A Pre and Post Development Hydrology and Hydraulics Analysis shall be provided with the characterization study. This analysis shall include:

4.3.1. The hydrologic analysis shall include the site and all down stream contributing drainage areas.

4.3.2. Runoff curve number (CN) reduction allowed when using water quality credit practices as per the 2000 Maryland Stormwater Design Manual is not applicable to these pre and post development hydrology calculations.

4.3.3. The pre-development hydrologic condition for all agriculture shall be “meadow in good condition”.

5. Additional Analysis Required for Offsite Drainage Easement:

5.1. Where the requirements of Section 3 cannot be met, an additional hydrologic and hydraulic analysis will be required to be submitted to define the limits of the down stream drainage easement. This analysis shall include the following:

5.1.1. The hydraulic analysis shall calculate the pre and post development velocity, depth and width of flow to the adequate outfall.

5.1.2. Where stormwater runoff from the site outfall is conveyed through a down stream conveyance channel, swale, stream, or other open natural or man-made conveyance to the adequate outfall, the pre and post development velocity, depth and width of flow shall be computed along this conveyance at pre-determined locations. Surveyed cross-sections at each study point shall be used to determine water surface elevation, velocity, depth, and width.

5.1.3. Where stormwater runoff from the site outfall is conveyed through a down stream closed public or private storm drain system, the system shall be shown to have the capacity to safely convey the post development 10-year 24-hour frequency storm.

5.1.4. The hydrologic and hydraulic analysis methods indicated in the latest version of the Washington County Hydraulic Design Criteria shall apply.

6. Exemptions:

Any development activity exempt from the provisions of the Washington County Stormwater Management Ordinance is exempt from the requirements of this Policy.

7. Waivers:

The Deputy Director of Land Development Engineering may grant a waiver to all or a part of the requirements listed in this policy for an individual site. Waivers will be evaluated, on a case-by-case basis, after a written request is submitted to the Deputy Director, Land Development

**WASHINGTON COUNTY, MARYLAND
DIVISION OF PUBLIC WORKS
POLICY MANUAL**

Engineering. The written request must contain all necessary photos, written description of the project and waiver request, calculations and any other information that is necessary to adequately evaluate the waiver request. The decision on the waiver request will be granted in writing by the Deputy Director, Land Development Engineering. In considering waiver requests, the Deputy Director shall consider circumstances specific to the site that may dictate that strict adherence to this Policy would result in unnecessary hardship to the applicant. .

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POLICY MANUAL**