

## City of Hopewell SWM Plan Preparer/Plan Reviewer Checklist (LDA Form 05)

**Instruction:** This checklist shall be completed if a SWM Plan and Narrative is required per the City of Hopewell Stormwater and/or Erosion and Sediment Control ordinance. The completed checklist shall be provided with the SWM Plan submittal. The Plan and Narrative submitted for review shall be signed and sealed by a licensed professional. This checklist is intended to only be used as a guide. The licensed professional is responsible for ensuring plans address the SWM laws and regulations.

**Project Information:**

Project Name: \_\_\_\_\_ Project Location: \_\_\_\_\_  
 Submittal Date: \_\_\_\_\_ Date on Plans: \_\_\_\_\_  
 Design Engineer (Printed): \_\_\_\_\_ Email: \_\_\_\_\_

Yes	No	N/A	SWM Plan/Narrative Requirement
<i>General Plan Information (Plan)</i>			
			North arrow.
			Legend.
			Location and vicinity map.
			Delineation of the site area and property lines in the vicinity of the project.
			Existing and proposed contours (2' interval minimum).
			Locations of test borings.
			Earthwork specifications.
			Compaction requirements specified.
			Sequence of construction.
			Limits of clearing and grading.
			Existing and proposed features including buildings, roads, parking areas, utilities, stormwater management facilities and any other physical attributes.
			SWM Facility Certification - Plans shall list all SWM facilities and critical construction inspection timeframes (i.e., liner, underdrain and outlet pipe installation) for which SWM BMP certification is required per the City of Hopewell Stormwater and Erosion and Sediment Control ordinance.
			The following note is on the plan: "A certified construction record drawing for permanent SWM facilities shall be submitted to the City of Hopewell for approval per the City of Hopewell Stormwater and Erosion and Sediment Control ordinance. Construction inspections and surveys, performed by a licensed professional, shall be required at each stage of installation (construction) as necessary to certify that the SWM facility has been built in accordance with the approved plan and design specifications. The Contractor shall provide a minimum of 2 business days' notice to the certifying professional to allow for critical inspections."
			BMP Inspection and maintenance plan for each permanent SWM facilities. For manufactured permanent BMPs, the construction drawings shall include manufacturer's recommendation on maintenance and inspection.
			Specifications for construction/installation of proprietary BMPs per the manufacturer's specifications
			Cross sections for stormwater conveyance channels with maximum water surface elevations for design storms (1-, 10-, and 100-year)
			Where applicable, outlet protection with dimensions at points of concentrated discharge

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<i>Site Information (Narrative)</i>			
			Description of existing and proposed site conditions.
			Summary table with pre- and post-development land cover conditions (i.e. forest, managed turf, and impervious areas).
			Discussion of the stormwater management strategy to address water quantity and quality criteria.
			Information on the type and location of stormwater discharges, including information on the features to which stormwater is being discharged including surface waters or karst features if present.
			If the project impacts any wetlands or surface waters, is all correspondence and permits concerning any proposed impacts to jurisdictional wetlands, stream and channels included (i.e. COE 404 permit). Note that the plan cannot be approved without proper documentation or necessary permits for jurisdictional impacts.
			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
			Information on the proposed stormwater management facilities, including (i) the type of facilities; (ii) location, (iii) impervious and pervious acres treated; and (iv) the surface waters or karst features into which the facility will discharge
			Discussion of possible stormwater impacts on downstream properties including mapping with sufficient information on adjoining parcels to assess the impacts.
			Geotechnical report when applicable (include infiltration rates when required for a BMP).
			Boring locations: borrow area, basin pool area and embankment area (centerline principal spillway, emergency spillway, abutments).
			Boring logs with Unified Soils Classifications, soil descriptions, depth to seasonal high groundwater table, etc.
			Additional geophysical investigation and recommendations in Karst environment.
			Description of inclusion of the locality's additional technical requirements into the plan, if any, and how they were addressed to the maximum extent practicable.
<i>Hydrologic Computations (Narrative)</i>			
			Mapping that supports computations and includes, at a minimum the following: <ul style="list-style-type: none"> <li>• Pre- and post-development development contours;</li> <li>• Existing streams, ponds, culverts, ditches, wetlands, other water bodies, and floodplains;</li> <li>• Current land use including existing structures, roads, and locations of known utilities and easements;</li> <li>• Limits of clearing and grading;</li> <li>• Proposed drainage patterns on the site;</li> <li>• Proposed buildings, roads, parking areas, utilities, and stormwater management facilities.</li> </ul>
			Pre-development drainage area mapping that includes all contributing drainage areas, CN labels, depiction of time of concentration flow paths, slopes and lengths used for runoff hydrographs.
			Post-development drainage area mapping that includes all contributing drainage areas, CN labels, depiction of time of concentration flow paths, slopes and lengths used for runoff hydrographs.

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<i>Hydrologic Computations cont. (Narrative)</i>			
			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.
			Summary table for determination of runoff curve numbers.
			Time of concentration calculations.
			Predevelopment runoff hydrographs.
			Post-development runoff hydrographs.
<i>Hydraulic Computations (Narrative &amp; Plans, as indicated)</i>			
			Routing computations for each proposed stormwater management facility for each applicable design storm provided in narrative.
			Stage-storage data used in routing computations in the narrative.
			Control structure information used in routing computations in the narrative.
			Summary table of pre- and post-development peak runoff rates for each point of discharge from the site provided in narrative.
			Maximum water surface elevations for design storms shown in sections or profiles on the plans for each stormwater management facility.
			Impoundments designed to convey the 100-year storm as demonstrated in computations in the narrative.
			Adequate freeboard is provided for impoundments as shown on the plans based on computations in the narrative.
			Hydraulic grade line computations in the narrative with indication of locations of surcharge or inadequacy.
			Storm sewer design computations in the narrative.
			Culvert calculations in the narrative.
			Gutter spread calculations in the narrative.
			Provide profiles of all storm conveyances (except roof drains) on plans. Profiles should include existing and proposed grade, structure types, pipe materials and sizes, slopes, inverts, etc.
<i>Water Quality Computations (Narrative &amp; Plans, as indicated)</i>			
			Provide Runoff Reduction Method spreadsheet output including: <ul style="list-style-type: none"> <li>• Site loadings</li> <li>• Required reductions</li> <li>• Input for each BMP employed and reductions achieved by each BMP</li> <li>• Compliance worksheet</li> <li>• Adjusted CN worksheet, when applicable.</li> </ul>
			Treatment volume calculations for sizing BMPs.
			Stage-storage information indicating the treatment volume required and volume provided.
			All proposed SWM design follows the Virginia BMP Clearinghouse design specifications.
			A BMP-type specific checklist from Appendix 8-A of the Virginia Stormwater Management Handbook, latest edition, is completed and provided in the narrative for each proposed BMP.