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

September 10, 2018

Mr. Keith Walker, Manager
Cypress Cove of Wilmington, LLC
1810 Professional Park Drive
Beaufort, NC 28516

Subject: **Stormwater Management Permit No. 2017043R1**
Cypress Cove Apartments
High Density Development

Dear Mr. Walker:

The City of Wilmington Engineering Division has received a request for a revision to the Stormwater Management Permit for Cypress Cove Apartments. 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:

- Grading changes in several locations
- Removal of the traffic calming device in the Emory Street right-of-way
- Reconfiguration of ADA spaces
- See approved plans, dated August 23, 2018.

Please be aware all terms and conditions of the permit Issued on October 10, 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: Jimmy Fentress, PE, Stroud Engineering, P.A.
Eryn Futral, Associate Planner, City of Wilmington

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*unless noted otherwise

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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.):

   Cypress Cove Apartments

2. Location of Project (street address):

   821 Emory Street

   City: Wilmington County: New Hanover Zip: 28405

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

   Travel north on N. 30th Street from Princess Place Drive, Turn left onto Emory Street. Entrance is approximately 1,100 LF on the left.

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: 0.0792 acres]
   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:

   NWP 29 & SAW 2017-00597 See attached

CITY OF WILMINGTON ENGINEERING

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: Cypress Cove of Wilmington, LLC

   Signing Official & Title: Keith Walker, Manager

   a. Contact information for Applicant / Signing Official:

   Street Address: 1810 Professional Park Drive

   City: Beaufort State: NC Zip: 28516

   Phone: 252-422-3996 Fax: _____ Email: kwalker@eccdi.com

   Mailing Address (if different than physical address): _____

   City: _____ State: _____ Zip: _____

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

   - [x] 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 will be collected with a storm drain network and discharge into wet detention basins

2. Total Property Area: 643,816.80 square feet
3. Total Coastal Wetlands Area: 0 square feet
4. Total Surface Water Area: 25,265 square feet
5. Total Property Area (2) – Total Coastal Wetlands Area (3) – Total Surface Water Area (4) = Total Project Area: 618,551.80 square feet.
6. Existing Impervious Surface within Property Area: 0 square feet
7. Existing Impervious Surface to be Removed/Demolished: 0 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	93,438.99 SF
Impervious Pavement	140,150.20 SF
Pervious Pavement (adj. total, with % credit applied)	0
Impervious Sidewalks	41,253.42 SF
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe) Curb & Gutter, Dump. Pad, Amenities	7,220.97 SF
Future Development	0
Total Onsite Newly Constructed Impervious Surface	282,063.58SF

10. Total Onsite Impervious Surface
    (Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) = 282,063.58 square feet
11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 45.60 %

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

Impervious Pavement	6,667.71
Pervious Pavement (adj. total, with % credit applied)	
Impervious Sidewalks	
Pervious Sidewalks (adj. total, with % credit applied)	
Other (describe)	
Total Offsite Newly Constructed Impervious Surface	6,667.71

13. Total Newly Constructed Impervious Surface
(Total Onsite + Offsite Newly Constructed Impervious Surface) = 288,731.29 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	BMP #1	BMP #2	BMP #3	BMI
Receiving Stream Name	Smith Creek	Smith Creek	Smith Creek	Smith Creek
Receiving Stream Index Number	18-74-63	18-74-63	18-74-63	18-74-63
Stream Classification	C;Sw	C;Sw	C;Sw	C;Sw
Total Drainage Area (sf)	205,405.56	56,292.89	158,725.35	126,949.13
On-Site Drainage Area (sf)	200,952.89	56,292.89	124,444.01	124,587.19
Off-Site Drainage Area (sf)	4,452.67	0	34,281.34	2,361.94
Total Impervious Area (sf)	117,234.31	31,795.79	73,822.42	70,103.61
Buildings/Lots (sf)	45,246.94	8,685.63	23,187.78	16,318.64
Impervious Pavement (sf)	54,068.08	17,356.31	34,297.66	41,095.83
Pervious Pavement (sf)	0	0	0	0
Impervious Sidewalks (sf)	16,136.54	4,601.05	10,223.03	10,292.80
Pervious Sidewalks (sf)	0	0	0	0
Other (sf)	1,782.75	1,152.80	1,889.08	2,396.34
Future Development (sf)	0	0	0	0
Existing Impervious to remain (sf)	0	0	0	0
Offsite (sf)	0	0	4,224.87	0
Percent Impervious Area (%)	57.07	56.48	46.51	55.22

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

Survey provided by Michael Underwood, PLS of existing building and CAD were used to determined areas

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
   212 Operations Center Dr
   Wilmington, NC 28412

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: Charles M. Cullipher, P.E.

   Consulting Firm: Stroud Engineering, P.A.

   a. Contact information for consultant listed above:

   Mailing Address: 151-A NC HWY 24

   City: Morehead City State: NC Zip: 28557

   Phone: 252-247-7479 Fax: 252-247-4098 Email: ccullipher@stroudengineer.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.

SEAL

Signature: _____

_____Date:_____

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,

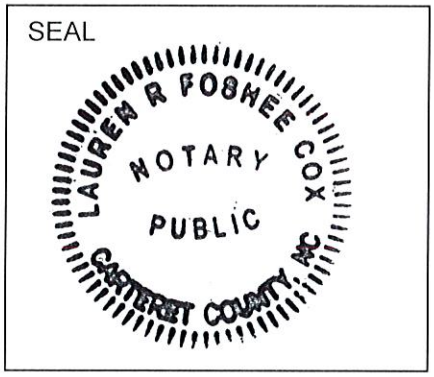
_____

My commission expires: _____

VIII. APPLICANT'S CERTIFICATION

I, *(print or type name of person listed in Contact Information, item 1)* , Keith Walker 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.

SEAL



Signature: _____

Date: 5-23-17

I, Lauren R. Foshee Cox, a Notary Public for the State of NC, County of Carteret, do hereby certify that Keith Walker personally appeared before me this day of May 23, 2017, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

Lauren R. Foshee Cox

My commission expires: 11/16/2019

Permit No._____
(to be provided by DWQ)

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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	Cypress Cove Apartments
Contact person	Chase Cullipher
Phone number	252-247-7479, ext 225
Date	9/6/2017
Drainage area number	Wet Detention Pond #1

II. DESIGN INFORMATION

Site Characteristics

Drainage area	205,406	ft^2	
Impervious area, post-development	117,234	ft^2	
% impervious	57.07	%	
Design rainfall depth	1.5	in	

Storage Volume: Non-SA Waters

Minimum volume required	14,473	ft^3	OK
Volume provided	14,482	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	18.85	fmsl	
Permanent pool elevation	17.50	fmsl	
SHWT elevation (approx. at the perm. pool elevation)	N/A	fmsl	
Top of 10ft vegetated shelf elevation	18.00	fmsl	
Bottom of 10ft vegetated shelf elevation	17.00	fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment cleanout, top elevation (bottom of pond)	11.00	fmsl	
Sediment cleanout, bottom elevation	10.00	fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment storage provided	1.00	ft	
Is there additional volume stored above the state-required temp. pool?	N	(Y or N)	
Elevation of the top of the additional volume		fmsl	

Permit No._____
(to be provided by DWQ)

II. DESIGN INFORMATION

Surface Areas				
Area, temporary pool	11,802	ft^2		
Area REQUIRED, permanent pool	6,922	ft^2		
SA/DA ratio	3.37	(unitless)		
Area PROVIDED, permanent pool, A_{perm_pool}	9,012	ft^2	OK	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	5,717	ft^2		
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	2,013	ft^2		
Volumes				
Volume, temporary pool	14,452	ft^3	Insufficient. Volume does not agree with data previously entered.	
Volume, permanent pool, V_{perm_pool}	25,739	ft^3		
Volume, forebay (sum of forebays if more than one forebay)	4,344	ft^3		
Forebay % of permanent pool volume	16.9%	%	Insufficient forebay volume.	
SA/DA Table Data				
Design TSS removal		%		
Coastal SA/DA Table Used?	Y	(Y or N)		
Mountain/Piedmont SA/DA Table Used?		(Y or N)		
SA/DA ratio	3.37	(unitless)		
Average depth (used in SA/DA table):				
Calculation option 1 used? (See Figure 10-2b)	Y	(Y or N)		
Volume, permanent pool, V_{perm_pool}	25,739	ft^3		
Area provided, permanent pool, A_{perm_pool}	9,012	ft^2		
Average depth calculated	3.80	ft	OK	
Average depth used in SA/DA, d_{av},	3.8	ft	OK	
Calculation option 2 used? (See Figure 10-2b)	N	(Y or N)		
Area provided, permanent pool, A_{perm_pool}	9,012	ft^2		
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	5,717	ft^2		
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	2,013	ft^2		
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	6.00	ft		
Average depth calculated	N/A	ft	OK	
Average depth used in SA/DA, d_{av}, (Round to nearest 0.5ft)	N/A	ft		#VALUE!
Drawdown Calculations				
Drawdown through orifice?	Y	(Y or N)		
Diameter of orifice (if circular)	1.50	in		
Area of orifice (if-non-circular)		in^2		
Coefficient of discharge (C_D)	0.60	(unitless)		
Driving head (H_o)	1.35	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)		ft^3/sec		
Storage volume drawdown time	4.20	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	N/A	:1	OK	
Length to width ratio	N/A	:1	OK	
Trash rack for overflow & orifice?	Y	(Y or N)	OK	
Freeboard provided	4.7	ft	OK	
Vegetated filter provided?	N/A	(Y or N)	OK	
Recorded drainage easement provided?	N/A	(Y or N)	OK	
Capures all runoff at ultimate build-out?	Y	(Y or N)	OK	
Drain mechanism for maintenance or emergencies is:	Sump Pump			

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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	Cypress Cove Apartments
Contact person	Chase Cullipher
Phone number	252-247-7479, ext 225
Date	9/6/2017
Drainage area number	Wet Detention Pond #2

II. DESIGN INFORMATION

Site Characteristics

Drainage area	56,293	ft^2	
Impervious area, post-development	31,796	ft^2	
% impervious	56.48	%	
Design rainfall depth	1.5	in	

Storage Volume: Non-SA Waters

Minimum volume required	3,929	ft^3	OK
Volume provided	4,067	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	18.34	fmsl	
Permanent pool elevation	17.50	fmsl	
SHWT elevation (approx. at the perm. pool elevation)	N/A	fmsl	
Top of 10ft vegetated shelf elevation	18.00	fmsl	
Bottom of 10ft vegetated shelf elevation	17.00	fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment cleanout, top elevation (bottom of pond)	11.00	fmsl	
Sediment cleanout, bottom elevation	10.00	fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment storage provided	1.00	ft	
Is there additional volume stored above the state-required temp. pool?	N	(Y or N)	
Elevation of the top of the additional volume		fmsl	

Permit No. _____
(to be provided by DWQ)

II. DESIGN INFORMATION

Surface Areas				
Area, temporary pool	5,426	ft^2		
Area REQUIRED, permanent pool	2,184	ft^2		
SA/DA ratio	3.88	(unitless)		
Area PROVIDED, permanent pool, A_{perm_pool}	3,976	ft^2	OK	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	2,418	ft^2		
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	556	ft^2		
Volumes				
Volume, temporary pool	4,067	ft^3	OK	
Volume, permanent pool, V_{perm_pool}	9,695	ft^3		
Volume, forebay (sum of forebays if more than one forebay)	1,918	ft^3		
Forebay % of permanent pool volume	19.8%	%	OK	
SA/DA Table Data				
Design TSS removal		%		
Coastal SA/DA Table Used?	Y	(Y or N)		
Mountain/Piedmont SA/DA Table Used?		(Y or N)		
SA/DA ratio	3.88	(unitless)		
Average depth (used in SA/DA table):				
Calculation option 1 used? (See Figure 10-2b)	Y	(Y or N)		
Volume, permanent pool, V_{perm_pool}	9,695	ft^3		
Area provided, permanent pool, A_{perm_pool}	3,976	ft^2		
Average depth calculated	3.88	ft	OK	
Average depth used in SA/DA, $d_{av.}$	3.88	ft	OK	
Calculation option 2 used? (See Figure 10-2b)	N	(Y or N)		
Area provided, permanent pool, A_{perm_pool}	3,976	ft^2		
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	2,418	ft^2		
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	556	ft^2		
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	6.00	ft		
Average depth calculated	N/A	ft	OK	
Average depth used in SA/DA, $d_{av.}$ (Round to nearest 0.5ft)	N/A	ft		#VALUE!
Drawdown Calculations				
Drawdown through orifice?	Y	(Y or N)		
Diameter of orifice (if circular)	1.00	in		
Area of orifice (if-non-circular)		in^2		
Coefficient of discharge (C_D)	0.60	(unitless)		
Driving head (H_c)	0.84	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)		ft^3/sec		
Storage volume drawdown time	3.30	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	N/A	:1	OK	
Length to width ratio	N/A	:1	OK	
Trash rack for overflow & orifice?	Y	(Y or N)	OK	
Freeboard provided	4.7	ft	OK	
Vegetated filter provided?	N/A	(Y or N)	OK	
Recorded drainage easement provided?	N/A	(Y or N)	OK	
Capures all runoff at ultimate build-out?	Y	(Y or N)	OK	
Drain mechanism for maintenance or emergencies is:	Sump Pump			

Permit No._____
(to be provided by DWQ)

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STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

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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	Cypress Cove Apartments
Contact person	Chase Cullipher
Phone number	252-247-7479, ext 225
Date	9/6/2017
Drainage area number	Wet Detention Pond #3

II. DESIGN INFORMATION

Site Characteristics

Drainage area	158,725	ft^2
Impervious area, post-development	73,822	ft^2
% impervious	46.51	%
Design rainfall depth	1.5	in

Storage Volume: Non-SA Waters

Minimum volume required	9,297	ft^3	1 Insufficient required volume.
Volume provided	9,363	ft^3	1 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 0

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	18.61	fmsl	
Permanent pool elevation	17.50	fmsl	
SHWT elevation (approx. at the perm. pool elevation)	N/A	fmsl	
Top of 10ft vegetated shelf elevation	18.00	fmsl	
Bottom of 10ft vegetated shelf elevation	17.00	fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment cleanout, top elevation (bottom of pond)	12.00	fmsl	
Sediment cleanout, bottom elevation	11.00	fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment storage provided	1.00	ft	
Is there additional volume stored above the state-required temp. pool?	N	(Y or N)	
Elevation of the top of the additional volume		fmsl	1

Permit No._____
(to be provided by DWQ)

II. DESIGN INFORMATION

Surface Areas				
Area, temporary pool	9,355	ft^2		
Area REQUIRED, permanent pool	5,111	ft^2		
SA/DA ratio	3.22	(unitless)		
Area PROVIDED, permanent pool, A_{perm_pool}	6,945	ft^2		OK
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	4,724	ft^2		
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	1,858	ft^2		
Volumes				
Volume, temporary pool	9,363	ft^3		OK
Volume, permanent pool, V_{perm_pool}	18,690	ft^3		
Volume, forebay (sum of forebays if more than one forebay)	2,808	ft^3		
Forebay % of permanent pool volume	15.0%	%		Insufficient forebay volume.
SA/DA Table Data				
Design TSS removal		%		
Coastal SA/DA Table Used?	Y	(Y or N)	1	
Mountain/Piedmont SA/DA Table Used?		(Y or N)	0	
SA/DA ratio	3.22	(unitless)		
Average depth (used in SA/DA table):				
Calculation option 1 used? (See Figure 10-2b)	Y	(Y or N)	1	
Volume, permanent pool, V_{perm_pool}	18,690	ft^3		
Area provided, permanent pool, A_{perm_pool}	6,945	ft^2		
Average depth calculated	3.22	ft		OK
Average depth used in SA/DA, d_{av}	3.22	ft		OK
Calculation option 2 used? (See Figure 10-2b)	N	(Y or N)	0	
Area provided, permanent pool, A_{perm_pool}	6,945	ft^2		
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	4,724	ft^2		
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	1,858	ft^2		
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	5.00	ft		
Average depth calculated	N/A	ft		OK
Average depth used in SA/DA, d_{av}, (Round to nearest 0.5ft)	N/A	ft		#VALUE!
Drawdown Calculations				
Drawdown through orifice?	Y	(Y or N)	1	
Diameter of orifice (if circular)	1.50	in	1	
Area of orifice (if-non-circular)		in^2	0	
Coefficient of discharge (C_D)	0.60	(unitless)		
Driving head (H_o)	1.11	ft		
Drawdown through weir?	N	(Y or N)	0	
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)		ft^3/sec		
Storage volume drawdown time	3.00	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	N/A	:1		OK
Length to width ratio	N/A	:1		OK
Trash rack for overflow & orifice?	Y	(Y or N)		OK
Freeboard provided	4.4	ft		OK
Vegetated filter provided?	N/A	(Y or N)		OK
Recorded drainage easement provided?	N/A	(Y or N)		OK
Capures all runoff at ultimate build-out?	Y	(Y or N)		OK
Drain mechanism for maintenance or emergencies is:	Sump Pump			

RECEIVED
SEP 7 2017
ENGINEERING

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	Cypress Cove Apartments
Contact person	Chase Cullipher
Phone number	252-247-7479, ext 225
Date	9/6/2017
Drainage area number	Wet Detention Pond #4

II. DESIGN INFORMATION

Site Characteristics

Drainage area	126,949	ft^2	
Impervious area, post-development	70,104	ft^2	
% impervious	55.22	%	
Design rainfall depth	1.5	in	

Storage Volume: Non-SA Waters

Minimum volume required	8,680	ft^3	OK
Volume provided	8,694	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	17.86	fmsl	
Permanent pool elevation	16.50	fmsl	
SHWT elevation (approx. at the perm. pool elevation)	N/A	fmsl	
Top of 10ft vegetated shelf elevation	17.00	fmsl	
Bottom of 10ft vegetated shelf elevation	16.00	fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment cleanout, top elevation (bottom of pond)	9.00	fmsl	
Sediment cleanout, bottom elevation	8.00	fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment storage provided	1.00	ft	
Is there additional volume stored above the state-required temp. pool?	N	(Y or N)	
Elevation of the top of the additional volume		fmsl	

Permit No. _____
(to be provided by DWQ)

II. DESIGN INFORMATION

Surface Areas				
Area, temporary pool	7,264	ft^2		
Area REQUIRED, permanent pool	4,570	ft^2		
SA/DA ratio	3.60	(unitless)		
Area PROVIDED, permanent pool, A_{perm_pool}	5,133	ft^2	OK	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	3,263	ft^2		
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	470	ft^2		
Volumes				
Volume, temporary pool	8,694	ft^3	OK	
Volume, permanent pool, V_{perm_pool}	14,002	ft^3		
Volume, forebay (sum of forebays if more than one forebay)	2,192	ft^3		
Forebay % of permanent pool volume	15.7%	%	Insufficient forebay volume.	
SA/DA Table Data				
Design TSS removal		%		
Coastal SA/DA Table Used?	Y	(Y or N)		
Mountain/Piedmont SA/DA Table Used?		(Y or N)		
SA/DA ratio	3.60	(unitless)		
Average depth (used in SA/DA table):				
Calculation option 1 used? (See Figure 10-2b)	Y	(Y or N)		
Volume, permanent pool, V_{perm_pool}	14,002	ft^3		
Area provided, permanent pool, A_{perm_pool}	5,133	ft^2		
Average depth calculated	3.60	ft	OK	
Average depth used in SA/DA, d_{av}	3.6	ft	OK	
Calculation option 2 used? (See Figure 10-2b)	N	(Y or N)		
Area provided, permanent pool, A_{perm_pool}	5,133	ft^2		
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	3,263	ft^2		
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	470	ft^2		
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	7.00	ft		
Average depth calculated	N/A	ft	OK	
Average depth used in SA/DA, d_{av}, (Round to nearest 0.5ft)	N/A	ft		#VALUE!
Drawdown Calculations				
Drawdown through orifice?	Y	(Y or N)		
Diameter of orifice (if circular)	1.25	in		
Area of orifice (if-non-circular)		in^2		
Coefficient of discharge (C_D)	0.60	(unitless)		
Driving head (H_o)	1.36	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)		ft^3/sec		
Storage volume drawdown time	3.60	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	N/A	:1	OK	
Length to width ratio	N/A	:1	OK	
Trash rack for overflow & orifice?	Y	(Y or N)	OK	
Freeboard provided	4.6	ft	OK	
Vegetated filter provided?	N/A	(Y or N)	OK	
Recorded drainage easement provided?	N/A	(Y or N)	OK	
Capures all runoff at ultimate build-out?	Y	(Y or N)	OK	
Drain mechanism for maintenance or emergencies is:	Sump Pump			

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #: 1

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 #: 1

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 #: 1

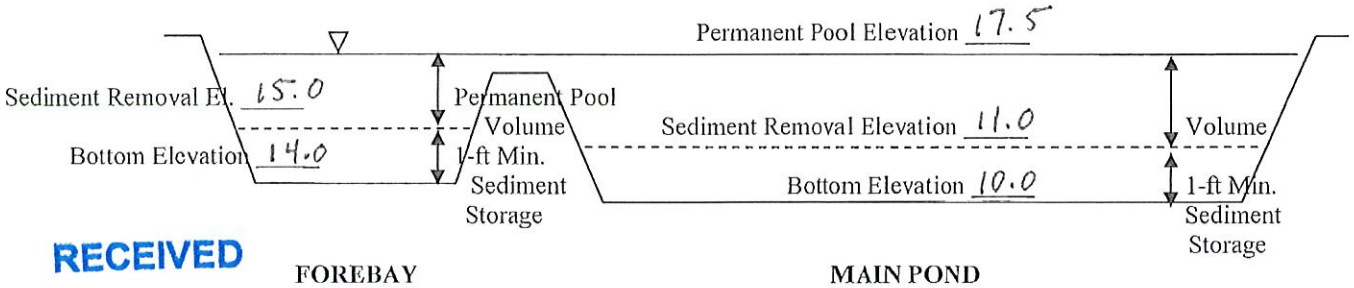
BMP element:	Potential problem:	How I will remediate the problem:
The main treatment area (continued)	Algal growth covers over 25% of the area.	Consult a professional to remove and control the algal growth.
	Cattails or other invasive plants cover >25% of the veg't shelf. A monculture of plants must 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 6.5 feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads 2.5 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:Cypress Cove Apartments

BMP drainage basin number:1

Print name:Keith Walker

Title:CEO & President

Address:108 Professional Park Dr. Beaufort, NC 28516

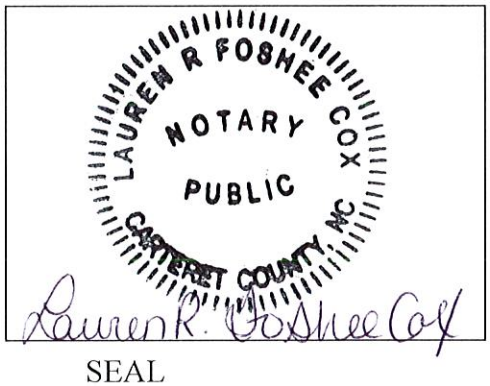
Phone:252-422-3996

Signature: K Walker

Date: 6/6/17

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, Lauren R. Foshee Cox, a Notary Public for the State of NC, County of Carteret, do hereby certify that Keith Walker personally appeared before me this 6 day of June, 2017, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,



SEAL

My commission expires 11/16/2019

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #: 2

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 #: 2

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 #: 2

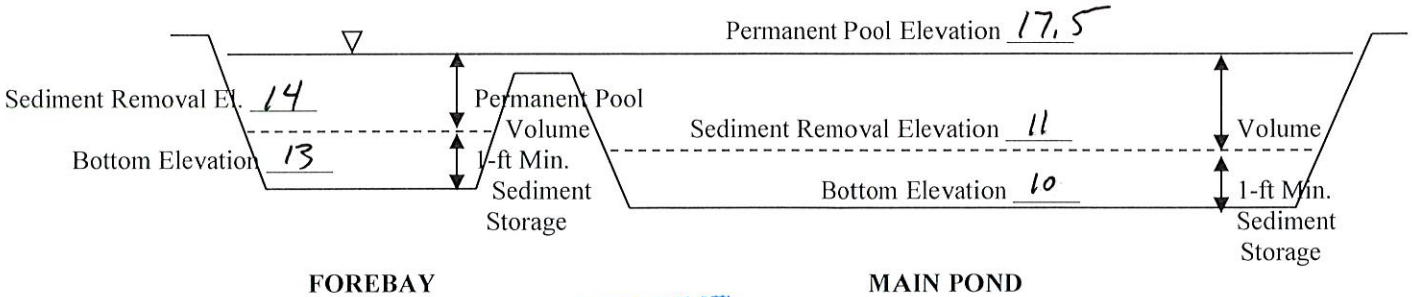
BMP element:	Potential problem:	How I will remediate the problem:
The main treatment area (continued)	Algal growth covers over 25% of the area.	Consult a professional to remove and control the algal growth.
	Cattails or other invasive plants cover >25% of the veg't shelf. A monculture of plants must 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 6.5 feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads 3.5 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:Cypress Cove Apartments

BMP drainage basin number:2

Print name:Keith Walker

Title:CEO & President

Address:108 Professional Park Dr. Beaufort, NC 28516

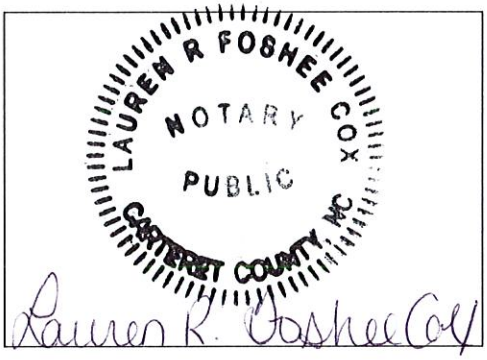
Phone:252-422-3996

Signature:

Date:6/6/17

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, Lauren R. FosheeCox, a Notary Public for the State of NC, County of Carteret, do hereby certify that Keith Walker personally appeared before me this 6 day of June, 2017, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,



SEAL

My commission expires 11/16/2019

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #: 3

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 #: 3

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 #: 3

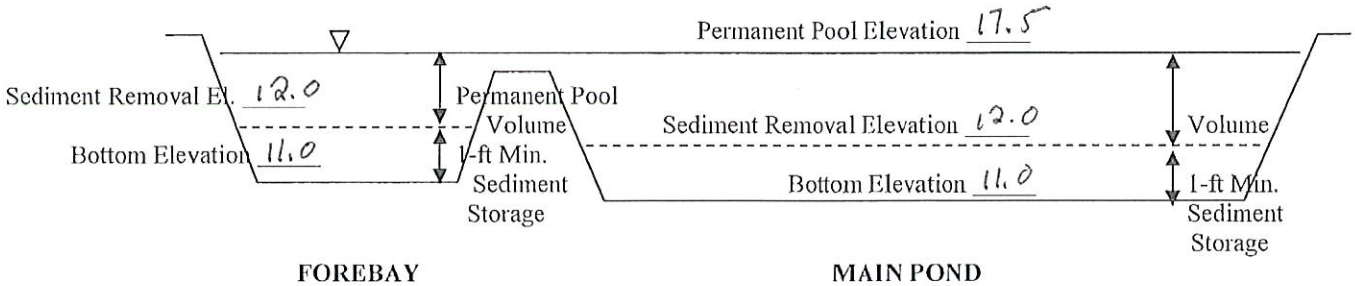
BMP element:	Potential problem:	How I will remediate the problem:
The main treatment area (continued)	Algal growth covers over 25% of the area.	Consult a professional to remove and control the algal growth.
	Cattails or other invasive plants cover >25% of the veg't shelf. A monculture of plants must 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 5.5 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:Cypress Cove Apartments

BMP drainage basin number:3

Print name:Keith Walker

Title:CEO & President

Address:108 Professional Park Dr. Beaufort, NC 28516

Phone:252-422-3996

Signature: K Walker

Date: 6/6/17

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, Lauren R. Foshee Cox, a Notary Public for the State of NC, County of Carteret, do hereby certify that Keith Walker personally appeared before me this 6 day of June, 2017, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,

LAUREN R FOSHEE COX NOTARY PUBLIC CARTERET COUNTY, NC

Lauren R. Foshee Cox

SEAL

My commission expires 11/16/2019

Permit Number:_____
(to be provided by City of Wilmington)
BMP Drainage Basin #: 4

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 #: 4

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 #: 4

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.
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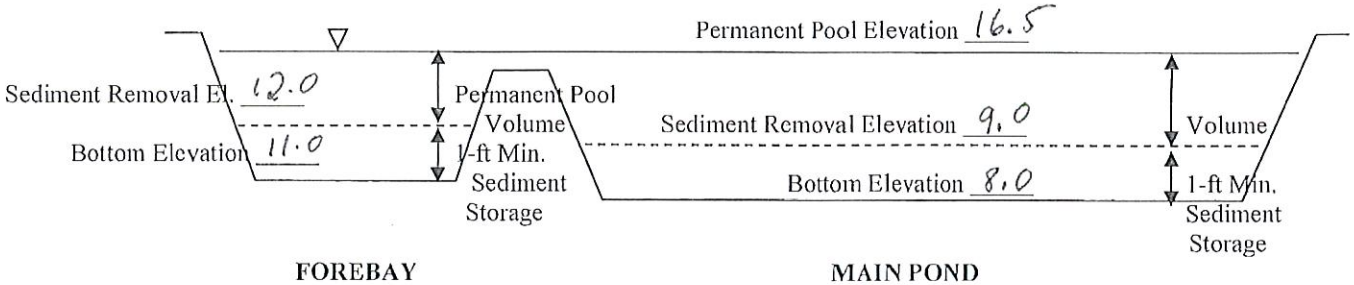
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair. (if applicable)	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. 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 4.5 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:Cypress Cove Apartments

BMP drainage basin number:4

Print name:Keith Walker

Title:CEO & President

Address:108 Professional Park Dr. Beaufort, NC 28516

Phone:252-422-3996

Signature: KWalker

Date: 6/6/17

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, Lauren R. Foshee Cox, a Notary Public for the State of NC, County of Carteret, do hereby certify that Keith Walker personally appeared before me this 6 day of June, 2017, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,

LAUREN R FOSHEE COX NOTARY PUBLIC CARTERET COUNTY, NC

Lauren R. Foshee Cox

SEAL

My commission expires 11/16/2019