DINWIDDIE COUNTY

PLANNING, ZONING, CODE COMPLIANCE AND ENVIRONMENTAL

WET SWALE

Site Design Checklist

Plan Name: _____ Date Submitted: _____

The following checklist only identifies the information and details that must be included in the SWM plan

☐ Level 1 ☐ Level 2

LEVEL 1 MINMUM DESIGN CRITERIA:

The treatment volume of the swale must be calculated using the following equation: (1 inch)(Rv)(A)]/12 – the volume reduced by an upstream RR BMP.	○
The swale slope must be < 2%.	

LEVEL 2 MINMUM DESIGN CRITERIA:

The treatment volume of the swale must be calculated using the following equation: (1.25 inch)(Rv)(A)]/12 – the volume reduced by an upstream RR BMP.	○
The swale slope must be < 1%.	
The facility must be designed off-line.	○
The planting plan must incorporate wetland species and trees.	

PLAN REQUIREMENTS:

Provide a site map identifying pertinent information regarding the Wet Swale.	○
- The contributing drainage area (CDA) boundaries, acreage, and land cover.	
- Topography of the site area including the Wet Swale	○

PLAN REQUIREMENTS:

- Wet Swales are not prohibited in the following areas: a) Areas that treat runoff from stormwater hot spots due to the potential interaction with the water table and the risk that hydrocarbons, trace metals, and other pollutants. b) Residential areas due to the risk of mosquito breeding;	
Provide a plan view showing:	
- Overall Wet Swale grading;	
- The layout and dimensions of the Wet Swale and pre-treatment device(s); as well as benches, check dams, and all conveyance system outfalls into the swale;	
- Check dam locations;	
- Adequate maintenance access to the facility is provided.	
- The location of the check dam(s) is shown;	
- Adequate maintenance access to the facility is provided.	
Provide profiles, section views, and details that show the following:	
- A trapezoidal or parabolic cross section.	
- Side slopes	
- Channel bottom width	
- Longitudinal slope	
- Check dam details	
- 10-year storm elevation	
- 2-year storm elevation	
- Tv (detention) volume elevation	
- Energy balance volume detention elevation	
- Outfall, tailwater conditions, and downstream limit analyses	

COMPUTATIONS:

Provide appropriate hydraulic calculations.	○
- Hydrologic analysis must be based on a 24-hour storm event using site specific rainfall precipitation frequency data recommended by the U.S. National Oceanic and Atmospheric Administration (NOAA) Atlas 14	
- The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) synthetic 24-hour rainfall distribution and models, including but not limited to TR-55 and TR-20; hydrologic and hydraulic methods developed by the U.S. Army Corps of Engineers; or other standard hydrologic and hydraulic methods must be used to conduct the analyses necessary to demonstrate compliance with the stormwater quality and quantity requirements	○
- The Rational Method may be used for evaluating the peak discharge.	
- The Modified Rational Method may be used for evaluating volumetric flows to stormwater conveyances.	○
- Provide pre- and post-development hydrologic and hydraulic information for the 1- year, 2- year, and 10- year, 24-hour storms, as needed.	
- Provide the calculated channel dimensions designed based on peak flow rate.	○
- Provide verification of the hydraulic capacity using Manning's Equation or an accepted equivalent method.	
- Provide the complete input used for the hydrograph generation on the plans.	○
- Provide a stage/storage table.	
- Provide a stage/discharge for each component of the outlet structure.	○
- Provide a composite stage/discharge table.	
- Provide an outlet control analysis.	○
- Provide receiving conveyance system channel protection and flood protection calculations carried to the appropriate limits of analysis.	

CHECK DAMS:

Check dams, if used, meet the following design criteria: The items checked blow have not been properly addressed:	○
- Check dams are composed of permanent, non-erodible material or should be configured with elevated driveway culverts; creosote treated materials and stone check dams are unacceptable.	
- Check dams must be firmly anchored into the side slopes and channel bottom.	○
- The maximum check dam height is 12 inches or 18 inches with additional design elements to ensure stability of the check dam for challenging sites.	
- Armoring is provided, if necessary, at the downstream toe of the check dam.	○
- Check dams are designed with a center weir sized to pass the channel design peak flow (10-year storm event for man-made channels).	
- The average ponding depth throughout the channel is 12 inches and must not exceed 18 inches.	○
- The ponded water at a downstream check dam does not touch the toe of the upstream check dam.	
- Each check dam must have water quality perforations designed to provide a detention time of 12 hours with wire mesh and stone placed in front of the water quality perforations.	○

LANDSCAPING:

Provide a landscape plan that specifies the following:	○
- The landscaping plan must indicate the methods to be used to establish and promote long term vegetative cover in the SWM facility and its buffer area.	
- SWM facilities that are visible from the right-of-way must be effectively screened from the public right-of-way or less intense uses of adjacent properties. Examples of acceptable screening include fencing, landscaping, or a combination of these features.	○

MAINTENANCE:

Provide a summary of the long term maintenance requirements for the SWM facility on the SWM plan.	○

CONSTRUCTION:

The sequence of construction must address the SWM facility installation and appropriate inspections, including: initial site preparation, excavation/grading, and installation of the embankment, principal outlet structure, and emergency spillway. We recommend the County staff be involved in these inspections..	
The sequence of construction must clearly state that a construction record drawing and certification that the stormwater management facility has been constructed in accordance with the approved plan must be submitted to the County and approved prior to Environmental Compliance Bond (ECB) release.	

Engineer Signature:_____ Date:_____