CITY OF WILMINGTON
NORTH CAROLINA

Public Services
Engineering
212 Operations Center Drive
Wilmington, NC 28412
910 341-7807
910 341-5881 fax
wilmingtonnc.gov
Dial 711 TTY/Voice

June 20, 2018

Ms. Leanne N. Lawrence, AIA-Dir., Facility, Planning & Construction
New Hanover County Schools
6410 Carolina Beach Road
Wilmington, NC 28412

Subject: **Stormwater Management Permit No. 2017012R1**
College Park Elementary School
High Density Development

Dear Ms. Lawrence:

The City of Wilmington Engineering Division has received a request for a revision to the Stormwater Management Permit for College Park Elementary. Having reviewed the application and all supporting materials, the City of Wilmington has determined that the proposed revision meets the requirements of the City of Wilmington's Comprehensive Stormwater Ordinance.

The revisions include:

Addition of two (2) shade structures (See approved plans dated June 20, 2018)

Please be aware all terms and conditions of the permit Issued on march 22, 2017 remain in full force and effect. Any additional changes to the approved plans must be approved by this office prior to construction. The issuance of the plan revision does not preclude the permittee from complying with all other applicable statutes, rules, regulations or ordinances which may have jurisdiction over the proposed activity, and obtaining a permit or approval prior to construction.

The revised stamped, approved stormwater management drawings will be released for construction by the Wilmington Planning Division under separate cover. Please replace any old plan sheets from the approved set with the new, revised sheet. An electronic copy of the approved drawing set, permit, application and supplementary documents will be maintained by the Wilmington Engineering Division. If you have any questions, or need additional information, please contact Richard Christensen at (910) 341-7813 or richard.christensen@wilmingtonnc.gov

Sincerely,

for Sterling Cheatham, City Manager
City of Wilmington

cc: Rob Balland, PE, Paramounte Engineering, Inc.
Jeff Walton, Associate Planner, City of Wilmington

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Public Services
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414 Chestnut St, Suite 200
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STORMWATER MANAGEMENT PERMIT APPLICATION FORM
(Form SWP 2.2)

I. GENERAL INFORMATION

1. Project Name (subdivision, facility, or establishment name - should be consistent with project name on plans, specifications, letters, operation and maintenance agreements, etc.):

   College Park Elementary School

2. Location of Project (street address):

   5001 Oriole Drive

   City: Wilmington County: New Hanover Zip: 28403

3. Directions to project (from nearest major intersection):

   Travel along Oriole Drive from College Road, site is on your left after you cross over Racine Drive.

II. PERMIT INFORMATION

1. Specify the type of project (check one): ☐ Low Density ☒ High Density
   ☐ Drains to an Offsite Stormwater System ☐ Drainage Plan ☐ Other
   If the project drains to an Offsite System, list the Stormwater Permit Number(s):

   City of Wilmington: _____ State – NCDENR/DWQ: _____

2. Is the project currently covered (whole or in part) by an existing City or State (NCDENR/DWQ) Stormwater Permit? ☐ Yes ☒ No
   If yes, list all applicable Stormwater Permit Numbers:

   City of Wilmington: _____ State – NCDENR/DWQ: _____

3. Additional Project Permit Requirements (check all applicable):
   ☐ CAMA Major ☒ Sedimentation/Erosion Control
   ☐ NPDES Industrial Stormwater ☐ 404/401 Permit: Proposed Impacts: _____
   If any of these permits have already been acquired please provide the Project Name, Project/Permit Number, issue date and the type of each permit:

   _____

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III. CONTACT INFORMATION

1. Print Applicant / Signing Official's name and title (specifically the developer, property owner, lessee, designated government official, individual, etc. who owns the project):

   Applicant / Organization: New Hanover County Schools

   Signing Official & Title: Leanne N. Lawrence, AIA - Director, Facility Planning & Construction

   a. Contact information for Applicant / Signing Official:

   Street Address: 6410 Carolina Beach Road

   City: Wilmington State: NC Zip: 28412

   Phone: 910-254-42810 Fax: _____ Email: patricia.lawrence@nhcs.net

   Mailing Address (if different than physical address): _____

   City: _____ State: _____ Zip: _____

   b. Please check the appropriate box. The applicant listed above is:

   ☒ The property owner (Skip to item 3)
   ☐ Lessee* (Attach a copy of the lease agreement and complete items 2 and 2a below)
   ☐ Purchaser* (Attach a copy of the pending sales agreement and complete items 2 and 2a below)
   ☐ Developer* (Complete items 2 and 2a below.)

2. Print Property Owner's name and title below, if you are the lessee, purchaser, or developer. (This is the person who owns the property that the project is on.)

   Property Owner / Organization: _____

   Signing Official & Title: _____

   a. Contact information for Property Owner:

   Street Address: _____

   City: _____ State: _____ Zip: _____

   Phone: _____ Fax: _____ Email: _____

   Mailing Address (if different than physical address): _____

   City: _____ State: _____ Zip: _____

3. (Optional) Print the name and title of another contact such as the project's construction supervisor or another person who can answer questions about the project:

   Other Contact Person / Organization: _____

   Signing Official & Title: _____

a. Contact information for person listed in item 3 above:

Street Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____ Email: _____

Mailing Address (if different than physical address): _____

City: _____ State: _____ Zip: _____

IV. PROJECT INFORMATION

1. In the space provided below, briefly summarize how the stormwater runoff will be treated.

   Stormwater runoff will be treated utilizing a piped network that conveys the stormwater to 1 of 2 wet detention ponds on site.

2. Total Property Area: 673,021 square feet
3. Total Coastal Wetlands Area: 0 square feet
4. Total Surface Water Area: _____ square feet
5. Total Property Area (2) – Total Coastal Wetlands Area (3) – Total Surface Water Area (4) = Total Project Area: 673,021 square feet.
6. Existing Impervious Surface within Property Area: 145,580 square feet
7. Existing Impervious Surface to be Removed/Demolished: 145,580 square feet
8. Existing Impervious Surface to Remain: 0 square feet
9. Total Onsite (within property boundary) Newly Constructed Impervious Surface (*in square feet*):

Buildings/Lots	58,772
Impervious Pavement	111,394
Pervious Pavement (adj. total, with % credit applied)	
Impervious Sidewalks	45,236
Pervious Sidewalks (adj. total, with % credit applied)	
Other (describe)	
Future Development	24,178
Total Onsite Newly Constructed Impervious Surface	239,580

10. Total Onsite Impervious Surface
    (Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) = 239,580 square feet
11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 36 %

12. Total Offsite Newly Constructed Impervious Area (improvements made outside of property boundary, *in square feet*):

Impervious Pavement	2,001
Pervious Pavement (adj. total, with % credit applied)	
Impervious Sidewalks	3,450
Pervious Sidewalks (adj. total, with % credit applied)	
Other (describe)	
Total Offsite Newly Constructed Impervious Surface	5,451

13. Total Newly Constructed Impervious Surface
(Total Onsite + Offsite Newly Constructed Impervious Surface) = 245031 square feet

14. Complete the following information for each Stormwater BMP drainage area. If there are more than three drainage areas in the project, attach an additional sheet with the information for each area provided in the same format as below. Low Density projects may omit this section and skip to Section V.

Basin Information	Wet Detention Basin BMP # 1	Wet Detention Basin BMP # 2	BMP #
Receiving Stream Name	Bradley Creek	Bradley Creek	
Receiving Stream Index Number	18-87-24-4-(1)	18-87-24-4-(1)	
Stream Classification	SC; HQW	SC; HQW	
Total Drainage Area (sf)	158558	514463	0
On-Site Drainage Area (sf)	158558	514463	
Off-Site Drainage Area (sf)			
Total Impervious Area (sf)	62202	177378	0
Buildings/Lots (sf)		58772	
Impervious Pavement (sf)	45794	65600	
Pervious Pavement, % credit (sf)			
Impervious Sidewalks (sf)	9434	35802	
Pervious Sidewalks, % credit (sf)			
Other (sf)			
Future Development (sf)	6974	17204	
Existing Impervious to remain (sf)			
Offsite (sf)			
Percent Impervious Area (%)	39.2	34.5	

15. How was the off-site impervious area listed above determined? Provide documentation:
N/A

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V. SUBMITTAL REQUIREMENTS

1. Supplemental and Operation & Maintenance Forms - One applicable City of Wilmington Stormwater BMP supplement form and checklist must be submitted for **each** BMP specified for this project. One applicable proposed operation and maintenance (O&M) form must be submitted for **each type** of stormwater BMP. Once approved, the operation and maintenance forms must be referenced on the final plat and recorded with the register of deeds office.

2. Deed Restrictions and Restrictive Covenants - For all subdivisions, outparcels, and future development, the appropriate property restrictions and protective covenants are required to be recorded prior to the sale of any lot. Due to variability in lot sizes or the proposed BUA allocations, a table listing each lot number, lot size, and the allowable built-upon area must be provided as an attachment to the completed and notarized deed restriction form. The appropriate deed restrictions and protective covenants forms can be downloaded at the link listed in section V (3). Download the latest versions for each submittal.

   In instances where the applicant is different than the property owner, it is the responsibility of the property owner to sign the deed restrictions and protective covenants form while the applicant is responsible for ensuring that the deed restrictions are recorded.

   By the notarized signature(s) below, the permit holder(s) certify that the recorded property restrictions and protective covenants for this project, if required, shall include all the items required in the permit and listed on the forms available on the website, that the covenants will be binding on all parties and persons claiming under them, that they will run with the land, that the required covenants cannot be changed or deleted without concurrence from the City of Wilmington, and that they will be recorded prior to the sale of any lot.

3. Only complete application packages will be accepted and reviewed by the City. A complete package includes all of the items listed on the City Engineering Plan Review Checklist, including the fee. Copies of the Engineering Plan Review Checklist, all Forms, Deed Restrictions as well as detailed instructions on how to complete this application form may be downloaded from:

   http://www.wilmingtonnc.gov/PublicServices/Engineering/PlanReview/StormwaterPermits.aspx

   The complete application package should be submitted to the following address:

   City of Wilmington – Engineering
   Plan Review Section
   414 Chestnut Street, Suite 200
   Wilmington, NC 28402

CITY OF WILMINGTON ENGINEERING

VI. CONSULTANT INFORMATION AND AUTHORIZATION

1. Applicant: Complete this section if you wish to designate authority to another individual and/or firm (such as a consulting engineer and /or firm) so that they may provide information on your behalf for this project (such as addressing requests for additional information).

   Consulting Engineer: Rob Balland, PE

   Consulting Firm: Paramounte Engineering, Inc.

   a. Contact information for consultant listed above:

   Mailing Address: 122 Cinema Drive

   City: Wilmington State: NC Zip: 28403

   Phone: 910-791-6707 Fax: 910-791-6760 Email: rballand@paramounte-eng.com

VII. PROPERTY OWNER AUTHORIZATION (If Section III(2) has been filled out, complete this section)

I, (*print or type name of person listed in Contact Information, item 2*)_____, certify that I own the property identified in this permit application, and thus give permission to (*print or type name of person listed in Contact Information, item 1*)_____ with (*print or type name of organization listed in Contact Information, item 1*) _____ to develop the project as currently proposed. A copy of the lease agreement or pending property sales contract has been provided with the submittal, which indicates the party responsible for the operation and maintenance of the stormwater system.

As the legal property owner I acknowledge, understand, and agree by my signature below, that if my designated agent (*entity listed in Contact Information, item 1*) dissolves their company and/or cancels or defaults on their lease agreement, or pending sale, responsibility for compliance with the City of Wilmington Stormwater Permit reverts back to me, the property owner. As the property owner, it is my responsibility to notify the City of Wilmington immediately and submit a completed Name/Ownership Change Form within 30 days; otherwise I will be operating a stormwater treatment facility without a valid permit. I understand that the operation of a stormwater treatment facility without a valid permit is a violation of the City of Wilmington Municipal Code of Ordinances and may result in appropriate enforcement including the assessment of civil penalties.

Signature: _____ Date:_____

SEAL

I, _____, a Notary Public for the State of _____, County of _____, do hereby certify that _____ personally appeared before me this day of _____, _____, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

_____

My commission expires: _____

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VIII. APPLICANT'S CERTIFICATION

I, *(print or type name of person listed in Contact Information, item 1)* , Leanne Lawrence, AIA - Director, Facility Planning & Construction certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans, that the required deed restrictions and protective covenants will be recorded, and that the proposed project complies with the requirements of the applicable stormwater rules under.

Signature: Leanne Lawrence Date: 11.22.16

SEAL

CRYSTAL M BUIE NOTARY PUBLIC NEW HANOVER COUNTY, NC

I, Crystal M Buie, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Leanne Lawrence personally appeared before me this day of November 22, 2016, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

Crystal M Buie

My commission expires: 5/18/2019

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Permit No._____
(to be provided by DWQ)

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

WET DETENTION BASIN SUPPLEMENT

This form must be filled out, printed and submitted.
The Required Items Checklist (Part III) must be printed, filled out and submitted along with all of the required information.

I. PROJECT INFORMATION

Project name	College Park Elementary School
Contact person	Robert Balland, PE
Phone number	910-791-6707
Date	11/22/2016
Drainage area number	1

II. DESIGN INFORMATION

Site Characteristics

Drainage area	158,558	ft^2	
Impervious area, post-development	62,202	ft^2	
% impervious	39.23	%	
Design rainfall depth	1.5	in	

Storage Volume: Non-SA Waters

Minimum volume required	7,990	ft^3	OK
Volume provided	21,550	ft^3	OK, volume provided is equal to or in excess of volume required.

Storage Volume: SA Waters

1.5" runoff volume		ft^3
Pre-development 1-yr, 24-hr runoff		ft^3
Post-development 1-yr, 24-hr runoff		ft^3
Minimum volume required		ft^3
Volume provided		ft^3

Peak Flow Calculations

Is the pre/post control of the 1yr 24hr storm peak flow required?	N	(Y or N)
1-yr, 24-hr rainfall depth		in
Rational C, pre-development		(unitless)
Rational C, post-development		(unitless)
Rainfall intensity: 1-yr, 24-hr storm		in/hr
Pre-development 1-yr, 24-hr peak flow		ft^3/sec
Post-development 1-yr, 24-hr peak flow		ft^3/sec
Pre/Post 1-yr, 24-hr peak flow control		ft^3/sec

Elevations

Temporary pool elevation	39.25	fmsl	
Permanent pool elevation	37.50	fmsl	
SHWT elevation (approx. at the perm. pool elevation)	36.45	fmsl	
Top of 10ft vegetated shelf elevation	37.50	fmsl	
Bottom of 10ft vegetated shelf elevation	36.50	fmsl	
Sediment cleanout, top elevation (bottom of pond)	30.00	fmsl	
Sediment cleanout, bottom elevation	29.00	fmsl	
Sediment storage provided	1.00	ft	
Is there additional volume stored above the state-required temp. pool?	Y	(Y or N)	
Elevation of the top of the additional volume	39.3	fmsl	OK

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Permit No._____
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II. DESIGN INFORMATION

Surface Areas			
Area, temporary pool	13,442	ft^2	
Area REQUIRED, permanent pool	5,452	ft^2	
SA/DA ratio	3.44	(unitless)	
Area PROVIDED, permanent pool, A_{perm_pool}	8,548	ft^2	OK
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	6,030	ft^2	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	750	ft^2	
Volumes			
Volume, temporary pool	21,550	ft^3	OK
Volume, permanent pool, V_{perm_pool}	26,019	ft^3	
Volume, forebay (sum of forebays if more than one forebay)	5,044	ft^3	
Forebay % of permanent pool volume	19.4%	%	OK
SA/DA Table Data			
Design TSS removal	90	%	
Coastal SA/DA Table Used?	Y	(Y or N)	
Mountain/Piedmont SA/DA Table Used?	N	(Y or N)	
SA/DA ratio	3.44	(unitless)	
Average depth (used in SA/DA table):	4		
Calculation option 1 used? (See Figure 10-2b)	N	(Y or N)	
Volume, permanent pool, V_{perm_pool}	26,019	ft^3	
Area provided, permanent pool, A_{perm_pool}	8,548	ft^2	
Average depth calculated		ft	Need 3 ft min.
Average depth used in SA/DA, d_{av}, (Round to nearest 0.5ft)		ft	
Calculation option 2 used? (See Figure 10-2b)	Y	(Y or N)	
Area provided, permanent pool, A_{perm_pool}	8,548	ft^2	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	6,030	ft^2	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	750	ft^2	
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	6.50	ft	
Average depth calculated	4.10	ft	OK
Average depth used in SA/DA, d_{av}, (Round to nearest 0.5ft)	4.0	ft	OK
Drawdown Calculations			
Drawdown through orifice?	Y	(Y or N)	
Diameter of orifice (if circular)	1.75	in	
Area of orifice (if-non-circular)		in^2	
Coefficient of discharge (C_D)	0.60	(unitless)	
Driving head (H_o)	0.58	ft	
Drawdown through weir?	N	(Y or N)	
Weir type		(unitless)	
Coefficient of discharge (C_w)		(unitless)	
Length of weir (L)		ft	
Driving head (H)		ft	
Pre-development 1-yr, 24-hr peak flow		ft^3/sec	
Post-development 1-yr, 24-hr peak flow		ft^3/sec	
Storage volume discharge rate (through discharge orifice or weir)	0.06	ft^3/sec	Storage volume discharge rate greater than pre-dev. 1yr24hr.
Storage volume drawdown time	4.02	days	OK, draws down in 2-5 days.
Additional Information			
Vegetated side slopes	3	:1	OK
Vegetated shelf slope	6	:1	Insufficient shelf slope.
Vegetated shelf width	6.0	ft	Insufficient shelf length.
Length of flowpath to width ratio	3	:1	OK
Length to width ratio	1.8	:1	OK
Trash rack for overflow & orifice?	Y	(Y or N)	OK
Freeboard provided	1.0	ft	OK
Vegetated filter provided?	N	(Y or N)	OK
Recorded drainage easement provided?	N	(Y or N)	Insufficient. Recorded drainage easement required.

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Permit No._____
(to be provided by DWQ)

II. DESIGN INFORMATION	
Capures all runoff at ultimate build-out?	Y (Y or N) OK
Drain mechanism for maintenance or emergencies is:	Pump

Permit No._____
(to be provided by DWQ)

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

WET DETENTION BASIN SUPPLEMENT

This form must be filled out, printed and submitted.
The Required Items Checklist (Part III) must be printed, filled out and submitted along with all of the required information.

I. PROJECT INFORMATION

Project name	College Park Elementary School
Contact person	Robert Balland, PE
Phone number	910-791-6707
Date	11/22/2016
Drainage area number	2

II. DESIGN INFORMATION

Site Characteristics

Drainage area	514,463	ft^2	
Impervious area, post-development	177,378	ft^2	
% impervious	34.48	%	
Design rainfall depth	1.5	in	

Storage Volume: Non-SA Waters

Minimum volume required	23,171	ft^3	OK
Volume provided	86,162	ft^3	OK, volume provided is equal to or in excess of volume required.

Storage Volume: SA Waters

1.5" runoff volume		ft^3
Pre-development 1-yr, 24-hr runoff		ft^3
Post-development 1-yr, 24-hr runoff		ft^3
Minimum volume required		ft^3
Volume provided		ft^3

Peak Flow Calculations

Is the pre/post control of the 1yr 24hr storm peak flow required?	N	(Y or N)
1-yr, 24-hr rainfall depth		in
Rational C, pre-development		(unitless)
Rational C, post-development		(unitless)
Rainfall intensity: 1-yr, 24-hr storm		in/hr
Pre-development 1-yr, 24-hr peak flow		ft^3/sec
Post-development 1-yr, 24-hr peak flow		ft^3/sec
Pre/Post 1-yr, 24-hr peak flow control		ft^3/sec

Elevations

Temporary pool elevation	34.50	fmsl	
Permanent pool elevation	32.60	fmsl	
SHWT elevation (approx. at the perm. pool elevation)	30.60	fmsl	
Top of 10ft vegetated shelf elevation	32.60	fmsl	
Bottom of 10ft vegetated shelf elevation	31.60	fmsl	
Sediment cleanout, top elevation (bottom of pond)	27.00	fmsl	
Sediment cleanout, bottom elevation	20.00	fmsl	
Sediment storage provided	7.00	ft	
Is there additional volume stored above the state-required temp. pool?	Y	(Y or N)	
Elevation of the top of the additional volume	34.5	fmsl	OK

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Permit No._____
(to be provided by DWQ)

II. DESIGN INFORMATION

Surface Areas			
Area, temporary pool	48,758	ft^2	
Area REQUIRED, permanent pool	17,749	ft^2	
SA/DA ratio	3.45	(unitless)	
Area PROVIDED, permanent pool, A_{perm_pool}	25,840	ft^2	OK
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	20,767	ft^2	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	9,040	ft^2	
Volumes			
Volume, temporary pool	86,162	ft^3	OK
Volume, permanent pool, V_{perm_pool}	95,875	ft^3	
Volume, forebay (sum of forebays if more than one forebay)	18,380	ft^3	
Forebay % of permanent pool volume	19.2%	%	OK
SA/DA Table Data			
Design TSS removal	90	%	
Coastal SA/DA Table Used?	Y	(Y or N)	
Mountain/Piedmont SA/DA Table Used?	N	(Y or N)	
SA/DA ratio	3.45	(unitless)	
Average depth (used in SA/DA table):			
Calculation option 1 used? (See Figure 10-2b)	N	(Y or N)	
Volume, permanent pool, V_{perm_pool}	95,875	ft^3	
Area provided, permanent pool, A_{perm_pool}	25,840	ft^2	
Average depth calculated		ft	Need 3 ft min.
Average depth used in SA/DA, d_{av}, (Round to nearest 0.5ft)		ft	
Calculation option 2 used? (See Figure 10-2b)	Y	(Y or N)	
Area provided, permanent pool, A_{perm_pool}	25,840	ft^2	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	20,767	ft^2	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	9,040	ft^2	
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	4.60	ft	
Average depth calculated	3.80	ft	OK
Average depth used in SA/DA, d_{av}, (Round to nearest 0.5ft)	3.5	ft	Insufficient. Check calculation.
Drawdown Calculations			
Drawdown through orifice?	Y	(Y or N)	
Diameter of orifice (if circular)	3.25	in	
Area of orifice (if-non-circular)		in^2	
Coefficient of discharge (C_D)	0.60	(unitless)	
Driving head (H_o)	0.63	ft	
Drawdown through weir?	N	(Y or N)	
Weir type		(unitless)	
Coefficient of discharge (C_w)		(unitless)	
Length of weir (L)		ft	
Driving head (H)		ft	
Pre-development 1-yr, 24-hr peak flow		ft^3/sec	
Post-development 1-yr, 24-hr peak flow		ft^3/sec	
Storage volume discharge rate (through discharge orifice or weir)	0.22	ft^3/sec	Storage volume discharge rate greater than pre-dev. 1yr24hr.
Storage volume drawdown time	4.45	days	OK, draws down in 2-5 days.
Additional Information			
Vegetated side slopes	3	:1	OK
Vegetated shelf slope	6	:1	Insufficient shelf slope.
Vegetated shelf width	6.0	ft	Insufficient shelf length.
Length of flowpath to width ratio	3	:1	OK
Length to width ratio	2.4	:1	OK
Trash rack for overflow & orifice?	Y	(Y or N)	OK
Freeboard provided	1.2	ft	OK
Vegetated filter provided?	N	(Y or N)	OK
Recorded drainage easement provided?	N	(Y or N)	Insufficient. Recorded drainage easement required.
Capures all runoff at ultimate build-out?	Y	(Y or N)	OK
Drain mechanism for maintenance or emergencies is:	Pump		

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #:_____

Wet Detention Basin Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

The wet detention basin system is defined as the wet detention basin, pretreatment including forebays and the vegetated filter if one is provided.

This system (*check one*):
☐ **does** ☒ **does not** **incorporate a vegetated filter at the outlet.**

This system (*check one*):
☐ **does** ☒ **does not** **incorporate pretreatment other than a forebay.**

Important maintenance procedures:

- Immediately after the wet detention basin is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).
- No portion of the wet detention pond should be fertilized after the first initial fertilization that is required to establish the plants on the vegetated shelf.
- Stable groundcover should be maintained in the drainage area to reduce the sediment load to the wet detention basin.
- If the basin must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain should be minimized to the maximum extent practical.
- Once a year, a dam safety expert should inspect the embankment.

After the wet detention pond is established, it should be inspected **once a month and within 24 hours after every storm event greater than 1.5 inches**. Records of operation and maintenance should be kept in a known set location and must be available upon request.Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The side slopes of the wet detention basin	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #:_____

BMP element:	Potential problem:	How I will remediate the problem:
The inlet device: pipe or swale	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
The forebay	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The vegetated shelf	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices
	The plant community and coverage is significantly (>25%) different from approved landscape plan.	Restore plant vegetation to approved condition. If landscape plan needs to be adjusted to specify vegetation more appropriate for site conditions, contact City Stormwater or Engineering Staff.
	Cattails or other invasive plants cover >25% of the veg't shelf. A monculture of plants must be avoided)	Remove all invasives by physical removal or by wiping them with pesticide (do not spray) – consult a professional.
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
The main treatment area	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #:_____

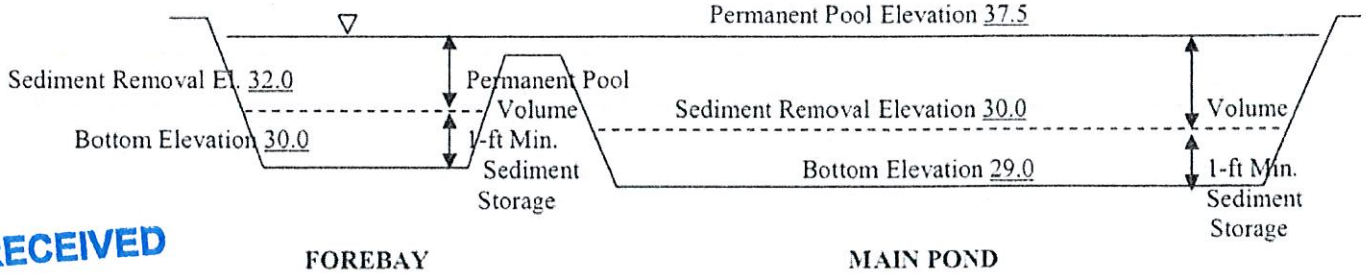
BMP element:	Potential problem:	How I will remediate the problem:
The main treatment area (continued)	Algal growth covers over 25% of the area.	Consult a professional to remove and control the algal growth.
	Cattails or other invasive plants cover >25% of the veg't shelf. A monculture of plants must be avoided)	Remove all invasives by physical removal or by wiping them with pesticide (do not spray) - consult a professional.
The embankment	Shrubs have started to grow on the embankment.	Remove shrubs immediately.
	Evidence of muskrat or beaver activity is present.	Use traps to remove muskrats and consult a professional to remove beavers.
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair. (if applicable)	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the local NC Division of Water Quality Regional Office, or the 401 Oversight Unit at 919-733-1786.

The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

When the permanent pool depth reads _7.5_ feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads _5.5_ feet in the forebay, the sediment shall be removed.

BASIN DIAGRAM
(fill in the blanks)



Permit Number:_____
(to be provided by City of Wilmington)

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed above. I agree to notify the City of Wilmington of any problems with the system or prior to any changes to the system or responsible party.

Project name:College Park Elementary School

BMP drainage basin number:1

Print name:Leanne N. Lawrence

Title:Director, Facility Planning & Construction

Address:6410 Carolina Beach Road, Wilmington, NC 28412

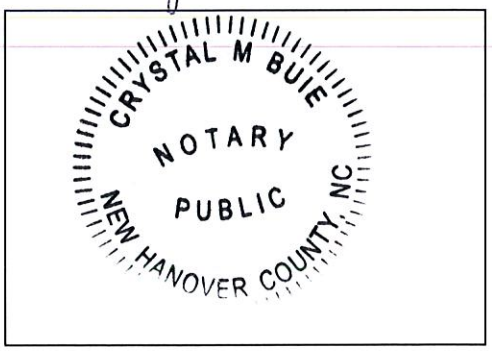
Phone:910-254-4281

Signature: Lee N Lo

Date: 11.22.16

Note: The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.

I, Crystal M Buie, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Leanne Lawrence personally appeared before me this 22 day of November, 2016, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal, Crystal M Buie



SEAL

My commission expires 5/18/2019

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #:_____

Wet Detention Basin Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

The wet detention basin system is defined as the wet detention basin, pretreatment including forebays and the vegetated filter if one is provided.

This system (*check one*):
☐ **does** ☒ **does not** **incorporate a vegetated filter at the outlet.**

This system (*check one*):
☐ **does** ☒ **does not** **incorporate pretreatment other than a forebay.**

Important maintenance procedures:

- Immediately after the wet detention basin is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).
- No portion of the wet detention pond should be fertilized after the first initial fertilization that is required to establish the plants on the vegetated shelf.
- Stable groundcover should be maintained in the drainage area to reduce the sediment load to the wet detention basin.
- If the basin must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain should be minimized to the maximum extent practical.
- Once a year, a dam safety expert should inspect the embankment.

After the wet detention pond is established, it should be inspected **once a month and within 24 hours after every storm event greater than 1.5 inches**. Records of operation and maintenance should be kept in a known set location and must be available upon request.Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The side slopes of the wet detention basin	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #:_____

BMP element:	Potential problem:	How I will remediate the problem:
The inlet device: pipe or swale	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
The forebay	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The vegetated shelf	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices
	The plant community and coverage is significantly (>25%) different from approved landscape plan.	Restore plant vegetation to approved condition. If landscape plan needs to be adjusted to specify vegetation more appropriate for site conditions, contact City Stormwater or Engineering Staff.
	Cattails or other invasive plants cover >25% of the veg't shelf. A monculture of plants must be avoided)	Remove all invasives by physical removal or by wiping them with pesticide (do not spray) - consult a professional.
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
The main treatment area	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #:_____

BMP element:	Potential problem:	How I will remediate the problem:
The main treatment area (continued)	Algal growth covers over 25% of the area.	Consult a professional to remove and control the algal growth.
	Cattails or other invasive plants cover >25% of the veg't shelf. A monculture of plants must be avoided)	Remove all invasives by physical removal or by wiping them with pesticide (do not spray) – consult a professional.
The embankment	Shrubs have started to grow on the embankment.	Remove shrubs immediately.
	Evidence of muskrat or beaver activity is present.	Use traps to remove muskrats and consult a professional to remove beavers.
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair. (if applicable)	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the local NC Division of Water Quality Regional Office, or the 401 Oversight Unit at 919-733-1786.

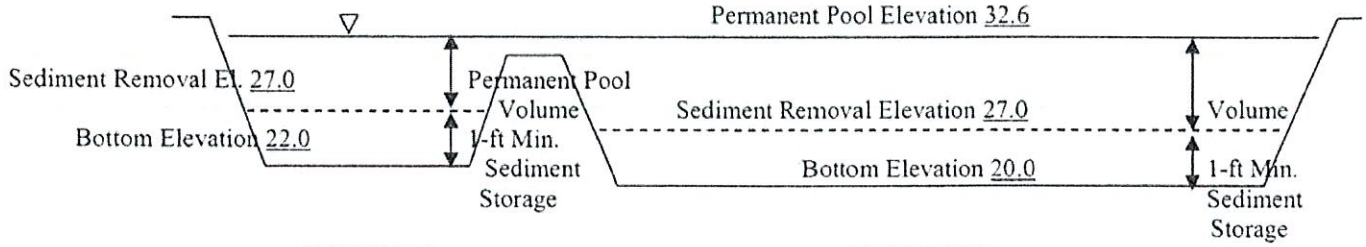
The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

When the permanent pool depth reads _11.6_ feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads _6.6_ feet in the forebay, the sediment shall be removed.

BASIN DIAGRAM

(fill in the blanks)



Permit Number:_____
(to be provided by City of Wilmington)

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed above. I agree to notify the City of Wilmington of any problems with the system or prior to any changes to the system or responsible party.

Project name:College Park Elementary School

BMP drainage basin number:2

Print name:Leanne N. Lawrence

Title:Director, Facility Planning & Construction

Address:6410 Carolina Beach Road, Wilmington, NC 28412

Phone:910-254-4281

Signature: Lee N Le

Date: 11.22.16

Note: The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.

I, Crystal M Buie, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Leanne Lawrence personally appeared before me this 22nd day of November, 2016, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal, Crystal M Buie

CRYSTAL M BUIE NOTARY PUBLIC NEW HANOVER CO NC

SEAL

My commission expires 5/18/2019

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #:_____

Infiltration Basin Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

Important maintenance procedures:

- The drainage area will be carefully managed to reduce the sediment load to the infiltration basin.
- Immediately after the infiltration basin is established, the vegetation will be watered twice weekly if needed until the plants become established (commonly six weeks).
- No portion of the infiltration basin will be fertilized after the initial fertilization that is required to establish the vegetation.
- The vegetation in and around the basin will be maintained at a height of approximately six inches.

After the infiltration basin is established, it will be inspected **once a quarter and within 24 hours after every storm event greater than 1.5 inches.** Records of operation and maintenance will be kept in a known set location and will be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the infiltration basin	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
The inlet device: pipe or swale	The pipe is clogged (if applicable).	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged (if applicable).	Replace the pipe.
	Erosion is occurring in the swale (if applicable).	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.

BMP element:	Potential problem:	How I will remediate the problem:
The forebay	Sediment has accumulated and reduced the depth to 75% of the original design depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred or riprap is displaced.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticides are used, wipe them on the plants rather than spraying.
The main treatment area	A visible layer of sediment has accumulated.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP. Replace any media that was removed in the process. Revegetate disturbed areas immediately.
	Water is standing more than 5 days after a storm event.	Replace the top few inches of filter media and see if this corrects the standing water problem. If so, revegetate immediately. If not, consult an appropriate professional for a more extensive repair.
	Weeds and noxious plants are growing in the main treatment area.	Remove the plants by hand or by wiping them with pesticide (do not spray).
The embankment	Shrubs or trees have started to grow on the embankment.	Remove shrubs or trees immediately.
	An annual inspection by an appropriate professional shows that the embankment needs repair.	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786.

Permit Number:_____
(to be provided by City of Wilmington)

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed above. I agree to notify the City of Wilmington of any problems with the system or prior to any changes to the system or responsible party.

Project name:College Park Elementary

School

BMP drainage basin number:1

Print name:Leanne N. Lawrence

Title:Director, Facility Planning & Construction

Address:6410 Carolina Beach Road, Wilmington, NC 28412

Phone:910-254-4281

Signature: Leanne N Lawrence

Date: 11.22.16

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I, Crystal M Buie, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Leanne Lawrence personally appeared before me this 22nd day of November, 2016, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements. Witness my hand and official seal,

Crystal M Buie

CRYSTAL M BUIE NOTARY PUBLIC NEW HANOVER COUNTY, NC

SEAL

My commission expires 5/18/2019

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #:_____

Infiltration Basin Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

Important maintenance procedures:

- The drainage area will be carefully managed to reduce the sediment load to the infiltration basin.
- Immediately after the infiltration basin is established, the vegetation will be watered twice weekly if needed until the plants become established (commonly six weeks).
- No portion of the infiltration basin will be fertilized after the initial fertilization that is required to establish the vegetation.
- The vegetation in and around the basin will be maintained at a height of approximately six inches.

After the infiltration basin is established, it will be inspected **once a quarter and within 24 hours after every storm event greater than 1.5 inches**. Records of operation and maintenance will be kept in a known set location and will be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the infiltration basin	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
The inlet device: pipe or swale	The pipe is clogged (if applicable).	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged (if applicable).	Replace the pipe.
	Erosion is occurring in the swale (if applicable).	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.

BMP element:	Potential problem:	How I will remediate the problem:
The forebay	Sediment has accumulated and reduced the depth to 75% of the original design depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred or riprap is displaced.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticides are used, wipe them on the plants rather than spraying.
The main treatment area	A visible layer of sediment has accumulated.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP. Replace any media that was removed in the process. Revegetate disturbed areas immediately.
	Water is standing more than 5 days after a storm event.	Replace the top few inches of filter media and see if this corrects the standing water problem. If so, revegetate immediately. If not, consult an appropriate professional for a more extensive repair.
	Weeds and noxious plants are growing in the main treatment area.	Remove the plants by hand or by wiping them with pesticide (do not spray).
The embankment	Shrubs or trees have started to grow on the embankment.	Remove shrubs or trees immediately.
	An annual inspection by an appropriate professional shows that the embankment needs repair.	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786.

Permit Number:_____
(to be provided by City of Wilmington)

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Project name:College Park Elementary

School_____

BMP drainage basin number:2

Print name:Leanne N. Lawrence

Title:Director, Facility Planning & Construction

Address:6410 Carolina Beach Road, Wilmington, NC 28412

Phone:910-254-4281

Signature: Leanne Lawrence

Date: 11.22.16

Note: The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.

I, Crystal M Buie, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Leanne Lawrence personally appeared before me this 22nd day of November, 2016, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements. Witness my hand and official seal,

Crystal M Buie

CRYSTAL M BUIE NOTARY PUBLIC NEW HANOVER COUNTY, NC

SEAL

My commission expires 5/18/2019