



Overview: This document serves to clarify the minimum standards that City staff will review to ensure compliance with stormwater regulations for all projects that are classified as ‘Large Projects’. This includes all projects that involve more than 20,000 square feet of ‘Proposed (Increased) Impervious Area’, as defined in the PWDSM, excluding projects that involve over 15 acres of land disturbance. The following criteria can be used if the following statement is included in the SWM narrative: *“This design was completed in accordance with the October 2025 Large Project Criteria, and requests all associated variances.”* See page 3 of this document for additional variance information.

STATE CODE SECTION 9VAC25-875-600

Channel Protection – 24-hour storm, tailwater based on SWMM submodel. Meet **one of the two** following at each point of discharge:

1. 2-year storm analysis to a point where the watershed contributing drainage area (CDA) is 100 times larger than the site’s drainage area (SDA). For private projects, the SDA is almost always the same as the disturbed area associated with the project.
 - a. If the entire flow path in limits of analysis (LOA) is paved (i.e. curb & gutter, concrete ditch, or pipe system) - Calculate maximum peak velocity at point of analysis for conveyance system (based on assumed full flow condition) and verify it’s less than erodible velocity of that conveyance system. Staff will accept any velocity less than 10 feet/second as non-erodible in this scenario.
 - b. If the flow path in limits of analysis includes unpaved sections (i.e. grass or earthen swales or ponds) - Calculate maximum peak velocity through each unpaved section, and verify it’s less than erodible velocity listed in VESCH. This is in addition to the calculation at the point of analysis listed above in ‘a’.

OR

2. 1-year storm – Meet energy balance equation at point of discharge. This option must be used when discharging to a natural conveyance system, or when the CDA includes a natural conveyance system.

Flood Protection – 10-year, 24-hour storm, tailwater based on SWMM submodel. VDOT H&H spreadsheet is acceptable if no BMP routing. Meet **one of the two** following at each point of discharge:

1. Capacity analysis - Provide reduction in peak flow rate at point of discharge.

OR

2. HGL analysis to a point where the watershed CDA is 100 times larger than the SDA. For private projects, the SDA is almost always the same as the disturbed area associated with the project. Must show no flooding (does not exceed the rim of a grate structure, gutter flowline of a curb inlet, or top of bank in an open channel) at any point within limits of analysis.
 - a. Acceptable to use best available information from City GIS for offsite structures and drainage areas.

Sheet Flow Alternative – Channel Protection and Flood Protection regulations apply to concentrated stormwater flow leaving the site. When there is no concentrated stormwater flow leaving the site in the post-development condition, the following conditions apply:

1. Sheet flow with a decreased runoff volume will generally not require any additional analysis (no need to comply with channel protection or flood protection). Provide hydrologic calculations to verify reduction in runoff, and address in narrative.
2. Sheet flow with an increased runoff volume will not be permitted to use this provision. Such projects shall be analyzed using the same criteria outlined above for channel protection and flood protection.

CITY STANDARDS / PWDSM

Design Storm – 10-year, 24-hour storm

1. Must use SWMM submodel as basis for design. All SWMFs, their outfall/connection to the public system, and proposed public conveyance systems must be included.
2. Check all nodes in SWMM model for proposed or increased flooding.
 - a. If node was flooding in existing condition, HGL cannot increase in proposed condition.
 - b. No new areas of flooding permitted.

Check Storm – 100-year, 24-hour storm

1. Must use SWMM submodel as basis for design. All SWMFs, their outfall/connection to the public system, and proposed public conveyance systems must be included.
2. Check all nodes in SWMM model for proposed or increased flooding.
 - a. If node was flooding in existing condition, HGL cannot increase in proposed condition.
 - b. No new areas of flooding permitted.

Pipe/Swale Calculations for Proposed Conveyance Channels – 10-year, 24-hour storm

1. Verify all flows are contained within the designed conveyance system. This can include designed ponding on-site (i.e. in parking lot), but must include a ponding area map with signed acknowledgment from owner.
2. All analyses must extend at least 1 structure beyond tie-in location of proposed work.
3. Tailwater options:
 - a. Static tailwater based on the peak 10-year HGL in the SWMF, **OR**
 - b. Variable tailwater provided by the City; analysis must extend to the node where tailwater was provided. This option is only available if using a model that accounts for multi-directional flow to account for upstream pipes filling along with variable tailwater.

VARIANCES AND INTERPRETATIONS

The design criteria listed above are based on multiple approved variances and updated regulatory interpretations. By including the standard variance request language listed on Page 1, the variances below will be granted and do not require separate applications.

1. PWDSM Section 8.3.E – Check Storm Requirements for All Projects - A variance is granted to exclude private conveyance systems from this section.
2. PWDSM Section 8.4.A.1.a.1 – Revise language to “*Public* pipes 15” and larger shall be included in SWMM models.”