BIORETENTION AREA SCM DESIGN CHECKLIST

Stormwater Management Division
c/o Development Services Department
One Exchange Plaza, 4th Floor
Raleigh, NC 27601
Telephone (919) 996-3773

I. PROJECT INFORMATION

Project Name: _____ Phase: _____
Project Address: _____ Disturbed Area (sf): _____
PIN: _____ Case #: _____ Submittal Date: _____
Previous Permit numbers (if applicable): _____
Zoning District: _____
Legal Name of Owner: _____
Owner Contact: _____ Phone: _____
Owner Address: _____
Design Contact Person: _____ Phone: _____
Design Contact Email: _____
The regulatory drainage basin in which the site is located: _____
The water supply watershed in which the site is located: _____

Function of Facility [check all that apply]:		
☐	Nutrient (Total Nitrogen) Reduction	
☐	Green Stormwater Infrastructure	
☐	TSS Reduction	
☐	Peak Flow Rate Attenuation	
	☐	1-Year event
	☐	10-Year event
	☐	100-Year event
	☐	Other [_____]
☐	Other [_____]	

BIORETENTION AREA SCM DESIGN CHECKLIST

II. SUBMITTAL REQUIREMENTS - See COR Stormwater Management Design Manual Chapter 5 for additional guidance. This completed checklist shall be submitted to the City of Raleigh with any proposed Bioretention Area. All files shall also be submitted electronically via CD or flash drive.

Routed flows and water surface elevations (WSE) at SCM [as applicable]:			
Storm Event	Inflow	Outflow	WSE
1-Year			
10-Year			
100-Year			
____-Year			

Peak flow rates at immediate point of analysis to which the SCM drains:			
Condition	1-year	10-year	_____-year
Pre-development			
Post-development			

General Design Criteria		
☐	**Sizing:** The design volume of the SCM accounts for the runoff at full build-out from all surfaces draining to it (calculations provided in Stormwater Development Analysis).	
	☐	Design Storm Volume: cf
☐	**Side Slopes of SCM:** Vegetated side slopes are no steeper than 3:1.	
☐	**Excess Flows:** SCM includes an overflow/bypass device for inflow volumes in excess of treatment volume or, if applicable, peak attenuation volume (calculations provided in Stormwater Development Analysis).	
	☐	Description of Overflow/Bypass:
	☐	Emergency Outlet Elevation: ft
	☐	Emergency Spillway Width: ft
	☐	Emergency Spillway Side Slopes: : 1
	☐	Emergency Spillway Slope: %
	☐	Depth of Flow: in

BIORETENTION AREA SCM DESIGN CHECKLIST

☐	**Freeboard:** Minimum 0.5 ft freeboard required for 100-year storm.	
	☐	Freeboard provided: ft
☐	**Dewatering:** SCM has a method to draw down any standing water to facilitate maintenance and inspection.	
☐	**Clean Out After Construction:** SCM impacted by sedimentation and erosion control during the construction phase shall be cleaned out and converted to its approved design state.	
☐	**Maintenance Access:** SCM has been provided with adequate access per City standards.	
☐	**Easements (except for SCMs located on single family residential lots):** Includes maintenance access, entire SCM footprint, and an additional 10 ft or more around the SCM.	
☐	**Single Family Residential Lots:** Plats for residential lots that contain an SCM shall include the location of SCM, typical detail of SCM, and note that the SCM on the property is required to meet stormwater regulations and that the property owner may be subject to enforcement actions if the SCM is removed, relocated, or altered without prior approval.	
☐	**Operation and Maintenance (O&M) Agreement.**	
☐	**Operation and Maintenance (O&M) Plan.**	
	☐	*Operation and Maintenance (O&M) Manual Submittal Checklist.*
☐	**Dam Embankment:** The dam top width is at least 10-ft with face slopes no steeper than 3:1. Material, compaction, and other appropriate geotechnical specifications for the construction of the dam embankment have been provided. Appropriate permanent turf grass stabilization has been specified for the entire dam. Note: Trees, shrubs, and clumping grass are prohibited on **ALL** dams.	
☐	**Principal Spillway:** Riser and principal spillway pipe is reinforced concrete.	
	☐	Appropriate seepage control elements have been provided.
	☐	A surface baffle, trash rack, or similar device has been specified for the riser top and intakes (as applicable).
	☐	Anti-floatation calculations and details have been included with the design of the riser structure.
☐	**Erosion Protection:** The SCM inlets and outlet have been designed to protect areas downstream of the discharge points from erosion resulting from peak flows for the 10-year storm event.	

BIORETENTION AREA SCM DESIGN CHECKLIST

Specific Bioretention Area Design Criteria		
☐	**Design Sizing:** The surface area of bioretention cell has been designed such that the storage depth of the design treatment volume is no greater than 12 inches.	
	☐	Depth of Design Volume: in
	☐	Surface Area: sf
☐	**Media Depth:** If the bioretention area is to be a planted facility, the minimum depth of media is 36 inches. If the bioretention area is to be a sodded facility, the minimum depth of media is 30 inches with IWS and 24 inches without IWS.	
	☐	Depth of Media: in
	☐	The top of the IWS zone is at least 18 inches below the surface of the bioretention area.
☐	**Seasonal High Water Table:** The separation between the SHWT and the invert of the perforated underdrain pipe system (at the riser) is at least 24 inches.	
	☐	SHWT Separation: in
☐	**Peak Attenuation Volume:** The maximum WSE of the largest attenuated storm event is no more than 24 inches above the bioretention area surface.	
	☐	Maximum Storm Depth: in
☐	**Pre-treatment:** A pre-treatment mechanism has been provided (i.e., grass filter strip, forebay, etc.).	
	☐	Flow entering the bioretention cell via disperse flow has a velocity less than one foot per second (fps) for mulched cells or three fps for sodded cells.
	☐	If inflow is concentrated in a pipe or swale, then a rip-rap lined entrance, a forebay, or another energy-dissipation device is used. *Note: If a forebay is used, it can both dissipate energy and provide pretreatment.*
☐	**Underdrains (as applicable):** Perforated schedule 40 PVC underdrain pipe (with non-perforated schedule 40 PVC cleanouts) has been provided. Maximum spacing between perforated underdrain pipe runs is 10-ft. Cleanouts (in the underdrain system) are provided at the beginning of each pipe run and at all pipe intersections.	
	☐	Cleanouts have been provided at the beginning of each pipe run and at all pipe intersections and extend above the maximum ponding depth.
☐	**Media Mix:** The material composition of the bioretention soil mix is MDC compliant in terms of its constituents, constituent percentages, and P-index. The bioretention soil mix has an infiltration or Ksat rate of at least 2 inches/hour.	

The SCM Plan Submittal shall also include the following elements:	
☐	A plan view of the SCM, with grading and appropriate critical spot shots, has been provided.
☐	A profile (showing all relevant component elevations and WSEs) through the riser, dam, and outlet structure/outfall has been provided.
☐	Details of other required SCM elements have been provided.

BIORETENTION AREA SCM DESIGN CHECKLIST

☐	All supporting design calculations (including all applicable site design calculations and drainage area exhibits) have been provided.

III. PROFESSIONAL CERTIFICATION

Name: _____

Contact Email: _____

Contact Phone Number: _____

Professional Seal: